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County of Alameda
Alameda County Flood
Control and Water
Conservation District
Zone 7 Water Agency

ALAMEDA
COUNTYWIDE CLEAN
WATER PROGRAM
FISCAL YEAR
2021/22 ANNUAL
REPORT TO THE
SAN FRANCISCO
BAY REGIONAL
WATER QUALITY
CONTROL BOARD

August 24, 2022

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List of Acronyms and Abbreviations

ACCWP	Alameda Countywide Clean Water Program
ACEH	Alameda County Environmental Health
AGOL	ArcGIS Online
BAMSC	Bay Area Municipal Stormwater Collaborative
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CCCWP	Contra Costa Clean Water Program
CEC	Chemicals of Emerging Concern
CEDEN	California Environmental Data Exchange Network
CRFS	California Recreational Fisheries Survey
CSCI	California Stream Condition Index
DA	District Attorney
DIY	Do It Yourself
DPR	Department of Pesticide Regulation
ECWG	Emerging Contaminants Work Group
EPA	Environmental Protection Agency
EPS	Expanded Polystyrene
FY	Fiscal Year
GI	Green Infrastructure
GIS	Geographic Information System
GSI	Green Stormwater Infrastructure
IIDC	Industrial and Illicit Discharge Control
IMR	Integrated Monitoring Report
IPM	Integrated Pest Management
LARPD	Livermore Area Recreation and Parks Department
LID	Low Impact Development
MPC	Monitoring and Pollutants of Concern

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MRP	Municipal Regional Permit
MRP 1	Municipal Regional Permit adopted in 2009
MRP 2	Municipal Regional Permit reissued in 2015
MRP 3	Municipal Regional Permit reissued in 2022
NDS	New Development Subcommittee
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
OWOW	Our Water Our World
PCBs	Polychlorinated Biphenyls
PMU	Priority Margin Unit
POC	Pollutants of Concern
RAA	Reasonable Assurance Analysis
RMC	Regional Monitoring Coalition
RMP	Regional Monitoring Program
SOP	Standard Operating Procedure
SSID	Stressor/Source Identification
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UCMR	Urban Creeks Monitoring Report
WY	Water Year

Preface

Provision C.17. of the San Francisco Bay Regional Water Quality Control Board's (Water Board's) Municipal Regional Stormwater Permit (MRP) (Order No. R2-2015-0049, NPDES No. CAS612008) and Provision C.22 (Order No. R2-2022-0018) require the Permittees covered by the MRP to submit Annual Reports by September 30 of each year that document the implementation of MRP requirements during the previous Fiscal Year (FY, July 1 through June 30). The MRP recognizes that the County of Alameda, the 14 cities within the County, the Alameda County Flood Control and Water Conservation District (District), and the Zone 7 Water Agency (Alameda Permittees) have joined together to form the Alameda Countywide Clean Water Program (ACCWP or Program). Each Alameda Permittee is submitting a separate Annual Report using the format entitled "Annual Report Template" approved by the Water Board Executive Officer. Those Alameda Permittee reports describe the activities conducted by each of the Permittees during the previous FY. This Program Annual Report describes the activities that were conducted by the Program, the Bay Area Stormwater Management Agencies Association (BASMAA) (now Bay Area Municipal Stormwater Collaborative (BAMSC)), and the California Stormwater Quality Association (CASQA) on behalf of the Alameda Permittees during the previous FY. This report is referenced in the Alameda Permittees' Annual Reports and is incorporated by reference into the Alameda Permittee Annual Reports.

Introduction

Background

The Alameda Countywide Clean Water Program (ACCWP or Program) is a consortium comprising the cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City; the County of Alameda; the Alameda County Flood Control and Water Conservation District (District); and the Zone 7 Water Agency (Member Agencies). The Program was established in 1991 through a Memorandum of Agreement in response to the San Francisco Bay Regional Water Quality Control Board's (Water Board's) issuance of a National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit (Permit) to the Member Agencies. The Program allows the Member Agencies to work together to more efficiently comply with many of the Permit requirements. The Program also works collaboratively with other jurisdictions in the Bay Area through the Bay Area Stormwater Management Agencies Association (BASMAA) (now Bay Area Municipal Stormwater Collaborative (BAMSC))¹, and throughout the State through the California Stormwater Quality Association (CASQA).

For the first several permit cycles, the Water Board issued permits on a county-by-county basis. In 2009, the Water Board decided to issue one permit to all the jurisdictions within the more urbanized counties in the Bay Area (Alameda, Contra Costa, San Mateo, and Santa Clara), as well as to the cities of Fairfield and Vallejo. This permit was referred to as the Municipal Regional Stormwater Permit or MRP 1. On November 19, 2015, the Water Board reissued the MRP. This reissued permit is referred to as MRP 2.

The effective start date of MRP 2 was January 1, 2016, and the 5-year permit term ended on December 31, 2020. The Program submitted an application for permit reissuance/report of waste discharge on July 1, 2020. The Regional Water Board accepted the application for permit reissuance and administratively extended the permit through the effective date of the reissued permit. The effective start date of MRP 3 was July 1, 2022. This Annual Report covers the Fiscal Year (FY) from July 1, 2021 to June 30, 2022 and is the last Annual Report under MRP 2.

Organization of the Report

This report is organized in order of the major MRP provisions, as listed below, unless there is nothing to report on that provision, or it is not applicable to the Program.

- C.1. Discharge Prohibitions and Receiving Waters Limitations: Nothing to report this reporting period
- C.2. Municipal Operations
- C.3. New Development and Redevelopment
- C.4. Industrial and Commercial Site Controls
- C.5. Illicit Discharge Detection and Elimination
- C.6. Construction Site Control
- C.7. Public Information and Outreach
- C.8. Water Quality Monitoring
- C.9. Pesticides Toxicity Control

¹ In 2021, BASMAA was dissolved as a 501(c)(3) non-profit organization. The Bay Area Municipal Stormwater Collaborative (BAMSC) was organized by the BASMAA Board of Directors to continue the information sharing and permittee advocacy functions of BASMAA in an informal manner after BASMAA's dissolution.

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- C.10. Trash Load Reduction
- C.11. Mercury Controls
- C.12. PCBs Controls
- C.13. Copper Controls: Relevant actions reporting in individual Permittee reports
- C.14. Bacteria Controls: Nothing reported; only applies to the City of Pacifica and County of San Mateo
- C.15. Exempted and Conditionally Exempted Discharges
- C.16. Discharges to Areas of Special Biological Significance: Only applies to San Mateo County

Within each section, the requirements being reported on are provided along with a description of Program, BASMAA, BAMSC, or CASQA activities conducted to comply with the Permit requirement.

Highlights of Significant FY 2021/22 Accomplishments

Our Water Our World



HELPING CONSUMERS FIND LESS-TOXIC PRODUCTS
FOR USE IN THEIR HOMES AND GARDENS

Our Water Our World (OWOW) is a highly successful point-of-purchase outreach campaign promoting the use of less-toxic pest control methods. As of FY 2021/22, the OWOW program is partnering with 31 retailers throughout Alameda. This includes nine Home Depot Stores. Three

new retailers were added to the program. A total of 22 training events were conducted, and 186 employees received the OWOW training. This is an increase of five training events and 50 associates trained relative to FY 2020/21. In addition, 14 public outreach events were held, including six online webinars, reaching a total of 1,919 attendees.



**Left: OWOW has a presence in 31 stores in Alameda County, including nine Home Depots.
Right: Brochure racks now include a poster with QR code for electronic distribution of fact sheets.**

Fred & Izzy Multicultural Adaptations

In FY 2021/22, the Program completed the adaptation of the four original Fred & Izzy videos into Spanish and Chinese. Content was adapted by a firm specializing in languages and culture, and the dialog was overdubbed and captioned. All videos have been promoted to Cantonese and Spanish speakers in Alameda County. The Chinese version resonated with one commenter, who praised the translation and thanked the program for providing the information in Cantonese. The videos can be found on the Program’s [YouTube page](#).



Screenshot of the Program’s Facebook Page Showing Comment on Cantonese-Language Video

Tap Into the Rain Webinar

In October 2021, the Program produced “Tap into the Rain,” a public webinar for homeowners on Rain Barrels, Rain Gardens, and Pervious Pavements. Several expert panelists presented slides to explain the features, provided instructions for webinar participants to implement each on their own property, and answered questions during the Q&A portion of the webinar. Participants also received a resource packet with fact sheets, referrals, and other materials. The webinar recording and Resource Packet download are available on the Program’s [Detail the Rain webpage](#).

The webinar was advertised via e-blast, social media promotions, and earned media and outreach partner shares. It was very well received, with 299 registered and 139 attending. The recording has received 286 views to date.



C.6 Joint Training with the Contra Costa Clean Water Program

Capitalizing on the opportunity provided by the transition to virtual training during the ongoing COVID-19 emergency, the Program worked collaboratively with the Contra Costa County Clean Water Program (CCCWP) to host a joint C.6 training workshop. During the workshop, inspectors from municipalities in both counties provided *Stories from the Field* that highlighted and shared their inspection experiences and tools. The workshop was attended by 133 municipal agency staff and 11 consultants (**Appendix B**).

PCBs and Mercury

The Program completed the *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction Update – 2022 (Appendix D)* and the *PCBs in Building Materials Management Program – Fiscal Year 2022 Data Summary (Appendix D)*. The *BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report was included with the FY 2019/20 Annual Report. Comments were received from the Regional Water Board on the *BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report in April 2021. A revised report was approved in January 2022 (**Appendix D**).

Provision C.2 Municipal Operations

Requirement: Provision C.2.e requires Permittees to implement Best Management Practices (BMPs) to control and reduce non-stormwater and polluted stormwater discharges to storm drains and watercourses during operation, inspection, and routine repair and maintenance activities from municipal facilities and infrastructure.

Program Activities:

Municipal Maintenance Subcommittee Meetings. The Program held three Municipal Maintenance Subcommittee meetings during the FY. Mike Wells, City of Livermore, was the chair of the Subcommittee. Subcommittee topics included MRP 3 revisions, updating Stormwater Pollution Prevention Plans (SWPPPs), managing blackwater issues, and municipal training options. A SWPPP template was provided to the Subcommittee as a starting point for agencies revising SWPPPs. The Subcommittee continues to provide a forum for member agencies to share information, benefit from other municipal staff field experiences, and receive information on products and trainings related to municipal maintenance activities.

Green Stormwater Infrastructure (GSI) Joint Workgroup. The Program held two Joint Workgroup meetings. Staff from the Cities of Livermore, Oakland, Alameda, Dublin, Newark and Union City and Program staff participated in the workgroup. The workgroup is developing a Standard Operating Procedure (SOP) to ensure consistent mapping, inspecting and maintenance of GSI facilities. Specifically, the SOP will provide municipalities with a roadmap to promote communication between departments during design, construction, and maintenance of GSI facilities. The SOP includes flow charts presenting the key touch points and actions to promote communication between departments at each project phase. The SOP addresses publicly built and publicly maintained projects; privately built projects that will be maintained by the municipality; and privately built and privately maintained projects. Comments to the draft SOP were obtained from the Municipal Maintenance and New Development subcommittees. A final SOP will be available in September 2022.

Provision C.3: New Development and Redevelopment

Requirement: Provision C.3 requires Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects.

Provision C.3.a.i.(4): Provision C.3 Training

Requirement: Provision C.3.a.i.(4) requires Permittees to provide training adequate to implement the requirements of Provision C.3 for staff including interdepartmental training.

Program Activities: To assist member agencies in complying with this provision, the Program provides C.3 training every other year. The FY 2021/22 workshop focused on C.6 Construction Inspector Training.

Provision C.3.b.: Regulated Projects

Requirement: Under Provision C.3.b, the Permittees must require all projects fitting the category descriptions provided in Provision C.3.b.ii (i.e., “Regulated Projects”) to implement low impact development (LID) source control, site design, and stormwater treatment, as required in Provisions C.3.c and C.3.d. Provision C.3.b.iv.(2) lists detailed information that must routinely be included in Annual Reports for Regulated Projects that are approved during the reporting period.

Program Activities: To assist member agencies in compiling the information on C.3 Regulated Projects that they are required to routinely report in accordance with Provision C.3.b.iv.(2), the Program continued to maintain the Project Tracking and Load Reduction Accounting Tool ArcGIS Online web application (AGOL Tool). This software tool includes a feature to support the reporting of C.3 Regulated Projects by the Program’s member agencies in the annual reports they prepare for compliance with the MRP. The Program completed the update to the AGOL Tool, including improving the C.3 App, to provide a short-form for data entry, which is anticipated to help member agencies improve efficiency in entering mandatory and commonly entered data. The Program began planning training on the new App, which will occur in 2022-2023.

Provision C.3.c.: Low Impact Development (LID)

Requirement: Provision C.3.c requires Permittees to implement LID source control, site design, and stormwater treatment requirements in all Regulated Projects.

Program Activities: To further assist member agencies in complying with the requirements in this provision, the Program maintains the Program’s C.3 Technical Guidance manual, which provides comprehensive guidance to project applicants and designers of municipal capital projects regarding the implementation of LID source control, site design, stormwater treatment, and hydromodification management measures. The last update to the manual was Version 7.1 of the C.3 Technical Guidance, posted to the Program’s Development [webpage](#) in February 2021. In anticipation of the reissuance of the MRP, the New Development Subcommittee (NDS) formed a workgroup and initiated work to update the C.3 Technical Guidance manual. Work commenced on the sections of the manual not directly related to the MRP changes, and work on the remainder of the manual is planned in 2022-2023. The release of the updated manual is anticipated in advance of the effective date of the changes to regulated projects in MRP 3.

Provision C.3.e.i.(2): In-Lieu Fee Compliance with Provision C.3.b

Requirement: Under Provision C.3.e.i.(2), Permittees may allow a Regulated Project to treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility and pay equivalent in-lieu fees to treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at a Regional Project.

Program Activities: To assist member agencies in providing an in-lieu fee option for projects in which such an option would achieve a net environmental benefit, the Program continued to coordinate with BAMSC regarding how other agencies are planning to develop in-lieu fee programs, including an ongoing grant-funded project by City of San Pablo, which will address Contra Costa County and could be a model for Alameda County.

Provision C.3.h.: Operation and Maintenance of Stormwater Treatment Systems

Requirement: Provision C.3.h requires each Permittee to implement an Operation and Maintenance (O&M) Verification Program in accordance with the requirements specified in Provision C.3.h.

Program Activities: The Program completed the update to its AGOL Tool, described in Provision C.3.b: Regulated Projects, to provide various improvements and continues work on a new Esri Field Map App for collecting data during O&M verification inspections required by Provision C.3.h. Work on the Program's NDS and Municipal Maintenance Subcommittee joint workgroup continued in FY 2021/22 to create a GSI SOP to provide municipalities with a roadmap to promote communication between departments during design, construction, and maintenance of GSI facilities. The final template SOP will be available in September 2022. (See discussion in Section Provision C.2 Municipal Operations.)

Provision C.3.j: Green Infrastructure Planning and Implementation

Requirement: Provision C.3.j of MRP 2 introduced requirements for each Permittee to complete and implement a Green Infrastructure (GI) Plan for the inclusion of LID storm drain infrastructure on public and private lands. The Plan is intended to serve as an implementation guide and reporting tool during this and subsequent Permit terms to provide reasonable assurance that urban runoff Total Maximum Daily Load (TMDL) waste load allocations (e.g., for the San Francisco Bay mercury and polychlorinated biphenyls (PCBs) TMDLs) will be met, and to set goals for reducing, over the long term, the adverse water quality impacts of urbanization and urban runoff on receiving waters.

Program Activities: To assist member agencies in complying with this provision, the Program conducted various activities, some of which are described here, while others address specific sub-provisions of C.3.j and are described below. The Program addressed topics related to GI at meetings of the NDS, including information sharing on the member agencies' activities to implement their GI Plans.

Provision C.3.j.i.(4): Green Infrastructure Plan Outreach and Education

Requirement: Provision C.3.j.i.(4) requires Permittees to conduct outreach and education on the requirements of Provision C.3.j and methods of implementation, including public outreach (both general outreach and targeted outreach to professionals involved in infrastructure planning and design); staff training (including planning, engineering, public works maintenance, finance, fire/life safety, and management staff); and education of appropriate Permittee elected officials (e.g., mayors, city council members, county supervisors, and district board members).

Program Activities: To assist member agencies in complying with this provision, the Program continued to make available to member agencies various tools developed earlier in the permit term. In addition, work continued on the inter-departmental SOP described in Section C.3.h, which is expected to be used to educate municipal staff.

Provision C.3.j.iii: Participate in Processes to Promote Green Infrastructure

Requirement: Provision C.3.j.iii requires Permittees to, individually or collectively, track processes, assemble and submit information, and provide informational materials and presentations as needed to assist relevant regional, State, and federal agencies to plan, design, and fund incorporation of GI measures into local infrastructure projects, including transportation projects. Issues to be addressed include coordinating the timing of funding from different sources, changes to standard designs and design criteria, ranking and prioritizing projects for funding, and implementation of cooperative in-lieu programs.

Program Activities: To support the member agencies in complying with this provision, the Program participated through BAMSC in sharing information about regional efforts and outreach. BAMSC and the NDS shared information on various workshops and seminars offered on GSI, including the Environmental Protection Agency's (EPA's) Green Infrastructure Webcast Series: Going Green for Good: Long-Term Considerations for Operations and Maintenance of Green Infrastructure, Navigating Federal Funding for Green Infrastructure and Nature-Based Solutions, and Recycle the Runoff Webinar: A Roadmap for Stormwater Diversions Webinar. Additionally, meetings of the NDS included information-sharing regarding GSI implementation, including the sharing of information provided through the BAMSC Development Subcommittee.

Provision C.3.j.iv: Tracking and Reporting Progress

Requirement: Provision C.3.j.iv requires Permittees to, individually or collectively, develop and implement regionally consistent methods to track and report implementation of GI measures including treated area and connected and disconnected impervious area on both public and private parcels within their jurisdictions. The methods shall also address tracking needed to provide reasonable assurance that waste load allocations for TMDLs, including the San Francisco Bay PCBs and mercury TMDLs, and trash, are being met.

Program Activities: To assist member agencies in complying with this provision, the Program continued to support the Alameda Countywide GSI Mechanism ("GSI Mechanism"), for its member agencies to use in prioritizing and mapping areas for planned and potential GSI projects. The mechanism consists of the Alameda Countywide Multi-Benefit Metrics Prioritization Protocol ("prioritization protocol") interface, in conjunction with the AGOL Tool described above, under the heading Provision C.3.b: Regulated Projects. The member agencies continued to use the AGOL Tool to track and map information on GI measures implemented on public and private parcels.

Additional Activities

The Program held four meetings of the NDS, which is currently chaired by Daniel Matlock, City of Fremont. The NDS provides a valuable venue for member agency staff members to share information, benefit from lessons learned by others, and receive training on permit requirements and products developed by the Program related to Provision C.3, as well as Provision C.6, Construction Site Control, and Provision C.13.a, Manage Waste Generated from Cleaning and Treating of Copper Architectural

Features. The NDS initiated an update of the Program's Bay Area Hydromodification Management review checklist in response to identified needs to update the document to improve reviews of hydromodification management projects (C.3.g). The NDS completed an update to the biotreatment soil media supplier list and posted it to the Program's Development [webpage](#) in August 2021. Program staff continued to provide on-call support to member agency requests for assistance regarding Provision C.3 compliance. Additionally, significant Program and member agency staff resources during FY 2021/22 were dedicated to the reissuance of the MRP, which included participation in numerous technical workgroups on GSI and C.3 issues, as well as keeping agency staff informed of proposed changes and the adopted permit.

Provision C.4: Industrial and Commercial Site Controls

Provision C.4.d.: Inspections

Requirement: Provision C.4.d requires Permittees to conduct inspections according to their Business Inspection Plan and Enforcement Response Plan to prevent stormwater pollution.

Program Activities: To assist member agencies in complying with this provision, the Program produced the following outreach pieces: 1) finalized “Tip Sheet for Mobile Fleet Services Providers,” 2) finalized “Tip Sheet for Businesses,” and 3) developed “Draft Tip Sheet for Small Construction Contractors.” The Tip Sheets for Grocery Stores/Supermarkets, Landscape Contractors, Machine Shops and Power Washers were translated into Spanish and Chinese. All the final Tip Sheets are available on the Program’s Businesses [webpage](#). See **Appendix A** for the finalized Tip Sheets described above.

Provision C.4.e.: Staff Training

Requirement: Provision C.4.e requires Permittees to provide focused training for industrial and commercial site inspectors and illicit discharge detection and elimination inspectors annually. Trainings may be program-wide, region-wide, or Permittee specific.

Program Activities: To comply with this provision, the Program’s Industrial and Illicit Discharge Control Subcommittee (IIDC) sponsored a virtual business inspectors training workshop on April 5, 2022. The workshop included the following presentations:

- What to Expect in MRP 3.0: Upcoming Stormwater Permit Requirements;
- Oakland Business Inspection Program Case Studies;
- Enforcement Case Studies; and
- Illicit Discharge Enforcement Panel Discussion.

Presentation materials from the workshop are available to Member Agencies for use as in-house training. Evaluation surveys showed that the training met expectations. Overall, attendees deemed the presentations informative and useful, with an average rating of 3.85 out of 4. See **Appendix A** for the workshop report that includes the agenda, attendance list, and evaluations.

Additional Activities

The Program held four IIDC Subcommittee meetings during the FY. Jose Soto, Union Sanitary District, was the chair of the Subcommittee and Aileen Mendoza, County Department of Environmental Health, was the vice-chair. On average, 18 people attended the meetings and shared information on MRP compliance and activities. The IIDC provides a valuable venue for member agency staff to share information, benefit from lessons learned by others, and receive information on permit requirements and products developed by the Program related to Provision C.4, as well as Provision C.5 Illicit Discharge Detection and Elimination, Provision C.13.b. Manage Discharges from Pools, Spas and Fountains that Contain Copper-Based Chemicals, Provision C.13.c Copper Source Control for Industrial Sources, and C.15. Exempt and Conditionally Exempt Discharges.

Provision C.5: Illicit Discharge Detection and Elimination

Provision C.5.c.: Spill, Dumping and Complaint Response Program

Requirement: Provision C.5.c requires Permittees to implement a program to respond to spills, dumping and complaints.

Program Activities: To assist member agencies in complying with this provision, the Program maintains a list of member agencies and a point of contact for reporting spills on the Program's Report a Spill [webpage](#). The list is periodically updated.

Provision C.5.e.: Control of Mobile Sources

Requirement: Provision C.5.e requires Permittees to implement a program to reduce the discharge of pollutants from mobile businesses. The Program must include standard BMPs, an enforcement strategy, inventory, outreach strategy and inspections, as needed.

Program Activities: The categories of mobile businesses currently addressed by the Program include automobile washing, power washing, steam cleaning, carpet cleaners and pet care providers. These mobile business categories have minimum standards and BMPs identified in a series of five Tip Sheets developed by the Program: "Fundraising Car Washes," "Tips for Carpet Cleaners," "Tips for Pet Care Providers," "Tips for Power Washers" and "Tips for Mobile Businesses." During this FY, the "Tip Sheet for Power Washers" was translated into Spanish and Chinese. All the Tip Sheets are available on the Program's Mobile Businesses [webpage](#).

Outreach to Mobile Businesses: The Program developed a countywide mobile business inventory from individual agencies, internet searches, the BASMAA surface cleaners list, Santa Clara Valley Urban Runoff Pollution Prevention Program inventory, and the CCCWP inventory in FY 2016/17. A transmittal letter and the appropriate Tip Sheet was sent to the businesses on the countywide inventory in FY 2016/17. The countywide inventory is updated periodically with businesses identified by municipal inspectors. The inventory is available on the IIDC Subcommittee's members-only webpage.

Mobile Business Enforcement Strategy: In FY 2017/18, the IIDC Subcommittee worked with the Alameda County District Attorney's (DA) office to develop an enforcement strategy for mobile businesses. When City and County IIDC inspectors issue an enforcement action to a mobile business they will also complete a Referral Form for the DA. The DA's office will keep a list of mobile businesses that receive enforcement actions from all jurisdictions in Alameda County. If an individual business receives more than one enforcement action, even if they are from different jurisdictions, the DA's office may choose to take action. During this FY, the DA Referral Form was updated with the new DA Inspector contact information and emailed to the Subcommittee for reference and use. BASMAA maintained a Surface Cleaner Training and Recognition Program that educated mobile surface cleaners about proper BMPs to protect water quality and allows them to market themselves as "recognized" cleaners. BAMSC will continue this program and maintain the [website](#) with the BMPs, training resources and recognized cleaners list.

Additional Activities

See C.4.e for a description of illicit discharge related training that was included in the IIDC workshop. Illicit Discharge Detection and Elimination Program activities are also discussed at the IIDC Subcommittee meetings (see C.4, Additional Activities).

Provision C.6: Construction Site Control

Provision C.6: Construction Site Control

Requirement: Provision C.6.b requires each Permittee to implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with each Permittee's respective enforcement response plan, to prevent construction site discharges of pollutants into storm drains.

Program Activities: To assist member agencies in complying with this provision, the Program included discussions of Provision C.6 requirements at meetings of the NDS, in which member agency staff share information, learn from the experience of other agencies, and receive guidance and training from the Program. Examples of C.6-related topics addressed at NDS meetings include discussing preparations for the wet season, planning the FY 2021/22 C.6 training, and providing updates on the proposed reissuance to the statewide Construction Stormwater General Permit. Additionally, Program staff continued to provide on-call support to member agency requests for assistance regarding Provision C.6 compliance.

Provision C.6.e.ii.(1): Wet Season Notification

Requirement: Provision C.6.e.ii.(1) requires Permittees to, by September 1 of each year, remind all site developers and/or owners disturbing one acre or more of soil, hillside projects, and high priority sites to prepare for the upcoming wet season.

Program Activities: To assist member agencies in complying with this provision, an email notification was sent to NDS members on August 6, 2021, regarding the requirement for member agencies to provide pre-wet season notifications by September 1, 2021, to all site developers or owners of hillside sites, high priority sites, and sites disturbing one acre or more of soil, in order to prepare for the upcoming wet season.

Provision C.6.f: Staff Training

Requirement: Provision C.6.f requires Permittees to provide training at least every other year to municipal staff responsible for conducting construction site stormwater inspections.

Program Activities: To assist member agencies in complying with this provision, the Program held a joint virtual Construction Stormwater Training in collaboration with the CCCWP on March 30, 2022. The presentations provided foundational C.6 information, pending updates to the Construction General Permit and the MRP, and inspection case studies. The case studies were presented by three experienced inspectors, followed by an extended panel discussion with the participants. The workshop was attended by 133 municipal agency staff (81 of which were from Alameda County agencies) and 11 consultants. The post workshop report is included in **Appendix B**.

Provision C.7: Public Information and Outreach

Provision C.7.b.: Outreach Campaigns

Requirement: Provision C.7.b requires Permittees to participate in or contribute to outreach campaigns, with the goal of significantly increasing overall awareness of stormwater runoff pollution prevention messages and behavior changes in target audiences.

Program Activities: To comply with this provision, the Program conducted the following activities.

This year’s public outreach campaign effort included the production and promotion of 13 Fred & Izzy videos covering all the strategic messaging goals: litter, promoting the OWOW program, car washing, surface hosing, fishing, mercury bulb pollution, pet waste, hiring a certified eco-friendly pest contractor, and general watershed/stormwater education. In Spring and Summer of 2022, eight of these videos were specifically promoted through a



strategy that used a mix of smaller, digital promotions on the usual low-cost media, such as Facebook, Google, and YouTube and the addition of new channels, including TikTok, Pandora, and streaming video. In addition to Fred & Izzy, the Program continued working with the OWOW team to successfully increase attendance of OWOW webinars, which are a key mechanism for promoting Program messages related to home and garden practices.

Fred & Izzy Videos & Promotions

The Program finished production of 13 Fred & Izzy videos in April 2022.

As of FY 2021/22, the YouTube Channel has 207 subscribers, an increase of 69 since FY 2020/21. Combined, all Fred & Izzy videos were viewed on YouTube over 709,400 times between July 2021 and June 2022. The videos are available at the Program’s [YouTube Channel](#).

Spring 2022 Campaign Summary

	YouTube Views	Facebook Reach	TikTok Views	Pandora Listeners	Streaming Views
Total	110,948	73,840	393,753	78,167	208,114

Spring 2022 Campaign Details

Date	Video	YouTube	Facebook	TikTok	Pandora	Streaming
April 2022	Mercury Bulb	Views: 8,947 Impressions: 47,233	Reach: 13,644 Impressions: 25,535	N/A	N/A	N/A
April 2022	General Program	Views: 44,630 Impressions: 95,147	Reach: 17,192 Impressions: 28,639	Views: 145,329 Impressions: 154,930	Impressions: 83,848 Listeners reached: 45,543	Views: 32,644 Impressions: 33,621
April 2022	Litter 1	Views: 19,686 Impressions: 85,578	Reach: 460 Impressions: 485	Views: 149,630 Impressions: 159,367	N/A	Views: 16,499 Impressions: 16,877
April 2022	OWOW	Views: 15,120 Impressions: 25,259	Reach: 3,770 Impressions: 4,596	N/A	Impressions: 55,910 Listeners reached: 32,624	Views: 32,920 Impressions: 33,730
May 2022	Fishing Advisory	Views: 518 Impressions: 46,040	Reach: 6,808 Impressions: 9,069	N/A	N/A	Views: 16,580 Impressions: 16,891
May 2022	Pest Contractor	Views: 3,735 Impressions: 24,601	Reach: 7,331 Impressions: 8,856	N/A	N/A	Views: 33,156 Impressions: 33,662
May 2022	Dog Poop	Views: 17,620 Impressions: 28,340	Reach: 23,860 Impressions: 29,776	Views: 98,794 Impressions: 106,361	N/A	Views: 49,680 Impressions: 50,487
June 2022	Car Wash	Views: 692 Impressions: 3,394	Reach: 775 Impressions: 819	N/A	N/A	Views: 26,635 Impressions: 26,982

Multi-lingual Fred & Izzy Videos

During FY 2021/22, the Garden/Integrated Pest Management (IPM) video was translated into [Spanish](#) and [Cantonese](#). Each video is promoted in its respective language. The Cantonese video received favorable comments on Facebook.

The “Bay Begins at Your Front Door” Brochure and Digital Interactive Game

In FY 2021/22, the Program finalized and promoted a digital version of the “[Bay Begins at Your Front Door](#)” brochure. Brochures were printed and distributed to member agencies. A [digital interactive game](#) was also developed and promoted via Facebook and digital ads. The game page has been visited 1,186 times.

Litter Hurts and Coastal Cleanup Promotion, September 2021

During Coastal Cleanup Month (September 2021), many local jurisdictions once again offered in-person events. In addition, the State continued to promote do-it-yourself (DIY) cleanups. The Program compiled and promoted the local events, as well as the DIY option, via its website, E-blasts, and social media.

Date	Campaign	Promo Activities	Results
Aug/Sep 2021	Coastal Cleanup Day 2021 News Release page Event listing page E-blast	News release, E-blast, Facebook posts, Tweets	E-blast: 1,181 recipients 20.5% open rate 17.8% click rate
Sep 1-16	Facebook Post <i>Happy #CoastalCleanupMonth!</i>	Facebook Ad	Reach: 14,409 Engagements: 349 Shares: 16 Clicks: 245

Earth Day, Spring 2022

In-person Earth Day activities resumed during FY 2021/22, including clean-ups, beautification events, and Earth Day fairs. The Program promoted these local events via the website, E-blasts, and social media. In addition, the website offered “evergreen” activity downloads for adults and kids to protect waterways from home.

Date	Outreach Tactic	Promo Activities	Results
Apr-May 2022	Earth Day 2022 Activities download page E-blast	E-blast to 1,175 contacts Facebook Posts, Tweets	2,687 unique pageviews with avg. 1 min on page E-blast: 1,175 recipients 34.3% open rate 7.3% click rate

Date	Outreach Tactic	Promo Activities	Results
April 2022	Happy Earth Day Post using Fred & Izzy General Snippet	Facebook Ad	Reach: 6,531 Engagements: 1,478 Shares: 2 Clicks: 465
April 2022	Happy Earth Day Post using Fred & Izzy General Snippet	Instagram Ad	Reach: 10,748 Engagements: 2,420 Clicks: 79 Shares: 10

Fishing Advisory Campaign

The Program ran a digital campaign to promote awareness of fish consumption health advisories. The ads targeted fishing and outdoor enthusiasts and included Google Display Ads, Facebook, Instagram Reels, YouTube, and streaming video. In addition to digital advertising, a paid article and advertisement in the Fish Sniffer Online Magazine reached 30,000 readers interested in fishing in California. Fish Sniffer also sent an E-blast to its full subscriber list with Program-only content. Digital ads linked to the Program’s [Fishing and Health page](#). The Fish Sniffer ads directed viewers to the State of California’s Fishing Advisory page.

Date	Campaign Content	Promo Activities	Results
May/June 2022	Fishing in the Bay Promote awareness of fish consumption health advisories. Fishing and Health content landing page	Web Page	Website: 290 pageviews with avg. 2:22 min on site
May 2022	30-second Video	Facebook	Reach: 6,808 Shares: 1 Clicks: 6
May 2022	30-second Video (vertical format)	Instagram Reels (Organic post)	Views: 1,767 Likes: 59 Shares: 9
May 2022	30-second Video	YouTube	Impressions: 46,000 Video views: 518
May 2022	30-second Video	Streaming Video	Completed Views: 16,580 (100% of video watched)
June 2022	Print Ad, Article	Fish Sniffer Magazine Advertising and E-blast	Reach: 30,000 subscribers

Hire a Certified Eco-Friendly Pest Contractor Ad Campaign

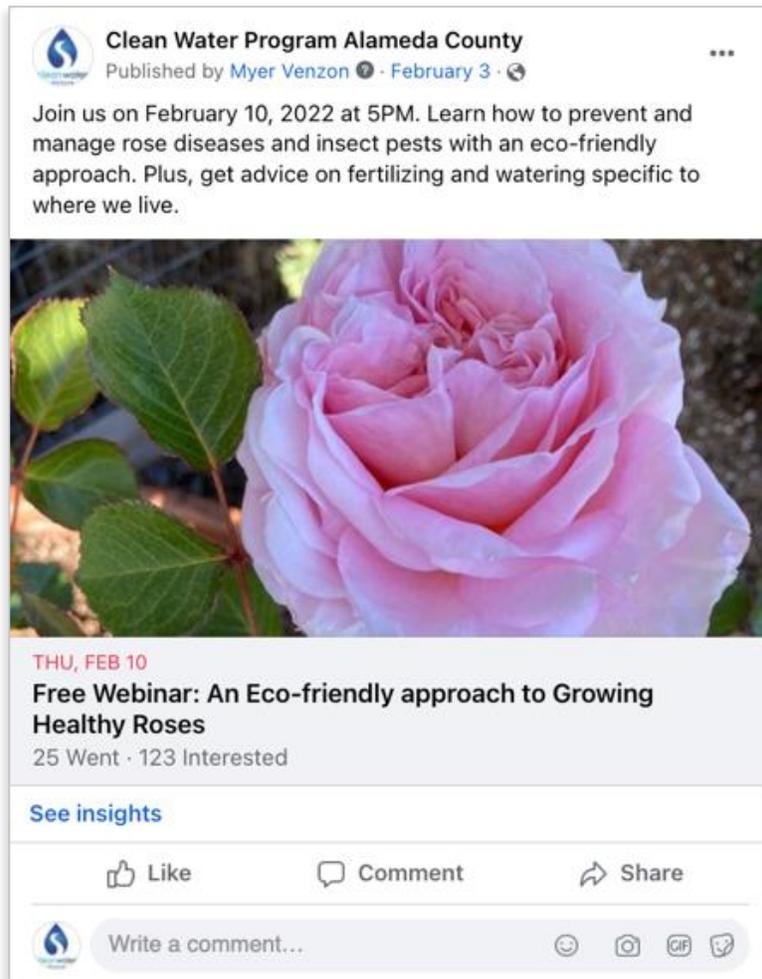
In May 2022, the Program re-ran its ad to promote the services of certified pest control professionals that use less-toxic methods. The ads included Facebook, Instagram Reels, YouTube and streaming video.

Date	Campaign Content	Promo Activities	Results
May/June 2022	Pest Control at Home Promote the hiring of certified, less-toxic pest professionals. Pest Control at Home Content landing page	Web Content	Website: 186 pageviews with avg. 1:43 min on site
May 2022	30-second Video Ad	Facebook	Reach: 7,331 Engagements: 113 Shares: 2 Clicks: 4
May 2022	30-second Video Ad (vertical format)	Instagram Reels (Organic post)	Views: 300 Likes: 7
May 2022	30-second Video Ad	YouTube	Impressions: 24,601 Video views: 3,735
May 2022	30-second Video Ad	Streaming Video	Completed Views: 33,156 (100% of video watched)

Our Water Our World Webinar Promotions

The Program’s support of the OWOW regional outreach efforts is an important way to reach people “on the ground” by influencing their choice of home and garden products and promoting non-toxic ways to maintain yards and gardens. In FY 2021/22, the Program continued its successful series of organic gardening webinars in lieu of in-person classes. The C.7/Public Outreach team supported this effort with an integrated promotional strategy that was instrumental in driving attendance of these webinars.

The Program promoted each webinar with a series of E-blasts, Facebook ads, and organic social media content and earned coverage across various local online channels, including gardening groups and municipal e-newsletters. All announcements included links to the webinar registration page.



Screenshot of the Program’s Facebook Page Showing Ad for Gardening-Related Webinar

Date	Webinar Title	Promotions	Results
January 2022	Webinar #1: How to Manage Weeds Safely and Effectively	E-blast, Facebook Posts, Ads, and Tweets	E-blast Reach: 1,203 Opens: 358 Social Reach: 9,134 Registrations: 317 Attendance: 173
February 2022	Webinar #2: An Eco-Friendly Approach to Growing Healthy Roses	E-blast, Facebook Posts, Ads, and Tweets	E-blast Reach: 1,191 Opens: 365 Social Reach: 8,444 Registrations: 93 Attendance: 55
March 2022	Webinar #3: Soil Basics	E-blast, Facebook Posts, Ads, and Tweets	E-blast Reach: 1,187 Opens: 376 Social Reach: 6,868 Registrations: 194 Attendance: 119
April 2022	Webinar #4: Growing Food the Eco-Friendly Way	E-blast, Facebook Posts, Ads, and Tweets	E-blast Reach: 1,184 Opens: 368 Social Reach: 6,800 Registrations: 85 Attendance: 45
May 2022	Webinar #5: Spring Pest Management	E-blast, Facebook Posts, Ads, and Tweets	E-blast Reach: 1,170 Opens: 374 Social Reach: 6,228 Registrations: 140 Attendance: 103
June 2022	Webinar #6: Bring in the Pollinators	E-blast, Facebook Posts, Ads, Events and Tweets	E-blast Reach: 1,167 Opens: 396 Social Reach: 7,815 Registrations: 130 Attendance: 74

Provision C.7.c.: Stormwater Pollution Prevention Education

Requirement: Provision C.7.c: Permittees shall continue to maintain a point of contact to provide the public with stormwater pollution prevention information.

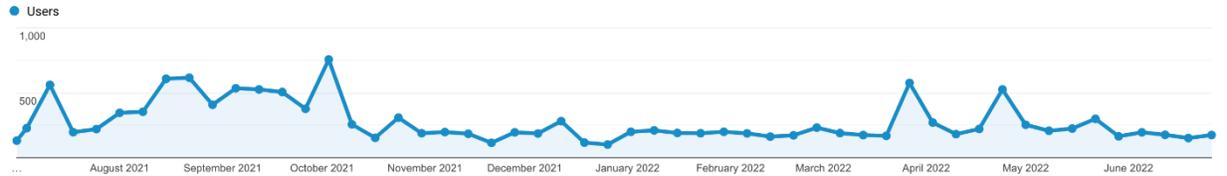
Program Activities: To comply with this provision, the Program conducted the following activities.

Website and Website Promotions

The Program’s website can be found at www.cleanwaterprogram.org. Besides comprehensive content on commercial stormwater pollution prevention issues, compliance guidelines and resources, the website offers information on the local watersheds and monitoring, the Program’s school outreach, and content tailored to residents, promoting everyday practices to help prevent stormwater pollution. Focus areas include toxics reduction and runoff prevention in home and garden, less-toxic pest control at home, car care, litter prevention, healthy fish consumption, and local volunteer opportunities. Users can connect with the Program through email or phone, listed in the “Contact Us” section.

In FY 2021/22, the website received 16,622 visits ("sessions"). During those sessions, a total of 34,097 pageviews occurred. That means an average of just over two pages (2.05) were viewed during each session. The graphs below show sessions per week during the reporting period.

Website traffic July 1, 2021 through June 30, 2022:



The site receives steady “baseline” traffic to pages tailored to the commercial audience, due to compliance requirements. “Peaks” in traffic are generally due to residential traffic that ebbs and flows with seasonal and topic-specific promotions. Throughout the reporting period, the Program launched several outreach efforts to drive traffic to specific portions (pages) of the residential website content.

Typically, efforts included one or more E-blasts to the Program’s e-news subscribers and social media posts. The campaigns described in section C.7.b. also used online advertising (YouTube video ads, Google display ads, search ads, text ads, and Facebook and TikTok ads), resulting in periods of particularly high website traffic in July 2021, September through October 2021, and April 2022. The peaks in the graph above correspond to Program webinar promotions and the roll-out of the new Fred & Izzy Snippet videos.

About the E-blasts: The Program maintains an email database of currently 1,293 active contacts. Residents can opt into receiving E-blasts via a signup form on the website or at outreach/tabling events.

In addition to sending E-blasts to the Program’s email list, the content was pitched directly to selected local media outlets to promote coverage. Other contacts, including neighborhood and creek groups, social media interest groups, and member cities helped increase the reach of Program announcements via their own E-blast, newsletter, or website listing, and/or by sharing a social media post.

Social Media

The Program has a presence on Facebook, Twitter, and Instagram, with the Facebook page content managed on a weekly basis. This year, the Program added a TikTok channel to reach younger viewers, since that platform is popular with Gen Z (age 10-20). The posting strategy includes promoting Program projects, events, and issues through original content, sharing member agency posts, monthly paid promotions, and posts about local watershed related events. Posts were made weekly from 7/1/21–6/30/22.

Facebook: <https://www.facebook.com/CleanWaterProgram>

The Program’s Facebook page currently has 1,403 followers. During the reporting period, the page reached 185,123 users. Paid promotions reached over 157,883 people and received 3,132 link clicks.

Instagram: <https://www.instagram.com/cleanwaterprog/>

The Program’s Instagram page currently has 238 followers. In the period from July 1, 2021 through June 30, 2022, the page had 46 posts and reached 32,799 accounts with 573 interactions and 50,800 impressions. Paid promotions resulted in 67% of the impressions.

Twitter: <https://twitter.com/CleanWaterProg>

The Program has 100 followers on Twitter. During FY 2021/22, the Program increased the number of tweets to 50, up from 44 in FY 2020/21. Tweets received over 24,025 impressions, 78 link clicks, 40 retweets, and 70 likes.

TikTok: https://www.tiktok.com/@fred_and_izzy

The Program's TikTok account currently has 121 followers. During FY 2021/22, three vertical format snippets were posted and promoted, and received a total of 420,658 impressions 2,156 likes, 48 shares, 45 comments, and 105 link clicks.

Provision C.7.e.: Watershed Stewardship Collaborative Efforts

Requirement: Provision C.7.e. requires permittees to encourage and support development of grassroots watershed groups or engagement of an existing group, such as a neighborhood association, in watershed stewardship activities.

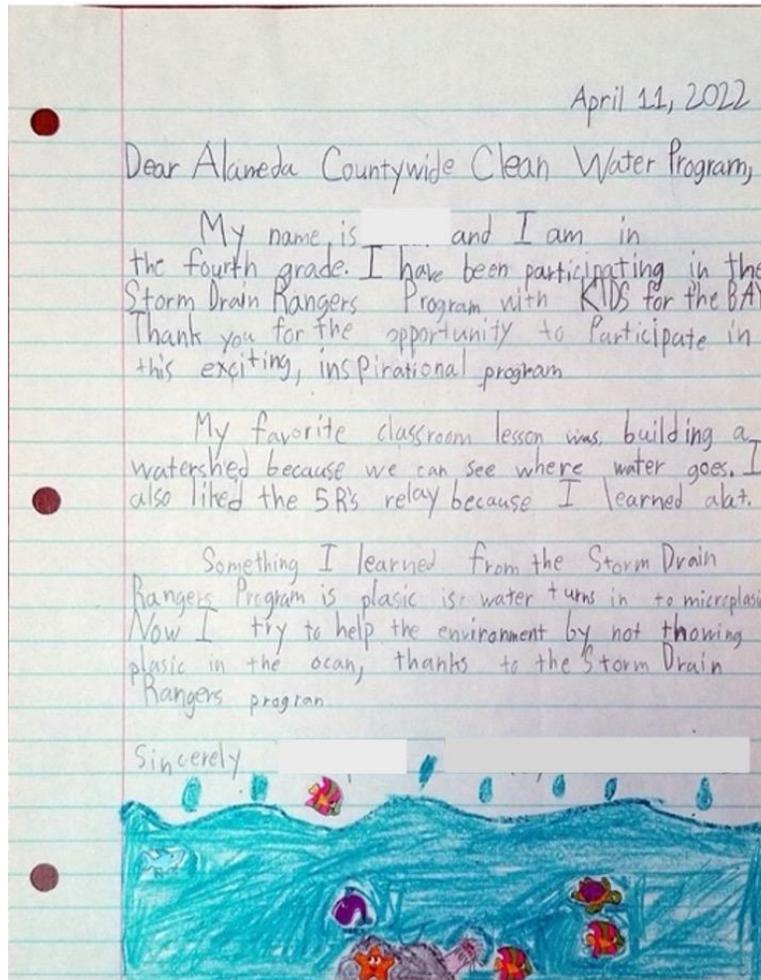
Program Activities: To fulfill this requirement, the Program hosted a webinar on October 7, 2021, featuring local stewardship groups Latino Outdoors, East Bay Regional Parks Foundation, I Heart Oakland Estuary and Friends of Sausal Creek, to promote responsible outdoor recreation in Alameda County watersheds. In return for participating, each group received a \$2,500 grant to promote the webinar and develop presentation content incorporating messages about pollution prevention practices for recreational activities such as hiking, kayaking, and fishing. The webinar included a segment on a different section of local watersheds (hills, creeks, reservoirs/lakes, and the estuary/Bay). The recorded webinar is available on the Program's [YouTube channel](#).

In addition to awarding these grants, the Program sponsored a Bringing Back the Natives Garden Tour, where materials such as non-toxic pest control recipe cards and native wildflower seeds were distributed to a highly motivated target audience. The Program also continued to promote volunteer opportunities and provided social media amplification to watershed stewardship groups.

Provision C.7.f.: School-Age Children Outreach

Provision C.7.f. requires Permittees to implement outreach activities designed to increase awareness of stormwater and/or watershed message(s) in school-age children (K through 12). During FY 2021/22, school outreach was performed by three of the environmental education organizations contracted by the Program: Kids for the Bay, Livermore Area Recreation and Parks Department (LARPD), and Caterpillar Puppets.

Kids for the Bay ran the "Storm Drain Rangers" program in 13 classrooms in six elementary schools, where they conducted cleanups and litter audits, assemblies and five classroom lessons on storm drains, litter, and water pollution. In total, they collected 4,634 pieces and 249 gallons of trash. Environmental stewardship activities totaled 1,197 hours.



Example Student Thank-You Letter for the “Storm Drain Rangers” Program

LARPD presented a series of watershed education programs to fourth and fifth grade classes in eastern Alameda County with an anti-littering focus. They gave 21 lessons at two schools, reaching a total of seven classes over the course of the year. The activities included field trips to a local creek. One of the new schools in this program serves disadvantaged students.

Caterpillar Puppets continued to offer video programs via Zoom as well as some in-person events. They presented at 37 Alameda County schools over the course of the school year. The program teaches the following topics: what is a watershed, what is a storm drain, how to keep our watershed clean, what causes watershed pollution, and how can such pollution be reduced or stopped. Caterpillar Puppets addresses the types of pollution, with a special emphasis on litter, that affect local waterways, including the animals of the creek, bay, and ocean. The follow up Q&A introduces children to the idea of campus clean-up clubs and picking up litter at school as a first step in making a difference and stopping pollution.

Provision C.8: Water Quality Monitoring

All water quality monitoring activities required by Provision C.8 are coordinated regionally through the Regional Monitoring Coalition (RMC), a collaborative effort of MRP Permittees under the auspices of BASMAA. The dissolution of BASMAA occurred in June 2021. Coordination of monitoring activities continues through ongoing communication of the former BASMAA member agencies and their representatives under BAMSC via a Steering Committee and Subcommittees.

Provision C.8.a.: Compliance Options

Requirement: Provision C.8.a outlines mechanisms that Permittees may choose to meet the monitoring requirements in Provision C.8.

Program Activities: As reported during the previous permit term, all Alameda Permittees notified the Water Board in 2010 that they would participate in the RMC and that monitoring would be coordinated through the Program. This agreement has been confirmed through authorization of the Program's annual work plans. Program staff and consultants continued to coordinate monitoring activities through meetings and communications of the RMC Work Group and the BAMSC Monitoring and Pollutants of Concern Subcommittee (MPC).

Provision C.8.b.: Monitoring Protocols and Data Quality

Requirement: Provision C.8.b requires that, where applicable, monitoring data must be Surface Water Ambient Monitoring Program (SWAMP) comparable.

Program Activities: To comply with this provision, the Program continued to ensure that monitoring activities follow the RMC Quality Assurance Project Plan and SOPs, as updated by the RMC in FY 2015/16 to incorporate changes in the MRP requirements and SWAMP standards. The Program conducted quality control review of the monitoring reports prepared by its consultants.

Provision C.8.c.: San Francisco Estuary Receiving Water Monitoring

Requirement: Provision C.8.c requires that Permittees participate in implementing an estuary receiving water monitoring program, at a minimum equivalent to the San Francisco Estuary Regional Monitoring Program (RMP) by contributing their fair share financially on an annual basis.

Program Activities: To comply with this provision, the Program made its fair-share annual contributions to the RMP during the reporting period. The Program participated in stakeholder oversight of the RMP through BAMSC representation on the Steering and Technical Review Committees; Sources, Pathways and Loadings Workgroup; and additional Strategy Teams for PCBs, Mercury, Small Tributaries, Sport Fish and Nutrients. Program and Permittee staff actively participated as BAMSC representatives to the following RMP work groups or teams:

- Sources, Pathways and Loadings Work Group;
- Small Tributaries Loading Strategy Team; and
- Emerging Contaminants Work Group (ECWG).

Participation included attending meetings or conference calls, reviewing technical reports and work products, reviewing articles included in the RMP's annual update, and providing general program direction to RMP staff.

Provision C.8.d.: Creek Status Monitoring

Requirement: Provision C.8.d requires Permittees to conduct Creek Status monitoring to answer the following questions:

- Are water quality objectives, both numeric and narrative, being met in local receiving waters, including creeks, rivers, and tributaries?
- Are conditions in local receiving waters supportive of or likely to be supportive of beneficial uses?

Program Activities: To comply with this provision, the Program implemented all Creek Status Monitoring for Water Year 2022 (WY, the 12-month period ending September 30, 2022) in coordination with other RMC programs and according to the seasonal requirements in the previous and current permits. Results will be reported in the Urban Creeks Monitoring Report (UCMR) to be submitted by March 31, 2023, as required by Provision C.8.h.

Provision C.8.e.: Stressor/Source Identification (SSID) Projects

Requirement: Provision C.8.e requires Permittees to initiate Stressor/Source Identification (SSID) projects as follow up when monitoring results exceed certain values or criteria listed for parameters in C.8.d and C.8.g. This provision describes a process for selecting and conducting SSID projects, oriented toward taking action(s) to alleviate stressors and reduce sources of pollutants to receiving waters. Permittees are required to:

- Review results of monitoring (C.8.d and C.8.g) annually and maintain a list of all results exceeding thresholds described therein. Pollutant of Concern Monitoring (C.8.f) results may be included on the list as appropriate.
- Select follow up SSID projects from the list developed in C.8.e.i. based on criteria such as magnitude of threshold exceedance; parameter (or a variety of parameters); likelihood that stormwater management action(s) could address the exceedance; and similar priorities. Permittees who conduct and report SSID projects through a regional collaborative (e.g., the RMC) shall collectively initiate a minimum of eight new SSID projects (minimum of one for toxicity) during the Permit term.
- Conduct site specific SSID project(s) (or non-site specific if the problem is widespread) in a stepwise process described in C.8.e.iii. A minimum of half the required number of SSID projects must be started (i.e., at a minimum have a workplan) by the third year of the permit term, with the goal of completing the technical SSID investigation step 2 for at least half of the projects by the end of the permit term.
- Submit an SSID status report in each UCMR which summarizes the actions taken in regard to C.8.e.i-iii.

Program Activities: To comply with this provision, the Program provided a final report for two SSID projects and a status report for one active SSID project, as described below.

Castro Valley Creek Sediment Quality – This SSID project was initiated in the previous permit term based on a combination of triggers including a “very poor” index of biological integrity score and elevated sediment chemistry concentrations at Site 204R00047. However, the WY 2017 progress report confirmed that the pollutant concentrations in Castro Valley Creek sediments are typical of urbanized areas in California. Additional monitoring was conducted in WY 2018, and the project was closed in

October 2018. The Final Report for this SSID project was included in the March 2020 Integrated Monitoring Report (IMR).

Exploring California Stream Condition Index (CSCI) Results and the Outcomes of Restoration Activities Along Sausal Creek – This recently initiated SSID project investigated low CSCI scores and the impacts of restoration activities along Sausal Creek, which has a watershed encompassing nearly 2,700 acres in Oakland. The SSID study evaluated whether benthic macroinvertebrate metrics improved from pre-project conditions in reaches with restoration projects and assess whether biological conditions associated with previously measured sub-optimal CSCI scores are a function of recovery/maturation stage or are due to previously unidentified stressors. Data collection and sampling began in Spring 2018, and the first SSID annual progress report was issued in the WY 2018 UCMR in March 2019. Data collection and sampling continued in WY 2019 and did not reveal a stressor/source. The Final Report for this SSID project was included in the March 2020 IMR.

Investigating Contributors to Nutrient/Eutrophication Biological Indicators in the Arroyo Las Positas Watershed – The project is exploring eutrophication indicators present in the watershed. Triggers from WY 2012 through WY 2018 included low CSCI scores, multiple instances of measured nitrate concentrations above guidelines for excess algal growth and nitrogen toxicity, and multiple exceedances of Basin Plan objective for pH. Planned monitoring efforts for WY 2020 were greatly impacted by the shelter-in-place restrictions enacted by Alameda County Public Health Department in response to the COVID-19 pandemic; some planned efforts were delayed, and others deferred to WY 2021. Results obtained in WY 2021 included temperature measurements above the MRP trigger for SSID consideration (more than 20% of measurements above 24°C at non-steelhead bearing streams) at one site and dissolved oxygen concentrations indicative of eutrophication at three sites. ACCWP also incorporated continuous monitoring of optical nitrate and chlorophyll-a for the first time in WY 2021. Results of this investigation proved quite informative as potential indicators of magnitude and duration of algal bloom and die-off cycles present; results also helped clarify the scale of eutrophication present between the various subwatersheds investigated.

Additionally, BASMAA completed a regional SSID project on behalf of all RMC members in FY 2019/20, which investigated sources of PCBs from electrical utility equipment in watersheds draining to the San Francisco Bay Basin.

Provision C.8.f.: Pollutants of Concern Monitoring

Requirement: Provision C.8.f requires that Permittees conduct Pollutants of Concern (POC) Monitoring to assess inputs of POCs to the Bay from local tributaries and urban runoff, provide information to support implementation of TMDLs and other pollutant control strategies, assess progress toward achieving waste load allocations for TMDLs and help resolve uncertainties associated with loading estimates and impairments associated with these pollutants. In particular, monitoring required by this provision must be directed toward addressing up to five priority POC management information needs (described in MRP Table 8.1, POC Monitoring Methods) for each of the priority POCs listed in MRP Table 8.2, POC Monitoring Parameters, Effort and Type – which identifies the minimum effort and type of samples to be collected for each POC.

Program Activities: To comply with this provision, the Program continued water quality sampling in WY 2022 for copper and nutrients to address information on Monitoring Type #4 (Loads and Presence/

Absence) and trends in POC loading to the Bay and POC concentrations in urban stormwater discharges or local tributaries over time (Monitoring Type #5). The Program conducted WY 2022 urban sediment/soil sampling to identify potential sources of PCBs to address Monitoring Types #1 and #2 (Source Identification and Contributions to Bay Impairment) in August and September 2022.

Results for WY 2022 POC monitoring will be reported in the March 2023 UCMR, which will also describe POC monitoring efforts planned for WY 2023.

Through the RMP's Sources Pathways and Loading Work Group and ECWG, Program staff initiated a project in 2018 to ensure that the RMP's Chemicals of Emerging Concern (CEC) Strategy addresses the MRP requirement that Permittees conduct, or cause to be conducted, a special study that addresses relevant management information needs for emerging contaminants² by the end of the current permit term. Pilot sampling began in 2019 in close coordination with the Small Tributaries Loading Strategy work group. Year Two, in 2019, included additional CECs (organophosphate esters, bisphenol A, and bisphenol S). Based on recommendations from the ECWG in April 2020, the RMP approved Year Three and an additional fourth year of monitoring to supplement the initial monitoring and provide more robust data across a better representation of watersheds. The final reports for this study are anticipated in fall 2022.

The RMP updated the CEC Strategy in 2020 to include an additional secondary factor for the tiered risk-based framework that addresses persistence of CECs in the environment and a strategy for supplementing the tiered risk-based framework with predictive toxicology. In FY 2021/22, the ECWG Multi-Year Work Plan was updated to include an overall strategy for prioritizing CECs, conducting ongoing monitoring, and linking monitoring data with modeling to evaluate sources, pathways, loadings and trends of priority CECs. The ECWG also plans to better align its work and special studies to leverage related work in other RMP workgroups, e.g., the Microplastics Workgroup and the Sources, Pathways and Loadings Workgroup. Lastly, the RMP continues to develop a multi-pollutant modeling effort that will be linked to the CECs stormwater monitoring strategy and will be designed to incorporate stormwater runoff-related impacts to the Bay.

Provision C.8.g.: Pesticides and Toxicity Monitoring

Requirement: Provision C.8.g requires Permittees to conduct wet weather and dry weather monitoring of pesticides and toxicity in urban creeks. If a statewide coordinated pesticides and pesticides-related toxicity monitoring program begins collecting data on an ongoing basis during the Permit term, Permittees may request that the Water Board Executive Officer modify, reduce, or eliminate this monitoring requirement.

Program Activities: To comply with this provision, the Program conducted dry weather toxicity and pesticide monitoring in water and sediment during June 2022. Results for WY 2021 were reported in the March 2022 IMR as required by Provision C.8.h. In WY 2018, in coordination with other RMC members, the Program conducted wet weather toxicity and pesticide monitoring collaboratively through the RMC.

² The special study must account for relevant CECs in stormwater and would address at least perfluorooctane sulfonates (PFOS), perfluoroalkyl sulfonates (PFAS), and alternative flame retardants being used to replace polybrominated diphenyl ethers (PBDEs). The RMP has completed work on PFAS and PFOA. The RMP developed and funded a special study in 2018 to review available data and previously developed conceptual models for PBDEs to support a stormwater-related alternative flame retardants conceptual model.

This collaboration satisfied all MRP 2 wet season monitoring requirements. Analyses of results from pesticide and toxicity monitoring conducted by the Program in WY 2019, as well as monitoring conducted in WYs 2014 through 2018, were presented along with other regionally designed Creek Status Monitoring parameters in the March 2020 IMR. Results for WY 2022 efforts will be reported in the March 2023 UCMR.

Provision C.8.h.: Reporting

Requirement: Provision C.8.h requires Permittees to submit the following by March 31 of each year, concerning data collected during the previous October 1–September 30 period (WY):

- Electronic data to the California Environmental Data Exchange Network (CEDEN), including results from monitoring conducted pursuant to Provisions C.8.d, C.8.e, C.8.f and C.8.g. Data that CEDEN cannot accept are exempt from this requirement.
- A comprehensive UCMR on these results.
- An IMR, in lieu of the UCMR and which reports on the data collected since the previous IMR, in 2020.

Program Activities: To comply with this provision, the Program submitted its UCMR and electronic data in March 2022.

Provision C.9: Pesticides Toxicity Control

Provision C.9.d.: Interface with County Agricultural Commissioners

Requirement: Provision C.9.d. requires that Permittees maintain communications with county agricultural commissioners to (a) get input and assistance on urban pest management practices and use of pesticides; (b) inform them of water quality issues related to pesticides; and (c) report any observed or citizen-reported violations of pesticide regulations (e.g., illegal handling and applications of pesticides) associated with stormwater management, particularly the California Department of Pesticide Regulation (DPR) surface water protection regulations for outdoor, nonagricultural use of pyrethroid pesticides by any person performing pest control for hire.

Program Activities: To assist member agencies in complying with this provision, the Program contacted the County Agricultural Department to discuss any issues with the implementation of pest control regulations. The following updates were provided:

- 1) In FY 2021/22, despite COVID-19 operational restrictions, the County Agricultural Department maintained a regulatory enforcement presence in the community, as required by law, and conducted numerous inspections and investigations in response to complaints and incidents. During these activities, inspectors document violations and conduct various types of enforcement response. Frequently encountered violations included: unlicensed or unregistered pest control companies; employees not wearing required personal protective equipment; pesticides not applied in accordance with label requirements; and failure to submit monthly pesticide reports. Public complaints by residents are frequently received regarding concern about nearby pesticide use by pest control companies, agencies, or nearby residents.
- 2) The County Agricultural Department has observed that due to concerns about glyphosate carcinogenicity, many agencies and applicators are moving away from glyphosate and seeking alternatives.
- 3) In January 2021, AB1788 banned the use of all second-generation anticoagulants in California in general pest control and on the consumer market. The specific materials include Brodifacoum, Bromadiolone, Difenacoum, and Difethialone. There are exceptions to the ban, including agricultural uses and other special district, governmental, and regulatory type applications. The County Agricultural Department has observed that many operators in Alameda County are no longer reporting use of these materials, except to a limited extent in the cases of regulatory exceptions. The ban may have resulted in a steep decline in the use of these materials locally.

Provision C.9.e.ii (1): Public Outreach: Point of Purchase

Requirement: Provision C.9.e.ii(1) requires Permittees to:

- Conduct outreach to consumers at the point of purchase;
- Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control; and
- Participate in and provide resources for the OWOW program or a functionally equivalent pesticide use reduction outreach program.

Program Activities: The OWOW program is now partnering with 31 retailers throughout Alameda. This includes nine Home Depot Stores. Three new retailers were added to the program. A total of 22 training events were conducted, and 186 employees received the OWOW training. This is an increase of five training events and 50 trained employees relative to FY 2020/21.

The report on the ACCWP FY 2021/22 OWOW activities and its effectiveness is included in **Appendix C**. Through its point-of-purchase materials and website, the Program also provides targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control.

Provision C.9.e.ii (2): Pest Control Contracting Outreach

The Permit requires that the Permittees conduct outreach to residents who use or contract for structural pest control and landscape professionals by (a) explaining the links between pesticide usage and water quality; (b) providing information about IPM in structural pest management certification programs and landscape professional trainings; and (c) disseminating tips for hiring structural pest control operators and landscape professionals such as the tips prepared by the University of California Extension IPM Program (UC-IPM).

Program Activities: The Program explains the links between pesticide usage and water quality via numerous outreach efforts including a new Fred & Izzy video promoting IPM (see Provision C.7 Public Information and Outreach section for details). To promote pest control companies that use IPM, the Program re-ran its ad to promote the services of certified pest control professionals that use less-toxic methods (see Section C.7.b.8 for details).

Provision C.9.e.ii (3): Outreach to Pest Control Professionals

Permit Requirement: The Permittees shall conduct outreach to pest control operators, urging them to promote IPM services to customers and to become IPM-certified by EcoWise Certified or a functionally equivalent certification program.

Program Activities: In FY 2017/18, the Program sent a letter to all pest control companies registered in Alameda County that encouraged them to provide and promote IPM services to their customers. In FY 2021/22, the Program created a video ad using [Fred & Izzy](#) that promoted the hiring of EcoWise Certified and other IPM services providers, since having customers reach out to pest control professionals and request IPM services seems like a more productive approach. The Program is continuing to promote EcoWise Certified contractors on its Pest Control at Home [webpage](#).

Provision C.9.f.: Track and Participate in the Regulatory Processes

The Permittees shall conduct the following activities, which may be done at a county, regional, or state wide level: (1) the Permittees shall track U.S. EPA pesticide evaluation and registration activities as they relate to surface water quality and, when necessary, encourage U.S. EPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act and to accommodate water quality concerns within its pesticide registration process; (2) the Permittees shall track DPR pesticide evaluation activities as they relate to surface water quality and, when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with the California Water Code and to accommodate water quality concerns within its pesticide evaluation process; (3) the Permittees shall assemble and submit information (such as monitoring data) as needed to assist DPR

and county agricultural commissioners in ensuring that pesticide applications comply with WQS; and (4) as appropriate, the Permittees shall submit comment letters on U.S. EPA and DPR re-registration, re-evaluation, and other actions relating to pesticides of concern for water quality.

Program Activities: The Program fulfilled this requirement through participation in and financial support of the CASQA Pesticide Subcommittee activities. See the *CASQA Pesticide Subcommittee Annual Report and Effectiveness Assessment* in **Appendix C**.

Provision C.10: Trash Load Reduction

Provision C.10.a. Trash Reduction Requirements

Requirement: Provision C.10.a requires Permittees to reduce their trash load by 70% by July 1, 2017, and 80% by July 1, 2019.

Program Activities: To assist member agencies in complying with this provision, the Program provided technical assistance with the mapping of generation rates, full trash capture devices, full trash capture device treatment areas, private lands drainage areas, and trash management areas. The Program established a Trash Subcommittee that met three times in FY 2021/22. The Subcommittee was chaired by Elisa Wilfong, City of Hayward. The Subcommittee has provided a forum for disseminating technical information, providing training on AGOL applications, and sharing information among member agencies.

Provision C.10.b.i. Full Trash Capture Systems

Requirement: Provision C.10.b.i. Permittees shall maintain, and provide for inspection and review upon request, documentation of the design, operation, and maintenance of each of their full trash capture systems, including the mapped location and drainage area served by each system.

Program Activities: To assist member agencies in complying with this provision, the Program developed an AGOL tool that allows member agencies to document and track the maintenance of each of their full trash capture devices including the mapped location, drainage area, and maintenance history.

Provision C.10.b.ii.b. Visual Assessment of Outcomes

Requirement: Provision C.10.b.ii.b. requires Permittees to conduct visual on-land assessment, including photo documentation, or other acceptable assessment method (see C.10.b.ii.b.(iv.)), of each trash generation area within which it is implementing other trash management actions or combination of actions other than full trash capture, to determine or verify the effectiveness of the action or combination of actions.

Program Activities: To assist member agencies in complying with this provision, the Program developed an AGOL tool that allows member agencies to document and track their visual assessment results.

Provision C.10.b.iv. Source Control

Provision C.10.b.ii.b.iv. allows Permittees to claim a reduction credit of up to 10% of their baseline load for source control actions such as single-use bag bans and polystyrene bans.

Single-Use Bag Ban

The original Single-Use Bag Ban went into effect in January 2013 and required grocery stores and other stores in Alameda County that sell alcohol or four item types—milk, bread, packaged food, and soda—no longer provide single-use plastic carryout bags, nor distribute paper bags or reusable bags for free at checkout. The 2013 Single-Use Bag Ban covered approximately 1,300 stores in the County.

An expanded Countywide Single-Use Bag Ban was adopted by Alameda County Waste Management Authority (StopWaste) on October 26, 2016. The Program funded this effort through a \$180,000 contribution to StopWaste. The 2016 Single-Use Bag Ban included two phases. The first phase went into effect on May 1, 2017 and expanded the 2013 Single-Use Bag Ban to include all retail stores except retail food establishments. This phase of the 2016 Single-Use Bag Ban increased the number of stores covered

nearly seven-fold, from approximately 1,300 to approximately 9,000. The second phase went into effect in November 2017 and further expanded the 2016 Single-Use Bag Ban to include all public eating establishments. Approximately 5,000 public eating establishments are now also covered by the 2016 Single-Use Bag Ban.

Assessment: The following methods were used to assess the effectiveness of the Single-Use Bag Ban: (1) inspection and enforcement; (2) parking lot survey; (3) voluntary data reporting; and (4) characterization of single-use bags in storm drains.

StopWaste has implemented an inspection and enforcement program. Nearly every store covered by the Single-Use Bag Ban has been inspected. Enforcement actions were initiated against stores that were not fully compliant. These enforcement actions are expected to increase the effectiveness of the Single-Use Bag Ban over time.

StopWaste also conducted a pre- and post-Single-Use Bag Ban survey of bag usage in the parking lots of 17 stores covered by the ordinance. Results of the survey indicated that there was a 95% reduction in the use of plastic bags at those stores following the implementation of the ordinance.

A total of 69 stores covered by the Single-Use Bag Ban participated in a voluntary data reporting exercise. Participating stores provided data on the number of single-use plastic bags purchased before and after the start of the ban. Based on these results, StopWaste estimated that there was an 85% reduction in plastic bags purchased by the stores covered by the Ban. This equates to approximately 150 million fewer bags purchased.

The Program worked with StopWaste during FY 2013/14 (Spring 2014) to conduct a study to assess the reduction in the number of plastic bags found in storm drains after the implementation of the 2013 Single-Use Bag Ban compared to what was found during the BASMAA baseline loading study conducted during FY 2011/12. The BASMAA study found that 8% of the trash found in storm drains comprised single-use plastic bags. The Alameda Countywide Storm Drain Trash Monitoring and Characterization Project (Characterization Project) found significantly fewer single-use bags in the storm drain inlets throughout the County as compared to the BASMAA study. Initial results indicated an estimated 44% reduction. Based on the results of these assessment efforts and the previous characterization conducted by BASMAA, Program staff recommended that, in the absence of additional jurisdiction specific information, Permittees should estimate that the 2013 Single-Use Bag Ban reduced the discharge of single-use bags by 50%, which equates to an estimated 4% reduction in trash discharged to their storm drain system. Now that the 2016 Single-Use Bag Ban has expanded coverage from approximately 1,300 to 14,000 facilities, Program staff recommends that Permittees estimate that the trash discharged is reduced by 6%.

Expanded Polystyrene Food Ware Bans

The following 11 cities within the County have adopted expanded polystyrene (EPS) food ware bans: Alameda, Albany, Berkeley, Emeryville, Fremont, Hayward, Livermore, Oakland, Pleasanton, San Leandro, and Union City. The County of Alameda has also adopted a polystyrene ban that applies to the unincorporated area of the County.

Assessment: One of the goals of the Characterization Project was to develop an estimate of the effectiveness of EPS food ware bans at reducing the amount of EPS food ware discharged to the storm

drain system. Since the City of San Leandro EPS food ware ban went into effect after the completion of the BASMAA baseline study in FY 2011/12 and prior to the implementation of the Characterization Project in Spring 2014, and 25 of the 47 Alameda County sites included in the BASMAA Baseline Study were in the City of San Leandro, the assessment of the effectiveness of EPS food ware bans focused on the City of San Leandro. Initial results of the Characterization Project suggest an estimated 62% reduction in the amount of EPS food ware discharged to the storm drain system following the implementation of the EPS food ware ban. Based on the results of the Characterization Project and the previous characterization conducted by BASMAA, Program staff recommend that, in the absence of additional jurisdiction specific information, Permittees estimate that an EPS food ware ban equates to an estimated 4% reduction in trash discharged to their storm drain system.

[Provision C.10.e.i. Optional Trash Load Reduction Offset Opportunities/Additional Creek and Shoreline Cleanup](#)

Program Activities: To assist member agencies in complying with this provision, the Program has developed an AGOL tool that allows member agencies to document and track their creek and shoreline cleanup efforts.

[Additional Activities](#)

The Program also conducted anti-litter public outreach efforts. See Provision C.7 reporting for details.

In addition, the Program participates in bimonthly BAMSC Trash Subcommittee meetings. The Subcommittee includes Permittee staff, Water Board staff, Caltrans representatives, Non-Governmental Organization representatives, and Stormwater Program staff and managers. It provides a forum for members to discuss MRP compliance-related matters, receive updates from Water Board staff and Caltrans, and hear from guest speakers on various trash topics.

Provision C.11: Mercury Controls

Provisions in C.11 reflect the implementation plan incorporated in the Basin Plan through the TMDL for mercury in San Francisco Bay. The MRP 2 Fact Sheet describes a General Strategy for Sediment-Bound Pollutants that progresses from pilot testing of controls in a few specific locations, through focused implementation in areas where benefits are likely to accrue, to full-scale implementation throughout the region, where warranted, by understanding the effectiveness of each control measure or activity. As noted in the MRP 2 Fact Sheet, the permit emphasizes focused implementation and in some cases movement towards full-scale implementation.

Most of the MRP provisions for mercury are similar to provisions in C.12 for controlling PCBs; in this permit term, management decisions may be driven predominantly by considerations for reducing PCBs loads but are expected to also result in mercury load reductions. Permittees may comply with any requirement of this provision through a collaborative effort.

Provision C.11.a.: Implement Control Measures to Achieve Mercury Load Reductions

Requirement: Provision C.11.a requires Permittees to:

- Identify the watersheds or portions of watersheds (management areas) in which mercury control measures are currently being implemented and those in which new control measures will be implemented during the term of MRP 2;
- Identify the control measures that are currently being implemented and those that will be implemented in these watersheds or management areas;
- Submit a schedule of control measure implementation; and
- Implement mercury source and treatment control measures and pollution prevention strategies and quantify mercury load reductions achieved by using the accounting methods established according to provision C.11.b.

Program Activities: To comply with the requirements of this provision, Program staff and consultants have been assisting and coordinating Permittees' review of potential high priority areas and source properties for mercury and PCBs load reduction that were identified through a source area screening process initiated with the IMR³ in 2014. Pursuant to Provision C.11.a.iii(2), the Program has prepared a report documenting the list of the watersheds or management areas within Alameda County and the specific control measures being implemented or to be implemented during the permit term. See **Appendix D** for the *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction – Update 2022* report which is submitted on behalf of all ACCWP Permittees to comply with Provision C.11.a.iii(3). The Information in this report has been updated to account for additional control measures implemented during FY 2021/22.

Provision C.11.b.: Assess Mercury Load Reductions from Stormwater

Requirement: Provision C.11.b requires Permittees to develop and implement an assessment methodology and data collection program to quantify, in a technically sound manner, mercury loads reduced through implementation of pollution prevention, source control, and treatment control

³ ACCWP Integrated Monitoring Report Part C: PCBs and Mercury Load Reduction Planning. March 14, 2014.

measures to demonstrate progress toward achieving the interim load reductions required in this permit term.

Program Activities: To comply with this provision, the Program participated in a regional project on behalf of all Permittees, conducted through BASMAA. Program staff worked with BASMAA's contractors and Water Board staff to document, update and refine the load reduction accounting system described in the MRP 2 Fact Sheet. The regional *Interim Accounting Methodology for TMDL Loads Reduced* report was approved by the Water Board Executive Officer in May 2017. The *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction – Update 2022* report (**Appendix D**) implements the Interim Accounting Methodology to estimate the mercury and PCBs loads reduced by the Permittees to date.

Provisions C.11.b requires the Permittees to submit, in 2018 and subsequent Annual Reports, refinements to the Interim Accounting Methodology to assess load reductions in the next permit term. The Program and Permittees participated in a BASMAA Regional Project to refine the source control measure load reduction accounting methods for the next permit term. The *BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report was included with the FY 2019/20 Annual Report. Comments were received from the Regional Water Board on the *BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report in April 2021. A revised report was approved in January 2022 (**Appendix D**).

[Provision C.11.c.: Plan and Implement Green Infrastructure to Reduce Mercury Loads](#)

Requirement: Provision C.11.c requires Permittees to implement GI projects and demonstrate achievement of load reductions specified in the MRP by using the accounting methods documented and approved under provision C.11.b. Provision C.11.c.iii.(3) required the submittal of the quantitative relationship between GI and mercury load reductions in 2018. Provision C.11.c.iii.(4) requires the Permittees to report an estimate of the amount of mercury load reductions resulting from GI implementation during the current term of the MRP, including a description of all data used and a full description of models and model inputs relied on to generate this estimate. Reporting requirements for 2020 include documentation of interim load reductions, an estimate of land area to be treated through GI implementation and a Reasonable Assurance Analysis (RAA) to quantitatively demonstrate that mercury load reductions of at least 10 kg/year will be realized by 2040 through implementation of GI projects across the region by all MRP Permittees.

Program Activities: To assist member agencies in complying with this provision, the Program facilitated Work Groups for GI and ArcGIS with activities described above for Provision C.3. The Program completed the GI RAA in FY 2019/20, which was initiated in FY 2017/18. A *Quantitative Relationship between Green Infrastructure Implementation and PCBs/Mercury Load Reductions* report was prepared by the Program in cooperation with the CCCWP in FY 2017/18. This report fulfilled the requirements of MRP Provisions C.11.b.iii.(3), C.11.c.iii.(3), C.12.b.iii.(3), and C.12.c.iii.(1) for submitting the quantitative relationship between GI implementation and mercury and PCBs load reductions that was used for the RAA required by MRP Provisions C.11.c.ii.(2), C.11.d.ii, C.12.c.ii.(2), and C.12.d.ii.

The GI RAA (i.e., an estimate of the land area that will be treated through GI implementation by 2020, 2030, and 2040; the estimated PCBs and mercury loads reduced; and a description of models and model inputs relied on to generate this estimate) was provided in the *Alameda County PCBs and Mercury*

Control Measure Plan and Reasonable Assurance Analysis Report with the FY 2019/20 Annual Report. This report fulfilled the requirements of MRP Provisions C.11.c.iii.(2), C.11.c.iii.(3), C.11.d.iii, C.12.c.iii.(2), C.12.b.iii.(2), and C.12.d.iii for providing a mercury and PCBs control measure implementation plan and corresponding RAA.

Provision C.11.d.: Prepare Implementation Plan and Schedule to Achieve TMDL Wasteload Allocations

Requirement: Provision C.11.d requires Permittees to submit with their FY 2019/20 Annual Reports a mercury control measures implementation plan and corresponding RAA that demonstrates quantitatively that the plan will result in mercury load reductions sufficient to attain the mercury TMDL wasteload allocations by 2028.

Program Activities: To comply with this provision, the Program prepared the required Implementation Plan and schedule. The *Alameda County PCBs and Mercury Control Measure Plan and Reasonable Assurance Analysis Report* was provided with the FY 2019/20 Annual Report.

Provision C.11.e.: Implement a Risk Reduction Program

Requirement: Provision C.11.h requires Permittees to conduct an ongoing risk reduction program to address public health impacts of mercury in San Francisco Bay/Delta fish. The fish risk reduction program shall take actions to reduce actual and potential health risks in those people and communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families. At a minimum, Permittees shall conduct or cause to be conducted an ongoing risk reduction program with the potential to annually reach 3,000 individuals throughout the region who are likely consumers of San Francisco Bay-caught fish. The Permittees shall report on the status of the risk reduction program in each of their Annual Reports and report the findings of the effectiveness evaluation of their risk reduction program in their FY 2019/20 Annual Report.

Program Activities: To comply with this provision, the Program works with the Alameda County Environmental Health (ACEH) Department to maintain fish consumption advisory signs posted at popular fishing locations and boat ramps along the Bay shoreline. Many of these sites are included in the California Recreational Fisheries Survey (CRFS) that estimates total marine recreational fin fish catch and effort for California. While CRFS surveys are designed to aggregate data statewide across multiple types of sites and fishing modes, available results obtained from the Recreational Fisheries Information Network suggest that there were at least 2,000 angler visits to the posted Alameda County sites in 2015. While some individual fishers make repeated visits during the year, there are no data to indicate how many people this represents. A survey by San Francisco Bay Fish Project also found that a significant number of fishers who have seen the signs would share the information with other fishers and consumers. Program staff will continue working with ACEH to try to secure additional sites for posting and explore extending outreach to local bait and tackle stores or other outlets. The Program also developed and promoted an online advertisement to promote awareness of proper consumption. See Section C.7 for details on the effort.

Fishing Advisory Campaign

The Program ran a digital campaign in June 2022 to promote awareness of fish consumption health advisories. The ads targeted fishing and outdoor enthusiasts and included Google Display Ads, Facebook, Instagram Reels, YouTube, and streaming video. In addition to digital advertising, a paid article and

advertisement in the Fish Sniffer Online Magazine reached 30,000 readers interested in fishing in California. Fish Sniffer also sent an E-blast to its full subscriber list with Program-only content. Digital ads linked to the Program's [Fishing and Health page](#). The Fish Sniffer ads directed viewers directly to the State of California's Fishing Advisory page. See Section C.7 for details on the effort.

Provision C.12: Polychlorinated Biphenyls (PCBs) Controls

Provisions in C.12 reflect the implementation plan incorporated in the Basin Plan through the TMDL for PCBs in San Francisco Bay. The MRP 2 Fact Sheet describes a General Strategy for Sediment-Bound Pollutants that progresses from pilot testing of controls in a few specific locations, through focused implementation in areas where benefits are likely to accrue, to full-scale implementation throughout the region where warranted by understanding the effectiveness of each control measure or activity. As noted in the MRP 2 Fact Sheet, the current permit emphasizes focused implementation and in some cases movement towards full-scale implementation. Permittees may comply with any requirement of this provision through a collaborative effort.

Provision C.12.a.: Implement Control Measures to Achieve PCBs Load Reductions

Requirement: Provision C.12.a requires Permittees to:

- Identify the watersheds or portions of watersheds (management areas) in which PCBs control measures are currently being implemented and those in which new control measures will be implemented during the term of this permit;
- Identify the control measures that are currently being implemented and those that will be implemented in these watersheds or management areas;
- Submit a schedule of control measure implementation; and
- Implement sufficient control measures to achieve the permit-area-wide reduction or the county-specific load reduction performance criteria shown in Table 12.1 of the MRP. Beginning with the FY 2016/17 Annual Report, Permittees shall demonstrate achievement of these load reductions as required in provision C.12.b.

Program Activities: To comply with the requirements of this provision, Program staff and consultants have been assisting and coordinating Permittees' review of potential high priority areas and source properties for mercury and PCBs load reduction that were identified through a source area screening process initiated with the IMR⁴ in 2014. Pursuant to Provision C.12.a.iii(2), the Program has prepared a report documenting a list of the watersheds or management areas within Alameda County and the specific control measures being implemented or to be implemented during the permit term. See **Appendix D** for the *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction – Update 2022* report which is submitted on behalf of all ACCWP Permittees to comply with Provision C.12.a.iii(3). The Information in this report has been updated to account for additional control measures implemented during FY 2021/22.

The Program continued sediment monitoring and data review to assist in identification of potential source properties as described for Provision C.8.f above.

Provision C.12.b.: Assess PCBs Load Reductions from Stormwater

Requirement: Provision C.12.b requires Permittees to develop, document, and implement an assessment methodology and data collection program to quantify, in a technically sound manner, PCBs loads reduced through implementation of pollution prevention, source control, and treatment control

⁴ ACCWP Integrated Monitoring Report Part C: PCBs and Mercury Load Reduction Planning. March 14, 2014.

measures, to demonstrate progress toward achieving the interim load reductions required in this permit term.

Program Activities: To comply with this provision, the Program participated in a regional project on behalf of all Permittees, conducted through BASMAA. Program staff worked with BASMAA's contractors and Water Board staff to document, update and refine the load reduction accounting system described in the MRP 2 Fact Sheet. The regional *Interim Accounting Methodology for TMDL Loads Reduced* report was approved by the Water Board Executive Officer in May 2017. The *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction – Update 2022* report (**Appendix D**) implements the Interim Accounting Methodology to estimate the mercury and PCBs loads reduced by the Permittees to date.

Provisions C.12.b requires the Permittees to submit, in 2018 and subsequent Annual Reports, refinements to the Interim Accounting Methodology to assess load reductions in the next permit term. The Program and Permittees participated in a BASMAA Regional Project to refine the source control measure load reduction accounting methods for the next permit term. The *BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report is provided in **Appendix D**.

[Provision C.12.c.: Plan and Implement Green Infrastructure to Reduce PCBs loads](#)

Requirement: Provision C.12.c requires Permittees to implement GI projects and demonstrate achievement of load reductions specified in the MRP by using the accounting methods documented and approved under provision C.12.b. Provision C.12.c.iii.(3) required the submittal of the quantitative relationship between GI and mercury load reductions in 2018. Provision C.12.c.iii.(4) requires the Permittees to report an estimate of the amount of PCBs load reductions resulting from GI implementation during the current term of the MRP, including a description of all data used and a full description of models and model inputs relied on to generate this estimate. Future reporting requirements for 2020 include documentation of interim load reductions, an estimate of land area to be treated through GI implementation and an RAA to demonstrate quantitatively that PCBs load reductions of at least 3 kg/year will be realized by 2040 through implementation of GI projects across the region by all MRP Permittees.

Program Activities: To assist member agencies in complying with this provision, the Program facilitated Work Groups for GI and ArcGIS with activities described above for Provision C.3. The Program completed the GI RAA in FY 2019/20, which was initiated in FY 2017/18. A *Quantitative Relationship between Green Infrastructure Implementation and PCBs/Mercury Load Reductions* report was prepared by the Program in cooperation with the CCWP in FY 2017/18. This report fulfilled the requirements of MRP Provisions C.11.b.iii.(3), C.11.c.iii.(3), C.12.b.iii.(3), and C.12.c.iii.(1) for submitting the quantitative relationship between GI implementation and mercury and PCBs load reductions that will be used for the RAA required by MRP Provisions C.11.c.ii.(2), C.11.d.ii, C.12.c.ii.(2), and C.12.d.ii.

The GI RAA (i.e., an estimate of the land area that will be treated through GI implementation by 2020, 2030, and 2040; the estimated PCBs and mercury loads reduced; and a description of models and model inputs relied on to generate this estimate) was provided in the *Alameda County PCBs and Mercury Control Measure Plan and Reasonable Assurance Analysis Report*, which was included in the FY 2019/20 Annual Report. This report fulfilled the requirements of MRP Provisions C.11.c.iii.(2), C.11.c.iii.(3),

C.11.d.iii, C.12.c.iii.(2), C.12.b.iii.(2), and C.12.d.iii for providing a mercury and PCBs control measure implementation plan and corresponding RAA.

Provision C.12.d.: Prepare Implementation Plan and Schedule to Achieve TMDL Wasteload Allocations

Requirement: Provision C.12.d requires Permittees to prepare and submit with the 2020 Annual Report a PCBs control measures implementation plan and corresponding RAA that demonstrates quantitatively that the plan will result in PCBs load reductions sufficient to attain the PCBs TMDL wasteload allocations by 2030.

Program Activities: To comply with this provision, the Program prepared the required Implementation Plan and schedule. The *Alameda County PCBs and Mercury Control Measure Plan and Reasonable Assurance Analysis Report* was provided with the FY 2019/20 Annual Report.

Provision C.12.e.: Evaluate PCBs Presence in Caulks/Sealants Used in Storm Drain or Roadway Infrastructure in Public Rights-of-Way

Requirement: Provision C.12.e requires Permittees to collect samples of caulk and other sealants used in storm drains and between concrete curbs and street pavement and investigate whether PCBs are present in such material and in what concentrations. Permittees shall report on the results of this investigation no later than the 2018 Annual Report.

Program Activities: The Program participated in the BASMAA Regional Project to evaluate PCBs presence in caulks/sealants used in storm drains and roadway infrastructure, and to quantify the potential PCBs load reduction benefits that may result from public infrastructure improvements. The final project report was provided in the FY 2017/18 Annual Report.

Provision C.12.f.: Manage PCBs-Containing Materials and Wastes during Building Demolition Activities

Requirement: MRP Provision C.12.f. requires that Permittees develop and implement or cause to be developed and implemented an effective protocol for managing materials with PCBs concentrations of 50 ppm or greater in applicable buildings at the time such buildings undergo demolition, so that PCBs do not enter municipal storm drain systems. Applicable buildings include, at a minimum, non-residential buildings constructed or remodeled between the years 1950 and 1980 with building materials such as masonry and concrete with PCBs concentrations of 50 ppm or greater. Single-family residential and wood frame buildings are exempt. Also, a Permittee is exempt from this requirement if it provided evidence acceptable to the Water Board Executive Officer in its FY 2016/17 Annual Report that the only buildings that existed pre-1980 within its jurisdiction were single-family residential and/or wood-frame buildings.

Permittees were required to develop a protocol by June 30, 2019 that includes each of the following components, at a minimum:

1. The necessary authority to ensure that PCBs do not enter municipal storm drains from PCBs-containing materials in applicable buildings at the time such buildings undergo demolition;
2. A method for identifying applicable buildings prior to their demolition; and

3. Method(s) for ensuring PCBs are not discharged to the municipal storm drain from demolition of applicable buildings.

By July 1, 2019 and thereafter, Permittees are required to:

- Implement or cause to be implemented the PCBs management protocol for ensuring PCBs are not discharged to municipal storm drains from demolition of applicable buildings via vehicle track-out, airborne releases, soil erosion, or stormwater runoff.
- Develop an assessment methodology and data collection program to quantify in a technically sound manner PCBs loads reduced through implementation of the protocol for controlling PCBs during demolition of applicable buildings.

Program Activities: On behalf of MRP Permittees, BASMAA conducted a multi-year regional project to assist MRP Permittees to address Provision C.12.f. The BASMAA project, which began in FY 2016/17 and was completed in March 2019, assisted Permittees in developing local programs to manage PCBs-containing materials during building demolition. It developed guidance materials, tools and training materials and conducted outreach. Permittees began implementing the program on or before July 1, 2019.

During FY 2018/19 and FY 2019/20, MRP Permittees worked together through the BASMAA MPC Committee to develop a framework to comply with data collection/evaluation and reporting requirements under Provision C.12.f. As mentioned previously, these requirements include developing an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of the new program. The regional process developed includes the following steps:

1. The municipality informs demolition permit applicants that their projects are subject to the MRP Provision C.12.f requirements, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.
2. For every demolition project, applicants complete and submit a version of BASMAA's model "PCBs Screening Assessment Form" (Screening Form) or equivalent to the municipality.
3. The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
4. The municipality then issues the demolition permit or equivalent, according to its procedures.⁵
5. For Applicable Structures only, the municipality submits completed Screening Forms and any supporting documents (consultant's report from PCBs building survey, QA/QC checklist, and lab reports) to its countywide program; forms for exempt sites need not be submitted. Forms should be submitted to the countywide programs electronically if feasible, and at a minimum annually, but quarterly is preferred.
6. The countywide programs compile the completed Screening Forms and any supporting documents. The countywide program then works with the other MRP countywide programs

⁵ Municipalities should require that applicants fill out and certify a Screening Form for every demolition. For non-Applicable Structures, applicants simply check the boxes, certify, and submit to municipality. Then the municipality can authorize the demolition (e.g., issue a demolition permit). In general, municipalities should have a completed and certified Screening Form before authorizing a demolition, unless they are a small community that is exempt or has some other arrangement with Regional Water Board staff. Municipalities do not need to track non-Applicable Structures otherwise.

through BASMAA to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

Appendix D provides a memorandum that documents the number of applicable structures that applied for a demolition permit during the FY, and provides a running list of the applicable structures that applied for a demolition permit (since the date the PCBs control protocol was implemented) that had material(s) with PCBs at 50 ppm or greater, with the address, demolition date, and brief description of PCBs control method(s) used for the ACCWP Permittees (*PCBs in Building Materials Management Program – Alameda County Data Summary*). The FY 2019/20 Annual Report included an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of the protocol for controlling PCBs during building demolition.

[Provision C.12.g.: Fate and Transport Study of PCBs: Urban Runoff Impact on San Francisco Bay Margins](#)

Requirement: Provision C.12.g requires Permittees to conduct or cause to be conducted studies concerning the fate, transport, and biological uptake of PCBs discharged from urban runoff to San Francisco Bay margin areas. Permittees submitted in their FY 2016/17 Annual Reports a workplan describing how these information needs will be accomplished, including the studies to be performed and a preliminary schedule. Permittees were required to report on status of the studies in their FY 2017/18 Annual Report. The Permittees were required to report the findings and results of the studies completed, planned, or in progress, as well as implications of studies on potential control measures to be investigated, piloted or implemented in future permit cycles in the March 15, 2020 IMR.

Program Activities: Provision C.12.g is being addressed through a multi-year project by the RMP to develop a series of conceptual models of PCBs in Priority Margin Units (PMUs). The project is:

- Identifying margin units that are high priority for management and monitoring;
- Developing conceptual models and mass budgets for margin units downstream of watersheds where management actions will occur; and
- Conducting monitoring in these units as a performance measure.

This work informed the review and possible revision of the PCBs TMDL and informed the reissuance of the MRP. During FY 2019/20, BASMAA representatives to the RMP continued to participate in the RMP PCBs Workgroup, which provided ongoing oversight of the project. A general description and multi-year budget for this project is in the “PCBs” section of the [RMP Multi-Year Plan, 2019 Annual Update](#) (dated May 2019).

Four urban embayments along the Bay shoreline with management actions to address PCBs planned or ongoing in the upstream watersheds were initially selected as PMU for conceptual modeling:

- Emeryville Crescent (Alameda County),
- San Leandro Bay (Alameda County),
- Steinberger Slough/Redwood Creek (San Mateo County), and
- Richmond Harbor (Contra Costa County).

The conceptual models are intended to provide a foundation for future monitoring to track responses to load reductions and may eventually help guide planning of management actions. Three of the selected

embayments (all except San Leandro Bay) receive drainage from pilot watersheds that were included in BASMAA's Clean Watersheds for a Clean Bay project.

During FY 2021/22 and future years, BAMSC representatives to the RMP continued and will continue to participate in the RMP PCBs Workgroup to help provide ongoing oversight of PMU conceptual model development and the related RMP Special Studies.

Provision C.12.h.: Implement a Risk Reduction Program

Requirement: Provision C.12.h requires Permittees to conduct an ongoing risk reduction program to address public health impacts of PCBs in San Francisco Bay/Delta fish. The fish risk reduction program shall take actions to reduce actual and potential health risks in those people and communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families. At a minimum, Permittees shall conduct or cause to be conducted an ongoing risk reduction program with the potential to annually reach 3,000 individuals throughout the region who are likely consumers of San Francisco Bay-caught fish. The Permittees shall report on the status of the risk reduction program in each of their Annual Reports and report the findings of the effectiveness evaluation of their risk reduction program in their FY 2019/20 Annual Report.

Program Activities: To comply with this provision, the Program works with the ACEH Department to maintain fish consumption advisory signs posted at popular fishing locations and boat ramps along the Bay shoreline. Many of these sites are included in the CRFS that estimates total marine recreational fin fish catch and effort for California. While CRFS surveys are designed to aggregate data statewide across multiple types of sites and fishing modes, available results obtained from the Recreational Fisheries Information Network suggest that there were at least 2,000 angler visits to the posted Alameda County sites in 2015. While some individual fishers make repeated visits during the year, there are no data to indicate how many people this represents. A survey by San Francisco Bay Fish Project also found that a significant number of fishers who have seen the signs would share the information with other fishers and consumers. Program staff will continue working with ACEH to try to secure additional sites for posting and explore extending outreach to local bait and tackle stores or other outlets. The Program also developed and promoted an online advertisement to promote awareness of proper consumption. See Section C.7 for details on the effort.

Fishing Advisory Campaign

The Program ran a digital campaign in June 2022 to promote awareness of fish consumption health advisories. The ads targeted fishing and outdoor enthusiasts and included Google Display Ads, Facebook, Instagram Reels, YouTube, and streaming video. In addition to digital advertising, a paid article and advertisement in the Fish Sniffer Online Magazine reached 30,000 readers interested in fishing in California. Fish Sniffer also sent an E-blast to its full subscriber list with Program-only content. Digital ads linked to the Program's [Fishing and Health page](#). Fish Sniffer ads directed viewers directly to the State of California's Fishing Advisory page. See Section C.7 for details on the effort.

Provision C.15: Exempted and Conditionally Exempted Discharges

Provision C.15.b.iv: Individual Residential Car Washing

Requirement: Provision C.15.b.iv requires the Permittee to discourage, through outreach efforts, individual residential car washing discharges into the storm drain system. It also requires Permittees to encourage individuals to direct car wash water to landscape, use as little detergent as necessary, or wash cars at commercial car wash facilities.

Program Activities: To assist member agencies in complying with this provision, the Program has developed outreach materials and posted information on proper car washing for residents on the Program's Car Care [webpage](#). This year, the Program developed and promoted a car wash [video](#) using the Program's mascots Fred and Izzy, in addition to the [video](#) discouraging hosing off driveways and other impervious surfaces.

Provision C.15.b.v.: Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges

Requirement: Provision C.15.b.v requires Permittees to prohibit polluted discharges from pools, hot tubs, spas, and fountains; provide public outreach; allow discharges to the storm drain system only if there are no other alternatives and proper BMPs are implemented; require new facilities to have a connection to the sanitary sewer; and implement illicit discharge program Enforcement Response Plans to address polluted discharges from these facilities.

Program Activities: To assist member agencies in complying with this provision, the Program developed the "Proper Disposal of Wastewater: Don't Drain Pools, Spas and Fountains to Storm Drains" Tip Sheet developed in August 2013 and provides it on the Program [website](#).

Provision C.15.b.vi.: Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering

Requirement: Provision C.15.b.vi. requires Permittees to promote measures that minimize runoff and pollutant loading from excess irrigation.

Program Activities: To assist member agencies in complying with this provision, the Program implements several countywide outreach efforts through the New and Re-Development program (C.3), Public Information and Outreach program (C.7), and Pesticide Toxicity Control program (C.9). These efforts are discussed in those sections of the Annual Report.

Additional Activities

Compliance with the conditionally exempt discharge categories, specifically pumped groundwater, foundation drains, water from crawl space pumps, and footing drains, are also discussed at the IIDC Subcommittee meetings. As mentioned in Section C.4, there were four meetings held this FY, and the focus of the meetings is to share information on MRP compliance and activities, including conditionally exempt discharges that stormwater inspectors may encounter. The Public Information and Participation Subcommittee also addresses outreach and education for several of the conditionally exempt discharge categories.

Appendix A

Industrial and Commercial Site Controls

RESPONSIBILITIES FOR STORMWATER

Tips for Mobile Fleet Services Providers

Mobile fleet services providers are responsible for any activities that lead to non-stormwater discharges to the street, gutter or storm drain. The Clean Water Program's friendly and knowledgeable staff support business owners and managers like you in preventing water pollution and complying with stormwater regulations. The fact that you're reading this fact sheet means you have already decided to take steps to do the right thing. Thank you for keeping our water safe and healthy.

General Best Management Practices

- Know possible pollution sources from your operations, such as:
 - ✓ Leaking oil from vehicles.
 - ✓ Fuel, soaps, and other liquids.
 - ✓ Hose water.
 - ✓ Trash and litter.
- Inspect vehicles regularly to make sure there are no leaks, spills, or other source of stormwater pollution outdoors.
- Never allow hose water, wastewater, or other wastes to enter streets or storm drains.
- Have a spill prevention and management plan so that nothing enters storm drains and pollutes our local waterways.

Spill Prevention and Management

- Train all staff on Best Management Practices to prevent spills, leaks and discharges into streets and sidewalks.
- Make sure all activities are contained. Anything that is hosed off into streets or storm drains, or that could be carried to streets or storm drains by rainwater, is an illegal discharge.
- Have a spill plan. **Keep a clearly labelled spill kit on hand with instructions and materials for cleaning spills with dry methods: absorbents, towels/rags, brooms, shop vacuum.**
- **Spills must be cleaned with absorbent and never hosed down.**

Bathroom Waste

- All buses must have direct connections to the waste line to evacuate the bathroom wastewater. Dumping bathroom waste into catch pans is not allowed.
- All buses must have a vacuum hose connected directly to the outlet pipe from the on-board waste holding tank on the bus.
- All vacuumed bathroom wastewater must be hauled off site.



Keep wash waters, wastewater, trash, and debris OUT of the storm drains. Keep oils, grease, and hazardous chemicals OUT of storm drains and sanitary sewers.



Draining wash water from cleaning activities into the street or storm drains damages sensitive habitats and can kill wildlife. Water flowing into storm drains travels directly to local creeks and then to **San Francisco Bay**. It does not go to a wastewater treatment plant.

Learn more about preventing water pollution and the Clean Water Program at www.cleanwaterprogram.org.



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cleanwater PROGRAM cleanwaterprogram.org

Mobile Fueling

Mobile fueling might not be an approved business activity in all cities/towns. You must obtain approval from each municipality you plan to operate in before providing any services. You must obtain any required licenses and/or permits from the appropriate departments (e.g., Fire, Business Licensing, Planning, CUPA).

If mobile fueling is approved, then the following BMPs apply:

- On-site vehicle fueling must only be practiced where it is impractical to send vehicles off site for fueling.
- Avoid operations within 15 feet of a storm drain inlet or use a storm drain cover or equivalent method to prevent fuel from reaching the storm drain.
- Drip pans or absorbent pads must be used during fueling.
- Spill kits must be in fueling areas and on fueling trucks.
- Spills must be cleaned with absorbent and never hosed down.
- Never top off fuel and Diesel Exhaust Fluids (DEF).
- Fueling operations must not be left unattended.

Mobile Washing

- Property owners must have a designated wash area. This area must be clearly defined with signs and directions for staff.
- The wash area must be at least 25 feet from any storm drain and be flat to prevent runoff and impacts to storm drains.
- You must use a wash mat to contain the wash area so that water does not drain down streets and gutters. It must be made of durable vinyl coated material (not woven) that is reinforced to withstand traffic and heavy equipment.
- Wash mat must have metal ramps for buses to enter and exit.
- All staff must be trained to prevent over-spray or drag-out.
- Use a wet-vacuum or pump and hose to properly dispose of collected wash water.

Be a BASMAA Recognized Mobile Cleaner

Take the online “mobile surface cleaning” training from BASMAA (Bay Area Stormwater Management Agencies Association). This program will train you on how to clean different surfaces in an environmentally acceptable way and publish your name as a trained cleaner. Visit www.basmaa.org

KEY DEFINITIONS

The **Storm Drain System** was built to collect and transport rain to prevent flooding in urban areas. Anything that flows or is discharged into the storm drain system goes directly into local creeks or San Francisco Bay without any treatment.

The **Sanitary Sewer System** collects and transports sanitary wastes from interior building plumbing systems to the wastewater treatment plant where the wastewater is treated.



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Simple changes to your operations and maintenance can help you comply with local regulations. The Clean Water Program makes it easy.

Learn more about preventing water pollution and the Clean Water Program at www.cleanwaterprogram.org.

Local Stormwater Agencies

For advice on avoiding disposal to the storm drain system, contact:

Alameda.....	(510) 747-7930
Albany	(510) 528-5770
Berkeley.....	(510) 981-6400
Dublin	(925) 833-6630
Emeryville	(510) 596-3728
Fremont	(510) 494-4570
Hayward	(510) 881-7900
Livermore	(925) 960-8100
Newark	(510) 578-4286
Oakland	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6700
Union City.....	(510) 675-5308
Clean Water Program.....	(510) 670-6548

For More Help

For advice and approval on wastewater disposal to the sanitary sewer system, contact:

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District..... (510) 477-7500

City of Hayward

City of Hayward

City of Livermore

City of Livermore

City of Pleasanton

City of Pleasanton

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District..... (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

RESPONSIBILITIES FOR STORMWATER

Tips for Businesses

Commercial and industrial businesses are responsible for any activities on their property that lead to non-stormwater discharges to the street, gutter, or storm drain. The Clean Water Program's friendly and knowledgeable staff support businesses like yours in preventing water pollution and complying with stormwater regulations. The fact that you are reading this factsheet means you have already decided to take steps to do the right thing when maintaining your property. Thank you for keeping our water safe and healthy.

General Practices

- Keep your business neat and clean – it saves time and money and prevents pollution.
- Know pollution sources from your business. Automotive fluids, paints, solvents, food wastes, grease, pesticides, herbicides, litter, sediment, cement and landscape wastes are some of the pollutants that get into the storm drain system.
- Protect your storm drain inlets from pollution of any kind (hose water, wastewater, and other liquid or solid waste).
- Protect materials from rain and runoff.
- Be prepared! Keep spill cleanup materials accessible and train staff so they know how to use them.
- Use dry methods to clean up spills whenever possible and never wash spills down the storm drain.
- Sweep parking lots and pick up litter regularly.
- Inspect equipment and vehicles often for leaks. Repair leaks promptly and use drip pans to collect leaks until fixed.

Training Customers and Staff

- Make sure all staff know good housekeeping practices. Any material (liquid or solid) that is hosed off into streets or storm drains, or that could be carried to streets or storm drains by rainwater, is an illegal discharge.
- Post signs and/or notify staff to keep all dumpster and waste container lids closed, and outdoor areas clean.
- Label storm drain inlets so that customers and employees do not dispose of waste there.
- Post signs and/or notify staff of location of spill control equipment.



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Draining wash water from cleaning activities into the street or storm drains damages sensitive habitats and can kill wildlife. Water flowing into storm drains travels directly to local creeks and then to **San Francisco Bay**. It does not go to a wastewater treatment plant.

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Materials Management

- Perform work indoors or under cover whenever possible, to avoid exposure to rainfall, runoff, and wind. Small particles or dust must be contained and vacuumed.
- Store all equipment, materials and waste products indoors.
- Use caution and control when transferring liquids to minimize spill potential.

Outdoor Storage and Waste Areas

- Cover and contain outdoor materials when not in-use.
- Have the right size, type, and number of waste containers/dumpsters/bins for your business activities.
- Keep the lids to dumpsters, recycling bins, and other waste containers closed when not in use. Ensure that they are not leaking or overfilled - inspect daily.
- Use secondary containment when storing fluids outside. Keep lids, caps, and openings closed when not in use.
- Store all items as far as possible from storm drain inlets.
- Use drip pans under outdoor work or storage areas where there is the potential for spills and leaks.

Cleaning and Emergency Spill Control

- Clean up any spills immediately using dry cleanup methods.
- For drips or spills, absorbents, rags or cat litter may be used, then swept up and properly disposed of.
- If wet cleaning methods are required, block storm drains, use minimal water, and collect wash water for proper disposal.
- It is important that wash water on your property is collected and disposed of at an approved location – never into the street, parking lot, or storm drain.
- Consider hiring a Mobile Cleaner recognized by the Bay Area Stormwater Management Agencies Association. Visit www.basmaa.org/featured-programs-projects/surface-cleaning-program/.

KEY DEFINITIONS

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Oakland	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6702
Union City.....	(510) 675-5308

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City of San Leandro

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RESPONSABILIDADES EN MATERIA DE AGUAS PLUVIALES

Consejos para supermercados y tiendas de alimentos

Los propietarios y operadores de supermercados y tiendas de alimentos son responsables de cualquier actividad en su propiedad que conduzca a descargas de aguas no pluviales a la calle, las cunetas o a las alcantarillas. El personal amable y capacitado del Programa de Agua Limpia (Clean Water Program) apoya a los propietarios y gerentes de negocios, como usted, en la prevención de la contaminación del agua y el cumplimiento de los reglamentos de aguas pluviales. El hecho de que esté leyendo esta hoja informativa significa que ya ha decidido tomar las medidas necesarias para hacer lo correcto en el mantenimiento de su propiedad. Gracias por mantener nuestra agua segura y saludable.

Prácticas generales

- Conozca las posibles fuentes de contaminación de su tienda, como por ejemplo:
 - ✓ Derrames, fugas o desbordamiento de la basura en las áreas de contenedores de basura
 - ✓ Desechos líquidos y fugas de fluido hidráulico de los compactadores de basura.
 - ✓ Fugas de aceite y basura suelta en el muelle de carga.
 - ✓ Agua de manguera exterior (contiene cloro).
 - ✓ Actividades de preparación de alimentos que generan grasa, basura, aguas residuales y otros productos de desecho.
- Inspeccione las áreas de contenedores de basura y las áreas de carga con regularidad para asegurarse de que no haya fugas, derrames, basura suelta u otra fuente de contaminación de las aguas pluviales en el exterior.
- Mantenga la propiedad limpia. No permita nunca que el agua de la manguera, el agua de lavado u otros desechos entren en la calle o en las alcantarillas.
- Tenga un plan de prevención y control de derrames para que nada ingrese en las alcantarillas y contamine nuestras vías fluviales locales.

Capacitación del personal

- Capacite a todo el personal sobre las Mejores Prácticas de Gestión. Cualquier material (líquido o sólido) que se vierta con una manguera en la calle o en las alcantarillas, o que pueda ser llevado a la calle o a las alcantarillas por el agua de lluvia, es una descarga ilegal.
- Coloque letreros para notificar al personal que mantenga cerradas todas las tapas de los contenedores de desechos y las áreas exteriores limpias.
- Coloque letreros para notificar al personal sobre los planes de respuesta a derrames y la ubicación del equipo de control de derrames.
- Esté preparado para los derrames. Mantenga un equipo etiquetado en el lugar para limpiar los derrames con métodos secos: absorbentes, escobas, aspiradora.



Mantenga el agua de las mangueras, hojas, polvo, tierra y otros escombros FUERA de las alcantarillas. Mantenga los aceites y los desechos peligrosos FUERA de las alcantarillas y los alcantarillados sanitarios.



Drenar el agua de lavado de las actividades de limpieza en la calle o en las alcantarillas daña los hábitats sensibles y puede matar la vida silvestre. El agua que fluye hacia las alcantarillas viaja directamente a los arroyos locales y luego a la **Bahía de San Francisco**. No va a una planta de tratamiento de aguas residuales.

Aprenda más sobre cómo prevenir la contaminación del agua y acerca del Clean Water Program en www.cleanwaterprogram.org



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Limpieza de carros, alfombras y otros equipos

- Limpie el equipo en un área de lavado designada que drene al alcantarillado sanitario, lejos de las calles y las alcantarillas.
- Si el área de limpieza designada está en el exterior, recoja y bombee el agua de lavado al alcantarillado sanitario.
- Las áreas de limpieza temporal deben contener todas las aguas de lavado.
- Si realiza operaciones de cocina, asegúrese de realizar el mantenimiento adecuado del equipo de extracción en el techo. Toda el agua de lavado se debe contener, aspirar y desechar en el alcantarillado sanitario.
- Usted es responsable de cualquier actividad en su propiedad, incluidas las actividades de los contratistas que emplee, que conduzcan a descargas de aguas no pluviales a la calle o alcantarillas, incluida el agua de lavado.
- Esté atento cómo su contratista está limpiando el equipo. Comparta esta hoja informativa con sus contratistas según sea necesario.

Mantenimiento de contenedores de basura, estacionamiento y áreas exteriores

- Los contenedores de basura, los recipientes de reciclaje y otros recipientes deben estar siempre cerrados. Asegúrese de que no tengan fugas ni estén demasiado llenos.
- Siempre cubra y contenga los materiales de exteriores cuando no estén en uso.
- Disponga de los desechos de comida, reciclaje, grasa y basura en los contenedores adecuados.
- Mantenga los contenedores y los compactadores de basura libres de desechos líquidos. Drene los líquidos en el alcantarillado sanitario o en un recipiente adecuado. Separe el líquido de los desechos sólidos de alimentos con un colador antes de botar en la basura. Coloque solo los contenedores vacíos en los compactadores.
- Mantenga las áreas de estacionamiento libres de basura.

Limpieza y control de derrames de emergencia

- Para goteos o derrames de grasa, se pueden usar absorbentes como trapos o arena para gatos, barrerlos y desecharlos en un recipiente sellado.
- Si se utilizan métodos de limpieza en húmedo, proteja las alcantarillas, use una cantidad mínima de agua y recoja toda el agua de lavado para su eliminación adecuada.
- Recoja el agua de lavado y deséchela en un lugar aprobado, nunca en la calle, el estacionamiento o las alcantarillas.
- Considere contratar a un limpiador móvil reconocido por la Asociación de Agencias de Gestión de Aguas Pluviales del Área de la Bahía (Bay Area Stormwater Management Agencies Association). Para obtener más información, visite www.basmaa.org/training.

DEFINICIONES CLAVE

El Sistema de Alcantarillas se construyó para recoger y transportar la lluvia a fin de evitar inundaciones en áreas urbanas. Todo lo que fluye o se descarga en el sistema de alcantarillas va directamente a los arroyos locales o la Bahía de San Francisco sin ningún tratamiento.

El Sistema de Alcantarillado Sanitario recoge y transporta los desechos sanitarios desde los sistemas de plomería del interior del edificio hasta la planta de tratamiento de aguas residuales donde son tratadas.



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Algunos cambios simples en sus operaciones y mantenimiento pueden ayudar a cumplir con los reglamentos locales. El Clean Water Program lo hace fácil.

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Para más ayuda

Para obtener asesoramiento y aprobación sobre la eliminación de aguas residuales al sistema de alcantarillado sanitario, comuníquese con:

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East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

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City of Hayward (510) 881-7900

City of Livermore

City of Livermore (925) 960-8100

City of Pleasanton

City of Livermore (925) 931-5500

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

Agencias locales del sistema de aguas pluviales

Para obtener asesoramiento sobre cómo evitar la eliminación al sistema de alcantarillas, comuníquese con:

Alameda..... (510) 747-7930

Albany (510) 528-5770

Berkeley..... (510) 981-6400

Dublin (925) 833-6630

Emeryville (510) 596-3728

Fremont (510) 494-4570

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Livermore (925) 960-8100

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Pleasanton (925) 931-5500

San Leandro..... (510) 577-3401

Unincorporated Alameda

County..... (510) 567-6700

Union City..... (510) 675-5308

暴雨水責任

超級市場和糧食雜貨店作業提示

如果超級市場和雜貨店所在的物業有任何活動，導致暴雨水以外的物質排入街道、排水溝或暴雨排水渠，則業主或經營者必須負責。潔淨水專案 (Clean Water Program) 的工作人員友善且知識豐富，能支援像你一樣的商業業主和經營者，幫助你防止水污染並符合暴雨水管制法規。你正在閱讀這份情況說明書，代表你已決定當對你的物業作維護時會採取步驟做正確的事。謝謝你協助保持本地水質的安全和衛生。

一般措施和做法

- 了解你的店鋪有哪些可能的污染源，例如：
 - ✓ 垃圾集中箱放置區有液體潑灑、洩漏或垃圾滿出。
 - ✓ 垃圾壓實機有液態廢棄物或液壓油洩漏。
 - ✓ 裝卸貨平台有漏油情形或垃圾散落。
 - ✓ 室外水管用水 (含氧)。
 - ✓ 食物製備活動產生油脂、垃圾、廢水或其他廢棄物。
- 定時檢查垃圾集中箱放置區和裝卸貨區，確保室外沒有任何液體潑灑、洩漏、垃圾散落或其他暴雨水污染源。
- 保持物業乾淨。絕不要讓水管水、清洗廢水或其他廢棄物進入街道或暴雨排水渠。
- 制定一套潑灑防制計劃，不讓任何東西流入暴風雨排水渠，污染了本地水道。

訓練員工

- 訓練所有員工執行最佳管理措施。若有任何物質 (液態或固態) 被水管水沖入街道或暴雨排水渠，或可能隨著雨水流入街道或暴雨排水渠，都屬於非法排放。
- 張貼標誌，告知員工應保持所有垃圾集中箱和廢棄物容器的蓋子蓋緊，並保持室外區域乾淨。
- 張貼標誌，告知員工潑灑應變計劃的內容，以及潑灑控制設備的存放位置。
- 為潑灑做好準備。在現場放置一套乾式潑灑清潔工具組：吸收材料、掃把、乾濕兩用吸塵器。



防止清洗廢水、污水、垃圾和碎片雜物進入暴雨排水渠。防止油脂和有害化學品進入暴雨排水渠和排污下水道。



若將清潔活動所產生的清洗廢水排入街道或暴雨排水渠，會破壞敏感的棲息地，且可能殺害野生動物。流入暴雨排水渠的水會直接通往本地溪流，然後進入舊金山灣。這些水不會經過污水處理廠。若想了解更多有關水污染防制以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org



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Creeks, Wetlands & the Bay

保護阿拉米達縣的溪流、濕地和舊金山灣

cleanwaterprogram.org



清潔推車、地毯和其他設備

- 在一個可將水排入排污下水道的指定清洗區域清潔設備，遠離街道、排水溝和暴雨排水渠。
- 如果該指定清潔區域位於室外，請收集並抽取清洗廢水，排入排污下水道。
- 臨時性的清潔區域必須圍阻所有清潔廢水。
- 如果你有烹飪作業，請務必妥善維修屋頂排氣設備。所有清洗廢水都必須圍阻、用濕式吸塵器吸起，然後倒入排污下水道。
- 如果你的物業有任何活動 - 包括你僱用承包商進行的活動 - 導致暴雨水以外的物質 (包括清洗廢水) 排入街道、排水溝或暴雨排水渠，你必須負責。
- 了解你的承包商如何清潔設備。在需要時，請將這份情況說明書分享給你的承包商。

維護垃圾集中箱、停車場和室外區域

- 垃圾集中箱、資源回收桶和其他容器必須一直保持蓋上。確保沒有液體洩漏或垃圾滿出的問題。
- 室外材料不用時一定要圍起並加蓋。
- 將廚餘、可回收物、油脂和垃圾分別丟進適當的容器內。
- 保持垃圾集中箱和垃圾壓實機沒有液態廢棄物流出。將液體排入排污下水道或適當容器內。用篩子濾出固態廚餘中的液體。只將空的容器放入垃圾壓實機內。
- 保持停車區域沒有垃圾掉在地上。

清潔和緊急潑灑控制

- 如有油脂滴落或潑灑，可用破布或貓砂之類的材料吸收、掃起，然後丟進一個密封容器內。
- 如使用濕式清潔法，應保護暴雨排水渠、使用最少量的水，然後收集所有清洗廢水並妥善丟棄。
- 收集清潔廢水並倒入一個經核准的地點 - 絕不要倒入街道、停車場或暴雨排水渠。
- 考慮僱用一個經灣區暴雨水管理機構協會 (Bay Area Stormwater Management Agencies Association) 認可的流動清潔業者。詳情請見 www.basmaa.org/training。

重要定義

暴雨排水系統 (Storm Drain System) 的功能是收集和輸送雨水，防止城市地區發生淹水。任何流入或排入暴雨排水系統的東西，都會直接進入本地溪流或舊金山灣，不會經過任何處理。

排污下水道系統 (Sanitary Sewer System) 的功能是收集室內建築物管道系統排出的生活廢棄物，然後輸送到污水處理廠進行污水處理。



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你只需在作業和維護方面做一些簡單改變，即可符合地方法規。潔淨水專案能助你輕鬆達成目標。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org

想要更多協助

如果你需要尋求建議和批准，以便將污水排入排污下水道系統，請聯絡：

Alameda.....	(510) 747-7930
Albany	(510) 528-5770
Berkeley.....	(510) 981-6400
Dublin	(925) 833-6630
Emeryville	(510) 596-3728
Fremont	(510) 494-4570
Hayward	(510) 881-7900
Livermore	(925) 960-8100
Newark	(510) 578-4286
Oakland	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6700
Union City.....	(510) 675-5308

本地暴雨水主管機關

如果你需要尋求建議，以避免將污染物排入暴雨排水系統，請聯絡：

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

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Services District..... (925) 828-0515

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City of Pleasanton

City of Pleasanton

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District

City of San Leandro

City of San Leandro..... (510) 577-3401

GESTIÓN ADECUADA DE DESECHOS

Consejos para el mantenimiento de paisajes

El personal amable y capacitado del Programa de Agua Limpia (Clean Water Program) apoya a negocios como el suyo en la prevención de la contaminación del agua. El hecho de que esté leyendo esta hoja informativa significa que ya ha decidido tomar las medidas necesarias para hacer lo correcto en el mantenimiento de los paisajes. Gracias por mantener nuestra agua segura y saludable.

Prácticas generales

- Conozca las posibles fuentes de contaminación que debe gestionar, como por ejemplo:
 - ✓ Fertilizantes, pesticidas y aplicadores de sustancias químicas
 - ✓ Recortes de jardín, hojas, tierra y escombros
 - ✓ Materiales y equipos de trabajo de concreto
 - ✓ Agua de manguera (contiene cloro), equipo de riego
 - ✓ Equipo de gas, goteos de aceite y grasa
- Inspeccione, repare o reemplace el equipo para reducir derrames o fugas.
- Si abastece de combustible el equipo en el exterior, hágalo con un embudo, sobre una alfombra para derrames y sobre un área pavimentada lejos de las alcantarillas.
- Tenga siempre cerca el equipo para derrames.
- Barra su área de trabajo con regularidad.
- Cubra y contenga los materiales cuando no estén en uso.
- Tenga un plan de control y prevención de derrames, para que nada ingrese en las alcantarillas y contamine los arroyos y la Bahía de San Francisco.

Recortes de jardín, control de sedimentos

- Barra el material suelto, la arena y la grava de su área de trabajo, para que la tierra y los sedimentos no lleguen a la calle.
- Elimine los desechos del jardín según el programa de desechos verdes de la ciudad. Los desechos del jardín no deben ser arrastrados por las lluvias a las alcantarillas.
- Si tiene que lavar el polvo, proteja las alcantarillas, recoja el agua y rediríjala a la jardinería o alcantarillado sanitario.

Obras con concreto

- Cubra y almacene el concreto, la lechada o el mortero lejos de las alcantarillas.
- Nunca permita que el agua del trabajo de concreto (limpieza de herramientas, mezcla, acabado, curados) ingrese a las alcantarillas, al suelo o a la tierra.
- Lave las herramientas y el equipo sobre un recipiente y déjelos secar. Deseche el concreto endurecido en la basura.
- Proteja siempre las alcantarillas cercanas con bermas, alfombras u otros dispositivos para evitar que el agua y los escombros contaminen nuestras vías fluviales.



Mantenga el agua de las mangueras, hojas, polvo, tierra y otros escombros FUERA de las alcantarillas. Mantenga los aceites y los desechos peligrosos FUERA de las alcantarillas y los alcantarillados sanitarios.



Drenar el agua de lavado de las actividades de limpieza en la calle o en las alcantarillas daña los hábitats sensibles y puede matar la vida silvestre. El agua que fluye hacia las alcantarillas viaja directamente a los arroyos locales y luego a la **Bahía de San Francisco**. No va a una planta de tratamiento de aguas residuales.

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Protecting Alameda County
Creeks, Wetlands & the Bay
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Control de plagas y malezas

- Considere la Gestión Integrada de Plagas (Integrated Pest Management, IPM). IPM es un enfoque basado en el ecosistema que se centra en la prevención de plagas a largo plazo, minimizando los riesgos para las personas y la naturaleza.
 - ✓ Elija plantas nativas y tolerantes a la sequía, que son menos susceptibles a las plagas y necesitan menos mantenimiento.
 - ✓ Use productos o métodos de control de plagas o malezas menos tóxicos.
 - ✓ Infórmese sobre los ciclos de vida y los hábitos de las plagas específicas de interés, para que las acciones de control sean más efectivas.
- Siga las instrucciones del fabricante para todos los productos utilizados, a fin de evitar el uso excesivo de pesticidas químicos.
- Deseche los productos químicos excedentes o vencidos como desechos peligrosos.

Limpieza y control de derrames

- En primer lugar, considere usar métodos de limpieza en seco. Barra o aspire para recoger la tierra y los escombros.
- Para goteos o derrames de grasa, use absorbentes como trapos o arena para gatos y, luego, barra y deseche los absorbentes usados adecuadamente
- Si usa métodos de limpieza en húmedo, bloquee los desagües, proteja las alcantarillas según sea necesario, use un mínimo de agua y recoja toda el agua de lavado.
- Bombee o aspire los desechos no peligrosos y deséchelos en el alcantarillado sanitario.
- No riegue el jardín más de lo indispensable.

Cómo recoger el agua de lavado: Use bermas de bolsas de grava, barbas o alfombras para contener el área de lavado, a fin de que el agua no fluya hacia las alcantarillas, las cunetas y la calle. Use una aspiradora para líquidos o una bomba pequeña y una manguera para dirigir el agua a un punto de descarga del alcantarillado sanitario o a un tanque.

Considere convertirse en un Profesional Calificado Amigable con la Bahía (Bay-Friendly Qualified Professional, BFQP):

Los BFQP completan la capacitación sobre cómo crear paisajes que conserven el agua y el suelo, reduzcan los desechos y eviten la contaminación. Para obtener información, visite rescapeca.org/directory.

DEFINICIONES CLAVE

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El Sistema de Alcantarillado Sanitario recoge y transporta los desechos sanitarios desde los sistemas de plomería del interior del edificio hasta la planta de tratamiento de aguas residuales donde son tratadas.



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Para más ayuda

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East Bay Municipal

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Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District (510) 477-7500

City of Hayward

City of Hayward (510) 881-7900

City of Livermore

City of Livermore (925) 960-8100

City of Pleasanton

City of Livermore (925) 931-5500

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

Agencias locales del sistema de aguas pluviales

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Albany (510) 528-5770

Berkeley..... (510) 981-6400

Dublin (925) 833-6630

Emeryville (510) 596-3728

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Pleasanton (925) 931-5500

San Leandro..... (510) 577-3401

Unincorporated Alameda

County..... (510) 567-6700

Union City..... (510) 675-5308

妥善的廢棄物管理

景觀維護作業提示

潔淨水專案 (Clean Water Program) 的工作人員友善且知識豐富，能支援像你一樣的商業業主，幫助你防止水污染。你正在閱讀這份情況說明書，代表你已決定當對景觀做維護時會採取步驟做正確的事。謝謝你協助保持本地水質的安全和衛生。

一般措施和做法

- 了解你必須管理哪些可能的污染源，例如：
 - ✓ 肥料、農藥和化學溶劑
 - ✓ 庭院修剪物、樹葉、土壤、碎片雜物
 - ✓ 混凝土施工材料和設備
 - ✓ 水管用水 (含氯)、灌溉設備
 - ✓ 燃氣設備、滴落的油脂
- 檢查、修理或更換設備，以減少潑灑/洩漏。
- 如果在室外替設備加油，請使用漏斗倒油，底下墊一塊防灑墊，並且在遠離暴雨排水渠的鋪面區域作業。
- 附近要隨時準備一套潑灑處理工具。
- 定時清掃你的工作區域。
- 材料不用時要圍起並加蓋。
- 制定一套潑灑防制計劃，不讓任何東西流入暴雨排水渠，污染了溪流和舊金山灣。

庭院修剪物、沉積物控制

- 掃起工作區域的散落材料、沙子和碎石，以免塵土和沉積物被人車帶到街道上。
- 按照市政府的綠色廢棄物計劃丟棄庭院廢棄物。不可讓庭院廢棄物被風雨吹入/沖入暴雨排水渠。
- 如果你必須沖洗塵土，請保護暴雨排水渠、收集廢水，再導入景觀或排污下水道。

混凝土施工

- 混凝土/水泥漿/灰泥必須加蓋，並存放在遠離暴雨排水渠的地方。
- 絕對不要讓混凝土施工所產生的廢水 (清洗工具、攪拌、修整、養護) 進入暴雨排水渠、地面或土壤區域。
- 在一個容器上方清洗工具和設備，然後晾乾。將硬化的混凝土丟進垃圾桶。
- 經常用護坡、地墊或其他工具圍阻廢水和碎片雜物，來保護鄰近暴雨排水渠，以防污染本地水道。



防止清洗廢水、污水、垃圾和碎片雜物進入暴雨排水渠。防止油脂和有害化學品進入暴雨排水渠和排污下水道。



若將清潔活動所產生的清洗廢水排入街道或暴雨排水渠，會破壞敏感的棲息地，且可能殺害野生動物。流入暴雨排水渠的水會直接通往本地溪流，然後進入舊金山灣。這些水不會經過污水處理廠。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org。



病蟲害和雜草控制

- 考慮實施「病蟲害整合管理」(Integrated Pest Management, IPM)。IPM 是一種以生態系統為基礎的方法，其重點是在儘量降低對人類和大自然風險的原則下，進行長期病蟲害防制。
 - ✓ 選用耐旱的原生種植物，因其比較不容易得到病蟲害，且需要較少維護。
 - ✓ 使用毒性最低的病蟲害/雜草控制產品或方法。
 - ✓ 了解特定害蟲的生命周期和習性，以便採取最有效的控制行動。
- 使用所有產品，都要遵照製造商的指示，切忌過量使用化學農藥。
- 將過量或過期的化學品當作有害廢棄物丟棄。

清潔和潑灑控制

- 先考慮使用乾式清潔法。用掃把或吸塵器清除塵土和碎片雜物。
- 如有油脂滴落或潑灑，請用碎布或貓砂之類的材料吸收，然後掃起並妥善丟棄。
- 如使用濕式清潔法，請封住排水孔，視需要保護暴雨排水渠、使用最少量的水，並且收集所有清洗廢水。
- 用水泵/濕式吸塵器吸取無危害的廢水，然後倒進排污下水道。
- 不要過度灌溉景觀。

如何收集清洗廢水：用碎石袋護坡、枝條或地墊圍阻清洗區域，讓水不會流入暴雨排水渠、街道和排水溝。使用濕式吸塵器或小水泵和水管，將水導入一個排污下水道排放點或水桶內。

考慮成為一個「海灣友善合格專業人士」(Bay-Friendly Qualified Professional, BFQP)：BFQP 經過完整訓練，知道如何打造能夠省水、保護土壤、減少廢棄物和防制污染的景觀。詳情請見 rescapeca.org/directory。

重要定義

暴雨排水系統 (Storm Drain System) 的功能是收集和輸送雨水，防止城市地區發生淹水。任何流入或排入暴雨排水系統的東西，都會直接進入本地溪流或舊金山灣，不會經過任何處理。

排污下水道系統 (Sanitary Sewer System) 的功能是收集室內建築物管道系統排出的生活廢棄物，然後輸送到污水處理廠進行污水處理。



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你只需在作業和維護方面做一些簡單改變，即可符合地方法規。潔淨水專案能助你輕鬆達成目標。若想了解更多有關水污染防制以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org

想要更多協助

如果你需要尋求建議和批准，以便將污水排入排污下水道系統，請聯絡：

Alameda.....	(510) 747-7930
Albany	(510) 528-5770
Berkeley.....	(510) 981-6400
Dublin	(925) 833-6630
Emeryville	(510) 596-3728
Fremont	(510) 494-4570
Hayward	(510) 881-7900
Livermore	(925) 960-8100
Newark	(510) 578-4286
Oakland	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6700
Union City.....	(510) 675-5308

本地暴雨水主管機關

如果你需要尋求建議，以避免將污染物排入暴雨排水系統，請聯絡：

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District..... (510) 477-7500

City of Hayward

City of Hayward

City of Livermore

City of Livermore

City of Pleasanton

City of Pleasanton

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District..... (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

GESTIÓN ADECUADA DE DESECHOS

Consejos para talleres mecánicos

El personal amable y capacitado del Programa de Agua Limpia (Clean Water Program) apoya a negocios como el suyo en la prevención de la contaminación del agua. El hecho de que esté leyendo esta hoja informativa significa que ya ha decidido tomar las medidas necesarias para hacer lo correcto con la gestión de su taller. Gracias por mantener nuestra agua segura y saludable.

Primer paso: Buen servicio de limpieza

- Inspeccione periódicamente los contenedores y el equipo en busca de fugas.
- Utilice contención secundaria (p. ej., bermas, paletas de contención de derrames, contenedores de doble pared, bandejas de goteo) para atrapar las fugas.
- Proteja las entradas de las alcantarillas en las áreas de producción y trabajo de metales.
 - ✓ Elimine o selle los desagües del piso que van a los sistemas de aguas pluviales.
 - ✓ Utilice bermas para aislar las áreas de trabajo de las alcantarillas.
- Inspeccione las áreas exteriores en busca de derrames de productos químicos o aceite, virutas de metal y basura suelta, especialmente cerca de puertas traseras y puertas enrollables. Barra con frecuencia para evitar que las virutas de metal entren en las alcantarillas.

Gestión de materiales

- **Almacene todo los equipos, los suministros de limpieza y los productos de desecho (p. ej, sobras de metal, virutas de metal, escombros) en el interior.**
- Obtenga las Hojas de Datos de Seguridad (SDS) de todos los productos químicos y metales almacenados en su instalación y manténgalas accesibles en todo momento.
- Estandarice los tipos de fluidos, disolventes y soluciones de limpieza que se utilizan en el taller. El uso de los mismos fluidos para varias aplicaciones facilita la reutilización, el reciclaje, el tratamiento, el almacenamiento y la eliminación.
- Solicite el mínimo de materiales y productos químicos, y use los materiales en el orden en que fueron recibidos (“primero en entrar, primero en salir”).
- El conocimiento del uso de materiales tiene varios beneficios:
 - ✓ Los materiales almacenados no vencen antes de su uso.
 - ✓ Ahorra dinero para su negocio.
 - ✓ Reduce los desechos y los materiales sobrantes cuando los procedimientos cambian y pasan las fechas de vencimiento.
 - ✓ Minimiza los problemas cuando ocurren derrames o emergencias como incendios, terremotos, etc.
- Mantenga todas las tapas, tapones y aberturas de los recipientes cerrados cuando no estén en uso.



Mantenga los desechos, los disolventes, los escombros, las virutas de metal y los fluidos para trabajar metales en el interior y FUERA de las alcantarillas.



Drenar el agua de lavado de las actividades de limpieza en la calle o en las alcantarillas daña los hábitats sensibles y puede matar la vida silvestre. El agua que fluye hacia las alcantarillas viaja directamente a los arroyos locales y luego a la **Bahía de San Francisco**. No va a una planta de tratamiento de aguas residuales.

Aprenda más sobre cómo prevenir la contaminación del agua y acerca del Clean Water Program en www.cleanwaterprogram.org



Protecting Alameda County
Creeks, Wetlands & the Bay

cleanwaterprogram.org



Limpeza de derrames

- Mantenga un equipo para derrames cerca y bien etiquetado. Deseche adecuadamente el absorbente usado.
- Evite el uso de productos químicos en el exterior que podrían dejar residuos que terminan en las alcantarillas en caso de lluvia.
- Use métodos de limpieza “en seco” para limpiar y confinar los derrames, incluida una aspiradora o materiales absorbentes (p. ej., trapos, absorbentes tipo calcetín, almohadillas, arena para gatos).
- Si un derrame húmedo es grande, use bermas de bolsas de grava, barbas o alfombras para contener el área húmeda. Luego, use una aspiradora para líquidos o una bomba pequeña y una manguera para dirigir los desechos húmedos a un tanque. Comuníquese con un transportista de desechos peligrosos registrado para eliminar estos desechos.
- Mantenga su Plan de Respuesta a Derrames actualizado y fácilmente disponible para los empleados. **Capacite a los empleados sobre la prevención y respuesta a derrames.**



Spill Kit
Equipo de derrames
(AIRE Industrial)

Desechos peligrosos

- Los fluidos para trabajar metales (es decir, disolventes, lubricantes y refrigerantes) deben reciclarse y reutilizarse tanto como sea posible.
- Los fluidos usados que no se pueden reciclar, las soluciones de limpieza y los materiales absorbentes utilizados para limpiar los fluidos deben eliminarse como desechos peligrosos.
- **Almacene los desechos peligrosos en el interior y en contenedores cerrados, para que los recoja un transportista registrado.**



DEFINICIONES CLAVE

El Sistema de Alcantarillas se construyó para recoger y transportar la lluvia a fin de evitar inundaciones en áreas urbanas. Todo lo que fluye o se descarga en el sistema de alcantarillas va directamente a los arroyos locales o la Bahía de San Francisco sin ningún tratamiento.

El Sistema de Alcantarillado Sanitario recoge y transporta los desechos sanitarios desde los sistemas de plomería del interior del edificio hasta la planta de tratamiento de aguas residuales donde son tratadas.



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CLEAN WATER PROGRAM

Algunos cambios simples en sus operaciones y mantenimiento pueden ayudar a cumplir con los reglamentos locales. El Clean Water Program lo hace fácil.

Aprenda más sobre cómo prevenir la contaminación del agua y acerca del Clean Water Program en

www.cleanwaterprogram.org.

Para más ayuda

Para obtener asesoramiento y aprobación sobre la eliminación de aguas residuales al sistema de alcantarillado sanitario, comuníquese con:

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District (510) 477-7500

City of Hayward

City of Hayward (510) 881-7900

City of Livermore

City of Livermore (925) 960-8100

City of Pleasanton

City of Livermore (925) 931-5500

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

Agencias locales del sistema de aguas pluviales

Para obtener asesoramiento sobre cómo evitar la eliminación al sistema de alcantarillas, comuníquese con:

Alameda..... (510) 747-7930

Albany (510) 528-5770

Berkeley..... (510) 981-6400

Dublin (925) 833-6630

Emeryville (510) 596-3728

Fremont (510) 494-4570

Hayward (510) 881-7900

Livermore (925) 960-8100

Newark (510) 578-4286

Oakland (510) 238-6544

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Pleasanton (925) 931-5500

San Leandro..... (510) 577-3401

Unincorporated Alameda

County..... (510) 567-6700

Union City..... (510) 675-5308

妥善的廢棄物管理

機械工廠作業提示

潔淨水專案 (Clean Water Program) 的工作人員友善且知識豐富，能支援像你一樣的商業業主，幫助你防止水污染。你正在閱讀這份情況說明書，代表你已決定採取步驟在管理你的工廠時做正確的事。謝謝你協助保持本地水質的安全和衛生。

第一步：良好的實務管理

- 定時檢查容器和設備是否有洩漏情形。
- 利用二次圍阻 (如護坡、防漏棧板、雙層容器、滴油盤) 來接住洩漏的液體。
- 保護生產和金屬加工區域的暴雨排水渠入口。
 - ✓ 移除/封住通往雨水系統的地面排水孔。
 - ✓ 用護坡將工作區域孤立，與暴雨排水渠隔開。
- 檢查室外區域是否有化學品/油品潑灑、金屬刨屑和散落的垃圾，尤其是靠近後門和鐵捲門的地方。經常掃地，以防止金屬刨屑進入暴雨排水渠。

材料管理

- 將所有設備、清潔用品和廢料 (如金屬剩料、金屬刨屑和碎片雜物) 存放在室內。
- 為廠內存放的所有化學品和金屬取得安全資料表 (Safety Data Sheet, SDS), 並保存在隨時可供取閱的地方。
- 讓廠內使用的液體、溶劑和清潔劑種類標準化。將相同的溶劑應用於多種工序, 有助於再利用、回收、處理、存放和丟棄。
- 訂購最少量的材料和化學品, 並按照到貨順序使用材料 (「先進先出」)。
- 具有材料使用意識有幾種好處：
 - ✓ 堆放的材料不會在使用前過期。
 - ✓ 幫你的公司省錢。
 - ✓ 減少材料在程序改變和效期過去時的廢棄量和剩餘量。
 - ✓ 當潑灑事故或緊急狀況發生時 (如火災、地震等), 受災程度可降至最低。
- 所有容器不用時都應將蓋子、帽蓋和開口蓋好。



將廢棄物、溶劑、碎片雜物、金屬刨屑和金屬加工液存放在室內，防止它們進入暴雨排水渠。



若將清潔活動所產生的清洗廢水排入街道或暴雨排水渠，會破壞敏感的棲息地，且可能殺害野生動物。流入暴雨排水渠的水會直接通往本地溪流，然後進入舊金山灣。這些水不會經過污水處理廠。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽 www.cleanwaterprogram.org。



潑灑清理

- 在附近存放一套潑灑處理工具組並清楚加上標記。妥善丟棄用過的吸收材料。
- 避免在室外使用可能殘留並被沖入暴雨排水渠的化學品。
- 使用「乾式」清潔法來清潔和阻擋潑灑出來的液體，包括乾濕兩用吸塵器和吸收材料 (如碎布、條狀吸收棉、吸收墊、貓砂)。
- 如果潑灑範圍很廣，請用碎石袋護坡、枝條或地墊圍阻潑灑區域。接著用濕式吸塵器或小水泵和水管，將液態廢棄物導入一個水桶內。聯絡一個有害廢棄物註冊拖運業者來丟棄此廢棄物。
- 保持你的潑灑應變計劃更新，並可隨時供員工參閱。訓練員工進行潑灑防制和應變。



Spill Kit
潑灑處理工具組
(AIRE Industrial)

有害廢棄物

- 金屬加工液 (例如：溶劑、潤滑劑和冷卻劑) 應儘量回收和再利用。
- 凡是無法回收的用過液體、清潔液和用來清理潑灑的吸收材料，都應當作有害廢棄物丟棄。
- 將有害廢棄物存放在室內的密封容器內，並請註冊拖運業者前來收取。



重要定義

暴雨排水系統 (Storm Drain System) 的功能是收集和輸送雨水，防止城市地區發生淹水。任何流入或排入暴雨排水系統的東西，都會直接進入本地溪流或舊金山灣，不會經過任何處理。

排污下水道系統 (Sanitary Sewer System) 的功能是收集室內建築物管道系統排出的生活廢棄物，然後輸送到污水處理廠進行污水處理。



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你只需在作業和維護方面做一些簡單改變，即可符合地方法規。潔淨水專案能助你輕鬆達成目標。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽

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Albany.....	(510) 528-5770
Berkeley.....	(510) 981-6400
Dublin.....	(925) 833-6630
Emeryville.....	(510) 596-3728
Fremont.....	(510) 494-4570
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Newark.....	(510) 578-4286
Oakland.....	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton.....	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6700
Union City.....	(510) 675-5308

本地暴雨水主管機關

如果你需要尋求建議，以避免將污染物排入暴雨排水系統，請聯絡：

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East Bay Municipal
Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

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Cities of Fremont, Newark or Union City

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City of Hayward

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City of Livermore

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City of Pleasanton

City of Pleasanton..... (925) 931-5500

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District..... (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

ELIMINACIÓN ADECUADA DE LAS AGUAS RESIDUALES

Consejos para la limpieza de superficies y lavado a presión

El personal amable y capacitado del Programa de Agua Limpia (Clean Water Program) apoya a compañías como la suya en la prevención de la contaminación del agua. El hecho de que esté leyendo esta hoja informativa significa que ya ha decidido tomar las medidas necesarias para hacer lo correcto con las aguas residuales de su negocio. Gracias por ayudar a mantener nuestra agua segura y saludable.

Limpiar usando métodos secos

- Considere usar métodos de limpieza en seco: utilice absorbentes como trapos o arena para gatos a fin de recoger los derrames de grasa o aceite. Barra o aspire para recoger basura, escombros o absorbentes saturados. Deseche los absorbentes usados en la basura.
- Si se requiere una limpieza en húmedo, barra primero para eliminar los escombros. Minimice la cantidad de agua utilizada y evite usar jabón siempre que sea posible. Incluso el jabón biodegradable es perjudicial para el medio ambiente.

Aceras, plazas, entradas a cocheras, estacionamientos:

- Barra, recoja y deseche los escombros primero.
- Contenga, recoja y descargue el agua de lavado al alcantarillado sanitario o llévela fuera del sitio para su eliminación adecuada.
- Limpie en seco primero las manchas de aceite y deseche el absorbente adecuadamente.
- Si hay depósitos de aceite en exceso y el área no se limpia con frecuencia, recoja y deseche el agua de lavado en el alcantarillado sanitario a través de un separador de agua o aceite, si es posible. Hable con el operador del lugar y la agencia de aguas residuales.
- Si limpia peligros biológicos, comuníquese con su agencia local para conocer las prácticas adecuadas.

Descarga correcta

Posibles puntos de descarga en alcantarillado sanitario: fregaderos interiores, inodoros, desagües de piso o bocas de limpieza para plomería. Debe comunicarse con su agencia local de aguas residuales antes de descargar al alcantarillado sanitario.



Protecting Alameda County
Creeks, Wetlands & the Bay

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Mantenga las aguas de lavado de la limpieza de superficies y el lavado a presión FUERA de las alcantarillas.



Drenar el agua de lavado de las actividades de limpieza en la calle o en las alcantarillas daña los hábitats sensibles y puede matar la vida silvestre. El agua que fluye hacia las alcantarillas viaja directamente a los arroyos locales y luego a la **Bahía de San Francisco**. No va a una planta de tratamiento de aguas residuales.

Aprenda más sobre cómo prevenir la contaminación del agua y acerca del Clean Water Program en www.cleanwaterprogram.org



Exteriores de edificios y eliminación de grafiti

- **Edificios de vidrio y acero o edificios pintados con pintura sin plomo y sin jabón:** bloquee las alcantarillas y dirija el agua de lavado al alcantarillado sanitario o recójala y llévela fuera del sitio para su eliminación adecuada.
- **Edificios pintados con pintura a base de plomo o aditivos de mercurio:** bloquee las alcantarillas y recoja el agua de lavado. Bombee a un tanque y descargue al alcantarillado sanitario o deséchelo como desperdicio peligroso, si es necesario. * *Compruebe los requisitos de las autoridades de aguas residuales para la descarga.*
- **Eliminación de grafiti: si utiliza el chorro de arena húmedo** (sin bicarbonato de sodio), minimice la cantidad de agua utilizada o, **si usa compuestos de limpieza y lavado a alta presión**, bloquee las alcantarillas y recoja el agua de lavado. Si es posible, hable con el operador del lugar y la agencia de aguas residuales, y luego descargue en el alcantarillado sanitario.
- **Eflorescencia de mampostería con lavado ácido:** bloquee las alcantarillas y recoja el agua de lavado. Si el pH está entre 6 y 10, bombee a un tanque y descargue al alcantarillado sanitario. * *Compruebe los requisitos de las autoridades de aguas residuales para la descarga.*

Cómo recoger el agua de lavado: use bermas de bolsas de grava, barbas o alfombras para contener el área de lavado, a fin de que el agua no se escurra por la calle y alcantarillas. Use una aspiradora para líquidos o una bomba pequeña y una manguera para dirigir el agua a un punto de descarga del alcantarillado sanitario o a un tanque.

Ser limpiador móvil reconocido por BASMAA

Tome la capacitación en línea sobre “limpieza de superficies móviles” de la Asociación de Agencias de Gestión de Aguas Pluviales del Área de la Bahía (Bay Area Stormwater Management Agencies Association, BASMAA). Este programa le entrenará sobre cómo limpiar diferentes superficies de una manera ambientalmente aceptable y le permitirá publicar su nombre como limpiador capacitado. Visite www.basmaa.org/training para obtener más información.

DEFINICIONES CLAVE

El Sistema de Alcantarillas se construyó para recoger y transportar la lluvia a fin de evitar inundaciones en áreas urbanas. Todo lo que fluye o se descarga en el sistema de alcantarillas va directamente a los arroyos locales o la Bahía de San Francisco sin ningún tratamiento.

El Sistema de Alcantarillado Sanitario recoge y transporta los desechos sanitarios desde los sistemas de plomería del interior del edificio hasta la planta de tratamiento de aguas residuales donde son tratadas.



cleanwaterprogram.org

Algunos cambios simples en sus operaciones y mantenimiento pueden ayudar a cumplir con los reglamentos locales. El Clean Water Program lo hace fácil.

Aprenda más sobre cómo prevenir la contaminación del agua y acerca del Clean Water Program en www.cleanwaterprogram.org.

Para más ayuda

Para obtener asesoramiento y aprobación sobre la eliminación de aguas residuales al sistema de alcantarillado sanitario, comuníquese con:

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District (510) 477-7500

City of Hayward

City of Hayward (510) 881-7900

City of Livermore

City of Livermore (925) 960-8100

City of Pleasanton

City of Livermore (925) 931-5500

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District (510) 481-6971

City of San Leandro

City of San Leandro..... (510) 577-3401

Agencias locales del sistema de aguas pluviales

Para obtener asesoramiento sobre cómo evitar la eliminación al sistema de alcantarillas, comuníquese con:

Alameda..... (510) 747-7930

Albany (510) 528-5770

Berkeley..... (510) 981-6400

Dublin (925) 833-6630

Emeryville (510) 596-3728

Fremont (510) 494-4570

Hayward (510) 881-7900

Livermore (925) 960-8100

Newark (510) 578-4286

Oakland (510) 238-6544

Piedmont..... (510) 420-3050

Pleasanton (925) 931-5500

San Leandro..... (510) 577-3401

Unincorporated Alameda

County..... (510) 567-6700

Union City..... (510) 675-5308

妥善丟棄污水

表面清潔和高壓清洗作業提示

潔淨水專案 (Clean Water Program) 的工作人員友善且知識豐富，能支援像你一樣的公司，幫助你防止水污染。你正在閱讀這份情況說明書，代表你已決定在處理你的營業廢水時採取步驟做正確的事。謝謝你協助保持本地水質的安全和衛生。

使用乾式清潔法

- 請考慮使用乾式清潔法：用碎布或貓砂等吸收材料清除潑灑出來的油脂。用掃把或吸塵器清除垃圾、雜物或已吸飽的吸收材料。將用過的吸收材料丟入垃圾桶。
- 如果必須使用濕式清潔法，請先掃去碎片雜物。儘量減少用水量，並且儘可能避免使用肥皂。即使是可生物分解的肥皂，仍會對環境有害。

人行道、廣場、車道、停車場：

- 先掃除、收集並丟棄碎片雜物。
- 圍阻和收集任何清洗廢水，然後排入排污下水道，或拖運至其他地方妥善丟棄。
- 先用乾式法清潔漏油點，然後妥善丟棄吸收材料。
- 如果現場積油過多，且該區不常清理，則在可能的情況下，當你收集清潔廢水之後，請經由油水分離器排入排污下水道。請和場地經營者和污水主管機關討論相關事宜。
- 如須清潔生物危害物質，請聯絡當地主管機關詢問適當做法。

妥善排放

可能的排污下水道排放點：室內水槽、馬桶、地面排水孔或污水管清潔孔。將廢水排入排污下水道之前，你必須先聯絡當地污水主管機關。



防止表面清潔和高壓清洗所產生的清洗廢水進入暴雨排水渠。



若將清潔活動所產生的清洗廢水排入街道或暴雨排水渠，會破壞敏感的棲息地，且可能殺害野生動物。流入暴雨排水渠的水會直接通往本地溪流，然後進入舊金山灣。這些水不會經過污水處理廠。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org。



建築物外牆清洗和清除塗鴉

- 玻璃和鋼造建築或使用無鉛漆料的漆裝建築，不用肥皂 – 擋住暴雨排水渠，並且將清洗廢水導入排污下水道，或收集並拖運至其他地方妥善丟棄。
- 可能使用含鉛或含汞漆料的漆裝建築 – 擋住暴雨排水渠並收集清洗廢水。用水泵抽入一個水桶內，然後排入排污下水道或按需要當作有害廢棄物丟棄。**檢查污水主管機關的排放規定。*
- 塗鴉清除 – 如使用濕噴砂法 (不使用小蘇打粉)，應儘量減少用水量，或使用高壓清洗和清潔劑；作業時擋住暴雨排水渠並收集清洗廢水。如有可能，請先和場地經營者和污水主管機關討論，然後再排入排污下水道。
- 使用酸洗法清除石牆壁癌 – 擋住暴雨排水渠並收集清洗廢水；如果酸鹼值 (pH) 介於 6 和 10 之間，請用水泵抽入一個水桶內，然後排入排污下水道。**檢查污水主管機關的排放規定。*

如何收集清洗廢水：用碎石袋護坡、枝條或地墊圍阻清洗區域，讓水不會排入街道和排水溝。使用濕式吸塵器或小水泵和水管，將水導入一個排污下水道排放點或水桶內。

成為一個 BASMAA 認可的流動清潔業者

參加 BASMAA (灣區暴風雨水管理機構協會) 開辦的「流動表面清潔」線上培訓課程。此課程將訓練你如何使用環境可接受的方式清潔各種不同的表面，並作為受過訓練的清潔業者公佈你的名字。詳情請見 www.basmaa.org/training。

重要定義

暴雨排水系統 (Storm Drain System) 的功能是收集和輸送雨水，防止城市地區發生淹水。任何流入或排入暴雨排水系統的東西，都會直接進入本地溪流或舊金山灣，不會經過任何處理。

排污下水道系統 (Sanitary Sewer System) 的功能是收集室內建築物管道系統排出的生活廢棄物，然後輸送到污水處理廠進行污水處理。



cleanwaterprogram.org

你只需在作業和維護方面做一些簡單改變，即可符合地方法規。潔淨水專案能助你輕鬆達成目標。若想了解更多有關水污染防治以及潔淨水專案的資訊，請瀏覽

www.cleanwaterprogram.org

想要更多協助

如果你需要尋求建議和批准，以便將污水排入排污下水道系統，請聯絡：

Alameda.....	(510) 747-7930
Albany	(510) 528-5770
Berkeley.....	(510) 981-6400
Dublin	(925) 833-6630
Emeryville	(510) 596-3728
Fremont	(510) 494-4570
Hayward	(510) 881-7900
Livermore	(925) 960-8100
Newark	(510) 578-4286
Oakland	(510) 238-6600
Piedmont.....	(510) 420-3050
Pleasanton	(925) 931-5500
San Leandro.....	(510) 577-3401
Unincorp. Alameda County....	(510) 567-6700
Union City.....	(510) 675-5308

本地暴雨水主管機關

如果你需要尋求建議，以避免將污染物排入暴雨排水系統，請聯絡：

Cities of Alameda, Albany, Berkeley, Emeryville, Oakland or Piedmont

East Bay Municipal

Utility District (EBMUD)..... (510) 287-1651

Castro Valley

Castro Valley Sanitary District..(510) 537-0757

City of Dublin

Dublin-San Ramon

Services District..... (925) 828-0515

Cities of Fremont, Newark or Union City

Union Sanitary District

City of Hayward

City of Hayward

City of Livermore

City of Livermore

City of Pleasanton

City of Pleasanton

Cities of San Lorenzo, unincorporated portions of San Leandro and Hayward

Oro Loma Sanitary District

City of San Leandro

City of San Leandro.....



Post Workshop Report: Stormwater Business and Illicit Discharge Inspectors Workshop Training Fiscal Year 2021-2022

The Clean Water Program’s Industrial and Illicit Discharge subcommittee (IIDC) sponsored a stormwater business inspectors training workshop on April 5, 2022. The Workshop was held virtually via the Zoom Meeting platform. The Training Workgroup responsible for planning the workshop are identified below.

Jose Soto	Union Sanitary District
Jim Scanlin	Clean Water Program
Sharon Gosselin	Alameda County
Jennifer Stern	City of Oakland
Kristin Kerr	EOA, Inc.
Kylie Kammerer	EOA, Inc.

The Agenda for the Workshop is attached. Sixty-eight (68) people attended the 2 hour workshop. The attendance list for the Workshop, sorted by agency, is attached. Presentation materials from the workshop are available to Clean Water Program member agencies on the Program’s website.

Workshop Evaluation

Completed evaluations: 46

Percent of attendees completing evaluation: 68%

Evaluation Question	Response
The presentations were clear and easy to follow	3.89 average rating (out of 4) ¹
Overall, the presentations were informative and useful	3.85 average rating (out of 4) ¹
I will use the skills learned in the workshop today on the job	3.86 average rating (out of 4) ¹
The presenter(s) were knowledgeable in the subject matter	3.89 average rating (out of 4) ¹
Did this training meet your expectations?	Yes: 45 No: 1
Which presentation was most valuable to your job role?	What to Expect in MRP 3.0 Update: 14 Oakland Business Inspection Program Case Studies: 8 Enforcement Case Studies: 15 Illicit Discharge Enforcement Panel: 8
What type of training would you prefer in the future?	In-person: 7 Virtual/On-line: 11 Either: 28

Note: ¹Strongly Disagree = 1, Strongly Agree = 4

What did you find the most valuable about today's training?

- MRP 3.0: Upcoming Stormwater Permit Requirements (9)
- All of the photos and examples
- The Oakland photos and talk.
- Case studies with examples.
- I gained some valuable background on permitting/enforcement regulations and recent changes in stormwater management/policies!
- Learning about the clean-water program and types of enforcement that are done within the program.
- I learned about the new provisions in the new MRP.
- Seeing different enforcement cases and what was required to correct them
- It was a lot broader and more involved than I thought
- How the program works.
- Hearing about how other jurisdictions did enforcement.
- Upcoming updates. Good photos. Interesting to hear comparison of programs
- Understanding what inspectors look for
- Others enforcement tools
- The real-life examples and the enforcement actions taken.
- Storm drain discharges
- I always appreciate case studies and how they were handled.
- Knowledge sharing
- The enforcement case studies presented by Jose Soto were great.
- The variety of topics and compatible themes was good.
- Stories of how agencies cooperate together.
- MRP 3.0, enforcement and how other agencies implement the permit program
- What's new in MRP 3 and Enforcement Case Studies
- Jose's presentation
- The pictures and case studies
- Polls and comparison to other agencies

Do you have any suggestions for improvements that could be made to the training?

- Break into groups and review cases
- N/A, I thought the training was great (3)
- Focus on inspection flow.
- Case studies are very helpful (re Oakland program and the Enforcement presentations)
- Continue with this format to update new requirements, illicit discharges, and industrial discharges. Panel discussion.
- Videos on proper ways of surface washing and/or other BMPs. Also add pictures about what clean looks like for the different enforcement cases.
- The first presentation had lots of echo and was hard to follow because of it.
- Better Audio for certain speakers (D. Hammond): suggest headset.
- Always more examples.

- Break out sessions for C4 and C5, for 10 to 15 minutes, with pre-prepared questions. Or break out sessions with two panels, one for C4 and one for C5.
- Maybe a more detailed case study with examples of correspondence, enforcement documents and referrals.
- This session was well-done and very organized.
- More case studies and violation references
- Some audio were not clear, perhaps a soundcheck before the presentation. Some fonts e.g., color, on the slides were not very visible.

What topics would you like to see addressed in future workshops?

- ERPs
- Inspection walk-throughs and feedback
- More updates.
- How new policies will be addressed in the future by various departments
- New laws and or regulations that are coming up in the future and how those can be implemented in the future.
- Mobile and Homeless BMPs (C.17) (4)
- Cleanup options for the businesses
- A discussion regarding potential vs. actual discharges.
- More case studies (2)
- More enforcement case studies.
- Things specific to construction
- More examples and explanation for how compliance is reached.
- More on enforcement
- How to get fines and fees into your Municipal Code
- More challenging, complicated case studies
- Continue with program 101 and enforcement, mobile businesses, a presentation on: when you see this, what do you do.
- NOI facility inspections and using a SWPPP to conduct them.

General Comments

- Very good presentation!
- Thank you! (5)
- Thank you for the information sharing and panel discussion.
- Meeting in person sometimes in nice but it's easier to get more attendees and having the recording available is nice.
- It was worthwhile training. There probably should be more training in the future than just what meets the minimum requirements.
- I liked the training
- Great training! Thanks all (2)
- Great refresh on current storm water enforcement requirements and practices
- Good learning tool to check out what other municipalities are doing.
- Good job (4)

- Facilitation and management of Zoom training was excellent. Polls, Chat oversight, multiple speakers all good.

Workshop Poll Questions

How many times have you attended an ACCWP IIDC Workshop?

First time	18
1-2 times	9
3-5 times	7
5-10 times	5
So many times	8

How many years of stormwater inspection experience do you have?

Just Starting	10
1-2 Years	11
2-5 Years	12
5-10 years	9
More than I Can Count	11

What types of stormwater inspections do you do (select all that apply).

Commercial business inspections (C.4)	41
NOI Industrial Facility Inspections (C.4)	32
Low Impact Development (LID) treatment measure during inspection (C.3)	8
Construction Sites (C.6)	6
LID treatment measures O&M verification (C.3.h)	5



Stormwater Business and Illicit Discharge Inspectors Workshop

**Tuesday, April 5, 2022
9:00 a.m. to 11:00 a.m.**

	Topic	Speaker	Time
	Welcome		9:00 am
1	What to Expect in MRP 3.0: Upcoming Stormwater Permit Requirements	Kristin Kerr, EOA, Inc.	9:10 am
2.	Oakland Business Inspection Program Case Studies	Alizée Jenck, Oakland inspector (consultant)	9:40 am
3.	Enforcement Case Studies	Jose Soto, Union Sanitary District	10:00
4.	Illicit Discharge Enforcement Panel	Dylan Hammond, Alameda Jamie Cooney, Berkeley Jaime Rosenberg, Hayward Jennifer Stern, Oakland Lisa Maffei, San Leandro	10:30 am
	Wrap Up	Kristin Kerr, EOA, Inc.	11:00 am

ACCWP IIDC Stormwater Insepector Workshop

April 5, 2022

Attendance List

	First Name	Last Name	Agency
1	Kyle	Fennessy	Alameda County
2	Roseanna	Garcia La Grille	Alameda County
3	Devin	Gomez	Alameda County
4	Stephanie	Hessler	Alameda County
5	Timothy	Hildreth	Alameda County
6	Emily	Hoe	Alameda County
7	Barbara	Jakub	Alameda County
8	Aileen	Mendoza	Alameda County
9	Nicholas	Nobrega	Alameda County
10	Marisol	Novak	Alameda County
11	Steven	Plunkett	Alameda County
12	Angelica	Santos	Alameda County
13	Matthew	Soby	Alameda County
14	Antoinette	Stetzenmeyer	Alameda County
15	Kayla	Thomas	Alameda County
16	Luke	Voropaeff	Alameda County
17	Fatinah	Zareef	Alameda County
18	Sharon	Gosselin	Alameda County
19	Jim	Barse	City of Alameda
20	Dylan	Hammond	City of Alameda
21	David	Lam	City of Albany
22	Lam	Inthavong	City of Berkeley
23	Jamie	Cooney	City of Berkeley
24	Jeffrey	Diep	City of Berkeley
25	Dale	Holder	City of Berkeley
26	Samantha	Kinstrey	City of Berkeley
27	Meridith	Lear	City of Berkeley
28	Tracey	Nguyen	City of Berkeley
29	Ronald	Torres	City of Berkeley
30	Michelle	Sung	City of Dublin
31	Shannan	Young	City of Dublin
32	Jaime	Rosenberg	City of Hayward
33	Braden	Christensen	City of Livermore
34	Jennifer	Peet	City of Livermore
35	James	Scanlin	City of Newark
36	Jennifer	Stern	City of Oakland
37	Ben	Livsey	City of Oakland
38	Kiana	Rodgers	City of Pleasanton
39	Michael	Warning	City of Pleasanton
40	Dave	Dennis	City of San Leandro
41	Lisa	Maffei	City of San Leandro

ACCWP IIDC Stormwater Insepector Workshop
April 5, 2022
Attendance List

	First Name	Last Name	Agency
42	Andrew	Savage	City of San Leandro
43	Tiffany	Treece	City of San Leandro
44	Dave	Dennis	City of San Leandro
45	Kylie	Kammerer	EOA, Inc. (Emeryville)
46	Phoebe	Rafferty	EOA, Inc. (Emeryville)
47	Elizabeth	Frantz	Surf to Snow Environmental Resource Management
48	Kelsey	Laux	Surf to Snow Environmental Resource Management
49	Eddie	Yu	Union City
50	Michael	Lothian	Union Sanitary Distcit
51	Marian	Gonzalez	Union Sanitary Distrcit
52	Michael	Dunning	Union Sanitary District
53	Edda	Marasigan	Union Sanitary District
54	Victor	Padilla	Union Sanitary District
55	Alexander	Paredes	Union Sanitary District
56	Aaron	Robles	Union Sanitary District
57	Jose	Soto	Union Sanitary District
58	Joseph	Mendoza	Union Sanitary District
59	Philip	Anderson	Wood PLC
60	Bill	Feller	Wood PLC
61	Scott	Graham	Wood PLC
62	Jim	Honniball	Wood PLC
63	Alizee	Jenck	Wood PLC
64	Steven	Mendoza	Wood PLC
65	Christine	Nims	Wood PLC
66	Gene	Briones	Zone 7 Water
67	Elliott	Levitsky	Zone 7 Water
68	Athena	Watson	Zone 7 Water

Appendix B

Construction Site Control

Workshop Report: Construction Stormwater Training

Fiscal Year 2021-22

On March 30, 2022, the Alameda Countywide Clean Water Program (ACCWP) and the Contra Costa County Clean Water Program (CCCWP) held a joint Construction Stormwater Training. The training was designed to fulfill the Municipal Regional Permit (MRP) Provision C.6 biennial training requirement. The workshop was held virtually on the *GoTo Training* platform. 133 municipal agency staff and 11 consultants attended the workshop. The workgroup members responsible for planning the workshop were:

Daniel Matlock	City of Fremont
Dennis Larks	City of Oakland
Mike Perlmutter	City of Oakland
Sharon Gosselin	Alameda County
Jim Scanlin	Clean Water Program
Dan Cloak	DCEC representing CCCWP
Alina Constantinescu	LWA representing CCCWP
Sandy Mathews	LWA representing ACCWP

The presentations provided foundational C.6 information, pending updates to the Construction General Permit (CGP) and the MRP, and inspection case studies.

- *MRP C.6 Refresher* presented by Alina Constantinescu, LWA representing CCCWP
- *Regulatory Update, CGP and MRP* presented by Sandy Mathews, LWA representing ACCWP
- *Stories from the Field* presented by Dennis Larks, City of Oakland; Elliot Wier, City of Fremont; and David Klapperich, Contra Costa County

The *Stories from the Field* included short case studies based on the experiences of the three inspectors and was followed up with an extended panel discussion with the participants on these examples and other inspection questions.

The virtual training session was recorded and will remain available on the training platform <https://attendee.gototraining.com/r/4562255696262100738> through August 2022, after which the recording will be downloaded as an MP4 file and be available to the ACCWP and CCCWP members.

Effectiveness Assessment

Pre- and post-workshop surveys provided insights into the knowledge of the participants before and after the workshop. The pre-workshop survey had an average correct response rating of 70% that improved to 81% in the post-workshop survey (**Table 1**).

Workshop Evaluation

Seventy-two percent of the attendees (104 out of 143) completed evaluations. 45% of the attendees stated a preference for future online trainings and 20% preferring in-person training. The remaining 35% indicated no preference. **Table 2** provides a summary of the evaluations.

Attendees were asked “What C.6 questions did you wish were covered, or were not covered enough in this workshop?” These responses, which can help to identify future training topics and needs, included: information on enforcement tools and options for non-responsive contractors; review how to complete

inspection forms; Water Board contacts; resources and tools for inspectors; clarification on CGP disturbance thresholds; review of small project Erosion Control Plans; more detailed discussion of the differences between C.6 and the CGP; and proper BMP implementation.

Table 1. Workshop Effectiveness Assessment Summary

Question	Pre-Workshop Survey	Post-Workshop Survey	
	% Answered Correctly	% Answered Correctly	Difference
Which of the following is not a requirement of MRP provision C.6?	68%	69%	1%
How frequently must active high priority sites be inspected by the local agency?	57%	83%	26%
What is the primary purpose of the pre-raining season notification?	92%	92%	0%
Which should be inspector use to determine appropriate enforcement actions?	77%	84%	7%
Timely corrections of discharge or potential discharge means which of the following?	72%	82%	11%
Erosion Control Plans for C.6 projects that are less than one acre must contain the same information as a CGP SWPPP.	52%	76%	24%
Totals			
Average Test Score	70%	81%	11%
Total Surveys Completed	88	101	
Total attendees	143		
% completing surveys	62%	71%	

Table 2. Workshop Evaluation Summary

Evaluation Item	Average Rating (out of 5) ¹
The training was useful and informative.	4.50
I will use the skills learned in the workshop today on the job.	4.34
Preference for Future Training Format	%
Online	45
In-Person	20
No Preference	35

¹ Rating scale 1-5 with 1 = Strongly Disagree and 5 = Strongly Agree

Attachments: Workshop Agenda, Attendance Report



**CONTRA COSTA
CLEAN WATER
PROGRAM**

C.6 Construction Stormwater Training Workshop Agenda

March 30, 2022

8:30-11:00 a.m.

Platform opens at 8:00 a.m. for logging in.

Topic/Activity	Speaker	Time
Log-in	<ul style="list-style-type: none"> • Troubleshoot your connection. • Complete the pre-workshop survey (if you haven't done so already). 	8:00-8:30
Welcome & Intro to Platform	Daniel Matlock, ACCWP NDS Chair, City of Fremont Karin Graves, CCCWP Interim Program Manager	8:30-8:45
MRP C.6 Refresher	Alina Constantinescu, CCCWP Consultant	8:45-9:05
Regulatory Update, CGP and MRP	Sandy Mathews, ACCWP Consultant	9:05-9:20
Q&A on C.6 and Updates	Participants	9:20-9:30
Stories from the Field	Dennis Larks, City of Oakland David Klapperich, Contra Costa County Elliot Wier, City of Fremont	9:30-10:15
Panel – Discussion with the inspector panel	Municipal Inspectors & Participants	10:15-10:45
Wrap up	<ul style="list-style-type: none"> • Complete the post workshop survey and evaluation 	10:45-11:00

ACCWP-CCCWP Join Construction Site Stormwater C.6 Training**March 30, 2022**

Last Name	First Name	Agency	Program
Barse	Jim	Alameda	ACCWP
Hammond	Dylan	Alameda	ACCWP
Beauchamps	Isabelle	Alameda County	ACCWP
Garrison	Jason	Alameda County	ACCWP
Gosselin	Sharon	Alameda County	ACCWP
Reed	Matthew	Alameda County	ACCWP
Lam	David	Albany	ACCWP
Alonso	Jose	Berkeley	ACCWP
Angla	Stephanie	Berkeley	ACCWP
Caudillo	Jonathan	Berkeley	ACCWP
Holder	Dale	Berkeley	ACCWP
Kinstrey	Samantha	Berkeley	ACCWP
MacArthur	Matthew	Berkeley	ACCWP
merry	adrian	Berkeley	ACCWP
Ching	Erwin	Dublin	ACCWP
Young	Shannan	Dublin	ACCWP
Bailey	Martin	Fremont	ACCWP
Matlock	Daniel	Fremont	ACCWP
Wier	Elliot	Fremont	ACCWP
Ahmed	Haitham	Hayward	ACCWP
Damasco	James	Hayward	ACCWP
Del Rio	Miguel	Hayward	ACCWP
Kenney	Adam	Hayward	ACCWP
Pulu	Paulo	Hayward	ACCWP
Sharma	Mo	Hayward	ACCWP
Taha	Mustafa	Hayward	ACCWP
Titus	Geoff	Hayward	ACCWP
Whipple	Jason	Hayward	ACCWP
Chiu	Julie	Livermore	ACCWP
Levers	Farnoush	Livermore	ACCWP
Liu	Joanna	Livermore	ACCWP
NIJHAWAN	SAURABH	Livermore	ACCWP
Reyes	Edward	Livermore	ACCWP
Teczon	Rick	Livermore	ACCWP
Tenorio	Juan	Livermore	ACCWP
Farrell	Matthew	Newark	ACCWP
Kreutzer	Karl	Newark	ACCWP
Mirza	Anwar	Newark	ACCWP
Scanlin	James	Newark	ACCWP
Atkinson	Russell	Oakland	ACCWP
Ferracane	Christina	Oakland	ACCWP
Fryer	John	Oakland	ACCWP
Gunari	Seth	Oakland	ACCWP

ACCWP-CCCWP Join Construction Site Stormwater C.6 Training**March 30, 2022**

Last Name	First Name	Agency	Program
Ha	Travis	Oakland	ACCWP
Harris	Victor	Oakland	ACCWP
Hasert	Theodore	Oakland	ACCWP
Ibarra	Gabriel	Oakland	ACCWP
Larks	Dennis	Oakland	ACCWP
Legault	Michae	Oakland	ACCWP
Marlette	John	Oakland	ACCWP
Miles	David	Oakland	ACCWP
Morales	Adam	Oakland	ACCWP
Norris	Shane	Oakland	ACCWP
Perlmutter	Mike	Oakland	ACCWP
Ray	Cliff	Oakland	ACCWP
Reyes	Jorge	Oakland	ACCWP
Rojo	Mariano	Oakland	ACCWP
Scyphers	Chris	Oakland	ACCWP
Sinor	Andrew	Oakland	ACCWP
Tanios	Joseph	Oakland	ACCWP
Velasquez	Carlos	Oakland	ACCWP
WIMBISH	JAMES	Oakland	ACCWP
Carlotti	Justin	Pleasanton	ACCWP
Deshmukh	Vibha	Pleasanton	ACCWP
Nolta	Dave	Pleasanton	ACCWP
Rodgers	Kiana	Pleasanton	ACCWP
Vasquez	Alfredo	Pleasanton	ACCWP
Walker	Scott	Pleasanton	ACCWP
Magno	Robert	San Leandro	ACCWP
Cho	Tommy	Union City	ACCWP
Tran	Trieu	Union City	ACCWP
Yu	Eddie	Union City	ACCWP
Briones	Gene	Zone 7	ACCWP
Harris	Jerry	Zone 7	ACCWP
Levitsky	Elliott	Zone 7	ACCWP
Rank	Elke	Zone 7	ACCWP
Reyna	Andrew	Zone 7	ACCWP
Ruggiero	Joshua	Zone 7	ACCWP
Tang	Jeff	Zone 7	ACCWP
Watson	Athena	Zone 7	ACCWP
Woods	Brandon	Zone 7	ACCWP

ACCWP-CCCWP Join Construction Site Stormwater C.6 Training**March 30, 2022**

Last Name	First Name	Agency	Program
Barcelona	Melissa	Brentwood	CCCWP
herrera	edward	Brentwood	CCCWP
Oliveira	Meghan	Brentwood	CCCWP
Shah	Jigar	Brentwood	CCCWP
Avalon	Mitch	CCCWP	CCCWP
Burger	Michael	CCCWP	CCCWP
Graves	Karin	CCCWP	CCCWP
Hoffmeister	Laura	Clayton	CCCWP
Abkenari	mitra	Concord	CCCWP
Bautista	Aldrich	Concord	CCCWP
Davis	Bruce	Concord	CCCWP
Kis	Nicholas	Concord	CCCWP
Llata	Chris	Concord	CCCWP
Martin	Alecia	Concord	CCCWP
Wheat	Kevin	Concord	CCCWP
Baldwin	Beth	Contra Costa	CCCWP
Boateng	Caleb	Contra Costa	CCCWP
Duncan	Erik	Contra Costa	CCCWP
Giolli	Michelle	Contra Costa	CCCWP
Klapperich	David	Contra Costa	CCCWP
Mancuso	Michele	Contra Costa	CCCWP
Tehaney	Paul	Contra Costa	CCCWP
Rusch	Mark	Danville	CCCWP
Russell	Bob	Danville	CCCWP
Swenson	Bruce	Danville	CCCWP
Bernardes	Ana	El Cerrito	CCCWP
lambert	Roland	El Cerrito	CCCWP
Leard	Christina	El Cerrito	CCCWP
Alvarez	Armando	Hercules	CCCWP
Clark	Tim	Lafayette	CCCWP
Kuykendall	Francine	Lafayette	CCCWP
Lyons	James	Martinez	CCCWP
TAYLOR	JEFFERY	Martinez	CCCWP
Yowakim	Khalil	Martinez	CCCWP
Camaddo	Joseph	Pittsburg	CCCWP
Cardiel	Stephen	Pittsburg	CCCWP
Chung	Calvin	Pittsburg	CCCWP
Labao	Khristin	Pittsburg	CCCWP
Lopez	Sergio	Pittsburg	CCCWP
LUO	YUJIA	Pittsburg	CCCWP
Peters	Andrew	Pittsburg	CCCWP
Piña	Gabriel	Pittsburg	CCCWP
Ramos	Miguel	Pittsburg	CCCWP

ACCWP-CCCWP Join Construction Site Stormwater C.6 Training**March 30, 2022**

Last Name	First Name	Agency	Program
Avila	Christopher	Richmond	CCCWP
Mason	Arterrias	Richmond	CCCWP
Navas	Marcella	Richmond	CCCWP
Phelps	Mary	Richmond	CCCWP
Booth	Amanda	San Pablo	CCCWP
Guzman	Erick	San Pablo	CCCWP
Samkian	Karineh	San Pablo	CCCWP
Shogren	Karl	San Ramon	CCCWP
Paquette	Lucile	Walnut Creek	CCCWP
Chen	Jason	Anchor CM	Private
Bocalan	Michelle	CSG Engineers	Private
Camorongon	Mario	CSG Engineers	Private
Gardiner	Nancy	Haley Aldrich	Private
Hrovat	Yvana	Haley Aldrich	Private
Bell	Libbey	Kennedy & Associates	Private
Kennedy	Frank	Kennedy & Associates	Private
Kennedy	Andrew	Kennedy & Associates	Private
Richey	Steve	MNS Engineers	Private
Mathews	Sandy	LWA/ACCWP	Private
Constantinescu	Alina	LWA/CCCWP	Private
	Total Attendees		144
	ACCWP		81
	CCCWP		52
	Private		11

Appendix C

Pesticide Toxicity Control



OUR WATER – OUR WORLD

Alameda

Countywide Clean Water Program
Our Water Our World
Integrated Pest Management Retail Store Partnership Program
Final Report for contract fiscal year 2021-2022
Prepared by Suzanne Bontempo, July 2022

Program Overview

We currently have 31 retailers in the OWOW Store Partnership Program. Suzanne Bontempo was the lead for the OWOW program with the assistance of IPM Advocate Lisa Ratusz and Charlotte Canner.

Here is the current list of retailers in the OWOW partnership:

Encinal Nursery	2057 Encinal Ave	Alameda
Encinal Hardware	2801 Encinal Ave	Alameda
Ploughshares	2701 Main St.	Alameda
Flowerland Nursery	1330 Solano Ave.	Albany
Ace Hardware	2145 University Ave.	Berkeley
Berkeley Horticultural Nursery	1310 McGee Ave.	Berkeley
East Bay Nursery	2332 San Pablo Ave.	Berkeley
Westbrae Nursery Garden Supply	1272 Gilman Ave.	Berkeley
Pete's Ace Hardware	2569 Castro Valley Blvd.	Castro Valley
Alamo Ace Hardware	7373 Village Pkwy.	Dublin
Summer Winds Nursery	7360 San Ramon Rd.	Dublin
Home Depot	3838 Hollis St.	Emeryville
Dale Hardware	3700 Thornton Ave	Fremont
Home Depot	43900 Ice House Tr.	Fremont
Regan Nursery	4268 Decoto Rd.	Fremont
Home Depot	21787 Hesperian Blvd.	Hayward
Home Depot	2500 Las Positas Rd.	Livermore
Alden Lane Nursery	981 Alden Ln.	Livermore
Home Depot	5401 Thornton Ave	Newark
Grand Lake Ace Garden Center	4001 Grand Ave.	Oakland
Broadway Terrace Nursery	4340 Clarewood Dr.	Oakland
Cole Hardware	5533 College Ave.	Oakland
Home Depot	4000 Alameda Ave.	Oakland
Laurel Ace Hardware	4024 MacArthur Blvd.	Oakland
Montclair Village Hardware	5048 Woodminister Ln.	Oakland
Yarrow	6250 Thornhill Dr.	Oakland
Home Depot	6000 Johnson Dr.	Pleasanton
Western Garden Nursery	2756 Vineyard Ave.	Pleasanton
Evergreen Nursery and Garden Supply	350 San Leandro Blvd.	San Leandro
Home Depot	1933 Davis St.	San Leandro
Home Depot	30055 Industrial Pkwy SW	Union City



**Welcoming new retailers to the OWOW partnership: (L to R)
Alamo Ace Hardware, Dublin – Ploughshares, Alameda – SummerWinds, Dublin**

Store Set-up:

Each retailer received new shelf talker tags to identify the eco-pesticides available for consumers to purchase. The Home Depot Stores physically remerchandise their products each winter. As for the other retailers, they might remerchandise and/or add new eco-products to the retail shelves for sale.



Placing new shelf talkers tags on eco-pesticides at retailers throughout the OWOW partnership. Here are is a photo of shelf tags at the Dale Ace and at the Home Depot in Pleasanton

Retail Store Mentoring and Maintenance Visits:

A total number 182 program store mentoring and maintenance visits were provided for the year.

Retailer	Number of visits
Encinal Nursery	6
Encinal Hardware	6
Ploughshares	1
Flowerland Nursery	4
Berkeley Ace Hardware	4
Berkeley Horticultural Nursery	4
East Bay Nursery	6
Westbrae Nursery	6

Pete's Ace Hardware	7
Alamo Ace Hardware	3
Summer Winds Nursery	3
Home Depot, Emeryville	7
Dale Hardware	7
Home Depot, Fremont	8
Regan Nursery	6
Home Depot, Hayward	7
Home Depot, Livermore	6
Alden Lane Nursery	5
Home Depot, Newark	7
Grand Lake Ace Garden Center	8
Broadway Terrace Nursery	6
Cole Hardware	7
Home Depot, Oakland	8
Laurel Ace Hardware	7
Montclair Village Hardware	4
Yarrow	5
Home Depot, Pleasanton	6
Western Garden Nursery	5
Evergreen Nursery and Garden Supply	7
Home Depot, San Leandro	8
Home Depot, Union City	8

Store mentoring and maintenance activities throughout the year:

- Replenish fact sheets
- Update shelf talkers on new products
- Ask associates if they are hearing of any new or unusual pest problems from their customers
- Focus on the pest of the month calendar
- Bring the quarterly UCIPM Retail Newsletter to each retailer
- Remind associates about the resource on the OWOW & UCIPM website
- Demonstrate how to use the UCIPM website for pest problem assistance
- Demonstrate how to access OWOW fact sheet through the QR code poster
- Guide customers to less-toxic solutions in the aisle
- Mentor buyer and manager at each retailer about new eco-friendly product on the market
- Mentor associates about the current pest problems and IPM strategies for the pests
- Mentor associates on how less toxic active ingredients work
- Follow up with emails and phone calls on pest questions from associates, as well as customers

Throughout the year, subcontractors Lisa, Charlotte and I provided each store with monthly mentoring and support around assorted seasonal pest, such as aphids, earwigs, and cucumber beetle, along with leaf and plant diseases, especially powdery mildew, due to the dry conditions. Yellowjackets, gophers, rats & mice were also highlighted with many customers coming in the stores with these pests.

With California faced with another year of drought conditions, they also provided each retailer with more resources for keeping plants healthy through times of drought, how to efficiently water plants that reduces water usage, and the benefits of planting regionally appropriate plant material.

New for the 2021-22 contract year:

QR Code for fact sheets:

With the intention of keeping the OWOW program relevant, we developed trackable QR code posters of the fact sheets. This has been extremely well received by each retailer.

OWOW Retail Newsletter:

In addition to the monthly mentoring visits, per the request from several managers asking for additional OWOW educational resources, I created a monthly digital newsletter that is emailed to any of the associates who were interested in signing up. This is targeted specifically for the associates and is another way to share the seasonal pest support that each of us provide on our monthly visits. If we are unable to connect with our key associates on any visit, then the information is still provided to them in a newsletter format. I also include upcoming events that such as OWOW webinars, IPM Advocate tabling events and other activities that are open to the public. I have included upcoming trainings that retail associates may find valuable such as the recent QWEL training, and ReScape Landscape Training Qualification. We saw that many of the retailers would post upcoming events on their e-newsletters and print the articles I wrote to share with their team of associates. This is a fantastic success. **PHOTO**

Many of the retail partners have witnessed an increase in sales with the eco-friendly alternative pesticides. Even throughout the challenging year of covid restrictions and an early spring season, we see that people are looking for alternative to the toxic pesticides. This is trending up throughout the retail markets. Many of the retailers have increased the number of eco-pesticides as they replace problem pesticides with these alternatives.

Extra educational materials:

In the fall we provided each retailer with the BASMAA handouts for keeping rainwater on sight. In the spring they provided each with how to keep gardens healthy through times of drought. They also provided each with the CA Pest Alert 'Keep the Spotted Lanternfly out of CA' to post, & the quarterly UC IPM Retailer Newsletter.

Extra handouts include:

- BASMAA's Rain Barrel & Cisterns
- BASMAA's Rain Garden Guide
- The Bay Friendly 'Guide to Mulch'
- CA Pest Alert Keep the Spotted Lanternfly out of CA' to post
- The quarterly UC IPM Retailer Newsletter.
- Dormant Spray for pest prevention
- 'Keeping Rats Out' of both home & garden



Photos of Berkeley Hort, Flowerland Nursery, and Alden Lane receiving helpful resources for their stores.

OWOW IPM Retailer Trainings

Alameda County Store Trainings:

We conducted **22 training events** throughout the year
And provided a training to **179 associates**

Date	Store	Number Trained	Instructor
9/16/21	Dale Ace Hardware	10	Lisa
10/12/21	Evergreen Nursery	4	Charlotte
10/17/21	Home Depot Hayward	4	Lisa
10/20/21	Home Depot Emeryville	11	Suzanne
10/29/21	Grand Lake Ace	8	Suzanne
10/29/21	Cole Hardware	4	Suzanne
11/8/21	Home Depot San Leandro	6	Charlotte
11/9/21	Home Depot Livermore	2	Charlotte
2/1/22	Alden Lane	26	Suzanne
2/3/22	East Bay Nursery	16	Suzanne
2/24/22	Dale Ace Hardware	16	Lisa
2/28/22	Western Garden	4	Charlotte
3/6/22	Pete's Ace Hardware	7	Lisa
3/8/22	Home Depot Fremont	11	Lisa
3/10/22	Home Depot Union City	7	Lisa
3/17/22	Pete's Ace Hardware	6	Lisa
3/30/22	Broadway Terrace Nurser	4	Suzanne
3/30/22	Cole Hardware	5	Suzanne
4/3/22	Home Depot Pleasanton	5	Charlotte
4/13/22	Yarrow Nursery	5	Suzanne
6/5/22	Laurel Ace Hardware	5	Lisa
6/6/22	Home Depot Oakland	13	Charlotte
Total associates trained:		179	

Topics covered in the training:

- An OWOW partnership program overview
- Pesticides that are water pollutants of concern
- Where to dispose of local HHW
- 'How less-toxic products' work
- How to read a pesticide label
- IPM principles & techniques
- Beneficial Insect Identification
- Water Conservation
- Benefits of Compost
- Benefits of Mulch
- Water-wise plant choices for our area
- Pests highlighted: Aphids, ants, powdery mildew, citrus leaf miner, earwigs, fleas, gophers, rats & mice, snails & slugs, spider mites, whitefly, fungal diseases, codling moth, rose care without problem pesticides and how to address the many customer habits, such as how over fertilizing

can increase pest populations. Also, the importance of adding compost to the soil and protecting the soil with a layer of mulch.

- Invasive pests: Asian Citrus Psyllid
- OWOW website, UC Davis IPM website, BIRC website
- The UC IPM You Tube informational channel

Resources provided to each OWOW training attendee includes:

- The Mac's Field Guide Good Garden Bugs of California
- Monthly Pest Calendar
- How to Apply Beneficial Nematode
- 'How Less Toxic Products Work' handout
- Home Depot less toxic product list for the Home Depot Store training
- List of websites, books, and catalogs on a resource sheet
- Sheet Mulching instructions
- The CA DPR's 'How to read a pesticide label' handout
- Information on pest problem solving for the following pests: spider mites, lifecycle of grubs, whiteflies, spider mites, citrus leaf miner, codling moth, keeping rodent out of the home and reducing their activity in the garden, Asian Citrus Psyllid, and the UCIPM Quick tips for Mealybugs & Powdery Mildew
- '10 Most Wanted Bugs for Your Garden' brochure
- OWOW pocket guides
- A one sheet informational handout on 'Protecting Landscapes in a Drought' and '10 Tips for Water-wise Gardening'
- A one sheet informational handout on 'Keeping Rats & Mice out'
- A one sheet informational handout on 'Rats in the Garden'
- Asian Citrus Psyllid Campaign fliers in the nursery, displayed in the aisle and stocked in the OWOW literature rack
- Eco-herbicide recommendations
- Retail Nursery & Garden Center IPM News
- A one sheet handout that includes services offered by the Alameda County Mosquito Abatement District and the Alameda County Vector Control Program

Compilation of Training Feedback 2021-22 contract year

Scheduling associate trainings for the retailer partners was challenging with the ongoing flux from Covid-19. Throughout this contract year, most of the retailers were too busy due to the early spring rush to schedule time for the OWOW training. When we did schedule a training, it was not uncommon that associates were out due to Covid exposure, thus needing us to train fewer associates or reschedule all together. I'm impressed that we have been able to train as many associates as we have.

The training classes are well received by the associates, as they see the value and appreciate the up-to-date IPM education I provide to them. This year specifically, with the increase of new gardeners, we focused our attention on how to guide their customers, these new gardeners, through the importance of adding compost to the soil, feeding plants organically, protecting the soil with mulch, and how to water to grow healthy plants, because when we grow healthy plants, they are more resilient and less likely to be affected by pest issues.

The more recent interests have been on how to protect gardens in times of drought. We continued to share resources and information about how to be very strategic with water, ways to recycle water such as easy to install laundry to landscape greywater systems, and products on the market to protect the plants with anti-transpirants and water retaining soil polymers.



Training associates at Alden Lane, Livermore.



At East Bay Nursery, Berkeley



At the Home Depot, Oakland



At the Home Depot, Pleasanton



At Yarrow Nursery, Oakland



At Broadway Terrace Nursery, Oakland

Compilation of training surveys are here on the next page:

Summary of Store Training Pre-Training Surveys

A total of 22 trainings were conducted, 179 associates were trained,
162 training surveys were returned.
Here are the results of those surveys.

1) Are you familiar with the OWOW program?
a) Yes: 34%
b) No: 66%
2) When does urban runoff occur?
a) When a sprinkler is broken & excess water is running into the street: 1%
b) During & after a rain event:
c) From watering or irrigation overflows: 4%
d) All of the above: 95%
3) Which of these pollutants can be carried into the waterways with urban runoff?
a) Motor oil & solvents: 1%
b) Pet waste, debris & litter: 3%
c) Pesticides & synthetic fertilizers:
d) Household cleaning agents 1%
e) All of the above: 95%
4) Storm drains, including the storm drains in parking lots & loading docks, flow directly to:
a) The sanitary sewer that goes to the wastewater treatment facility: 30%
b) The nearest creek, river, bay, or ocean: 64%
no answer: 6%
5) Are pesticides removed at the wastewater treatment facility?
a) Yes: 11%
b) No: 23%
c) I'm not sure: 66%
6) What is the best way to dispose of unused household hazardous waste, including pesticides & fertilizers?
a) Bury them in the garden
b) Dump them into the trash:
c) Pour them down the sink or flush down toilet
d) Take them to the local HHW facility: 100%
7) Do you know where your local HHW facility is located?
a) They do not know: 65%
b) Yes, they do know: 24%
c) Gave a good guess: 11%
8) Do your customers ask for eco-friendly solutions & less-toxic products that are safer for the environment?
a) Yes: 64%
b) No: 15%
c) Sometimes: 21%
9) What is the highly effective, science-based strategy for controlling pests in the home/garden that also helps to protect our waterways from toxic pesticide pollutants?
a) Synthetic pesticide program: 18%
b) Homemade, D.I.Y. remedies & cures: 9%
c) IPM (Integrated Pest Management) Principles: 73%

Summary of Store Training Post-Training Surveys

1) Are you familiar with the OWOW program
<ul style="list-style-type: none"> a) Yes: 76% b) No: 4% <li style="padding-left: 20px;">No response: 20%
2) When does urban runoff occur?
<ul style="list-style-type: none"> a) When a sprinkler is broken & excess water is running into the street: b) During & after a rain event: c) From watering or irrigation overflows: d) All of the above: 93% <li style="padding-left: 20px;">no answer: 7%
3) Which of these pollutants can be carried into the waterways with urban runoff?
<ul style="list-style-type: none"> a) Motor oil & solvents: b) Pest waste, debris & litter: c) Pesticides & synthetic fertilizers: d) Household cleaning agents: e) All of the above: 93% <li style="padding-left: 20px;">no answer: 7%
4) Storm drains, including the storm drains in parking lots & loading docks, flow directly to:
<ul style="list-style-type: none"> a) The sanitary sewer that goes to the wastewater treatment facility: 1% b) The nearest creek, river, bay or ocean: 93% <li style="padding-left: 20px;">no answer: 7%
5) Are pesticides removed at the wastewater treatment facility?
<ul style="list-style-type: none"> a) Yes: b) No: 91% c) I'm not sure: 2% <li style="padding-left: 20px;">no answer: 7%
6) What is the best way to dispose of unused household hazardous waste, including pesticides & fertilizers?
<ul style="list-style-type: none"> a) Bury them in the garden: b) Dump them into the trash: c) Pour them down the sink or flush down toilet: d) Take them to the local HHW facility: 95% <li style="padding-left: 20px;">no response: 5%
7) Do you know where your local HHW facility is located?
<ul style="list-style-type: none"> a) Do not know: 5% b) Yes, knew: 90% c) Gave a good guess <li style="padding-left: 20px;">left blank: 5%
8) How can you identify products that are less toxic for pest management in your store?
<ul style="list-style-type: none"> a) The OWOW shelf labels that identify eco-friendly products: 3% b) The OWOW pest management fact sheets: 2% c) The OWOW website at www.ourwaterourworld.org d) Talking with an OWOW IPM Advocate: 5% e) All of the above: 85% <li style="padding-left: 20px;">no response: 5%
9) What is the highly effective, science-based strategy for controlling pests in the home/garden that also helps to protect our waterways from toxic pesticide pollutants?
<ul style="list-style-type: none"> a) Synthetic pesticide program: b) Homemade, D.I.Y. remedies & cures: c) IPM (Integrated Pest Management) Principles: 93% <li style="padding-left: 20px;">no response: 7%

Summary of End of Training Evaluation Form.

1) You feel comfortable using the OWOW resources available in this store?
a) Yes: 98% b) No: 2%
2) You understand a less toxic solution for at least one pest problem discussed today.
a) Yes: 99% b) No: 1%
3) What type of support can the OWOW IPM Advocate provide you more of?
a) More print & online resources for less toxic pest management: 24%
b) More information about seasonal pest problems and how to manage less toxically: 37%
c) More OWOW training & product knowledge classes: 39%

Would you like to sign up to receive emails providing information about seasonal pest updates and educational event?

58 associates agreed to sign up to receive more information throughout the year – this is **36% of those who submitted the trainings.**

These are a few comments that the associates provided on the post training evaluations.

“Good class. well explained.”

“Knowledge is power”

“The rep Charlotte was very knowledgeable and persistent.”

“Very polite & professional”

“That was the best PK I received at Home Depot”



Training associates at the Grandlake Ace, Oakland

Summary of the OWOW Outreach Events for the 2020-21 contract year

Throughout the year, we provided **14 public outreach events, reaching a total of 1919 people** with the OWOW IPM message. This number does not include those who registered for a webinar and did not attend. All who register for a webinar do still receive the digital resources I send and the link for viewing the recording on the CWP Alameda Co YouTube channel.

- Charlotte & I provided 9 virtual outreach events,
- I was the keynote speaker for the City of Piedmont’s ‘Living with Drought’ presentation for the public,
- We provided 4 in-person tabling events

Date	Type of Event	Number of Attendees
7/8/21	Gardening During Drought – Webinar	308 Registered, 178 Attended 122 views on CWP YouTube
8/12/21	Vegetable Pest Management - Webinar	261 Registered,

		153 Attended 63 views on CWP YouTube
9/4/21	In-person Tabling at Yarrow Nursery	45 people reached
9/9/21	Fall is for Planting - Webinar	232 Registered, 119 Attended 40 views on CWP YouTube
9/30/21	Living with Drought – Presentation for Piedmont	48 Attended <i>(This number may not be accurate)</i>
10/17/21	In-person Tabling at Home Depot Hayward	29 people reached
1/13/22	Managing Weeds Effectively – Webinar	317 Registered, 173 Attended 106 views on CWP YouTube
2/10/22	Organic Rose Care - Webinar	93 Registered, 55 Attended 104 views on CWP YouTube
3/10/22	Soil Basics – Webinar	194 Registered, 119 Attended 48 views on CWP YouTube
4/13/22	In-person Tabling at Pete’s Ace	45 people reached
4/14/22	Waterwise Food Gardening – Webinar	85 Registered, 45 Attended 25 views on CWP YouTube
4/16/22	In-person Tabling at Home Depot Newark	49 people reached
5/12/22	Spring Pest Management – Webinar	140 Registered, 103 Attended 53 views on CWP YouTube
6/9/22	Bring in the Pollinators - Webinar	130 Registered, 74 Attended 123 views on CWP YouTube

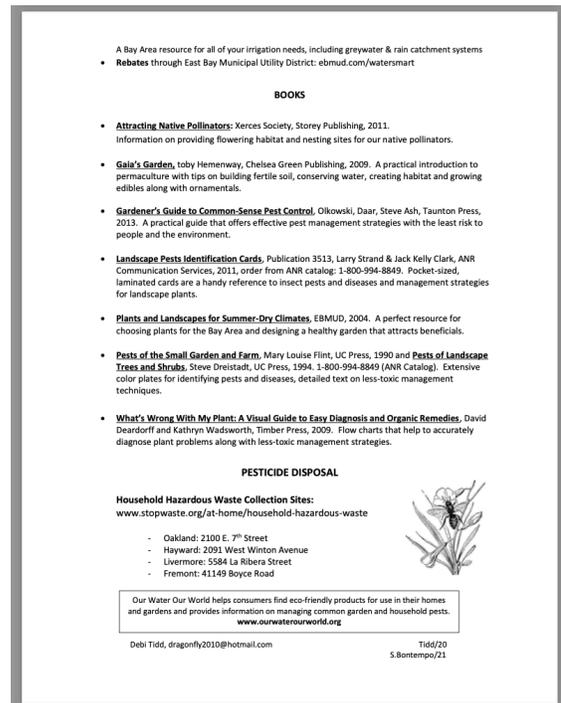
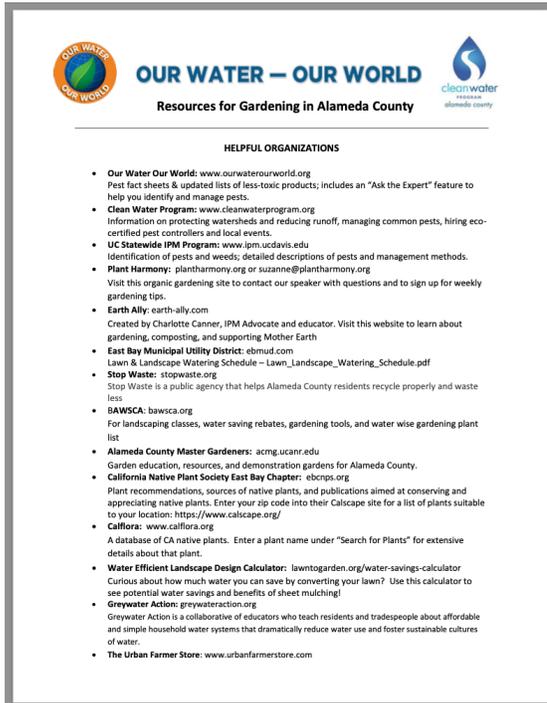


Lisa tabling at the Pete’s Ace, Castro Valley

Virtual events for the public:

The virtual education for the public continues to prove a reach beyond what we can with an in-person tabling event. This is very much due to the wonderful support OWOW receives from Gigantic Idea Studio and their amazing promotional support. It’s been incredible to have this opportunity to deliver the OWOW message to such a broad reach.

Each registrant received an email from me that included a 'Helpful Gardening Resource' page. This was created to help the guest with writing notes and help them pay attention without needing to scramble to note each website references throughout the program. Here is the 'Helpful Resources' I created for the webinars in partnership:



Social media posts:

'Pest of the Month' content for a post was provided to post on the Clean Water Program Facebook page, Twitter and Instagram feed.

- Mosquitoes – post for July
- Powdery Mildew– post for August
- Rodent Exclusion – post for September
- Fall is for Planting – post for October
- Benefits of a Rain Garden – post for November
- Hiring a Professional – post for December
- Weed Management – post for January
- Yellowjacket Prevention – post for February
- Rose Care – post for March
- Benefits of Compost – post for April
- Benefits of Organic Fertilizers – post for May
- Irrigation – post for May
- Mulch – post for June
- Gophers – post for June
- Mosquitoes – post for July

Industry Trade Shows:

I attended the virtual L&L Distributor Trade Show in October of 2021. I hope to attend this trade show in person in October 2022.

OWOW program influencing eco-friendly decision making in the aisle:

I continue to work with the Home Depot corporate to keep them up to date on store activates and events. We discussed additional ways to expand our partnership. They are happy for the recent OWOW statewide expansion with CASQA.

Many of the retail partners have witnessed an increase in sales with the eco-friendly alternative pesticides. Even throughout the challenges the year faced with covid spikes, labor shortages and water restrictions, we see that people are looking for alternative to the toxic pesticides. This trend has continued throughout the retail markets. Over this past year all the retailers have increased the number of eco-pesticides as they replace problem pesticides with these alternatives.

Closing comments:

Each of the retailers in the partnership have been great to work with. All the associates we meet with at these stores are in full support of the OWOW program, happy to learn about the program & receive support. They are very open to learning about the new eco-products their retailer sells, tips for less toxic pest management, and how to better support their customers. Each year the ecofriendly product interest seems to increase, with more awareness for less toxic choices requested by the consumer.

The associates see the value with the OWOW partnership support, as this program provides them with education on the new products, how they work, and for the buyers what product they should bring in as an alternative to the problem pesticides. In addition to mentoring retail associates, each store appreciates the assistance when helping their customers in the aisle. This support of guiding the customers to choose a product that is less-toxic, also includes other IPM tools that the retailer may sell when a pesticide isn't necessarily the best solution, such as the importance of adding compost and organic fertilizer to your soil to increase plant health, choosing water-wise plants for longer term success, and the importance of mulch for water retention and optimum soil health.

Many of the managers requested additional OWOW training for their associates, suggesting a fall and a spring class to address seasonally relevant pest issues. I will do what I can to accommodate this request while working within the means of the annual program budget.

In close, I'd like to thank you for the opportunity to provide OWOW services to these retailers throughout Alameda County. An extra thanks to all of the Clean Water Program partners for being flexible, to expand the OWOW outreach message through digital platforms, which has continued to provide me the opportunity to execute the valuable message of the OWOW program. Lisa, Charlotte & I very much appreciate being able to reduce pesticide pollutants by sharing IPM knowledge, by offering support around stressful pest problems, and by being available to guide folks to less toxic, sustainable pest & gardening solutions.

Thank you so much for allowing me to lead the contract. I appreciate the opportunity to work with the retailers throughout Alameda County.

Suzanne Bontempo

Our Water Our World



Annual Summary Report

California Stormwater Quality Association

September 2022



Preface

The California Stormwater Quality Association (CASQA) is a nonprofit corporation that advances sustainable stormwater management protective of California water resources. With approximately 2,000 members, CASQA's membership is comprised of a diverse range of stormwater quality management organizations and individuals, including over 180 cities, 23 counties, special districts, federal agencies, state agencies, ports, universities and school districts, wastewater agencies, water suppliers, industries, and consulting firms throughout the state. Collectively, CASQA represents over 26 million people in California.

This report provides CASQA's members with focused information on its efforts to raise awareness about the connection between pesticide use and water quality through the Our Water, Our World program (OWOW). The goal of Our Water, Our World is to support a statewide integrated pest management IPM outreach program that provides direct to consumer information on less-toxic IPM practices.

By focusing on true source control and public outreach, OWOW advances two core components of [CASQA's Vision for Sustainable Stormwater Management](#)¹ (Principles 1 and 3).

Acknowledgements

Our Water, Our World is funded by CASQA, the organizations implementing the OWOW program (see Table 1 in Section 2 of this report) and is sponsored by the Bay Area Clean Water Association (BACWA). This report was prepared by Suzanne Bontempo, with support from Roshan Christoph (CASQA).

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¹ https://www.casqa.org/sites/default/files/downloads/final_-_vision_for_sustainable_stormwater_management_-_10-07-2020.pdf

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Section 1. Introduction

Our Water Our World (OWOW) Our Water, Our World (OWOW) is an award-winning partnership between city- and county-based water pollution prevention agencies and garden centers and hardware stores that sell pest control products. Initiated in 1998, the program focuses on less-toxic, eco-friendly products and techniques as many common pesticides are harmful to sensitive species and ecosystems when they reach local creeks, bays, and the ocean.

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 CASQA, with the goal of providing statewide access to this important and successful outreach program.

From a stormwater management perspective, OWOW is an excellent opportunity and cost-efficient way to educate the public and reduce toxicity in waterways from current use pesticides. Several municipalities utilize OWOW to meet permit requirements, including the San Francisco Bay Area Municipal Regional Permit², the Central Valley Region-wide MS4³, and the Phase II – Small MS4 General Permit⁴.

This report provides a summary of the OWOW program activities implemented between July 2021 and June 2022.

Section 2. OWOW Program Elements

The OWOW program consists of several elements, which are integral to its effectiveness.

2.1 INTEGRATED PEST MANAGEMENT (IPM) ADVOCATES

A critical component of the program, IPM Advocates are individuals who have been specifically trained on how to engage with retailers and the public. IPM Advocates provide in-store presentations and advice to customers about pest management methods that are healthier for people and the environment. IPM Advocates also provide training for store employees and on an annual basis, receive continuing education and training.

2.2 EDUCATIONAL MATERIALS

In the store, consumers are directed to less-toxic products and techniques through a variety of ways:

- Fact sheets are provided to educate the public on a wide range of pest management topics
- Shelf tags and display materials guide customers to less-toxic products
- Additional educational resources are provided, such as product lists and information about active ingredients in pest management products
- Many of the educational outreach materials provided in-store are being updated to include QR codes, linking directly to the [OWOW website](#).

² Municipal Regional NPDES Permit and Waste Discharge Requirements General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4), California Regional Water Quality Control Board – San Francisco Bay Region, 2009. Water Quality (WQ) Order R2-2009-0074-DWQ, NPDES NO. CAS612008, CA.

³ Municipal Regional NPDES Permit and Waste Discharge Requirements General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4), California Regional Water Quality Control Board – Central Valley, 2016. Water Quality (WQ) Order R5-2016-0040-DWQ, NPDES NO. CAS0085324, CA.

⁴ NPDES Permit for Waste Discharge Requirements for Discharges from Small MS4, California State Resources Control Board, 2013. WQ Order 2013-0001-DWQ, NPDES No. CAS000004, CA.

Online, via the OWOW website, consumers can view the following:

- All 18 fact sheets
- A list of stores participating in OWOW in their local communities
- A current list of eco-friendly and less-toxic products available in stores

2.3 TRADE SHOWS

OWOW representatives provide exhibits annually at trade shows to educate buyers on less-toxic products. Participation in these events is a critical step to ensure stores carry less-toxic products.

Section 3: OWOW Partnerships

The program is currently administered by CASQA, implemented by local cities and counties, with IPM Advocates and University of California Statewide IPM Program (UC IPM) serving as collaborative partners as shown in Figure 1.

CASQA manages and provides the central services necessary to operate and maintain Our Water, Our World, including the development of the in-store education materials (e.g., less-toxic product lists, label files, and active ingredient lists), creation and updates of outreach materials, operation and updates to the OWOW website, vendor (i.e., retail partners and pesticide distributors) outreach, preparation of an annual report, fulfillment of outreach materials orders, and program management and development.

IPM Advocates are highly trained individuals that support local implementation of the OWOW program in retail stores and are a crucial component of the OWOW program. They provide retail nurseries, hardware stores, and garden centers direct to consumer information on integrated pest management tools, products, and practices. They are the link between the municipalities and the retailers where they reach consumers. The IPM Advocates provide IPM trainings for store staff, and host webinars and events for customers via separate contracts with local agencies. Suzanne Bontempo was contracted by CASQA to coordinate the IPM Advocates to keep continuity within the program, hold regular meetings to communicate updates on new pests and new pest management techniques, and maintain the outreach material. The active IPM Advocates include: Suzanne Bontempo, Debi Tidd, Julie Barbour, Lorenzo Levinger, Charlotte Canner, Maris Sidenstacker, and Lisa Ratusz.

The UC IPM Program provides research and expertise on IPM practices promoted throughout the state and maintains a website of less-toxic integrated pest management practices for nearly 1000 home, garden, landscape, and turf pests. Karey Windbiel-Rojas, Staff Director for Urban and Community IPM, UC IPM Program has been involved with the IPM Advocate program since its inception and continues to assist with advocate training, technical resources on pest management practices, and as a liaison with UC resources.

Municipal agencies subscribe to OWOW through CASQA and implement the OWOW program in their local retail stores by contracting with IPM Advocates or using municipal staff or other contractors. Implementation may be implemented by a single agency at stores within their jurisdiction or organized at a regional scale, where Agencies combine resources to implement the OWOW program at select stores used by multiple jurisdictions. In addition, municipal agencies conduct outreach to educate residents about the OWOW program.

PROGRAMMATIC ROLES AND RESPONSIBILITIES



Figure 1. OWOW Program Roles and Responsibilities

Table 1 provides the list of agencies implementing OWOW as of June 30, 2022. Bay Area Clean Water Agencies (BACWA) continue to support the OWOW program as a sponsor.

Table 1 List of Agencies Implementing OWOW

Bay Area	
	City of Fremont
Alameda County	City of Half Moon Bay
Alameda County Flood Control & Water Conservation District	City of Hayward
Alameda County Public Works Agency	City of Healdsburg
City of Alameda	City of Hercules
City of Albany	City of Lafayette
City of American Canyon	City of Larkspur
City of Antioch	City of Livermore
City of Belmont	City of Los Altos
City of Belvedere	City of Martinez
City of Berkeley	City of Menlo Park
City of Brentwood	City of Mill Valley
City of Brisbane	City of Millbrae
City of Burlingame	City of Milpitas
City of Calistoga	City of Monte Sereno
City of Campbell	City of Mountain View
City of Clayton	City of Napa
City of Cloverdale	City of Newark
City of Concord	City of Novato
City of Cotati	City of Oakland
City of Cupertino	City of Oakley
City of Daly City	City of Orinda
City of Dublin	City of Pacifica
City of East Palo Alto	City of Palo Alto
City of El Cerrito	City of Piedmont
City of Emeryville	City of Pinole
City of Foster City	City of Pittsburg

Bay Area (Con't)

City of Pleasant Hill	County of Santa Clara
City of Pleasanton	Marin Countywide Stormwater Pollution Prevention Program
City of Redwood City	Mendocino County
City of Richmond	Napa Countywide Stormwater Pollution Prevention Program
City of Rohnert Park	San Mateo Countywide Water Pollution Prevention Program
City of San Bruno	Santa Clara Valley Water District
City of San Carlos	Sonoma County
City of San Jose	Sonoma County Water Agency
City of San Leandro	Town of Atherton
City of San Mateo	Town of Colma
City of San Pablo	Town of Corte Madera
City of San Rafael	Town of Danville
City of San Ramon	Town of Fairfax
City of Santa Clara	Town of Hillsborough
City of Santa Rosa	Town of Los Altos Hills
City of Saratoga	Town of Portola Valley
City of Sausalito	Town of Ross
City of Sebastopol	Town of San Anselmo
City of South San Francisco	Town of Tiburon
City of St. Helena	Town of Windsor
City of Sunnyvale	Town of Woodside
City of Ukiah	Town of Yountville
City of Walnut Creek	Union City
Contra Costa Clean Water Program	Vallejo Flood and Wastewater District
Contra Costa County	Zone 7 Water Agency
County of Alameda	
County of Marin	
County of Napa	
County of San Mateo	

Central Valley

Butte County

City of Ceres

City of Davis

City of Escalon

City of Lathrop

City of Lincoln

City of Lodi

City of Manteca

City of Newman

City of Patterson

City of Ripon

City of Riverbank

City of Roseville

City of Sacramento

City of Stockton

City of Tracy

City of Turlock

City of West Sacramento

City of Woodland

City of Yuba City

County of Sacramento

County of San Joaquin

El Dorado County

Fresno Metropolitan Flood Control District

Sacramento Stormwater Quality Partnership

Mountain House Community Service District

San Joaquin County

Stanislaus County

Yuba City

Central Coast

City Buellton

City of Carmel-by-the Sea

City of Carpinteria

City of Del Rey Oaks

City of Goleta

City of Monterey

City of Pacific Grove

City of Sand City

City of Santa Maria

City of Seaside

City of Solvang

County of Monterey

Santa Barbara County

Southern California

City of Santa Clarita

Sponsor

Bay Area Clean Water Agencies (BACWA)

Section 4. Annual Program Implementation (2021-2022)

The following OWOW outreach services were conducted between July 2021 and June 2022.

4.1 IPM ADVOCATES

After training by the University of California IPM Program, Advocates are contracted by local municipalities and then assigned to stores, where they pass on their knowledge to staff and hold educational events for customers. Excellent relationships between the Advocates and store management and staff are key to the successful promotion of less-toxic, eco-friendly projects. Current IPM Advocates were trained prior to COVID-19 pandemic. Between July 2021 and June 2022, no training for new or existing IPM advocates was conducted.

IPM Coordination

Ms. Bontempo held regular meetings to communicate updates on new pests and new pest management techniques with current IPM Advocates.

DPR Grant Application

In the spring of 2022, CASQA and collaborating partners initiated worked on a draft DPR grant application to fund the development of a IPM Advocate Training Program. The application was held hold until the program needs are further refined, and the best funding approach is identified. The future activities to develop a IPM Advocate Training Program are described in Section 5.

4.2 EDUCATIONAL OUTREACH MATERIAL

Educational material includes fact sheets for specific pests, gardening and pesticide applications, shelf labels to identify eco-friendly products in stores, and OWOW website that makes the material accessible to the public. Some examples of OWOW outreach materials are provided in Appendix A. New OWOW outreach materials were not printed in this reporting year as the local jurisdictions and IPM Advocates had sufficient materials in stock.

Fact Sheets

There are 18 OWOW fact sheets available, including four (4) available in both English and Spanish. During the COVID-19 pandemic, the need to transition from paper fact sheets to a digital option was identified. Trackable QR codes were created to digitally access the OWOW fact sheets in the pesticide aisle at each retailer. The trackable QR codes record which fact sheets are viewed by consumers in retail stores. The trackable QR code posters were developed in 2021 and made available in select stores starting January 2022. According to the data from the QR code posters, the top three fact sheets viewed between January and June 2022, were ants, rats and mice, and moles, voles, and gophers. Table 2 presents a summary of QR code scans per month for each fact sheet.

Website

The [OWOW website](#) provides public access to OWOW outreach material, IPM resources, and the Store Locator, an interactive map to search for participating stores. Updates to the [Store Locator](#) are made on a quarterly basis. The Store Locator was revised in June 2022 to add 11 new participating stores and remove 6 stores that are closed or no longer supporting the OWOW program.

Store-based Product Lists

The store-based product lists provide the current lists of the eco-friendly products that the Home Depot stores and Ace Hardware stores sell each year. IPM Advocates use the store-based product lists to identify the eco-friendly products on store shelves using labels or “shelf talkers/tags”. Each year, the lists are reviewed, and updates are made as needed in consultation with subject-matter-experts. This year, the new products had the same active ingredients as others and

therefore, no revisions were necessary. Each year, more pesticide companies label eco-friendly products responding to purchasing habits by the consumer. Appendix B provides the products lists from 2022.

**Table 2. Summary of QR Code Scans by OWOW Product:
January to July 2022**

OWOW Product	Total	Jan 2022	Feb 2022	March 2022	April 2022	May 2022	June 2022
OWOW Website	45	1	5	16	8	8	7
Ants	83	1	6	25	22	11	18
Aphids	62	0	3	19	16	11	13
Bed Bugs	29	0	3	4	9	5	8
Cockroaches	65	0	5	10	19	14	17
Fleas	40	0	3	4	14	10	9
Healthy Gardens	25	0	2	7	9	5	2
Hiring a Pest Co	15	0	2	4	5	3	1
Lawns	17	0	3	1	1	4	8
Moles Voles Gophers	92	0	6	25	25	14	22
Mosquitoes	51	0	9	8	13	11	10
Pesticide U&D	16	0	2	2	4	6	2
Pesticides & Water Quality	9	0	1	2	1	3	2
Rats & Mice	68	1	3	15	18	15	16
Roses	38	1	7	9	8	7	6
Snails & Slugs	36	0	2	9	15	4	6
Spiders	30	1	2	3	6	11	7
Weeds	21	1	2	6	6	3	3
Yellowjackets	30	1	2	8	9	7	3
Spanish Fact Sheets	23	1	2	9	2	5	4
Total	795	8	70	186	210	157	164

4.3 VENDOR OUTREACH

Education of vendors and retailers on less-toxic products is a critical step to ensure stores carry less-toxic products.

Retail Partners

Ms. Bontempo as the IPM Advocate Coordinator leads collaboration with key retail partners. During the past year, she maintained a relationship with the Home Depot Corporate Sustainability Officer. She communicates quarterly to keep goals aligned and to provide Home Depot with updates on OWOW activities in the stores. Each year, OWOW receives a letter of support from the Home Depot Corporate Sustainability Officer that facilitates collaboration with local retailers. Home Depot Corporate is a model retailer partner and OWOW strives to replicate this partnership with other retailers and vendors. Ms. Bontempo plans to initiate communications with new contacts at Lowe's. She has also met with the CNRG Ace Hardware group with the goal of expanding the OWOW program into more of their stores. hardware group in hopes to expand the OWOW program throughout their stores.

Vendor Communication

OWOW has established relationships with national pesticide manufacturers. Annual communication with vendors is essential to learn about new pesticide active ingredients, products, and market trends. Key vendors have reported many obstacles in 2022 as follows:

- Supply chains are still straining product supply
- In-store sales have returned from the pandemic
- During a drought, consumers tend to purchase less live plant material.
- Consumer expendable cash flow is less available due to inflation and fuel cost

Trade Show Booths

Attending trade shows provides an opportunity to meet the vendors, learn about the new products coming onto the marketplace in California, answer questions, and provide mentorship to the retail buyers. In 2022, OWOW representatives planned to attend trade shows, however, the in-person events were suspended due to COVID-19. Below is the list of trade shows that OWOW representatives typically attend each year.

- Central Lawn & Garden Distributor Trade Show, Las Vegas NV
- L&L Nursery Distributor Trade Show, Reno, NV: OWOW representatives joining the L&L Distributors virtual trade show.
- NorCal Landscape Trade Show, San Mateo, CA

4.4 TRAINING AND OUTREACH FOR RETAILERS AND CONSUMERS

IPM Advocates and other OWOW service providers conduct OWOW outreach activities to educate retailers and consumers at the local level. Local OWOW Implementation activities vary between agencies. Agencies receive tailored OWOW reports from their contracted IPM Advocate with a summary of their local OWOW data (for example, the number of trainings, the number of staff trained, and/or the number of fact sheet distributed).

IPM Advocates provided OWOW services to approximately 243 participating retailers throughout California. This reporting year, 9 retailers were added in the Sacramento area, Marin County, Alameda County, Sonoma County, and Contra Costa County. Table 3 provides a summary of outreach activities between July 2021 and June 2022. These activities were funded by local municipalities and stormwater programs.

Table 3 Summary of Outreach Activities

Audience	OWOW Outreach Activity
Retailers	243 retailers participating in the OWOW program
	115 trainings were conducted
	768 retail staff were trained
Direct to Consumer	99 OWOW public outreach events
	8781 people attended OWOW public outreach events (In person and virtually)
	795 scans of QR Codes for OWOW fact sheets

Note: QR Code tracking began January 1, 2022

IPM Advocates conducted 115 trainings and trained 768 retail store staff. Main topics include IPM, managing pest problems with a less-toxic approach. In addition, IPM Advocates provided tips for new gardeners and how to protect gardens in the time of drought. Education has expanded to include protecting gardens during times of drought since plants are more prone to pest problems when they are (drought) stressed. IPM Advocates provided more digital support including a monthly retailer e-newsletter, online webinars and social media posts to the public. These activities are described in more detail below.

Impacts due to COVID-19 Pandemic:

- Retailers were still impacted by the supply chain challenges and inventory shortages.
- Retailers were also challenged by labor shortages, frequent new hires, and key staff out due to coronavirus related exposure or illness.
- Scheduling staff trainings for the retailer partners was challenging due to labor shortages and staff calling out due to coronavirus exposure. This caused IPM Advocates to reschedule several trainings, and/or work with the few staff present on the day.
- When in-person, IPM Advocates worked with store staff in smaller groups of multiple training sessions back-to-back.

OWOW Retailer e-Newsletter:

- Currently, of the total 243 retailers, there are 161 retailers receiving the e-newsletters.
- A monthly newsletter is emailed to participating retailers at the beginning of each month. This newsletter contains information on seasonal pest problems and eco-management solutions and assists with ensuring that all key store staff, including managers, are receiving the information. Many of the managers print the OWOW newsletter and post it for all staff to review. The newsletter lists the upcoming events that IPM Advocates are participating in, such as in-person tabling events or on-line webinars. Retailers have then posted the relevant events into their newsletters that are sent out to their customers. The newsletter also includes information on upcoming professional trainings, such as the Qualified Water Efficient Landscape (QWEL) trainings.

OWOW IPM Educational Webinars:

- Webinars were developed in lieu of in-person outreach events during the first year of the COVID-19 pandemic. These webinars have grown in popularity and now are a regular service provided by IPM Advocates to agencies that contract with them at the local scale. Each registrant received a program outline and a 'Helpful Gardening Resource' page.

OWOW IPM Social Media Posts/Tips:

- OWOW IPM tips were created for social media content as an additional way to expand the OWOW message to the public. IPM Advocates create seasonal content as a guide to prevent and manage each pest. This public outreach option is available at the local scale to those agencies contracted with an IPM Advocate. Agencies retain data of views and responses to each post.

Twelve bilingual IPM tips were provided throughout the contract year:

- Rodent exclusion
- Fall for planting
- Hiring a Pest Control Company
- Organic Fertilizers
- Rose Care
- Composting
- Yellow jacket prevention
- Installing a rain garden
- Dormant sprays
- Weed management
- Mosquitos
- Powdery mildew

Section 5: OWOW Program Development

To support a growing demand for OWOW outreach material and IPM Advocates, there are efforts currently underway, as well as future considerations, that are necessary to advance the OWOW program and its services.

5.1 UPDATES IN PROGRESS

Review of OWOW Outreach Materials

CASQA is establishing a review process for OWOW materials. In 2023, it is anticipated that OWOW outreach materials will be reviewed for technical accuracy and updated by subject matter experts. Retailer e-newsletters will be reviewed by subject matter experts prior to release starting July 2022. OWOW will also be coordinated with CASQA's larger pesticide regulatory work (CASQA, 2022)⁵.

New Order Process for OWOW Outreach Materials

The process for ordering OWOW outreach material was modified to conduct bulk ordering twice per year (starting August 2022). Ordering in bulk provides the best price for all materials. CASQA developed a new online order form to compile the bulk order.

5.2 FUTURE CONSIDERATIONS

Annual Reporting

In 2023, CASQA will develop a new process, schedule and supporting templates and tools, as needed, for OWOW Subscribers to report on OWOW implementation activities. This information can then be integrated into the Annual Report to provide a more robust perspective of local implementation activities throughout the state.

IPM Advocate Training Program

To operate at a statewide scale, and in a sustainable manner, certain aspects of the existing OWOW program must be formalized and expanded. In 2022, CASQA began developing an outline for a potential Qualified IPM Advocate Training Program. CASQA will coordinate workgroups comprised of OWOW Subscribers, current IPM Advocates, and training experts to develop a framework for the Qualified IPM Advocate Training Program. This framework will be utilized to seek outside funding (e.g., a future grant application or partnership with another organization).

IPM Advocate “In-Training”

While IPM Advocate training opportunities are not available, Suzanne Bontempo, as the IPM Advocate Coordinator will provide support for individuals interested in becoming IPM Advocates. The IPM Advocate “In-training” program will ensure that individuals providing OWOW outreach services in stores are providing the latest information and are consistent with the program. The IPM Advocate “In-training” program will be initiated in Fall of 2022 and provide a bridge for additional IPM Advocate services until the Qualified IPM Advocate program can be developed and implemented.

⁵ See report from 2022. the Pesticide Annual Report and Effectiveness Assessment. California Stormwater Quality Association. Sacramento, CA. This document is available in the CASQA [Member Library](#).



Appendix A – Images of OWOW Outreach Materials



Figure A.1 Trackable QR Code Poster in Store Aisle

EFFECTIVE ECO-FRIENDLY PEST CONTROL • LESS-TOXIC PRODUCTS



CONTROLLING ANTS IN YOUR HOME

CONTROL ANTS IN YOUR HOME WITH THESE ECO-FRIENDLY PRODUCTS

Bait stations containing borates or hydramethylnon	Amdro Kills Ants Ant Killer, Amdro Kills Ants Ant Killing Bait, Combat Source Kill 4 products, KM Ant Pro products, Maggie's Farm Simply Effective No Spill Ant Kill, Terro Ant Killer II Liquid Ant Baits
Diatomaceous earth (DE) products	Concern Diatomaceous Earth Crawling Insect Killer, Safer Brand Diatomaceous Earth Ant and Crawling Insect Killer, St. Gabriel Organics Insect Dust—Diatomaceous Earth
Applicator for diatomaceous earth (DE)	Pest Pistol
Plant-based insecticides	EcoLogic Ant and Roach Killer, Ecosmart Ant and Roach Killer, Orange Guard
Hose attachment	Bug Blaster
Sticky barrier	Stikem Special pest glue, Tree Tanglefoot Insect Barrier

Argentine ants are frequent invaders in California homes. They are tiny (1/8 inch). They come inside a few at a time at first (the scouts), and then in long lines, following scent trails to a food source.

A QUICK FIX FOR AN ANT EMERGENCY

If you deal with ants when they first come inside, a few simple steps can take care of the problem.

1. Find what ants are after (usually leftover food) and where they are entering the room (usually through a crack in the wall). Mark the spot so you can find it again. If you can't find an entry point, see Step 4.
2. Spray lines of ants with soapy water and wipe up with a sponge, and clean up any food or spills.
3. Next, block entry points temporarily with a smear of petroleum jelly or a piece of tape.
4. If you can't find an entry point, clean up the ants (Step 2). Place a bait station in an out-of-the-way spot on the line the ants have been following. Remember to remove the bait station when the line of ants has disappeared so you don't attract more ants into the house. (See *Tips for Using Ant Baits*.)

While they can be pests, ants are helpful creatures, especially outside. Ants kill and eat many pest insects, help to aerate soil, and recycle animal and vegetable material. This is good news, because it's probably not possible to eliminate ants from their outdoor habitat. The best way to manage an ant invasion is to keep them outside.

KEEP ANTS AWAY

- Store food in the refrigerator, or in containers that seal tightly.
- Keep things clean and dry, and fix leaking faucets and pipes (ants come in to find water as well as food).
- Weather-strip doors and windows.



Choose eco-friendly products for your home and garden. Look for this symbol before you buy.

Figure A.2 Ant Fact Sheet

OWOW Retail Newsletter July 2022 edition

July: Powdery Mildew, rodent exclusion, shade cloth and anti-transpirant

June: Mosquitos, Yellow jackets & Flies or Cucumber beetles

Powdery Mildew

As the summer temperatures warm up & dry out, powdery mildew seems to come on strong. This fungus is most noticed it on the leaves of crape myrtles, summer squash, roses, tomatoes and so many more.

Powdery mildew is a common fungal disease found on many different types of plants. It appears as a white or grayish, powdery growth that is most commonly found on leaf surfaces, but may also infect buds, shoots and even flowers and fruits. This ‘powder’ is actually the mycelium and spores of the fungi. Powdery mildew is rarely fatal, however on some plants, leaves may yellow and fall off, and leaves and shoots may distort.

There are many different types of powdery mildew fungi that can cause the disease, and spores can be spread to new plants by wind. But all of the spores need leaves free of water to germinate, so water on the plant surfaces can actually inhibit germination and kill the spores. Ideal conditions for powdery mildew are temperatures between 60° and 80° F, but it can be active in temperatures from 55° and 90° F. It is most common in shady conditions and dense plantings.

PREVENTION

The best way to manage powdery mildew is to prevent it through cultural practices.

- Place plants in full sun where possible, and provide good air circulation
- Avoid excess fertilizer that stimulates new growth that is more prone to the fungus. Use compost and organic fertilizers to prevent excessive tender, overgrown foliage that shades the leaves and provides the right conditions for the fungus.
- Prune out small infestations, but don’t over-prune to avoid rapid growth.
- Irrigate plants by watering leaves mid-morning to kill the spores, and to allow leaves to dry quickly to avoid other fungal infections.
- Clean up dead plant material and fallen leaves so that spores don’t spread and won’t be able to overwinter in plant tissue.
- Choose plant varieties that are resistant to powdery mildew when possible.

USING FUNGICIDES

In case of severe infections, there are several environmentally friendly products that can help to manage powdery mildew. Most of these products are best used to prevent powdery mildew, so apply them to plants susceptible to the disease before you see the powdery mildew or in the very beginning stages. Thoroughly cover all plant parts, including under the leaves. Additional applications may be needed as the plant grows.

Figure A.3 July e-Newsletter Page 1



Appendix B – Product Lists January 2022

The Home Depot product list 2022:

Pesticide Bays

Amdro Gopher Traps
BioAdvance House Plant Insect & Mite Control
Bird-B-Gone Stainless Steel Bird Spikes
Black Flag Pantry Pest Trap
Black Flag Roach Motel
Bonid Captain Jack's Lawnweed Brew
Bonide Copper Fungicide
Bonide Cpt Jack's Dead Bug Brew
Bonide Cpt Jack's Dead Weed Brew
Bonide Cpt Jack's Neem Max 70%
Bonide Insecticidal Super Soap
Bonide Mole Max
Bonide Neem Oil
Bonide Orchard Spray
Bonide Repels All
Bonide Rose Rx
Bonide Tomato & Vegetable
Buggy Beds Bed Bug Trap
Critter Ridder
Cutter Essentials Bug Control
Cutter Essentials Outdoor Fogger
Dr. Earth Pest Control Insect Killer
EcoLogic Ant & Roach Killer
EcoLogic Bed Bug Killer
EcoLogic Home Insect Control
Fly Swatter
Garden Safe Fungicide 3
Garden Safe Houseplant & garden
Garden Safe Insecticidal Soap
Garden Safe multi Garden Insect
Garden Safe Neem Oil
Garden Safe Rose & Flower
Garden Safe Slug & Snail
Gopher Traps
Green Gobbler 20% Vinegar Weed Killer
Harris Roach Tablets
Havahart Live Animal Trap
Hot Shot Bed Bug Killer Dust
Hot Shot MaxAttrax Roach Killing Powder
Liquid Fence Deer & Rabbit Repellent
Monterey B.t.
Mosquito Dunks
Mouse Traps
Mouse X
Ortho Bed Bug Trap
Ortho Ground Clear Weed & Grass Killer (green label)
Owl, Garden Defense
Raid Ant Baits III
Raid Fly Ribbon
Raid Fly Stick
Raid Fly Trap
Raid Window Fly Trap
Rat Traps
Rat X
Rescue Fly Trap
Rescue Fly Trap Refill
Rescue Outdoor Fly Trap
Rescue W-H-Y Trap
Rescue W-H-Y Trap Refills
Rescue Wasp Trap Stik
Rescue Yellow Jacket Trap
Rescue Yellow Jacket Trap Cartridge
Rescue Yellow Jacket Trap Refill
Sevin 2-in-1 Sulphur Dust
Safer Brand Ant, Roach & Spider Killer
Safer Brand Diatomaceous Earth Crawling Insect Killer
Safer Brand Home Pest Control
Safer Brand Indoor Fly Trap
Safer Brand Indoor Fly Trap Refills
Safer Brand Snake Shield
Skunk Scram Repellent Granulars
Southern Ag Thuricide Bt
Terro Flea Trap
Terro Fruit Fly Trap

Terro Indoor Fly trap	Victor Gopher Traps
Terro Liquid Ant Bait	Victor Mouse Traps
Terro Multi-Surface Liquid Ant Baits	Victor Rat Traps
Terro Outdoor Liquid Ant Bait Stakes	Victor Rat-A-Way Rat & Mouse Repellent
Tom Cat Attractant Gel	Victor Rodent Repeller Packs
Tom Cat Mouse Trap	Weed Block Landscaping Fabric
Tom Cat Rat Traps	Weed Control Fabric
Tom Cat Rodent Repellent	Zevo Ant, Roach & Spider
Treekote Aerosol Tree Wound	Zevo Fly, Gnat & Fruit Fly
Uncle Ian's Dog & Cat Repellent	Zevo Flying Insect Trap
Uncle Ian's Mole, Gopher, Deer, & Squirrel Repellent	Zevo Multi Insect
Victor Electric Mouse Trap	Zevo Wasp, Hornet, & Yellow Jacket
Victor Electric Rat Trap	

Fertilizer Bays

Alaska Fish Fertilizer
Dr Earth Lawn Food
Dr. Earth Fertilizer
Earthworm Castings
Espoma Fertilizer
Espoma Organic Lime
Espoma Organic Soil Acidifier
First Saturday Lime Insect Repellent
Kellogg Organic Plus Fertilizer
Kellogg Organic Plus Lawn Fertilizer
Kellogg Organic Plus Fish & Kelp Fertilizer
Mater Magic
Miracle-Gro Fertilizer Spikes
Miracle-Gro Fertilizer Spikes Tree & Shrub
Miracle-Gro Performance Organics
Monterey Fish & Guano Fertilizer
Osmocote
Pennington Epsom Salts
True Organic Fertilizer
True Organic Blood Meal
True Organic Bone Meal
Vigoro Fertilizer Spikes
Vigoro Tree & Shrub Fertilizer Spikes
Vigoro Fruit, Nut & Citrus Fertilizer Spikes

The ACE Hardware product list 2022:

Alaska Fish Fertilizer
Amdro Kills Ants Ant Killer
Answer Kills Roaches Powder
Bed Bug Traps
BioCare Codling Moth Traps
Bird Repellent Gel
Bird Scare Tape
Bird-B-Gone Flash Tape
Bird-B-Gone Steel Bird Spikes
Black Flag Roach Motel
Black Flag Window Fly Traps
Bonide All Seasons Spray Oil
Bonide Burnout
Bonide Captain Jack's Dead Bug Brew
Bonide Chipmunk, Squirrel, & Rodent Repellent
Bonide Copper Fungicide
Bonide Go Away! Rabbit, Dog, & Cat Repellent
Bonide Hot Pepper Wax Animal Repellent
Bonide Insecticidal Soap
Bonide Mole Max
Bonide Mosquito Beater
Bonide Mouse Magic
Bonide Neem Oil
Bonide Rat Magic
Bonide Repels All
Bonide Snake Stopper
Bonide Sulfur Fungicide
Bonide Tomato & Vegetable
Bonide Wilt Stop
Buggy Beds
Cloud Cover
Combat Ant Killing Bait
Combat Roach Killing Bait
Critter Ridder Sprinkler
Good Nature CO2 Rodent Trap
Gopher Baskets
Gopher Hawk
Gopher Scram
Gopher Traps
Harris 20% Vinegar Weed Killer
Harris Bed Bug Killer Diatomaceous Earth
Harris Boric Acid Roach Powder
De-Fence Deer & Rabbit Repellent
Deer Off Deer Repellent
Diatomaceous Earth
Dr. Earth Final Stop Disease Control Fungicide
Dr. Earth Final Stop Fruit Tree Insect Killer
Dr. Earth Final Stop Rose & Flower Insect Killer
Dr. Earth Final Stop Vegetable Insect Killer
Dr. Earth Final Stop Yard & Garden Insect Killer
Dr. Earth Organic Fertilizer
Drop in the Bucket Mouse Trap
E.B. Stone Organic Fertilizer
Earth's Ally Disease Control
Earth's Ally Insect Control
Earth's Ally Weed & Grass Killer
Earth's Ally Weed Killer
EcoSmart 3 in 1 Rose & Flower
EcoSmart Ant & Roach Killer
EcoSmart Flying Insect Killer
EcoSmart Garden Insect Killer
EcoSmart Home Pest Control
EcoSmart Insect Killer
EcoSmart Insect Killing Granules
EcoSmart Mosquito Fogger
EcoSmart Wasp & Hornet Killer
EcoSmart Weed & Grass Killer
Epsom Salts
Espoma Garden Lime
Espoma Organic Fertilizer
Espoma Organic Insect Soap
Espoma Soil Acidifier
Fly Paper
Fly Ribbon
Fly Stick
Fly Swatter
Fly Trap
Fresh Cab Rodent Repellent
Fruit Fly Trap
Giant Destroyer Garlic Repellent Clips Deer & Rabbit
Harris Diatomaceous Earth
Harris Famous Roach Tablets
Harris Neem Oil
Harris Roach Traps
Havahart Live Animal Cage Trap
Insect Sticky Traps
Jobe's Fertilizer Spikes
Jobe's Organic Fertilizer

Jobe's Organic Fertilizer Spikes
JT Eaton Kills Bed Bugs Powder
Liquid Fence Animal Repellent
Liquid Fence Deer & Rabbit
Liquid Fence Snake Repellent
Live Catch Mouse Trap
Messina's Animal Stopper
Messina's Deer Stopper
Messina's Rodent Stopper
Messina's Squirrel Stopper
Miracle Gro Performance Organics
Mole Trap
Mole X
Monterey 70% Neem Oil
Monterey Bt
Monterey Fish & Guano
Monterey Fruit Tree Spray Plus
Monterey Garden Insect Spray
Monterey Horticultural Oil
Monterey Liqui-Cop
Monterey Neem Oil
Monterey Take Down Garden Spray
Mosquito Bits
Mosquito Dunks
Moss Out! Roofs & Walks
Mouse Traps
Mouse X
Mouse Zero
Natria Grass & Weed Control
Natria Insect, Disease, & Mite Control
Natria Insecticidal Soap
Natria Neem Oil
Natria Rose & Flower
Natria Snail & Slug Killer Bait
Nature's Care Organic Fertilizer
Neem Oil
Orange Guard
Organocide Bee Safe 3 in 1 Garden Spray
Ortho 3 in 1 Insect, Mite, & Disease
Ortho Bed Bug Traps
Ortho Deer B Gon
Ortho GroundClear Weed & Grass
Ortho Home Defense Ant & Roach Killer w/ Essential Oils
Ortho Home Defense Crawling Bug Killer w/ Essential Oils
Ortho Home Defense Flying Bug Killer w/ Essential Oils
Ortho Insect Killer Tree & Shrub
Osmocote
Owl Garden Defense
Pulverize Weed & Grass Killer
Pulverize Weed Killer for Lawns
Pulverize Weed, Brush & Vine Killer
Raid Ant Baits III
Raid Essentials Ant & Roach
Raid Essentials Ant, Spider, & Roach
Raid Small Roach Baits
Rat Traps
Rat X
Rat Zero
Rescue Ant Baits
Rescue Fly Trap
Rescue Fly Trap Refill
Rescue Fly TrapStik
Rescue Pantry & Birdseed Moth Traps
Rescue WHY Trap
Rescue WHY Trap Refills
Rescue Yellowjacket Trap
Rescue Yellowjacket Trap Cartridge
Rescue Yellowjacket Trap Refill
Safer 3 in 1
Safer Ant & Crawling Insect Killer
Safer Caterpillar Killer
Safer Critter Ridder Animal Repellent
Safer Critter Ridder Deer & Rabbit
Safer Diatomaceous Earth
Safer End ALL
Safer Garden Dust
Safer Garden Fungicide
Safer Houseplant Sticky Stakes
Safer Insect Killing Soap
Safer Moss & Algae Killer
Safer Neem Oil
Safer Pantry Pest Trap
Safer Rose & Flower
Safer Snake Shield
Safer Tomato & Vegetable
Safer Yellowjacket & Wasp Attractant
Safer Yellowjacket & Wasp Trap
Scarecrow
Scott's Continuous Release Fertilizer
Scotts Moss EX
Scram for Cats
Sevin Sulfur Dust
Shake Away Rodent Repellent
Slug Trap
Sluggo
Sluggo Plus
Soil Moist
St. Gabriel Moss Killer

Stay Away Ants
Stay Away Mice
Stay Away Moths
Stay Away Spider
Tanglefoot
Terro Ant Killer Liquid
Terro Clothes Moth Alert
Terro Flea Trap
Terro Fly Magnet
Terro Fruit Fly Trap
Terro Indoor Fly Trap
Terro Liquid Ant Bait
Terro Moth Traps
Terro Multi-Purpose Insect Bait
Terro Multi-Surface Liquid Ant Bait
Terro Outdoor Liquid Ant Bait
Terro Roach Magnet
Terro Wasp & Fly Trap
Tom Cat Animal Repellent
Tom Cat Attractant Gel
Tom Cat Deer Repellent
Tom Cat Mouse Traps
Tom Cat Rat Traps
Tom Cat Rodent Repellent
Victor Black Box Gopher Trap
Victor Electronic Mouse Trap
Victor Electronic Rat Trap
Victor Fly Magnet
Victor Mole & Gopher Repellent
Victor Mole Trap
Victor Mouse Traps
Victor Mouse-A-Way Mouse Repellent
Victor Natural Rodent Repeller Packs
Victor Rat Traps
Victor Rat Zapper
Victor Rat-A-Way Rat & Mouse Repellent
Victor Tin Cat Mouse Trap
Whitney Farms Lawn Weed Killer
Whitney Farms Organic Fertilizer
Whitney Farms Weed & Grass Control
Window Fly Trap
Yard Enforcer Sprinkler

2022

Pesticide Annual Report and Effectiveness Assessment

California Stormwater Quality Association



Final Report
August 2022

Preface

The California Stormwater Quality Association (CASQA) is comprised of stormwater quality management organizations and individuals, including cities, counties, federal agencies, state agencies, ports, universities and school districts, wastewater agencies, water suppliers, special districts, industries, and consulting firms throughout California. CASQA's membership provides stormwater quality management services to more than 26 million people in California.

This report provides CASQA's members with focused information on its efforts to prevent pesticide pollution in urban waterways. It is a component of CASQA's True Source Control Initiative, which seeks to address stormwater and urban runoff pollutants at their sources. This report was funded by CASQA, Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, Fairfield-Suisun Urban Runoff Management Program, Marin County Stormwater Pollution Prevention Program, Napa Countywide Stormwater Pollution Prevention Program, Sacramento Stormwater Quality Partnership, San Mateo Countywide Water Pollution Prevention Program, Santa Clara Valley Urban Runoff Pollution Prevention Program, Sonoma County Water Agency, and Vallejo Flood & Wastewater District.

This report was prepared by Stephanie Hughes under the direction of the CASQA True Source Control Subcommittee (outgoing Program Manager: Dave Tamayo and incoming Program Manager: Vicki Kalkirtz), with input from Tammy Qualls of Qualls Environmental Consulting.

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Abbreviations Used in this Report

BACWA – Bay Area Clean Water Agencies

BO – Biological Opinion

CASQA – California Stormwater Quality Association

CEQA – California Environmental Quality Act

CWA – Clean Water Act

DPR – California Department of Pesticide Regulation

EMPM – Environmental Monitoring Public Meeting

EPA – United States Environmental Protection Agency

ESA – Endangered Species Act

FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act

IPM – Integrated Pest Management

MAA – Management Agency Agreement between DPR and the Water Boards

MS4 – Municipal Separate Storm Sewer System

NACWA – National Association of Clean Water Agencies

NPDES – National Pollutant Discharge Elimination System

OPP – U.S. EPA Office of Pesticide Programs

OW – U.S. EPA Office of Water

PAH – Polycyclic aromatic hydrocarbon

PEAIP – Program Effectiveness Assessment and Improvement Plan

PID – Proposed Interim Decision

PMAC – Pest Management Advisory Committee

PPDC – EPA's Pesticide Program Dialogue Committee

SFBRWQCB – San Francisco Bay Regional Water Quality Control Board

SPM – Sustainable Pest Management Work Group (DPR)

STORMS – Strategy to Optimize Resource Management of Storm Water (a program of the State Water Board)

SWAMP – California Water Boards Surface Water Ambient Monitoring Program

TMDL – Total Maximum Daily Load (regulatory plan for solving a water pollution problem)

TSC – CASQA True Source Control Subcommittee

UP3 – Urban Pesticides Pollution Prevention Partnership

UPA – Urban Pesticide Amendments

USGS – U.S. Geological Survey

Water Boards – California State Water Resources Control Board together with the California Regional Water Quality Control Boards

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Executive Summary

This report by the True Source Control (TSC) Subcommittee of the California Stormwater Quality Association (CASQA) describes CASQA's activities related to the goal of preventing pesticide pollution in urban waterways for the period of July 2021 through June 2022.

To address the problems caused by pesticides in California's urban waterways, CASQA collaborates with the California State Water Resources Control Board and the California Regional Water Quality Control Boards (Water Boards). By working with the Water Boards and other water quality organizations, we address the impacts of pesticides efficiently and proactively through the statutory authority of the California Department of Pesticide Regulation (DPR) and EPA's Office of Pesticide Programs (OPP). More than 18 years of collaboration with Urban Pesticides Pollution Prevention (UP3) Partnership, as well as EPA and DPR staff, has resulted in significant changes in pesticide regulation. A summary of CASQA's activities to address key management questions are described below, with more details and outcomes provided in Section 2.

Near term / Current problems – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

- 💧 CASQA shared its urban runoff expertise with pesticide regulators by preparing comment letters to EPA for eight pesticide reviews, providing the Water Boards and other partners with information that triggered additional letters on one pesticide. (See Table 3 and Appendix C.)
- 💧 CASQA and partners successfully lobbied the federal General Services Administration (GSA) to return functionality and transparency to the Regulations.Gov website, the public access point for federal agency rulemaking including EPA pesticide dockets.
- 💧 In response to requests from CASQA and partners, EPA proposed enhanced label language for pyrethrins.
- 💧 To mitigate risks to aquatic organisms and human health, EPA proposed substantial mitigation measures for the herbicide, oxyfluorfen.
- 💧 CASQA updated the Pesticide Watch List based on new EPA registrations and the State's update to the 303(d) list. The Watch List will be shared with pesticides regulators and with government agency and university scientists to stimulate generation of surface water monitoring and aquatic toxicity data for the highest priority pesticides. (See Table 2.)

Long term / Prevent future problems – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

- 💧 DPR continues to demonstrate its commitment to addressing pesticide impacts on receiving waters through timely mitigation and implementation of improved evaluation procedures.
- 💧 The State Water Board continued to work toward development of the Urban Pesticide Amendments (UPA). The desired outcome for these amendments is to institutionalize the State's strategy of utilizing pesticide regulations as the primary mechanism for addressing pesticide water quality problems associated with urban runoff. In spring 2022, CASQA met with State Water Board staff to provide potential options for evaluating the effectiveness of the UPAs in addressing MS4 pesticide discharges, to support identification of compliance pathway options for municipal stormwater permits.
- 💧 To support the UPA, the State Water Board continued to work toward establishing a coordinated urban runoff monitoring program intended to coordinate with existing Water Board and DPR urban pesticides and toxicity monitoring programs. The State Water Board continued to draft a proposed monitoring program and expects to present a document for public comment in spring 2023. CASQA remains dedicated to supporting State Water Board staff.

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- 💧 In 2022, the EPA published a workplan to address the incorporation of their Endangered Species Act (ESA) obligation with pesticide registrations and re-registrations.
- 💧 Although many improvements have been made by EPA OPP since the early 2000s, improvement in scientific evaluations supporting EPA OPP's regulatory efforts and better understanding of urban runoff management systems are still necessary to adequately protect urban surface waters from pesticide impairments. The regulatory climate recently improved at the federal level and we will continue to work with EPA OPP to further our goals.
- 💧 In June, CASQA spoke at EPA's Environmental Monitoring Public Meeting to convey the importance of including urban uses in ESA mitigations, emphasizing that such mitigations are feasible and cost-effective.
- 💧 In spring 2022, Dave Tamayo, a longtime TSC member and recent retiree from Sacramento County, was appointed to EPA's Pesticide Program Dialog Committee (PPDC) representing an important opportunity to enhance urban stormwater discussions at the federal level. CASQA subsequently designated Mr. Tamayo as CASQA's official representative at the PPDC.

In the coming year, CASQA plans to continue to address near-term pesticide concerns and seek long-term regulatory change. Future near-term and long-term tasks are identified in Section 3, Tables 5 and 6. Key topics include:

- 💧 Continued support of the eventual completion and adoption of the UPAs by the State Water Board;
- 💧 Continued development of a coordinated monitoring program in partnership with the Water Boards, DPR, and EPA Region 9;
- 💧 Registration review-related activities at EPA for pyrethroids and fipronil;
- 💧 Initiating discussion of urban water quality concerns at the EPA PPDC's future meetings;
- 💧 DPR registration applications and proposed decisions for new products.

Section 1. Introduction

1.1 IMPORTANCE OF CASQA'S EFFORTS TO IMPROVE PESTICIDE REGULATION

For decades, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Currently used pesticides are the primary cause of toxicity in California surface waters, including urban water bodies.¹ Under the Clean Water Act (CWA), when pesticides impact water bodies, local agencies may be held responsible for exceedances in surface waters, as well as costly monitoring and mitigation efforts. To date, some California municipalities² have incurred substantial costs to comply with pesticides-related Total Maximum Daily Loads (TMDLs) and additional permit requirements. In some cases (e.g., diazinon, chlorpyrifos), municipal compliance costs have continued more than a decade after termination of virtually all urban use. In the future, more municipalities throughout the state are expected to be subject to similar requirements, as additional TMDLs and Basin Plan Amendments are adopted (Table 1). Meanwhile, local agencies have no authority to restrict or regulate when or how pesticides are used³ in order to proactively prevent pesticide pollution and avoid these costs and liabilities.

Under federal and state statutes, EPA and DPR have the authority and responsibility to regulate pesticides and protect water bodies from adverse effects (including impacts from pesticides in urban runoff). Unfortunately, until the relatively recent past, these agencies did not recognize the need, nor possess the institutional capacity, to exercise their authority to protect urban water quality. As a result, past registration actions have allowed a number of pesticides (such as pyrethroids and fipronil) to be used legally in ways that have resulted in widespread pollution in urban water bodies. This situation is depicted in Figure 1.

To change this situation, CASQA is actively engaged with state and federal regulators in an effort to develop an effective pesticide regulatory system, based primarily on existing statutes, that includes timely identification and mitigation of urban water quality impacts, and proactively prevents additional problems through the registration and registration review processes (Figure 2).

New Pesticide 303(d) Listings and Delistings Approved in 2022

In January 2022, the State Water Board adopted the 2020-2022 Integrated Report for which the Central Coast, Central Valley and San Diego Regions were scheduled for on-cycle 303(d) reviews. The report was subsequently submitted to and approved by EPA.

Listings: The report included numerous additional 303(d) pesticide listings for all three regions. While the most common listings were for pyrethroids (either specific individual pesticides or the overall pyrethroid group), other listings include imidacloprid, fipronil and diuron. Dichlorvos was also added for an urban creek in San Diego and Bensulide (an organophosphate pesticide) was added for an urban/rural mixed region in Monterey County.

Delistings: The report included 38 delistings from the 303(d) list, most of which were diazinon (urban uses already prohibited) and chlorpyrifos (no meaningful urban uses). Notably, organophosphate pesticides were delisted for an urban waterway in Sacramento and two urban waterways in Stockton due to attaining water quality standards.

[\(State Water Board's 2020-2022 Integrated Report, May 11, 2022\).](#)

¹ See reports from the California Surface Water Ambient Monitoring Program Sediment Pollution Trends Program including Anderson, B.S., Hunt, J.W., Markewicz, D., Larsen, K., 2011. Toxicity in California Waters, Surface Water Ambient Monitoring Program. California Water Resources Control Board. Sacramento, CA.

² For example, Sacramento-area municipalities spent more than \$75,000 in the 2008-2013 permit term on pyrethroid pesticide monitoring alone; Riverside-area municipalities spent \$617,000 from 2007 to 2013 on pyrethroid pesticide chemical and toxicity monitoring.

³ Local agencies in California have authority over their own use of pesticides but are pre-empted by state law from regulating pesticide use by consumers and businesses.

Table 1. California TMDLs, Statewide Water Quality Control Plans, and Basin Plan Amendments Addressing Currently Registered Pesticides and/or Toxicity in Urban Watersheds^{4, 5, 6}

Water Board Region	Water Body	Pesticide	Status
Statewide	All MS4s/All Urban Waterways: Statewide Water Quality Control Plan amendments for urban pesticides reduction ["Urban Pesticides Amendments"] (Inland Surface Waters, Enclosed Bays & Estuaries, and Ocean)	All Pesticides/All pesticide-related toxicity	In preparation
	Sediment Quality Objectives (Enclosed Bays & Estuaries)	Sediment Toxicity ⁷	Approved
	Toxicity Provisions (Inland Surface Waters and Enclosed Bays & Estuaries)	Toxicity ⁷	Adopted by State; awaiting EPA approval ⁸
San Francisco Bay (2)	All Bay Area Urban Creeks	All Pesticide-Related Toxicity	Approved
Central Coast (3)	Santa Maria River Watershed Lower Salinas River Watershed	Pyrethroids, Toxicity Pyrethroids, Toxicity Malathion, Chlorpyrifos, Diazinon ⁹	Approved Approved Adopted by Central Coast Water Board, June 2022 ¹⁰
	San Lorenzo River Watershed (Santa Cruz)	Chlorpyrifos ⁹	Approved
Los Angeles (4)	Marina del Rey Harbor	Copper (Marine antifouling paint) ¹¹	Approved
	Oxnard Drain 3 (Ventura County)	Bifenthrin, Toxicity	EPA-Adopted Technical TMDL
	Calleguas Creek, its Tributaries and Mugu Lagoon	Water & Sediment Toxicity ⁷ Diazinon & Chlorpyrifos ⁹	Approved
	McGrath Lake (Ventura County)	Sediment Toxicity ⁷	Approved
	Colorado Lagoon (Long Beach)	Sediment Toxicity ⁷	Approved
	Dominguez Channel; Greater Los Angeles & Long Beach Harbor Ballona Creek Estuary	Sediment Toxicity ⁷ Sediment Toxicity ⁷	Approved Approved

⁴ Excludes pesticides that are not currently registered in California, such as organochlorine pesticides.

⁵ https://www.waterboards.ca.gov/water_issues/programs/tmdl/

⁶ https://www.waterboards.ca.gov/water_issues/programs/tmdl/2020_2022state_ir_reports_final/apx_d_adopted_tmdls_list.pdf

⁷ These TMDLs/Plan provisions can trigger toxicity testing stressor source identification studies, and additional follow up, even when toxicity is linked to current pesticides.

⁸ https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/tx_ass_cntrl.html

⁹ Use prohibited in urban areas (diazinon) or no meaningful use due to use limitations (chlorpyrifos).

¹⁰ https://www.waterboards.ca.gov/centralcoast/board_info/agendas/2022/jun/item8_att1a.pdf

¹¹ Primarily addresses pesticides that are directly discharged and should not ordinarily appear in stormwater (marine antifouling paint).

Water Board Region	Water Body	Pesticide	Status
Central Valley (5)	Sacramento River and San Joaquin River Basins	Pyrethroids	Approved
	Sacramento-San Joaquin River Delta Waterways	Diazinon & Chlorpyrifos ⁹	Approved
	Sacramento & Feather Rivers	Diazinon & Chlorpyrifos ⁹	Approved
	Sacramento County Urban Creeks	Diazinon & Chlorpyrifos ⁹	Approved
	Lower San Joaquin River	Diazinon & Chlorpyrifos ⁹	Approved
Lahontan (6)	Pesticide Discharge Prohibition	All Pesticides	Approved
Santa Ana (8)	Newport Bay	Copper (Marine antifouling paint) ¹¹	In preparation ¹²
	San Diego Creek, and Upper and Lower Newport Bay	Toxicity (Diazinon & Chlorpyrifos) ⁹	EPA-Adopted Technical TMDL
San Diego (9)	Shelter Island Yacht Basin (San Diego Bay)	Copper (Marine antifouling paint) ¹¹	Approved
	Chollas Creek	Diazinon ⁹	Approved

¹² <https://www.newportbeachca.gov/government/departments/public-works/ocean-water-quality/newport-bay-copper>

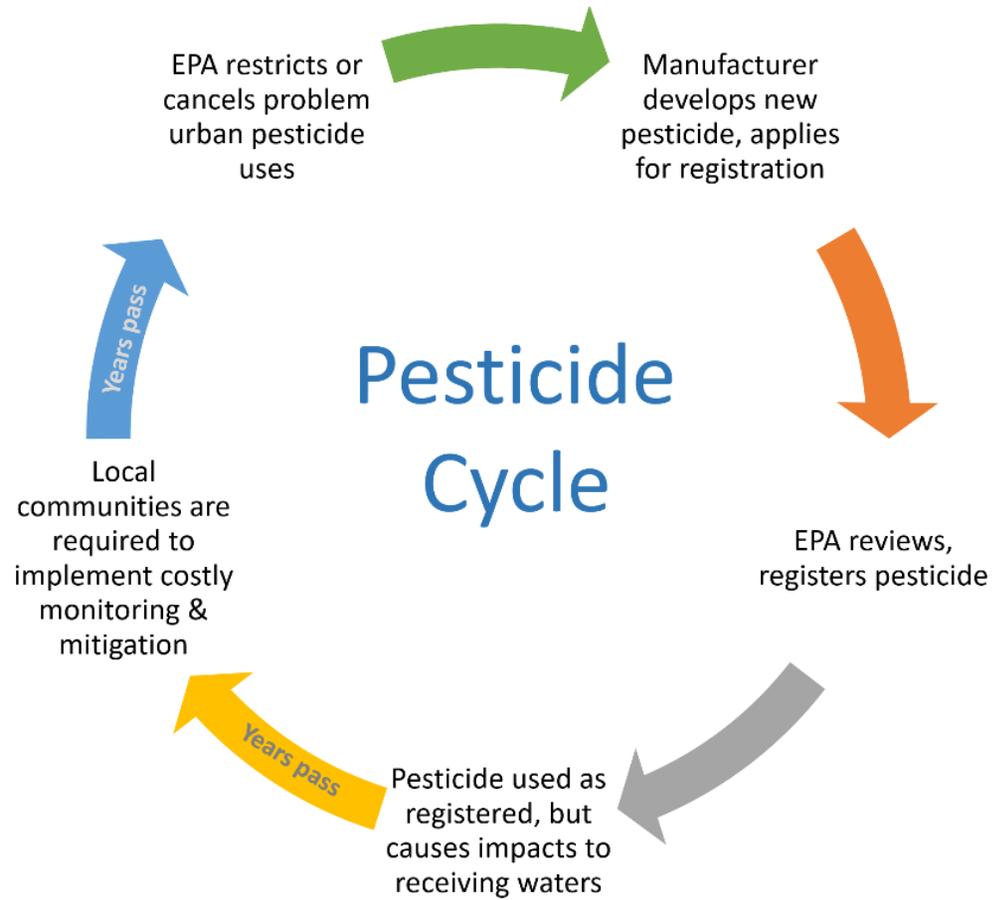


Figure 1. The Pesticide Regulatory System Can Lead to Harmful Outcomes to Surface Waters, Proving Costly to Municipalities.

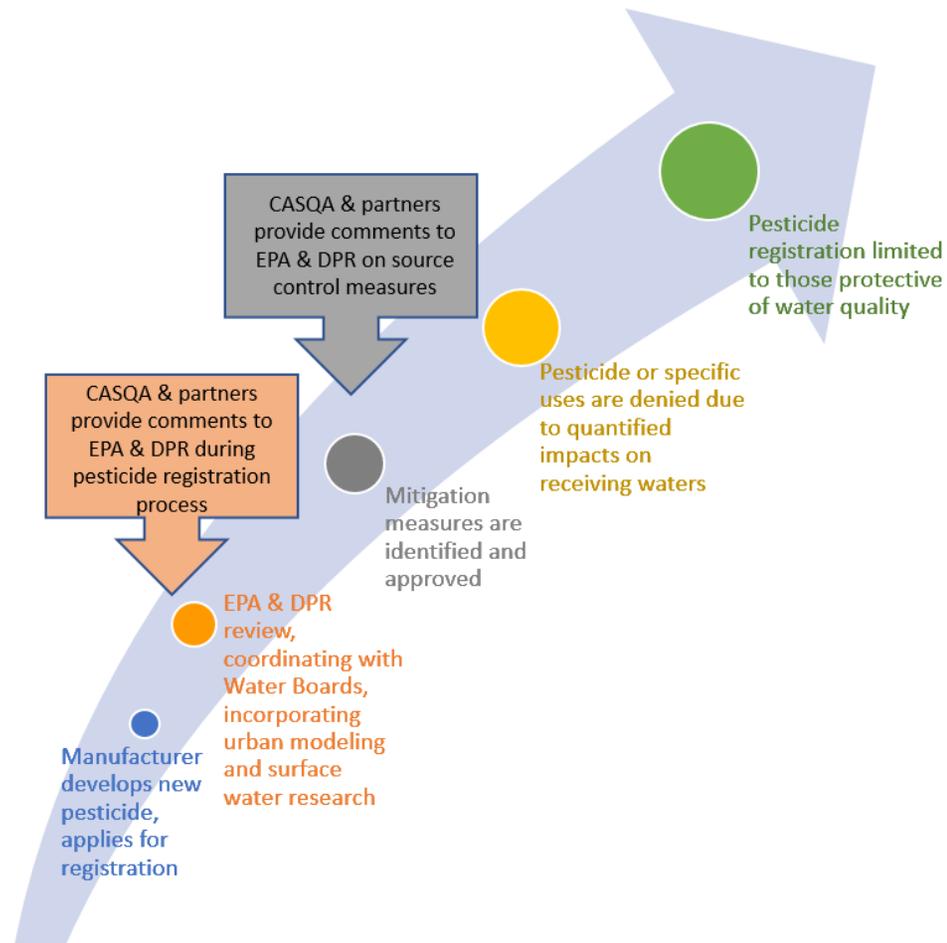


Figure 2. Via Proactive Use of the Pesticide Regulatory Structure, CASQA and Partners Seek to Restrict Pesticide Uses that have the Potential to Cause Urban Water Quality Problems.

1.2 CASQA'S GOALS AND APPLICATION TO PROGRAM EFFECTIVENESS ASSESSMENT

CASQA's *Vision for Stormwater*, first approved by the Board of Directors in 2015, is periodically updated to reflect developments in stormwater management. In October 2020, CASQA released the updated *Vision for Sustainable Stormwater Management*.¹³ Within CASQA's Vision, Action 1.2 is to "Minimize Pollution Through True Source Control." Among the objectives described within Action 1.2, Objective 2 has the following scope:

Objective 2: Implement an Urban Pesticide Program

For decades now, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Currently used pesticides are the primary cause of toxicity in California surface waters, including urban water bodies. CASQA is actively engaged with state and federal regulators in an effort to develop an effective pesticide regulatory system, based primarily on existing statutes, that includes timely identification and mitigation of urban water quality impacts, and proactively prevents additional problems through the registration and registration review processes.

Potential Collaborators: State Water Board, DTSC, EPA, DPR

The effectiveness of CASQA's efforts toward this scope can be expressed in relation to management questions established as part of Municipal Separate Storm Sewer Systems' (MS4s') program effectiveness assessments that are required in some MS4 permits. With respect to addressing urban pesticide impacts on water quality, the following two management questions are suggested for inclusion in MS4s' program effectiveness assessment:

Question 1: (Near term / Current problems) – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end recently observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

Question 2: (Long term / Prevent future problems) – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

This report is organized to answer these management questions and is intended to support annual permit compliance requirements for both Phase I and Phase II MS4s. It describes the year's status and progress, provides detail on stakeholder actions (by CASQA and others); and provides a roadmap / timeline showing the context of prior actions as well as anticipated end goal of these activities. This report may also be used as an element of future effectiveness assessment annual reporting.

¹³ [https://www.casqa.org/sites/default/files/downloads/final - vision for sustainable stormwater management - 10-07-2020.pdf](https://www.casqa.org/sites/default/files/downloads/final_-_vision_for_sustainable_stormwater_management_-_10-07-2020.pdf)

Section 2. Latest Results of CASQA Efforts

At any given time, there are dozens of pesticides with current or pending actions from the EPA or DPR. Addressing near term regulatory concerns is important because some pesticides may pose immediate threat to water quality that can lead to compliance liability for MS4s, and because some of the regulatory decisions made by EPA and DPR will last many years. For example, pesticide registration decisions are intended to be revisited on a fifteen-year cycle. To inform its engagement on near-term regulatory concerns, CASQA uses the Pesticide Watch List in the prioritization of near-term efforts (Section 2.1).

Meanwhile, CASQA and BACWA continue to work on parallel efforts to effect long-term systemic changes in the regulatory process itself (see inset). By identifying inadequacies and inefficiencies in the pesticide regulatory process, and persistently working with EPA and DPR to improve the overall system of regulating pesticides, CASQA and BACWA are gradually achieving results (Section 2.2).

2.1 NEAR-TERM REGULATORY CONCERNS

CASQA seeks to ensure that the Water Boards and EPA's Office of Water (OW) work with DPR and EPA's OPP to manage problem pesticides that are creating near-term water quality impairments. These efforts address CASQA Vision Action 1.2 as well as Phase II MS4 Program Effectiveness Assessment and Improvement Plan (PEAIP) Management Question 1 regarding observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff.

Assessment Question 1: (Near term / Current problems) – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end recently observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

Answer: As detailed below, at the State level, significant progress has been made by DPR in addressing near-term and current problems with pesticides in surface waters receiving urban runoff. DPR continues to implement improved registration processes and responses to observed water quality problems. DPR also continues to implement and evaluate mitigation measures for observed problems with pyrethroids and fipronil.

At the Federal level, less progress has been made at addressing near term problems. Some early actions were taken to address pyrethroid and fipronil problems at the urging of CASQA and DPR. However, EPA does not show a clear understanding of key urban uses in its analyses, and it is still unclear if its upcoming risk management decisions for pyrethroids, fipronil, and imidacloprid and other neonicotinoids will provide any additional protection of urban water bodies.

CASQA and BACWA Continue to Coordinate Monitoring EPA and DPR Pesticide Regulatory Actions



There has been a long history of collaboration between CASQA, the Bay Area Clean Water Agencies (BACWA), and the State Water Board, as all entities seek to track and respond to pesticide regulatory actions, with the goal of avoiding pesticide-related toxicity.

CASQA and BACWA regularly track pesticide regulatory activities by EPA, DPR and other agencies. In 2021, CASQA and BACWA combined resources to track stormwater and wastewater priorities into a single Action Plan, updated monthly.

Together, CASQA and BACWA accomplish tasks that are impractical for individual member agencies. Both CASQA and BACWA are committed to continued collaborations to streamline our proactive regulatory approach. In 2022, a factsheet was developed to help member agencies understand the importance of this coordinated effort. (See Appendix A.)

2.1.1 Updated Pesticide Watch List

A key tool for identifying near-term regulatory concerns is CASQA’s Pesticide Watch List. As time permits, CASQA reviews scientific literature, government reports, and monitoring studies as they are published. This information is used to prioritize pesticides based on the most up-to-date understanding of urban uses, pesticide characteristics, monitoring, and surface water quality toxicity (for pesticides and their degradates). CASQA uses these insights to update the list each year (Table 2), which serves as a management tool to help focus efforts on the most important pesticides from the perspective of MS4 agencies.¹⁴ There are two upgrades in priority from 2021 to 2022. Dichlorvos is the basis for one new impairment in the most recent 303(d) list (spring 2022), moving it from Priority 4 to Priority 3. Naled, registered for mosquito abatements, degrades to dichlorvos (DDVP) post-application and remains at levels toxic to aquatic organisms; therefore it too has been upgraded to Priority 3. Bensulide (an organophosphate pesticide) was added as a Priority 3 due to the new 303(d) listing for an urban/rural mixed waterbody in Salinas. Bensulide has urban herbicide uses for landscaping and golf courses, is highly toxic to freshwater invertebrates, very highly toxic to marine and estuary invertebrates, and frequently sold in products in combination with oxadiazon (Priority 4 on the Watch List). There are a number of antimicrobial pesticides under review by EPA for uses in outdoor paints and coatings, the leaching of which can lead to water quality impacts; CASQA anticipates adding such pesticides to the Watch List in the coming months.

2.1.2 Description of Near-Term Regulatory Processes

Immediate pesticide concerns may arise from regulatory processes undertaken at DPR or EPA’s OPP. For example, when EPA receives an application to register a new pesticide, there may be two opportunities for public comment that are noticed in the Federal Register, as depicted in green in Figure 3. EPA’s process usually takes less than a year while DPR typically evaluates new pesticides or major new uses of active ingredients within 120 days.

Table 2. Current Pesticide Watch List (July 2022)

Priority	Basis for Priority Assignment	Pesticides		
1	Monitoring data exceeding benchmarks; linked to toxicity in surface waters; urban 303(d) listings	Pyrethroids (20 chemicals ¹⁵)	Fipronil	Imidacloprid Malathion
2	Monitoring data approaching benchmarks; modeling predicts benchmark exceedances; very high toxicity and broadcast application on impervious surfaces; urban 303(d) listing for pesticide, degradate, or contaminant that also has non-pesticide sources	Carbendazim (Thiophanate methyl) ¹⁶ Chlorantraniliprole Copper pesticides *	Creosote (PAHs) Indoxacarb Neonicotinoids (other than Imidacloprid) ¹⁷ Pendimethalin	Pesticides with dioxins impurity ¹⁸ PHMB + Zinc pesticides (including Ziram) +
3	Pesticide contains a Clean Water Act Priority Pollutant; 303(d) listing for pesticide, degradate, or contaminant in watershed that is not exclusively urban	Arsenic pesticides Bensulide	Diuron Naled Naphthenates	Simazine Silver pesticides + Trifluralin

¹⁴ The first Watch List was published by the UP3 in 2005.

¹⁵ Allethrin, Bifenthrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Cyphenothrin, Deltamethrin, Esfenvalerate, Etofenprox, Flumethrin, Imiprothrin, Metofluthrin, Momfluothrin, Permethrin, Prallethrin, Resmethrin, Sumethrin [d-Phenothrin], Tau-Fluvalinate, Tetramethrin, Tralomethrin.

¹⁶ Carbendazim is a registered pesticide, and also a degradate of thiophanate-methyl

¹⁷ Acetamiprid, Clothianidin, Dinotefuran, Thiamethoxam (degrades into Clothianidin)

¹⁸ 2,4,-D, Chlorothalonil, Dacthal, Pentachlorophenol

* Used in pools, spas, and/or fountains

Priority	Basis for Priority Assignment	Pesticides		
		Chromium pesticides Dichlorvos (DDVP)		
4	High or unknown toxicity (parent or degradate) and urban use pattern associated with water pollution; synergist for higher tier pesticide; on DPR priority list	Abamectin ADBAC pesticides ¹⁹ + Antimicrobials in paints/coatings Azoxystrobin Bacillus sphaericus + Bacillus thuringiensis + Bromacil N-Bromosulfamates Busan-77 + Carbaryl Chlorinated isocyanurates+ Chlorine + Chlorine dioxide + Chlorfenapyr Chlorsulfuron DCOIT + DDAC +	Dichlobenil Dithiopyr Halohydantoins + Hydramethylnon Hypochlorites + Imazapyr Isoxaben Mancozeb Methomyl Methoprene + Methyl anthranilate + Mineral bases, weak + Mineral oil (aliphatic) + MGK-264 Novaluron Oryzalin Oxadiazon Oxyfluorfen	PCNB Peroxyacetic acid + Phenoxy herbicides ²⁰ Piperonyl butoxide (PBO) Prodiamine Propiconazole Pyrethrins Pyriproxyfen + Sodium bromide + Sodium chlorite + Sodium percarbonate + Sodium tetraborate + Spinosad + / Spinetoram Sulfometuron-methyl Tebuconazole Terbutylazine + Triclopyr Triclosan Trimethoxysilyl quats
5	Frequent questions from partners	Chloropyrifos (near zero urban use)	Diazinon (no urban use) Glyphosate	Metaldehyde
New	Priority determined on the basis of proposed urban use, aquatic toxicity, and other information in registration application.	Not known but may include the following:	Cyantraniliprole Cyclaniliprole Flupyradifurone	Nitenpyram (Neonic) Nithiazine (Neonic) Sulfoxaflor (Neonic)
None	Based on review of available data, no approved urban use or no tracking trigger as yet identified.	Most of the >1,000 existing pesticides		
Unknown	Lack of information. No systematic screening has been completed for the complete suite of urban pesticides.	Unknown		

¹⁹ Alkyl Dimethyl Benzyl Ammonium Chlorides (ADBAC) includes a family of 21 different quaternary ammonium pesticides.

²⁰ MCPA and salts, 2,4-D, 2,4-DP, MCPP, dicamba

Figure 3. EPA’s Registration Process for New Pesticides



Another regulatory process, “Registration Review,” depicted in Figure 4, is meant to evaluate currently registered pesticides about every 15 years, to account for new data available since initial registration. In general, it takes EPA five to eight years to complete the entire process. In addition to this process, pesticides are typically evaluated based on Endangered Species Act criteria. EPA regularly updates its schedule for approximately 50 pesticides that will begin the review process in a given year.²¹

Figure 4. EPA’s Registration Review – Process to Review Registered Pesticides at a Minimum of Every 15 Years.



DPR also has an ongoing, but informal review process (called continuous evaluation) that can address pesticides water pollution. If it needs to obtain data from manufacturers, DPR can initiate a formal action, called “Reevaluation.” These evaluations, mitigation measure development, and mitigation effectiveness evaluation have involved ongoing communication with CASQA and partners.

While EPA must consider water quality in all of its pesticide registration decisions, at DPR this step is not yet fully established as standard (most outdoor urban pesticide registration applications are routinely routed by DPR for surface water review, but a few – notably antimicrobial products used in storm drains – do not automatically receive this review). CASQA monitors registration applications, to identify those relevant to urban runoff, based on the Pesticide Watch List in Table 2 and use pattern/toxicity analysis for pesticides that have not previously been reviewed.

2.1.3 Key Near-Term Regulatory Activities and Progress

Table 3 presents a summary of recent CASQA and partner activities to address near-term regulatory concerns and the latest results; for additional insight regarding on-going pesticide registrations, see Appendix C. CASQA monitors the Federal Register and DPR’s website for notices of regulatory actions related to new pesticide registrations and registration reviews. This includes monitoring EPA’s dockets via the website [Regulations.Gov](https://www.epa.gov/regulations-gov) which had lost functionality during the previous administration and was recently restored thanks to CASQA and partners (see inset on next page). Since the Pesticide Watch List is not based on a comprehensive review of all pesticides, CASQA watches for additional pesticides that appear to have any of the following characteristics: proposed urban, outdoor uses with direct pathways for discharge to storm drains, high aquatic toxicity, or containing a priority pollutant. Participating in these regulatory processes can take many years to complete.

In addition, EPA’s OPP strives to update their Aquatic Life Benchmarks table on an annual basis.²² In August 2021, EPA’s Office of Pesticide Programs, Environmental Fate and Effects Division updated its pesticides Aquatic Life Benchmarks table.¹⁸ These updates included benchmarks for 9 newly registered

²¹ See <https://www.epa.gov/pesticide-reevaluation/registration-review-schedules> for schedule information.

²² <https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-and-ecological-risk>

pesticides (and their degradates) and 81 previously registered pesticides (and their degradates) undergoing registration review. This included updates for 26 pesticides (and 16 associated degradates) on CASQA's Pesticide Watch List. Among those were the following CASQA Priority 1 pesticides:

- Fipronil
- Three fipronil degradates
- Eleven individual pyrethroids
 - Bifenthrin
 - Beta-Cyfluthrin
 - Cyfluthrin
 - Gamma-Cyhalothrin
 - Lambda-Cyhalothrin
 - Alpha-Cypermethrin
 - Beta-Cypermethrin,
 - Cypermethrin,
 - Deltamethrin
 - Esfenvalerate
 - Permethrin

CASQA and Partners Succeed in Returning Transparency to EPA's Pesticide Dockets

The federal General Services Administration (GSA) operates the website Regulations.Gov. The website has long been the primary public access point for federal agency rulemaking "e-dockets" and their contents, such as proposed and final rules, supporting data, and public comments. Despite its historical limitations, the website maintained e-docket information in a way that was organized and reasonably accessible to interested parties.

Beginning around 2019, the website began to be altered in such a way that it impaired CASQA's ability to interact with EPA pesticide dockets, including the ability to search for and receive information and to post comments. Among the issues impacting CASQA's ability to engage with EPA's dockets were as follows:

- **Subscription Service Termination:** The subscription services feature was essential to CASQA and countless interested parties attempting to track changes in federal rules and regulations. Subscribing to a docket has been the only reasonably efficient way to know when EPA posts something on the docket.
- **Search Non-Functional:** The previous version of the Regulations.Gov site was easy to search; the new version's search engine did not provide any results.
- **User Interface:** The user interface hid prior comments and obfuscated access to all documents in the dockets.

In May 2021 the Democracy Forward Foundation and eight other public interest organizations submitted a letter to GSA describing concerns with the website. This opened the door to additional comment letters from CASQA, BACWA, and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). Subsequently, GSA invited CASQA and partners to online meetings in September 2021 and March 2022. During that time GSA made the following progress:

- **Subscription Services Restored:** GSA restored email subscriptions for updates on a specified docket.
- **User Interface:** One-stop access to all posted comments for a given docket.

CASQA continues to coordinate with GSA lead staff as they continue to make improvements and restore prior features. Their attention to our concerns this past year was encouraging.

Table 3. Latest Results of Efforts Communicating Near-Term Regulatory Concerns to EPA²³

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Cyhalothrins Proposed Interim Decision (PID)	✓			BACWA	Partial Success. In the PID, EPA concluded that outdoor / urban uses present substantial risks to freshwater and estuarine/marine fish and invertebrates. As mitigation, EPA proposed label language changes. CASQA sought enhancements to the proposed label language to include a graphic to prevent spilling or dumping into storm drains, to provide clear and consistent language regarding impervious and vertical surfaces, and provide California-specific labels for outdoor structural pest control. No such requests were granted. (See Appendix C for details.)
Pyrethroids and Pyrethrins Risk Mitigation Proposal for 23 Chemicals	✓			BACWA SFBRWQCB NACWA	CASQA noted that the risk/benefits should differentiate between the 23 chemicals and among the various outdoor uses. CASQA further argued that EPA should ban outdoor uses of bifenthrin. In a subsequent PID only for pyrethrins (not pyrethroids), EPA responded that their analysis was adequate and that <i>“bifenthrin is not outstanding among pyrethroids in terms of risk quotient exceedances, aquatic invertebrate toxicity, or environmental persistence.”</i>
Permethrin Draft Risk Assessment (Antimicrobial Uses)	✓				CASQA questioned the assumption that “exposure to aquatic areas from terrestrial uses is expected to be negligible,” and recommended modeling scenarios for existing terrestrial wood preservative uses – specifically fences and decks. EPA responded that the chemical parameters for permethrin suggest the leaching rate for those scenarios would lead to negligible exposure. EPA also referenced a 2020 document that indicates permethrin is not intended for such uses despite the fact that there are labeled permethrin-containing products for such uses. (See Appendix C for details.)
Malathion National Marine Fisheries Service ESA Biological Opinion (BO)	✓				CASQA sought significant mitigation measures such as restricting malathion use in non-agricultural settings to professional applicators and restricting urban applications to avoid impervious surfaces. While the BO includes significant language to limit application on impervious surfaces, the language only applies within 300 meters of ESA-listed species habitats. (See Appendix C for details.)

²³ Color coding in this table is meant to reflect the Pesticide Watch List prioritization color coding in Table 2.

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Chlorothalonil Draft Ecological Risk Assessment (Antimicrobial Uses)	✓				Pending. Asked that EPA perform surface water modeling for urban uses that were omitted from the Risk Assessment including commercial, industrial, and residential outdoor uses. For the uses EPA did include in the analysis (turf and nurseries), EPA concluded that the fungicide is highly toxic to freshwater and estuarine/marine fish, freshwater and estuarine/marine invertebrates, and amphibians. On that basis, CASQA requested that EPA (1) develop a comprehensive mitigation program to reduce potential negative impacts to aquatic organisms from non-agricultural uses, particularly those uses involving antimicrobial protection for building materials and (2) prioritize mitigation measures that reduce the transport of chlorothalonil to urban runoff.
Ziram Ecological Risk Assessment and Proposed Interim Decision	✓				Partial Success. For freshwater invertebrates, EPA cited several reasons why the calculated risks were likely to be overestimates leading to a conclusion that appeared to be speculative and arbitrary, the results of which may not be sufficiently protective of aquatic life. Therefore, CASQA asked that EPA modify its risk assessment analysis for freshwater invertebrates. In addition, CASQA requested that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates. In the subsequent PID, EPA agreed that additional analysis would be beneficial but that the analysis is no longer needed. Due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram. CASQA submitted a subsequent letter supporting product cancelations and controls. (See Appendix C for details.)
Creosote Proposed Interim Decision	✓				EPA's Decision was made without the benefit of an Ecological Risk Assessment. This was due to a lack of data despite multiple data requests by EPA to the registrants (dating back to 2011). Therefore, CASQA asked that an Ecological Risk Assessment be completed before publishing a registration review decision. EPA responded that they did not want to delay registration review to await ecological data given the need for mitigation for worker protection. CASQA further requested that EPA seek monitoring data given that PAHs found in creosote are commonly detected in urban runoff and receiving waters. EPA concurred that PAHs are common but that the registered upstream sources are so varied so as not to allow a correlation between creosote uses and PAH pollution. (See Appendix C for details.)

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Diuron Ecological Risk Assessment; Diuron Antimicrobial Use Risk Assessment and PID	✓				Partial Success. CASQA sought consistency in toxicity endpoints within EPA documentation. EPA concurred that the endpoints were inconsistent between the two risk assessments and that would be addressed in the amended Ecological Risk Assessment. CASQA requested that the risk assessment be amended to include sediment toxicity study for freshwater invertebrates. EPA noted that because they are cancelling all conventional herbicidal uses, such studies are not warranted. CASQA countered that such studies are still necessary due to the antimicrobial uses. (See Appendix C for details.)
Oxadiazon Draft Risk Assessment	✓				Partial Success. CASQA supported the termination of specific uses in the Draft Risk Assessment; some of which were removed from the subsequent PID. A prohibition of liquid applications is among the mitigations still in place in the PID. (See Appendix C for details.)
Pyrethrins PID	✓			BACWA SFBRWQCB NACWA	Success! CASQA recommended that the label language be updated to include water protection statements, definitions of spot-treatments, a reduction in height of building treatments (from 3 feet to 2 feet), weather prohibitions (rain and/or wind events), and a Spanish translation for the outdoor drain discharge prohibition. EPA concurred with these suggestions. CASQA also recommended that EPA include an outdoor drain graphic. The EPA responded that <i>“outdoor and agricultural product labels already have label statements to prevent these chemicals from reaching drainage systems.”</i> Instead, EPA added an indoor drain graphic which is still a valuable addition.(See Appendix C for details.)

2.2 LONG-TERM CHANGE IN THE PESTICIDES REGULATORY STRUCTURE

Since the mid-1990s, CASQA (and its predecessor organization the Storm Water Quality Task Force), have worked toward a future in which the pesticide regulatory structure at the state and federal level proactively restricts pesticide uses that have the potential to cause urban water quality problems. These efforts directly relate to Phase II MS4 PEAIP Management Question 2.

Assessment Question 2. (Long term / Prevent future problems) – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

Answer: Improvements in processes at EPA and especially at DPR have moved closer to that future. Many of these improvements are linked to the persistent work of CASQA and partners to educate regulators on how previous process deficiencies did not adequately address urban pesticide problems.

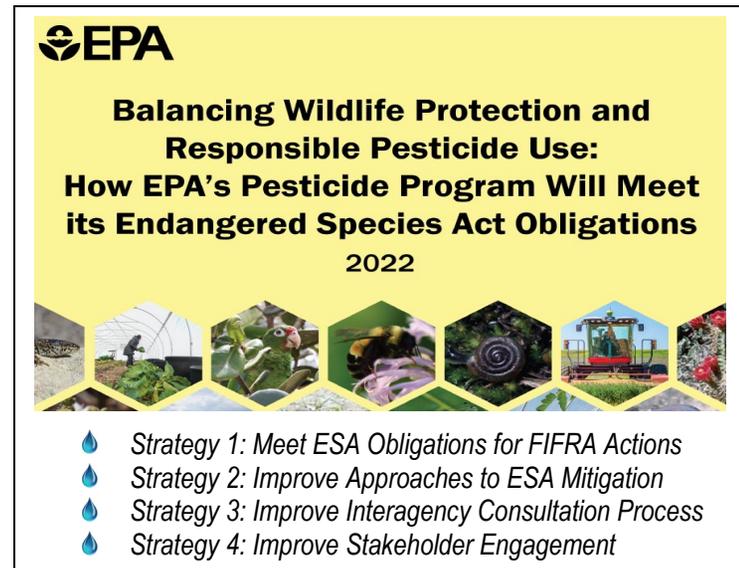
As detailed below, at the State level, significant progress has been made by DPR and the Water Boards in establishing a comprehensive statewide approach to utilizing pesticide regulatory authorities to prevent pesticide toxicity in urban water bodies. Overall, DPR has a system in place that is reasonably effective at addressing pesticide toxicity in urban water bodies, although improvement is needed to better coordinate this process with the requirements of the Clean Water Act and NPDES MS4 permits. DPR and the Water Board, along with CASQA and other stakeholders, are working diligently to strengthen this system and to institutionalize it. The goal is to embody this process in the State’s UPAs and the Management Agency Agreement (MAA) between DPR and the State Water Board.

At the Federal level, OPP has implemented some improvements in how it evaluates and responds to water quality problems associated with pesticides, but it does not yet do this reliably and does not have a system in place to ensure that this will happen consistently and adequately. Meanwhile, scientific studies are being conducted by USGS and EPA’s Office of Research and Development to better understand the complexities of pollution in urban stormwater. In addition, another EPA branch, the Office of Chemical Safety and Pollution Prevention (OCSPP), tasked their Pesticide Programs staff with improving the integration of the EPA and Services implementation of the Endangered Species Act.

2.2.1 Focus on EPA’s Federal Endangered Species Act

In April 2022, EPA published their “first-ever comprehensive workplan to address the decades-old challenge of protecting endangered species from pesticides.”²⁴ The workplan presents a vision and four strategies to approach this challenging effort to protect endangered species while protecting public health (see callout box at right).²⁵

CASQA communicated directly with OCSPP’s Deputy Assistant Administrator for Pesticide Programs to advance the importance of urban stormwater uses and the need for mitigations to clearly tie to risk analysis findings, targeting specific uses and products.



EPA

**Balancing Wildlife Protection and Responsible Pesticide Use:
How EPA’s Pesticide Program Will Meet its Endangered Species Act Obligations
2022**

- Strategy 1: Meet ESA Obligations for FIFRA Actions
- Strategy 2: Improve Approaches to ESA Mitigation
- Strategy 3: Improve Interagency Consultation Process
- Strategy 4: Improve Stakeholder Engagement

²⁴ <https://www.epa.gov/newsreleases/epa-announces-plan-protect-endangered-species-and-support-sustainable-agriculture>

²⁵ For complete document see https://www.epa.gov/system/files/documents/2022-04/balancing-wildlife-protection-and-responsible-pesticide-use_final.pdf.

In addition, in June, EPA hosted an Environmental Monitoring Public Meeting (EMPM), the focus of which was the Endangered Species Act and solutions to avoid, minimize or offset potential effects from pesticides to endangered and threatened species and designated critical habitats. CASQA representatives prepared an abstract (see inset) and was subsequently invited to speak. More than 200 participants, including staff from OCSPP Pesticide Programs, convened for the online meeting.

The primary message CASQA representatives conveyed was that practical ESA mitigations specific to urban users are necessary, feasible, and cost-effective. CASQA's presence at the meeting was key, given that other presenters represented registrants and agricultural users. CASQA was the single presentation to make connections between urban uses and endangered species. The presentation included numerous examples of effective mitigations, including DPR's strict limitations to structural use of fipronil by licensed, trained users. The presenters concluded with the following:

- Endangered species are exposed to pesticides used in urban areas via wastewater and urban runoff;
- Desktop studies and modeling can identify and prioritize specific urban pesticide uses for mitigation actions;
- Advanced treatment of pesticides in wastewater and urban runoff is not a feasible mitigation strategy;
- Pesticide label changes are only effective for licensed & trained users; and
- Sale and use restrictions most effective mitigation option for products designed for unlicensed/untrained pesticide users.

CASQA sought to educate all participants, particularly EPA staff, that these mitigations cannot be initiated at the local level and thus require EPA to enact these source control measures (See Appendix B).

2.2.2 Focus on California's Urban Pesticides Amendments (UPA)

In 2014 the State Water Board made a strategically important decision to institutionalize its commitment to work closely with DPR and EPA to utilize pesticide regulatory authority as the primary mechanism for preventing and responding to impairments of receiving waters linked to current use pesticides in urban runoff.

CASQA Representatives Invited to Present at EPA's Environmental Modeling Public Meeting (EMPM) – Topic: Endangered Species Assessment, June 23, 2022



Tammy Qualls, M.S., P.E (Qualls Environmental Consulting); Kelly Moran, Ph.D (San Francisco Estuary Ins Stephanie Hughes, M.S., P.E. (Santa Clara University); and Armand Ruby, M.S. (Armand Ruby Consulting).

Abstract: State water regulators are required to ensure compliance with the Endangered Species Act (ESA) via authority allocated by the Clean Water Act (CWA) under the NPDES permit program. Local agencies must comply with the NPDES program. Since they cannot regulate the use and sale of pesticides in their local area, they have had to develop practical measures to avoid, minimize, or offset chemicals of concern. Advanced treatment of pesticides in wastewater and stormwater is costly and often unfeasible. Local agencies have instead focused on targeted mitigation of specific chemicals at their source. Source control has led to reduced concentrations of chemicals at publicly owned treatment works (POTWs) and in stormwater. The State of California Department of Pesticide Regulation (CA-DPR) has performed modeling of specific label language changes for the pesticide fipronil to evaluate how changing the width of the application spray or the frequency of application can alter the concentration of fipronil in surface water. This type of modeling of changes in label language allows CA-DPR to focus mitigations on quantifiable results that minimize the impact to aquatic life.

To accomplish this goal, the State Water Board established an urban pesticides reduction project (now titled the Urban Pesticides Amendments or UPA) as a top priority project under the comprehensive stormwater strategy it adopted in December 2015, known as “Strategy to Optimize Resource Management of Storm Water” or STORMS.²⁶ CASQA representatives have been participating actively in the development of the Urban Pesticide Amendments since their inception.

The State Water Board continues to work towards developing the UPA which may be developed as separate, standalone policy or, be incorporated into the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries, and the Water Quality Control Plan for Ocean Waters of California (once it is established). In mid-2019, DPR and the State Water Board signed a major update to their formal MAA that memorializes their existing systems and growing cooperation and lays out the steps they are taking toward a “unified and cooperative program to protect water quality related to the use of pesticides.” The State Water Board STORMS staff indicate that communication with DPR staff regarding the UPAs has been enhanced by the MAA and that the two agencies meet regularly.

CASQA continues to work closely with STORMS staff on the UPA as an effective path to solving urban toxicity and to support urban stormwater capture and use. In 2022, STORMS staff held several meetings with stakeholders, including CASQA representatives.. CASQA provided the STORMS staff with input regarding potential options for evaluating the effectiveness of the UPA in addressing MS4 pesticide discharges to support identification of compliance pathway options for municipal stormwater permits. STORMS staff presented at the October 2021 CASQA conference, and a STORMS staff member typically attends each TSC meeting, providing updates and accepting feedback.

According to STORMS staff, a draft UPA is expected to be issued and available for comment in spring 2023.

2.2.3 CASQA Participation in Federal and State Advisory Groups

As presented in Table 4, CASQA remains actively involved with various agencies and advisory groups that affect pesticide use and pest management in urban areas. CASQA’s long-time state-level leadership is now complemented by a new federal opportunity (see inset at right).

Urban Stormwater Representation at OPP

In 2022, Dave Tamayo, was appointed to the EPA’s Pesticide Program Dialogue Committee (PPDC), on which he previously served from 2010 to 2016. Mr. Tamayo is a long time member of the TSC subcommittee and CASQA and recently retired from Sacramento County. Mr. Tamayo has been approved by the CASQA Board as its official representative to this committee. The 40-person committee, chaired by the Director of OPP, includes representatives from growers, industry, environmental, public health, farmworkers, as well as state/local/tribal government. This is expected to be an important opportunity to include urban stormwater concerns in federal level dialogue. Mr. Tamayo has placed urban pesticide concerns on the PPDC’s list of potential future agenda items.

²⁶ STORMS’ overall mission is to “lead the evolution of storm water management in California by advancing the perspective that storm water is a valuable resource, supporting policies for collaborative watershed-level storm water management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests.” (http://www.waterboards.ca.gov/water_issues/programs/stormwater/storms/)

Table 4. Participation in Federal and State Efforts to Support CASQA's Goals

Agency or Conference	Latest Outcomes
EPA's Pesticide Program Dialogue Committee (PPDC)	<p>The PPDC holds biannual public meetings. At the May 2022 meeting, key CASQA topics included:</p> <ul style="list-style-type: none"> • A discussion of label reform, including digitization and standardization; • An update on the Endangered Species Act Workplan by the Deputy Assistant Administrator for Pesticide Programs for Office of Chemical Safety and Pollution Prevention.
DPR's Pest Management Advisory Committee (PMAC)	<p>Participation on the PMAC has resulted in expanded focus by DPR on urban pest management and water quality issues and generated funding for urban IPM research and implementation programs.</p>
DPR's Sustainable Pest Management Work Group (SPM)	<p>DPR formed this work group in 2021. The goal of the SPM is "to develop a recommended roadmap with ambitious, measurable goals to practically achieve the state's vision to accelerate a system-wide transition to safer, more sustainable pest management."²⁷ Two CASQA members serve as invited members of the Urban Subgroup of the SPM. Formal release of the SPM draft roadmap for public comment is expected to occur later in 2022.</p>

²⁷ https://www.cdpr.ca.gov/docs/pestmgmt/sustainable_pest_management_workgroup.htm

Section 3. CASQA's Approach Looking Ahead

At any given time, EPA and DPR may be in the process of evaluating and registering various pesticides for urban use. CASQA will continue to track and engage in EPA and DPR activities, with a focus on top priority active ingredients (as identified in the annual Pesticide Watch List) and sharing relevant urban runoff information and CASQA's water-quality specific expertise with pesticides regulators. Key documents to be reviewed will include risk assessments and risk management proposals with an eye toward ensuring that pesticide regulators have and consider accurate information on relevant factors in urban areas such as pesticide use patterns, urban pollutant transport mechanisms, and receiving water conditions. CASQA strives to ensure that pesticide regulators have access to relevant information such as monitoring data, water quality regulatory requirements, and urban runoff agency compliance liabilities and cost information. As necessary, CASQA will continue to recommend changes in an individual pesticide's allowable uses or use instructions, request consideration of impacts on water bodies receiving urban runoff, and/or ask that regulators fill critical data gaps by obtaining more data from manufacturers. As resources allow and circumstances warrant, CASQA will continue to collaborate with wastewater organizations (such as BACWA), other water quality stakeholders, and the Water Boards in commenting on EPA and DPR actions.

In the coming year, CASQA will continue to address near-term pesticide concerns and seek long-term regulatory change. Although changes at the federal level are important for fully achieving CASQA's goal of protecting water quality through the effective use of pesticide regulations, until there is a more favorable situation at that level, we will continue to focus our efforts on solidifying progress at the state level. In the coming year, CASQA will continue engagement on specific regulatory actions for priority pesticides at the federal level, while continuing the strategic focus on supporting State adoption of the UPAs. CASQA's current priority activities are as follows:

- (1) Continue collaboration with DPR to address near-term regulatory concerns, while seeking OPP and OW actions to reduce inconsistencies:
 - 💧 Ensure DPR action on fipronil water pollution is completed, including effective professional user education about restrictions on its outdoor urban use.
 - 💧 Ensure DPR enforces mitigation measures for pyrethroids and fipronil, and adopts additional measures as necessary.
 - 💧 Ensure the state continues to conduct surveillance monitoring to evaluate pyrethroids and fipronil mitigation effectiveness and to evaluate occurrence of new threats like imidacloprid and other neonicotinoid insecticides.
 - 💧 Continue to encourage EPA to complete scientific groundwork and to identify and implement pyrethroids, fipronil, malathion, and imidacloprid mitigation measures, recognizing that it is likely that necessary mitigation cannot readily be implemented entirely by DPR.
- (2) Seek long-term changes in the pesticide regulatory structure:
 - 💧 Leverage success at the state level and continue to be a key stakeholder in the STORMS project to adopt the statewide UPA. Through this process, CASQA will work with other stakeholders to implement the planned restructuring of California's urban surface water pesticides monitoring to increase its effectiveness and improve coordination.
 - 💧 Encourage and assist the Water Board to continue to implement its MAA with DPR and increase its leadership role in preventing and mitigating pesticide impairments through more effective pesticide regulation at the state and federal level.
 - 💧 Seek procedure changes such that DPR continues to refine its registration procedures to address remaining gaps in water quality protection.
 - 💧 Seek increased transparency of DPR regulatory activities, including timely access to scientific evaluation reports that are the basis of registration decisions.

CASQA will continue to seek opportunities to coordinate on high priority regulatory actions, with the Water Boards and other water quality stakeholders such as POTWs and non-profits, to take advantage of efficiencies, increase effectiveness, and ensure that the water quality community has a consistent message. Table 5 presents CASQA's activities anticipated for the coming year; CASQA will conduct these activities as priorities indicate and resources allow. Table 6 summarizes upcoming regulatory action items that are likely to proceed and may require CASQA attention in the coming year.

Table 5. CASQA Pesticide Activities

Activity	Purpose	
Regulatory Tracking	Track Federal Register notices	Identify regulatory actions for high priority active ingredients that may require review.
	Track DPR notices of registration applications and decisions	Identify pesticides meriting surface water review that are not within DPR’s automatic routing procedures, identify gaps or potential urban runoff-related problems with current DPR evaluation or registration plans other regulations, procedures, and policies.
	Track activities at the Water Boards	Identify opportunities for improvements in TMDLs, Basin Plan Amendments, and permits.
	Review regulatory actions, guidance documents, and work plans	Identify potential urban runoff-related problems with current EPA evaluation or registration plans, other regulations, procedures, and policies.
Regulatory Communications	Briefing phone calls, informal in-person meetings, teleconference meetings, and emails with EPA and DPR	Information sharing about immediate issues or ongoing efforts; educate EPA and DPR about issues confronting water quality community. Provide early communication on upcoming proceedings that help reduce the need for time-intensive letters.
	Convene formal meetings, write letters, and track responses to letters	Ensure current pesticide evaluation or registration process accurately addresses urban runoff and urban pesticide use and management contexts. Take advantage of opportunities to formally provide information and suggest more robust approaches that could be used in future regulatory processes. Request and maintain communication on mitigation actions addressing highest priority pesticides.
Advisory	Serve on EPA, DPR, and Water Board policy and scientific advisory committees	Provide information and identify data needs and collaboration opportunities toward development of constructive approaches for managing pesticides.
Educational	Presentations to and informal discussions with EPA, DPR, Water Board, CASQA members,	Educate EPA, DPR, Water Board, and CASQA members about the urban runoff-related shortcomings of existing pesticide regulatory process, educational efforts to support process improvements, and report on achievements. Encourage research and monitoring programs to address urban runoff data needs and priorities. Stimulate academic, government, or private development of analytical and toxicity identification methods to address anticipated urban runoff monitoring needs. Inform development of new pesticides by manufacturers and selection of pesticides by professional users.
	Develop and deliver public testimony	Educate Water Board members about the problems with existing pesticide regulatory process, encourage change, and report on achievements.

Activity		Purpose
Monitoring and Science	Update Pesticide Watch List based on new scientific and regulatory information	The Pesticide Watch List (Table 2) serves as a management tool to prioritize and track pesticides used outdoors in urban areas.
	Data analysis of DPR/SWAMP/USGS/MS4 monitoring, pesticide use data, and information from scientific literature	Summarize data to educate CASQA members and water quality community, Water Boards, DPR, and EPA.
Reporting	Prepare Monthly Action Plans	Coordinate CASQA's regulatory actions with partners
	Prepare Annual Report to describe the year's status and progress, provide detail on stakeholder actions, and the context of prior actions as well as anticipated end goal of these activities.	Provide CASQA's members with focused information on its efforts to prevent pesticide pollution in urban waterways. The document serves annual compliance submittal for both Phase I and Phase II MS4s. It may also be used as an element of PEAIPIs and future effectiveness assessment annual reporting.

Table 6. Anticipated Upcoming Opportunities for Pesticides Regulatory Engagement

EPA Pesticide Registration Review (15-year cycle) (organized chronologically by anticipated next regulatory step) ²⁸			
Priority	Topic	Item	Urban Runoff Concern
unknown	New Antimicrobials	various	Varied; many of these pesticides are showing up for the first time at the PID level; review is needed to screen these for water quality issues
1	Fipronil	PID	Monitoring data; Anticipated 303(d) listings
2	Dacthal (DCPA)	RA	303(d) listings (dacthal, dioxins); Contains CWA Priority Pollutants (dioxins)
3	Sodium pyrethione	PID	Paint additive
4	Dicamba	RA	Phenoxy herbicide
1	Etofenprox	PID	Pyrethroid
2	Thiophanate methyl/ Carbendazim (MBC)	PID	Degradate toxicity, use patterns
4	2,4-D	PID	Phenoxy herbicide

²⁸ RA = Risk Assessment; PID = Proposed Interim Decision

4	Carbaryl	PID	Toxicity; monitoring data
4	Tebuconazole	PID	Fungicide
4	Chlorothalonil	PID	Central Valley Water Board high relative risk; 303(d) listings (dioxins); Contains CWA Priority Pollutant (Dioxins); DPR monitoring priority
4	Mancozeb	PID	Central Valley Water Board high relative risk
4	PCNB	PID	Dioxin impurity
4	Peroxy Compounds (peroxyacetic acid)	PID	Fountain chemical
2	Copper HDO	PID	303(d) listings (copper); TMDLs (copper); Contains CWA Priority Pollutant (Copper)
4	ADBAC group	RA	Antimicrobial
4	DDAC group	RA	Pool chemical
4	Isothiazolinones (includes DCOIT, BBIT, BIT, MIT, OIT)	RA	Antimicrobials. Uses include paints.

Other EPA-related Items

- U.S. EPA “[Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process](#)” affects how the U.S. EPA uses cost and benefit analysis in setting pollution standards. Rule proposal was expected in 5/19.
- Proposed rule to eliminate some OPP Federal Register Notices (was anticipated September 2018 according to U.S. EPA semi-annual regulatory agenda)
- U.S. EPA [Update to Guidelines for Deriving Aquatic Life Water Quality Criteria](#). Draft scoping document external peer review is next step. Seeking OPP engagement.

DPR New Pesticide Product Registration Decisions

New Product Applications (Active ingredient – product name)	Why tracking	Current Status
1R-Phenothrin - by MGK	Outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Tetranilprole	Outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Momfluorothrin (and Phenothrin) - S-1563	New urban pyrethroid	2014: DPR confirmed that Surface Water would review.
Momfluorothrin (and Cypermethrin) - MGK Products	New urban pyrethroid	2014: DPR confirmed that Surface Water would review.
Alpha-cypermethrin - Fendona CS	New urban pyrethroid	2018: DPR confirmed that Surface Water would review.

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Transfluthrin - Bayer Product	New urban pyrethroid. Indoor and outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Fipronil and Bifenthrin - Taurus Trio G	Landscaping product	2017: DPR confirmed that Surface Water would review.
Fipronil - Termidor HP II	Termite product	2018: DPR confirmed that Surface Water would review.
Fipronil - MGK Formula 3115	Outdoor yellow jacket product	2019: DPR confirmed that Surface Water would review. 7/9/21: Notice of Final Decision posted. Product limited to bait stations.
Bifenthrin, Novaluron, and pyriproxyfen - Duraflex CS	Use on non-residential sites	2019: DPR confirmed that Surface Water would review.
Indoxacarb - Doxem Precise	New aerated indoxacarb powder	2019: DPR confirmed that Surface Water would review.
Zinc, Thiabendazole and 2-pyridinethiol-1-oxide – Ultra-Fresh DW-30	Potential use in vehicle tires	DPR is asking the registrant of that product that should not have been approved for use in rubber to change the product label to again say “not for use in California” with regard to the use in rubber.
Fipronil – Imidacloprid: Fuse Foam by Control Solutions, Inc.	Indoor/outdoor fipronil-imidacloprid foam	BACWA/CASQA have been tracking this product since 2017. 7/2/2021: DPR issues notice to deny, noting several problems with the label. 5/27/2022: DPR confirmed that the label that they are reviewing is the same as the label available on the EPA website.
Bifenthrin / Acetamiprid F9228-2 RTU insecticide / miticide by FMC	Outdoor and indoor uses. Label allows liberal spraying.	1/5/2022: DPR confirmed that the Surface Water Group would review.

Other DPR-related Items

- Registration Application Surface Water Reviews – continue to follow up on communications requesting review of all storm drain products and outdoor antimicrobials

Water Boards

- [State Water Board Urban Pesticides Amendments](#). State Water Board workshop/public comment period and decision expected in 2023.
- Pesticides 303(d) listings
- Pesticide TMDL implementation requirements for permittees

Other Statewide Items

- [**DPR Sustainable Pest Management Workgroup**](#). Workgroup has the goal of establishing measurable goals to achieve the state’s vision of safer, more sustainable pest management. A subgroup is focusing on urban pesticides. The public will have opportunity to comment once the draft workplan is released in Summer 2022.
 - [**California Department of Food & Agriculture Program EIR on invasive species**](#) control covering potential broadcast pesticide applications urban areas of multiple priority pesticides. [**October 2021 update**](#): California’s Court of Appeal has ruled that a statewide pesticide-spraying program violates the law by failing to study and minimize the threats from pesticides and to properly inform the public about the risks of spraying. The ruling noted that the department did not analyze or disclose the health and environmental harms of the more than 75 pesticides. The court decision also noted a lack of public notice. Furthermore, they did not evaluate local impacts or allow opportunity for affected communities to opt out. **June 2022 Update**: New ruling by Sacramento County Superior Court orders the state to halt spraying.
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Appendix A

CASQA / BACWA Fact Sheet

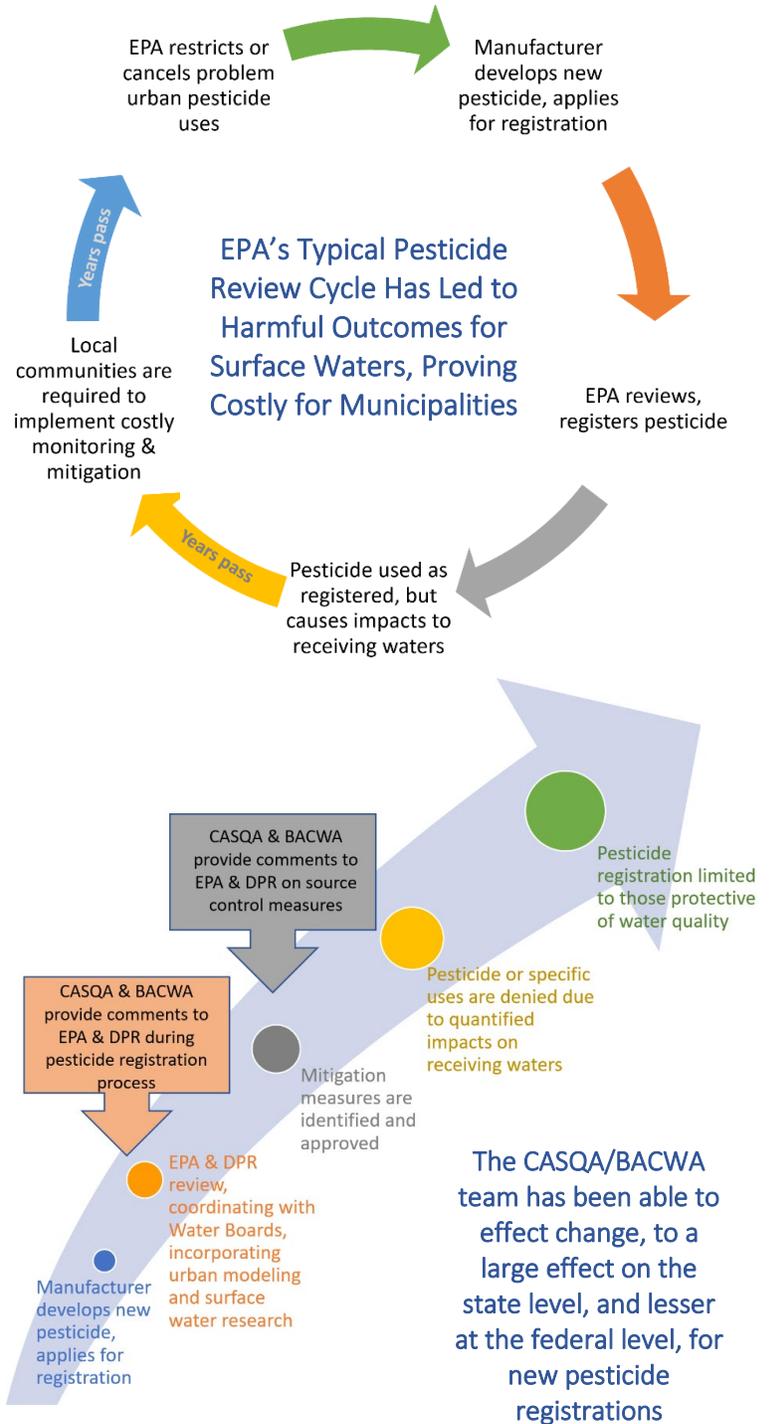
Urban Pesticides Threaten Ecosystem Health in California Watersheds

Pesticides including insecticides, herbicides, antimicrobials, fungicides, and rodenticides are a threat to aquatic ecosystems when they reach waterways through wastewater and stormwater. The Clean Water Act holds local agencies responsible for pollutant toxicity (including pesticides) in surface water, including the cost of monitoring and mitigation. Agencies also face substantial costs to comply with pesticides-related Total Maximum Daily Loads (TMDLs), Basin Plan Amendments, California State Water Board Toxicity Provisions, and additional permit requirements. Compliance costs for public agencies can continue years after a pesticide is banned (e.g. diazinon, chlorpyrifos) as the pesticides can remain in the aquatic environment long after they are used.

Unfortunately, local agencies only have authority over their own use of pesticides; they are pre-empted by state law from regulating pesticide sales or use by consumers and businesses. Instead, pesticides are regulated by the United States Environmental Protection Agency (EPA) and the California Department of Pesticides Regulation (DPR), which in some cases have not adequately protected urban discharges and water bodies from toxicity. Several pesticides are present in urban water bodies throughout California at concentrations above aquatic toxicity thresholds.¹

CASQA and BACWA Provide Input to EPA and DPR at Crucial Intersections

Since 2011, BACWA and CASQA have collaborated to educate EPA and DPR staff regarding wastewater and urban stormwater obligations. Such collaborations require information sharing, coordination of communications with pesticide regulators, and contributing staff time and other resources in support of the shared goal. Both organizations coordinate with the State and Regional Water Boards (Water Boards) to address the impacts of pesticides efficiently and proactively through the statutory authority of DPR and EPA. Furthermore, we share our findings with other partner agencies and stakeholders so that our voices are magnified.²



¹ California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report) https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html

² Partners include National Association of Clean Water Agencies and National Municipal Stormwater Alliance.

CASQA and BACWA Accomplish Tasks that are Impractical for Individual Member Agencies

Since local agencies cannot locally regulate pesticides, BACWA and CASQA work to reduce pesticides in the aquatic environment by:

- **Educating Regulators Regarding Wastewater and Urban Stormwater Issues.** Half of all pesticide use occurs in urban areas, yet pesticide work at EPA is largely focused on agricultural uses. We educate EPA on the impacts of indoor and outdoor urban uses, and call attention to the pesticide-related challenges facing local public agencies.
- **Tracking and Prioritizing Pesticide Regulatory Action.** We use a multifaceted method for pesticide tracking and action, with the goal of reducing the impact of priority pesticides on the aquatic environment.
- **Sharing Science.** CASQA and BACWA share new scientific studies and monitoring data with EPA and DPR, essential to science-based regulation.
- **Identifying Data Gaps and Faulty Assumptions.** Due to its agricultural focus, EPA frequently omits key outdoor uses or indoor sources with direct paths to the sewer. EPA's pesticide use assumptions are sometimes incongruent with known use practices in California. Omitting key urban uses and associated aquatic risks prevents regulatory actions that would reduce toxicity in wastewater and stormwater.
- **Analyzing Monitoring Data.** We review urban watershed and POTW effluent monitoring data to identify pesticides that are exceeding or approaching aquatic toxicity thresholds.
- **Recommending Source Control Strategies to Prevent Harm.** Once EPA identifies potential for harm to aquatic organisms, it is open to discuss source control alternatives (which EPA refers to as mitigation) to prevent such harm. At that point we identify and recommend source control measures that could reduce such impacts.

Working Together, BACWA and CASQA Get Results

- **Through our cross-agency collaboration, DPR has improved pesticide registration.** DPR now has permanent stormwater and wastewater monitoring programs, and a permanent process to protect both stormwater and wastewater when new pesticides are registered.³
- **We offer unique insights.** Without CASQA and BACWA on the pulse of DPR and EPA's data analysis and modeling, the only feedback might be from manufacturers unaware of the regulatory and water quality challenges posed by their products.
- **BACWA/CASQA feedback has led to improved assessments and improved source control:**
 - EPA improved label language for hundreds of pyrethroid products, including a pictogram provided by a BACWA member agency (at right) (stormwater and wastewater)
 - DPR adopted pyrethroids regulations, including restrictions on outdoor residential use (stormwater)
 - DPR adopted fipronil restrictions that are expected to reduce fipronil in urban runoff more than 90 percent (stormwater)
 - EPA labeling requirements that protect urban water quality are consistently being required for pool and spa treatments (stormwater and wastewater)
 - EPA developed root control chemical POTW notification requirements (wastewater)
 - DPR required manufacturers to fund the POTW pyrethroids survey, providing monitoring data necessary for EPA's first-ever POTW-specific detailed evaluation in its Pyrethroids Registration Review (wastewater)
 - EPA improved evaluations for hydramethylnon, which resulted in label language mitigations: environmental hazards, rain advisory, and avoidance of broadcast applications on impervious surfaces (stormwater)



This Work Remains Essential

CASQA and BACWA have spent more than a decade seeking restrictions for the highest priority pesticides. The pesticides review process—driven by EPA—often lasts more than a decade, with each pesticide open for re-registration every 15 years. California does not have a periodic review process. While our actions may take years to see results, these tasks demonstrate our effort to influence State and federal regulators to adequately protect California's urban waterways.

³Water Quality Impairments Due to Aquatic Life Pesticide Toxicity: Prevention and Mitigation in California, USA, Kelly Moran, Brian Anderson, Bryn Phillips, Yuzhou Luo, Nan Singhasemanon, Richard Breuer, Dawit Tadesse, *Environ Toxicol Chem* 2020;39:953–966. <https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4699>

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting

Practical measures and mitigations to reduce pesticide effects on endangered and threatened species in urban areas



Tammy Qualls, M.S., P.E (Qualls Environmental Consulting); Kelly Moran, Ph.D. (San Francisco Estuary Institute); Stephanie Hughes, M.S., P.E. (Santa Clara University); and Armand Ruby, M.S. (Armand Ruby Consulting).

Our work on this topic is funded by the Bay Area Clean Water Agencies and the California Stormwater Quality Association



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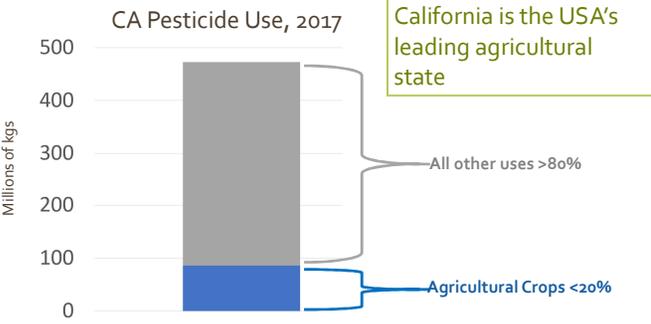
Endangered species habitat often overlaps with urban areas: **salmon example**

- Map shows urban areas on west coast of USA
- Darker brown areas are higher population density
- Green outline is Critical Habitat Designations for West Coast Salmon and Steelhead



Sources: NASA, NOAA Fisheries

Most pesticide use in California is **non-agricultural**



Category	Percentage
Agricultural Crops	<20%
All other uses	>80%

Sources: CDPR databases, Moran et al.(2020)

Non-agricultural uses of pesticides are ubiquitous

- Structural and landscape insecticides and herbicides
- Antimicrobial/ fungicides
- Industrial biocides
- Pesticides added to non-pesticide products, like building paint
- Disinfectants for drinking water and wastewater



Image credit: Tammy Qualls

Sources: CDPR databases, Moran et al. (2020)

Pesticides flow to surface waters through both indoor drains *and* outdoor runoff

Sewer



Storm Drain



Images sources: K. Moran, City of Palo Alto, and USGS

Pesticides create local agency liabilities

- Must comply with Clean Water Act
- Permit required for both wastewater and urban runoff discharges to Waters of the US
- Permit issuance requires ESA compliance

There are hundreds of current use pesticide impairments in CA alone, each requiring a Total Maximum Daily Load and discharge limit.



Ineffective mitigation example: Advanced water treatment

- Conventional treatment generally ineffective for pesticides
- Advanced treatment unrealistic
 - Costly and energy-intensive
 - No single treatment for all pesticides
 - Additional challenges with urban runoff due to large volume and episodic nature
 - Reverse osmosis concentrate can exceed toxicity thresholds for some pesticides, impacting disposal alternatives



Photo credits: City of Palo Alto

Sources: Sutton et al. (2019), UC Berkeley, Stanford, San Francisco Estuary Institute (2020).

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Ineffective mitigation example: product label changes for unlicensed/untrained users

- Unlicensed/untrained pesticide users typically don't read product labels
- Users that do read labels, usually don't read application instructions

Types of urban pesticide users	Percentage of pesticide use by user type (CA)
Licensed applicators	Small (<2%)
Trained applicators (e.g., water/wastewater treatment plant operators)	About half
Unlicensed/untrained applicators	About half

Sources: Dugger-Webster A, et al. (2018), Edworthy J, et al. (2004), Templeton, S., et al. (1998), Lockwood JA, et al (1994), Rother H-A, (2018), CDPR databases.



Mitigations that do work: targeted mitigation

- Pollution prevention is a common and effective mitigation approach
- Effective pollution prevention mitigation targets specific chemicals and particular users

Pollution Prevention means eliminating or reducing the amount and toxicity of potentially harmful substances at their sources, prior to generation, treatment, off-site recycling or disposal. It emphasizes preventing or minimizing pollution, rather than controlling it once it is generated.



Mitigation example 1: Fipronil for structural pest control CA Department of Pesticide Regulation

- Fipronil is toxic to aquatic invertebrates; monitoring data
- Modeled existing uses
 - Identified reductions needed to protect water quality
 - Identified primary source in urban runoff
 - Calculated reductions necessary
- Worked with users to confirm that proposed mitigation control pests



Image Source: Les Greenberg, UC Riverside

Focused, science-based label changes for licensed users expected to succeed

Source: Burant, A. et al. (2017).



Mitigation example 2: silver in wastewater effluent

- Silver impairment identified in San Francisco Bay and other CA waters
- Silver and other metals impact clam population and size
- Desktop studies found the main silver sources were discharges to wastewater treatment plants from photo processing and silver plating
- Wastewater agencies developed targeted mitigation:
 - Effluent limits and monitoring for large users
 - Silver waste recovery, onsite treatment/offsite disposal for small photo processors

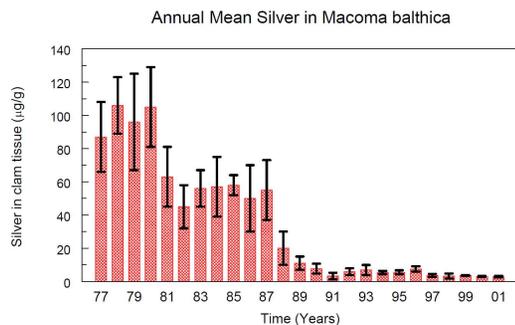


Image credit: Chanda Brietzke & Jessica Brown, <https://www.centralcoastbiodiversity.org/baltic-macoma-bull-macoma-balthica.html>

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Dramatic environmental response >95% silver reduction in clams and sediment near effluent discharge



Source: David, Carlos Primo C., et. al, (2002)



Mitigation example 3: Copper based root controls



- Copper impairment identified in the San Francisco Bay
- Single application **contaminates 20 million gallons of wastewater**
- Root control estimated at **5-12%** of the copper discharged to wastewater treatment plants.
- Mitigations and results:
 - ⊘ Point-of-sale public outreach generated no measurable copper reduction
 - CA DPR identified pesticide and non-pesticide alternatives
 - ✓ CA DPR prohibited sale and use of copper-based root killers in the San Francisco Bay Area.
 - Monitoring data showed a nearly 25% reduction in copper levels after prohibition enacted

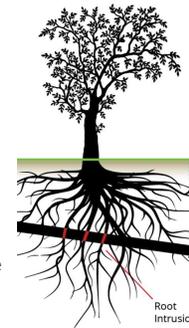


Image Source: Oro Loma Sanitary District



Mitigation example 4: tributyltin mitigation in cooling towers

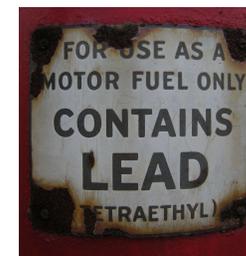
- Wastewater effluent tributyltin (TBT) exceeded water quality standards in SF Bay
- TBT cooling tower biocide was only known wastewater discharge source
- Voluntary efforts unsuccessful as facilities managers proved unable to identify TBT products
- CA DPR identified many alternatives
- CA DPR prohibited sale and use of TBT cooling tower additives in the San Francisco Bay Area
- After implementation, wastewater TBT concentration below detection



Mitigation example 5: urban runoff copper and lead



- CA and WA legislation requires copper to be removed from brake pads by 2025; became de facto law for all 50 states
- 60 percent of brake pads compliant as of 2022



- Lead banned from gas in 1979 for air quality purposes
- Resulted in dramatic reductions in surface water concentrations

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Numerous other examples of successful pollution protection programs

- **Pool, spa, and fountain maintenance** – eliminate fish kills by directing discharges to wastewater or open space like lawns
- **Dentists** – 45-75% reduction of mercury in wastewater biosolids after pollution prevention management practices program implemented in numerous US urban jurisdictions (locally-developed practices later became national EPA requirements)
- **Vehicle service facilities** – management practices to control metals, oils, solvents eliminated toxic stormwater and wastewater discharges
- **Restaurants** - grease traps eliminate sewage backups



Practical ESA mitigations specific to urban users are necessary, feasible, and cost-effective

- Endangered species are exposed to pesticides used in urban areas via wastewater and urban runoff
- Desktop studies and modeling can identify and prioritize specific urban pesticide uses for mitigation actions
- Advanced treatment of pesticides in wastewater and urban runoff is not a feasible pesticide mitigation strategy
- Pesticide label changes only effective for licensed & trained users
- Sale and use restrictions most effective mitigation option for products designed for unlicensed/untrained pesticide users



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Appendix C

Regulatory Participation Outcomes and Effectiveness Assessment Summary Tables

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Creosote

Cyhalothrins

Diuron

Malathion

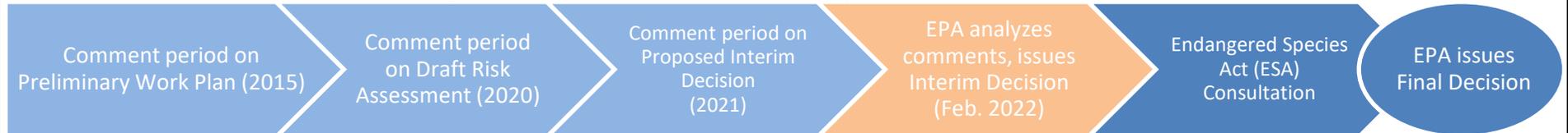
Oxadiazon

Permethrin

Pyrethrins

Ziram

Pesticide: Creosote – EPA-HQ-OPP-2014-0823
Why we care: 303(d) listings (PAHs); Contains CWA Priority Pollutants (PAHs); UP3 Priority (toxicity; use patterns)
Actions taken: CASQA sent a comment letter to EPA on the creosote Proposed Interim Decision (PID) on May 19, 2021.
Status: EPA released the Interim Registration Review Decision (ID) in February 2022.



Next steps: EPA will complete an endangered species determination and any necessary consultation with the Services.

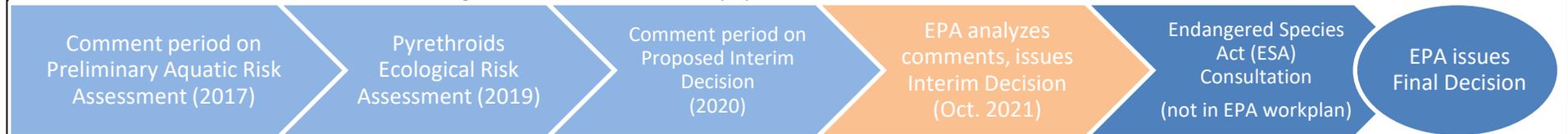
Recommendation: No action needed at this time as there is no open comment period.

CASQA 5/19/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
EPA did not provide a draft ecological risk assessment for creosote, and did not produce required ecological studies that the EPA itself said were required. (see p.12 of EPA's Proposed Interim Decision)	<i>"The Agency does not support delaying the issuance of this interim registration review decision while ecological data are being generated, citing the important mitigation measures that will protect workers."</i> (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)	No.
In addition to careful review and consideration of the required studies, the risk assessment should include surface water modeling using EPA's PRZM/VVWM runoff model, running under the current version of the Pesticide in Water Calculator (PWC), and including the right-of-way (ROW) scenario.	<i>"The Agency appreciates the suggestion; however, it believes there is no appropriate scenario available for the wood preservative use in the PWC. The Agency will consider the development of such a scenario in the future and is currently working on refining the modeling approaches used for estimating environmental exposures for antimicrobial pesticides."</i> (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)	Partially, but only for consideration of future antimicrobial pesticide evaluations.
An updated ecological risk assessment for creosote should include a survey of available monitoring data for potentially toxic components of creosote, including PAHs. Such a survey should include data available from the Water Quality Data Portal (https://www.waterqualitydata.us/portal/), as well as additional data available from the California Department of Pesticide Regulation	<i>"The Agency acknowledges that PAHs are commonly detected in water monitoring data, but aquatic exposure of these compounds is associated with numerous sources including pavement, oil, and gas activities, use of coal tar sealants, storm sewer runoff, tire wear, and burning of fossil fuels and wood. As a result, the Agency cannot attribute water detections of</i>	No.

(CDPR) surface water ("SURF") database. PAH compounds are very commonly detected in samples of urban runoff and urban receiving waters.

PAHs to registered creosote uses in many cases, as was discussed in the DRA." (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)

Pesticide: Cyhalothrins (Gamma and Lambda) – EPA–HQ–OPP–2010–0479 and EPA–HQ–OPP–2010–0480
Why we care: Priority pesticide due to toxicity, use, and monitoring data. Multiple 303(d) listings as well as adopted and pending TMDLs.
Actions taken: CASQA sent a comment letter to EPA on the cyhalothrins Proposed Interim Decision (PID) on January 11, 2021. In February 2020, CASQA also sent a comment letter to EPA on the Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal.
Status: EPA released the Interim Registration Review Decision (ID).



Next steps: EPA will complete an endangered species determination and any necessary consultation with the Services.

Recommendation: No action needed at this time as there is no open comment period.

CASQA 1/11/2020 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
CASQA strongly supports the "Required Label Language for Lambda-and Gamma-Cyhalothrin End-use products with outdoor, urban, non-agricultural uses". As defined in PID Appendix B, pp. 88-90, as a minimum level of mitigation required to address the known risks to aquatic species from outdoor / urban uses of cyhalothrins.	No direct response.	Yes, EPA kept the label language from the PID in the ID.
However, the Cyhalothrins PID does not provide any additional mitigation measures...to address the documented impacts of pyrethroid use in urban (non-agricultural) areas, and the risks to aquatic life of continued use of pyrethroid pesticides. This is despite significant evidence presented both in EPA's risk assessments and in our previous comment letters...consideration for possible additional mitigation measures should be afforded for each pyrethroid known through documented sources to contribute to surface water pollution.	"The Agency appreciates the comments from CASQA, SFBRWQCB, and BACWA. The Agency issued a single risk mitigation proposal to address ecological risks for 23 pesticides, which encompass the pyrethrins, synthetic pyrethroids, and pyrethroid-like insecticides, because they exhibit a common insecticidal mode of action and show similar ecological effects. Additionally, assessing these pesticides as a group would ensure a consistent approach to mitigating potential ecological risk, including providing equity to stakeholders, when implementing regulatory changes for pesticides in this group. EPA conducted a separate human health risk assessment for each chemical to account for different exposure pathways and human toxicity. The Agency has decided not to develop unique chemical-specific ecological risk mitigation for lambda-cyhalothrin and gamma-cyhalothrin at this time beyond what is already required as part of this ID. The Agency concludes that lambda-cyhalothrin and gamma-cyhalothrin provide high benefits for	No.

	controlling pests in indoor residential areas, outdoor urban areas, in agricultural crop production, and as an adult mosquito adulticide to control vectors for human disease. The Agency is requiring risk mitigation primarily to address risk to non-target invertebrates and fish. However, risks may remain to non-target organisms even after mitigation. Any remaining risks are outweighed by the benefits of lambda-cyhalothrin and gamma-cyhalothrin use.” (ID, pp. 14-15)	
<p>CASQA recommends the following enhancements to the proposed label language specified in Appendix B of the PID:</p> <ul style="list-style-type: none"> • design a clear schematic graphic for product labels to completely and effectively address prevention of product spilling or dumping into gutters and storm drains • review proposed label language text, and edit as needed to provide clear and consistent descriptions of pervious and impervious surfaces, to ensure clarity with respect to allowable exceptions, including with respect to applications to vertical surfaces, and • provide California-specific labels for outdoor structural pest control pyrethroids products that are completely consistent with California Surface Water Protection Regulations implemented by California Department of Pesticide Regulation. 	“...the Agency notes that all states, including California, are authorized to restrict pesticide use according to state requirements and standards.” (ID, pp. 15)	No.

Pesticide: Diuron – EPA–HQ–OPP– 2015–0077
Why we care: Fungicide/antimicrobial used in building products, including paint, caulks, and sealants. Also an herbicide. Highly toxic to aquatic life.
Actions taken: CASQA sent a comment letter to EPA on the Draft Ecological Risk Assessment (Draft RA) on May 7, 2021.
Status: EPA released the Proposed Interim Registration Review Decision (PID).



Next steps: EPA will issue an Interim Decision.
Recommendation: It is recommended that CASQA write a brief comment letter on the Diuron PID.

CASQA 5/7/2021 Comments to EPA (excerpt)	EPA Response	Did EPA incorporate CASQA's comment?
<p>A Chronic Sediment Toxicity Study Is Needed for Aquatic Invertebrates CASQA therefore requests that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates.</p>	<p>EPA is cancelling all conventional (herbicidal) uses of diuron, so they state that this chronic sediment toxicity study is not needed.</p>	<p>No. While CASQA supports the cancellation of the conventional uses, it will remain important to complete the chronic sediment toxicity study for aquatic invertebrates due to the antimicrobial uses of diuron. EPA's evaluation of diuron for antimicrobial uses is continuing on a separate review schedule, for which CASQA last provided comments to the Draft RA in June 2021.</p>
<p>Monitoring Data Summaries Are Incomplete and Understate Diuron Surface Water Levels It is important for the risk assessments to include fully representative data for diuron in surface waters, particularly because the CDPR dataset includes a range of concentrations higher than those reported in EPA's monitoring summaries. We therefore request that the Draft ERA and Antimicrobials RA be amended to incorporate the CDPR SURF data for diuron.</p>	<p>None.</p>	<p>No.</p>

<p>Toxicity Endpoints Used in Diuron Risk Assessments Do Not Agree Across EPA Sources The toxicity endpoints used in EPA's modeling for the Draft ERA and Antimicrobials RA are not consistent, and the endpoints used in both documents are not in agreement with the Aquatic Life Benchmarks for Pesticides published on EPA's web site.</p>	<p><i>"The Agency appreciates the comments and acknowledges that there are inconsistencies in the Draft Risk Assessment for the antimicrobial uses of diuron. These inconsistencies will be addressed in the amended diuron risk assessment."</i> (Response to Public Comments on N'(3,4-dichlorophenyl)-N,N-dimethylurea (Diuron) Draft Risk Assessment on the Antimicrobial Use, p.6)</p>	<p>Yes.</p>
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Pesticide: Malathion – EPA-HQ-OPP-2009-0317
Use: Insecticide
Why we care: Malathion occurs in urban watersheds at concentrations above EPA’s malathion water quality criterion.
Actions taken: CASQA commented on the Draft Biological Evaluation on June 10, 2016, the National Marine Fisheries Service Biological Opinion on July 23, 2018, and the US Fish and Wildlife Service Draft Biological Opinion on June 18, 2021.
Status: The National Marine Fisheries Service Endangered Species Act Section 7 Conference and Revised Biological Opinion was released June 30, 2022.



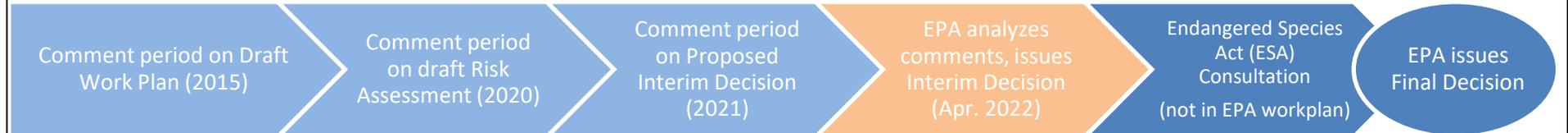
Recommendation: No action is needed at this time as there is no further opportunity for public comment.

CASQA Comments to EPA (June 2016, July 2018, and June 2021)	EPA Response (National Marine Fisheries Service Endangered Species Act Section 7 Conference and Revised Biological Opinion)	Did EPA incorporate CASQA’s comment?
Occurrence of malathion Clean Water Act 303(d) listings in urban water bodies is consistent with BiOp finding of adverse modification of critical habitat. Clean Water Act compliance assessments must be an integral part of BEs and Registration Review ecological risk assessments.	They acknowledged this linkage. (p. 718)	No.
<p>Evaluation of the proposed Reasonable and Prudent Alternatives (RPAs) in the context of urban (developed) areas. We highlight RPA approaches that are impractical or ineffective in the urban context and suggest alternatives. Mitigation is needed specifically for malathion impacts to aquatic life in developed watersheds. Suggested RPAs (through label modification) include:</p> <ul style="list-style-type: none"> • Restrict malathion use in non-agricultural settings to professional applicators. • Restrict applications in urban use sites to avoid impervious surfaces 	<p>“EPA and applicants agreed to modify the action to incorporate the draft RPA measures for all non-broadcast applications that occur within 300 m of specified ESA-listed species habitats.” (p. 897) They acknowledged that there is “limited use and exposure data on stressor of the action for non-agricultural uses of these pesticides” and “(u)ncertainty about pesticide concentrations resulting from non-agricultural uses”. (p. 1195) The report includes language to limit application on impervious surfaces (p. 131-132):</p> <ul style="list-style-type: none"> • Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, permanent streams, wetlands or natural ponds, estuaries, and commercial fish farm ponds). 	<p>Unclear. Although the language limiting the use of malathion on impervious surfaces is comprehensive, the language only applies within 300 meters of ESA-listed species habitats. It is unclear how EPA plans to implement this language. It is also not clear if the 300 meter limitation also includes non-agricultural sites,</p>

	<ul style="list-style-type: none"> • Do not apply directly to, or allow the product to enter sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur. • Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment. • Do not apply to vertical surfaces directly above pervious or impervious surfaces that drain into ditches, storm drains, gutters, or surface waters. • Do not apply or irrigate to the point of runoff. <p>However, this language appears to be limited to areas within 300m of specified ESA-listed species habitats.</p>	<p>and even if it is inclusive, it is not known how an unlicensed user would be able to determine if their location was within 300 meters of an ESA-listed habitat prior to using malathion.</p>
<p>Non-agricultural pesticide usage data. We share our analysis of California pesticide sales data, use data, and water quality monitoring data that suggests that most malathion in urban runoff likely stems from products sold at retail to non-professional users.</p>	<p>The report acknowledged CASQA's comment. (p.9) They reference CA DPR monitoring data, (p. 626 and p. 1344)</p>	<p>Partially</p>
<p>A BE is not a replacement for a Registration Review ecological risk assessment. An Ecological Risk Assessment is needed for malathion.</p>	<p>The document makes claims that they "followed an ecological risk assessment framework." (p.8)</p>	<p>No. The "framework" is not the same as an Ecological Risk Assessment.</p>
<p>The format of the public review documents was too complex, even for a nationwide BE.</p>	<p>No response.</p>	<p>No.</p>
<p>CASQA supports implementation of the Conservation Recommendations included in the FWS Biological Opinion, especially the following, which bear on issues relating to the presence and effects of malathion and other pesticides in the urban environment: 4. Work with other appropriate Federal, state, and local partners to study the efficacy of conservation practices in reducing pesticide loading to streams, lakes, wetlands, sinkholes, and other terrestrial and aquatic habitats from off-site transport.</p>	<p>It does not appear that they are going forward with any of these conservation measures. They cited other conservation measures, but did not reference these conservation measures (4-7) in the report.</p>	<p>No.</p>

<p>5. Develop methods and models that better describe and quantify pesticide persistence and fate and transport to assist in analyses for future pesticide consultations.</p> <p>6. Develop methods to better understand and quantify pesticide exposure from non-agricultural uses.</p> <p>7. Develop criteria that address when pesticide-contaminated sediment is an important route of exposure to aquatic or terrestrial organisms.</p> <p>[Biol. Op. pp. 519-520]</p>		
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Pesticide: Oxadiazon – EPA–HQ–OPP–2014–0782
Why we care: Herbicide applied in outdoor urban settings.
Actions taken: CASQA sent a comment letter to EPA on the Proposed Interim Decision (PID) on October 4, 2021.
Status: EPA released the Interim Registration Review Decision (ID) in April 2022.



Next steps: EPA will issue an Interim Decision.
Recommendation: CASQA will continue to monitor this pesticide. No opportunity for comment at this time.

CASQA 10/4/2021 Comments to EPA (excerpt)	EPA Response	Did EPA incorporate CASQA's comment?
<p>CASQA Supports Proposed Mitigation for Oxadiazon. These uses include terminating most turf applications, prohibiting liquid applications, reducing amount of remaining applications, adding a non-target organism advisor notice, updating and standardizing the environmental hazard and groundwater/ surface water advisory statements</p>	<p><i>"EPA thanks CASQA for its comments on the oxadiazon PID. In response to new information and proposals received during the public comment period, EPA has made several changes to the proposed mitigation originally presented in the PID and encourages CASQA to review these changes. Details of these changes are provided in Section IV.A. These updates provide additional flexibilities to users linked to additional requirements (e.g., classification of oxadiazon as an RUP and instructions directing the user to thoroughly irrigate after application as soon as possible on the same day of application) while still adequately protecting drinking water sources. EPA has determined that the revised mitigations would substantially reduce potential for surface water runoff and impacts to non-target aquatic organisms while still adequately preventing unreasonable adverse risks to human health."</i> (Oxadiazon Interim Registration Review Decision, Case Number 2485, March 2022, pp.15-16)</p> <p><i>"There were five mitigations proposed in the PID that EPA has determined are no longer needed in the ID. EPA originally proposed terminating all turf uses except for golf course fairways and sod farms to address post-application risks of concern. Due to the new label language needed that instructs the user to water-in as soon as possible after application, the anticipated requirement for new TTR data with watering-in, and the revised mitigation on golf courses allowing treatment on up to 30% of all managed turf surfaces, EPA will not require these proposed terminations at this time. EPA originally proposed cancelling the end use product registered for tees and greens (EPA Reg. No. 9198-176) to address drinking water risks of concern. EPA has decided on a 30% golf course turf area restriction instead (Mitigation #7), which will allow continued use on tees and greens, and therefore allow EPA Reg. No. 9198-176 to remain registered."</i> (Ibid. pp. 44-48)</p>	<p>Partially. Although they went back on several of the mitigations that they had proposed, including allowing some uses on turf, they did keep some of the mitigations that are significant to the urban environment, including the proposed ban on liquid applications in the urban environment.</p>

Pesticide: Permethrin (EPA–HQ–OPP–2011–0039),
Use: Insecticides
Why we care: Priority pesticide due to toxicity, use, and monitoring data. 303(d) listings as well as adopted and pending TMDLs.
Actions taken: In February 2020, CASQA sent a comment letter to EPA on the Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal. In May 2020, EPA released a Proposed Interim Decisions for permethrin. In December 2021, CASQA sent a comment letter on the antimicrobials draft risk assessment for permethrin.
Status: EPA issued the 2nd Amendment to the Permethrin Interim Registration Decision on March 16, 2022.



Next steps: The Endangered Species Act Consultation is the next step in the process.
Recommendation: CASQA will continue to monitor the permethrin docket. There is no opportunity for comment at this time.

CASQA 12/28/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA’s comment?
<p>“We question the assumption that “exposure to aquatic areas from terrestrial uses is expected to be negligible”. Permethrin can be transported to surface waters from terrestrial wood preservative uses – specifically fences and decks...” The CASQA comment goes on to document transport over pervious and impervious surfaces. “Assuming similar leaching rates during rainfall events, and efficient transport of suspended permethrin in runoff through the storm drain system directly to a surface water body, the risk to aquatic species from permethrin-treated wood structures in impervious surface settings could be similar to the risks identified in the Draft RA for the dock/lake scenario.”</p>	<p>“As described in Section 3.3.1 Terrestrial and Aquatic Exposure Profile in the DRA, “given the low leaching rate (0.0125 %/day, MRID 49638201) from treated wood that is limited by the water solubility (0.0055 mg/L, 5.5 ug/L, Table 1) and the expected sorption to soil (MRID 41868001), exposure to terrestrial and aquatic organisms is expected to be negligible if treated wood is used in a terrestrial setting.” (2nd Amendment to Permethrin Interim Registration Review Decision, Case Number 2510, March 16, 2022. p. 4)</p>	<p>Partially. EPA acknowledges CASQA’s comment on leaching, but did not model the specific scenario, relying on estimates based on the water solubility and expected sorption instead.</p>

<p>“Modeling is Needed for Terrestrial Wood Preservative Uses. CASQA recommends that EPA use available PWC scenarios to model the terrestrial wood preservative uses of permethrin prior to publishing a final risk assessment or proposed interim decision.”</p>	<p>“Additionally, guidance in the 2020 American Wood Protection Association (AWPA) Book of Standards indicates that permethrin is not intended for use in aquatic environments such as docks or for ground contact such as fences.” (2nd Amendment to Permethrin Interim Registration Review Decision, Case Number 2510, March 16, 2022. p. 4)</p>	<p>Partially. Although the American Wood Protection Association’s Book of Standards indicates that permethrin is not intended to be used for these uses, the fact remains that there are labeled permethrin pesticides for these uses. It is unclear if the registrants intend to withdraw these label uses but no further changes were listed in this 2nd Amendment to the EPA’s Permethrin ID.</p>
<p>“Mitigation Is Needed. CASQA requests that EPA develop a program of mitigation to reduce the potential for negative impacts to aquatic organisms from the terrestrial wood preservative uses of permethrin.”</p>	<p>See above.</p>	<p>Partially. If the registrants pull products that are of concern. (see above)</p>

Pesticide: Pyrethrins – EPA-HQ-OPP-2011-0885
Use: Insecticide
Why we care: Related to pyrethroids, but less toxic and less stable
Actions taken: CASQA commented on the Ecological Risk Mitigation Proposal (February 2020).
Status: EPA released the Proposed Interim Registration Review Decision (PID) (August 2021).



Next steps: ESA Consultation is required but unlikely to begin before 2022.
Recommendation: Send comment letter to EPA supporting the proposed mitigations to pesticide label language.

CASQA Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
<p>EPA's risk / benefit finding should be revised to differentiate among the 23 pyrethroids and pyrethrins and among the various outdoor urban uses of the 23 chemicals</p>	<p>"The pyrethroids have many uses across agricultural, residential, commercial, indoor and outdoor sites, and were grouped into broad categories to compare the potential exposure for those active ingredients that were not quantitatively assessed in the 2016 Ecological Risk Assessment.... For the purposes of risk-benefit analysis, and EPA considers this approach to provide adequate differentiation among uses assessed for the group of 23 chemicals. Among outdoor uses, EPA is aware of the potential for applications to impervious surfaces to contribute to waterway pollution. The Agency's mitigation for outdoor non-agricultural use as a category is reflective of those risk contributions. The Agency disagrees that a separate analysis of each pyrethroid or each specific use is needed to support EPA's risk assessment and risk management conclusions"</p> <p>"EPA's risk assessment supports the conclusions that there are risks of concern for aquatic organisms from exposure to pyrethroids, which is supported by water monitoring data that indicate that pyrethroids are present in the environment that result in adverse effects to aquatic invertebrates. The benefits from the use of these chemicals for these uses is also very high."</p>	<p>No.</p>

EPA should ban outdoor urban use of Bifenthrin (separate pesticide from pyrethrins, but CASQA's comments were in response to a Risk Assessment that include both pyrethrins and pyrethroids).	"EPA... disagrees that a representative analysis featuring bifenthrin is necessary, as bifenthrin is not outstanding among pyrethroids in terms of RQ exceedances, aquatic invertebrate toxicity, or environmental persistence."	No.
Label change: CASQA supports prohibition on applications during rain	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports advisory statement to avoid applications if rain is forecast within 24 hours	EPA incorporated suggested comment (although CASQA would prefer an enforceable statement via a word such as "prohibition").	Yes.
Label change: CASQA supports addition of water protection statements	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports definition of spot treatment (2 sq. ft.)	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports requirement that product labels explicitly state whether particular products are allowed to be used indoors only, outdoors only, or both indoors and outdoors	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports reduction in height above ground level of building treatments from 3 feet to 2 feet	EPA incorporated suggested comment.	Yes.
Label change: CASQA requests that EPA identify a specific outdoor drain graphic and require the same graphic be used on all products.	"Regarding the suggestion...to add the down-the-drain advisory statements to all pyrethroids/pyrethrins labels (both agricultural and non-agricultural), outdoor and agricultural product labels already have label statements to prevent these chemicals from reaching drainage systems. In contrast, products with indoor uses do not currently have this language. Therefore, EPA has determined that these down-the-drain advisory statements are only necessary on products with indoor uses. However, registrants have the option to consider including this language (i.e., "unless for use in pipes and sinks") to agricultural product labels at their discretion." (Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals, p. 7)	No.

<p>Label change: CASQA requests that EPA establish minimum size for the outdoor graphic, to ensure that it is legible, i.e., no smaller than 1.5 square centimeters unless this size is greater than 10% of the size of the label.</p>	<p>EPA incorporated CASQA's comment on graphic sizing for the <u>indoor</u> graphic, which helps fellow agencies such as BACWA.</p>	<p>Partially incorporated.</p>
<p>Label change: CASQA requests that EPA include Spanish translation for the outdoor drain discharge prohibition ("Do not allow the product to enter any drain during or after application."), and include this language on all outdoor non-agricultural products.</p>	<p>EPA incorporated suggested comment.</p>	<p>Yes.</p>

Pesticide: Ziram – EPA-HQ-OPP-2015-0568
Why we care: Fungicide/antimicrobial used in building products, including paint, caulks, and sealants. Highly toxic to aquatic life.
Actions taken: CASQA sent a comment letter to EPA on the Draft Ecological Risk Assessment (Draft RA) on January 19, 2021.
Status: EPA released the Proposed Interim Registration Review Decision (PID).



Next steps: EPA will issue an Interim Decision.
Recommendation: It is recommended that CASQA write a brief letter of support of the cancelation of Ziram in all paint products as well as additional controls placed on the non-paint uses (caulks, sealants) of Ziram.

CASQA 1/19/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
<p>Based on EPA's analysis, there is risk to freshwater invertebrates (and fish) when fairly small amounts of ziram are applied in a given watershed...If even a small fraction of those buildings are painted with paint containing ziram in a given year, and if even a fraction of the ziram contained in that paint leaches to a surface water body, freshwater invertebrate (and fish) life could be impacted. Rather than speculating, EPA should modify its risk assessment analysis for freshwater invertebrates analytically, and with full documentation. This may require acquisition of additional data to perform an accurate assessment.</p>	<p><i>"The Agency thanks CASQA for their comment. The Agency agrees that additional data would allow for a more refined assessment of risks to aquatic invertebrates from the use of ziram in paint. However, because the Agency relied on a screening-level risk assessment using conservative assumptions, additional analyses are not likely to result in a higher risk than determined in the DRA. Therefore, the Agency maintains its conclusions of no expected risks to aquatic invertebrates from the ziram paint use."</i> (Registration Review Response to Comments on the Ziram DRA for Antimicrobial Uses, March 9, 2021, p.2)</p>	<p>Partially. EPA agrees that additional study would be useful, but ignores CASQA's comment about the impact of Ziram-containing paint in urban environments. However, due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram.</p>

<p>The potential risk to sediment-dwelling aquatic invertebrates is incomplete, as the Draft EPA contains...confusing and contradictory language. CASQA therefore requests that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates.</p>	<p><i>“As mentioned in Section 1.5 of the draft risk assessment, a chronic spiked-sediment study with thiram (using either an amphipod or chironomid) could help to determine if added risk may also come from exposure to contaminated sediment. EFED acknowledges that chronic toxicity data for sediment (benthic) invertebrates were not available at the time of the assessment because sediment toxicity studies were not requested in the respective problem formulations. Potential chronic risk to benthic invertebrates were evaluated using water-column invertebrate toxicity data as surrogates and potential chronic risk was identified. Some uncertainty is acknowledged as to whether benthic aquatic invertebrates may need further evaluation using sediment-based toxicity data given the complex fate characteristics of the chemicals. However, because potential chronic risk based on sediment pore water exposure and surrogate toxicity data was identified, EFED acknowledges that the data would help inform future risk assessments.”</i> (Thiram, Ferbam, and Ziram: EFED Response to Comments on the Draft Ecological Risk Assessment, March 24, 2021, p.18)</p>	<p>Partially. EPA acknowledges that CASQA is correct but is not requiring the registrant to provide the needed data. However, due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram.</p>
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Appendix D

Mercury and PCB Controls



**ALAMEDA COUNTYWIDE
CLEAN WATER PROGRAM
MERCURY AND PCBS
WATERSHED/MANAGEMENT
AREAS, CONTROL
MEASURES, AND LOAD
REDUCTION – UPDATE
2022**

MEMBER AGENCIES:

Alameda
Albany
Berkeley
Dublin
Emeryville
Fremont
Hayward
Livermore
Newark
Oakland
Piedmont
Pleasanton
San Leandro
Union City
County of Alameda
Alameda County Flood
Control and Water
Conservation District
Zone 7 Water Agency

Report prepared by:

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Submitted to:

California Regional Water Quality
Control Board, San Francisco Bay Region

August 26, 2022

Acknowledgements

Geosyntec Consultants contributed substantially to the writing and preparation of this report.

Preface

This *Mercury and PCBs Watershed/Management Areas and Control Measures Implementation Report* was prepared by the Alameda Countywide Clean Water Program (ACCWP) per the Municipal Regional Permit (MRP; NPDES Permit No. CAS612008; Order No. R2-2015-0049) for urban stormwater issued by the San Francisco Bay Regional Water Quality Control Board. This report fulfills the requirements of MRP Provisions C.11.a.iii.(3), C.11.b.iii(2), C.12.a.iii.(3), and C.12.b.iii.(2) for updating the list of control measures reported in 2017 as necessary to account for new control measures and to report loads reduced by these control measures.

This report is submitted by ACCWP on behalf of the following Permittees:

- The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City;
- Alameda County;
- Alameda County Flood Control and Water Conservation District; and
- Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency).

List of Acronyms

Acronym	Definition
ACCWP	Alameda Countywide Clean Water Program (also Program)
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
ESPS	Ettie Street Pump Station
FY	Fiscal Year
GI	Green Infrastructure
GIS	Geographic Information System
mg/kg	milligram per kilogram
MPC	Monitoring and Pollutants of Concern Committee
MRP	Municipal Regional Stormwater Permit
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PCBs	Polychlorinated Biphenyls
POC	Pollutants of Concern
POTW	Publicly Owned Treatment Works
ROW	Right-of-Way
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board (also Regional Water Board)
SFEI	San Francisco Estuary Institute
TMDL	Total Maximum Daily Load
W/MA	Watershed / Management Area

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1 Introduction

1.1 Purpose and Report Organization

This *Mercury and PCBs Watershed/Management Areas, Control Measures, and Load Reduction – Update 2022* report was prepared by the Alameda Countywide Clean Water Program (ACCWP) per the Municipal Regional Stormwater Permit (MRP 2.0) issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB; Order No. R2-2015-0049). This report fulfills the requirements of MRP Provisions C.11.a.iii.(3), C.11.b.iii(2), C.12.a.iii.(3), and C.12.b.iii.(2) for updating the list of control measures reported in 2018 as necessary to account for new control measures and to report loads reduced by these control measures using the approved Interim Accounting Methodology (BASMAA, 2017).

The following MRP reporting requirements are addressed within this report:

- The list of Watershed/Management Areas (W/MAs) where control measures are currently being implemented;
- The number, type, and locations and/or frequency (if applicable) of control measures;
- A cumulative listing of all potentially PCBs-contaminated sites Permittees has referred to the SFBRWQCB to date, with a brief summary description of each site and where to obtain further information;
- The description, scope, and start date of polychlorinated biphenyls (PCBs) control measures;
- For each structural control and non-structural best management practice (BMP), interim implementation progress milestones (e.g., construction milestones for structural controls or other relevant implementation milestones for structural controls and non-structural BMPs) and a schedule for milestone achievement;
- Clear statements of the roles and responsibilities of each participating Permittee for implementation of identified control measures;
- Mercury and PCBs loads reduced using the approved assessment methodology to demonstrate cumulative mercury and PCBs load reduced from each control measure implemented since the beginning of the Permit term, including supporting data and information necessary to substantiate the load reduction estimates; and

- An estimate of the amount of mercury and PCBs load reductions resulting from green infrastructure implementation during the current term of the MRP, including a description of all data used and a full description of models and model inputs relied on to generate this estimate.

This report is organized into the following sections:

1. **Introduction and Background** – This section describes requirements for managing mercury and PCBs per the Total Maximum Daily Loads (TMDLs) and the MRP, followed by the management approach that has been implemented by ACCWP Permittees. This approach includes delineation of W/MAs based on screening of priority parcels in Old Industrial land classification for likelihood of ongoing PCBs discharge and implementation of control measures. Roles and responsibilities are also described in this section.
2. **Control Measures Overview** – This section provides a general description of the types of control measures that are currently being implemented to control PCBs and mercury.
3. **Watersheds/Management Areas, Control Measures, and Schedule for each Permittee** – These sections describe the Permittee-specific W/MAs and control measures identified by the Permittee that are currently being implemented in each W/MA during this permit term. At least one figure is provided for each Permittee. These figures show W/MA boundaries that contain priority land uses for PCBs management (Old Industrial and Old Urban, as well as “Categorical” overlays described in Section 1.3.2); classification of Old Industrial parcels in these W/MAs resulting from partial screening through 2015 (i.e., High, Moderate or Low/No Likelihood of ongoing PCBs discharge); other land use areas (e.g., New Urban/Other and Open Space); and locations of trash capture devices as examples of treatment controls or sites for enhanced sediment removal.
4. **Loads Reduced** – This section presents the estimates of mercury and PCBs loads reduced by the control measures that are currently being implemented.

1.2 Background

1.2.1 Mercury and PCBs Total Maximum Daily Loads

Fish tissue monitoring in San Francisco Bay (Bay) has revealed bioaccumulation of PCBs, mercury, and other pollutants. The levels found are thought to pose a health risk to people consuming fish

caught in the Bay. As a result of these findings, California has issued an interim advisory on the consumption of fish from the Bay. The advisory led to the Bay being designated as an impaired water body on the Clean Water Act "Section 303(d) list" due to mercury and PCBs. In response, the SFBRWQCB developed Total Maximum Daily Load (TMDL) water quality restoration programs targeting PCBs and mercury in the Bay. The general goals of the TMDLs are to identify sources of PCBs and mercury to the Bay and implement actions to control the sources and restore water quality.

Municipal separate storm sewer systems (MS4s) are one of the PCBs and mercury source/pathways identified in the TMDLs. Local public agencies (i.e., Permittees) subject to requirements via National Pollutant Discharge Elimination System (NPDES) permits are required to implement control measures in an attempt to reduce PCBs and mercury from entering stormwater runoff and the Bay. These control measures, also referred to as best management practices (BMPs), are the tools that Permittees can use to assist in restoring water quality in the Bay.

1.2.2 Municipal Regional Permit

NPDES permit requirements associated with Phase I municipal stormwater programs and Permittees in the Bay Area are included in the MRP, which was issued to 76 cities, counties, and flood control districts in 2009 and reissued in revised form in 2015.³ Consistent with the TMDLs, Provisions C.11.a. and C.12.a. of the MRP require the implementation of source and treatment control measures and pollution prevention strategies to reduce mercury and PCBs in urban stormwater runoff to achieve specified load reductions throughout the permit area. Although many of the control measures may be selected primarily for the purpose of achieving PCBs load reductions during this MRP permit term (i.e., MRP 2.0), substantial mercury load reductions may result as a tangential benefit and will be accounted for in tracking mercury load reductions. Specifically, the MRP requires the Permittees to:

¹ See: http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/TMDLs/sfbaypcbstdml.shtml and http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/TMDLs/sfbaypcbstdml.shtml.

² The MRP replaced previous permits issued to permittees grouped by county, but recognizes that many compliance activities are conducted or facilitated by ACCWP and other countywide stormwater consortia. ACCWP and other Bay Area stormwater programs collaborate regionally.

³ The MRP was amended by Order No. R2-2019-0004 to add the East Contra Costa County Permittees (the cities of Antioch, Brentwood, and Oakley).

- Identify the watersheds or portions of watersheds (management areas) in which PCBs control measures are currently being implemented and those in which new control measures will be implemented during the term of this permit;
- Identify the control measures that are currently being implemented and those that will be implemented in each watershed/management area;
- Submit a schedule of control measure implementation; and
- Implement sufficient control measures to achieve the mercury and PCBs load reductions stated in the permit.

Provisions C.11.b. and C.12.b. of the MRP require the Permittees to estimate loads reduced by the control measures that have been implemented since the beginning of the Permit term. The MRP allows for load reductions from control measures implemented prior to the effective date of the Permit to be counted toward the required reductions of this permit term if these control measures were established or implemented during the previous permit term, but load reductions from the activity were not realized or credited during the previous permit term (e.g., they were implemented after the 2014 Integrated Monitoring Report was submitted). Therefore, control measures implemented in Fiscal Year (FY) 2013/14, FY 2014/15, FY 2015/16, FY 2016/17, FY 2017/18, FY 2018/19, FY 2019/20, FY 2020/21, and FY 2021/22 (i.e., controls measures implemented between July 1, 2013 and June 30, 2022) may be reported herein.

1.3 Approach

1.3.1 Control Measures

The urban stormwater runoff wasteload allocation for PCBs represents a 90 percent reduction from the estimated existing load. The TMDL implementation plans set roughly 20-year timelines for achieving the reductions but also incorporate an adaptive implementation planning approach. The adaptive approach consists of the development of a plan that includes early implementation actions based on existing knowledge that have a reasonable probability of success and an overview of options for future actions. For PCBs and mercury in the Bay, the immediate or early implementation actions are not expected to completely eliminate the Bay impairment. Therefore, future actions must be evaluated based on continued monitoring and response to the

⁴Table 12.1 of the MRP lists interim PCBs load reduction performance criteria that Permittees should achieve during the current permit term. Provision C.11 does not list interim mercury load reduction performance criteria, except for green infrastructure implementation.

early implementation actions, as well as based on well-designed studies used for model refinement.

The MRP Fact Sheet notes that the initial focus of Provisions C.11/12 is on measures designed to reduce PCBs, while also evaluating opportunities for mercury reduction. Implementation actions may fall into four categories depending on the available knowledge and confidence in a control measure's effectiveness (listed in decreasing order of confidence):

1. Full-scale implementation throughout the region.
2. Focused implementation in areas where benefits are most likely to occur.
3. Pilot-testing in a few specific locations.
4. Other: This may refer to experimental control measures, research and development, desktop analysis, laboratory studies, and/or literature review.

During the previous MRP term, Permittee effort was largely focused on gathering necessary information about control measure effectiveness through pilot projects and some focused implementation of the most effective control measures. In this term of the MRP, the emphasis has shifted towards focused and some full-scale implementation of the most effective control measures. Progress is measured through accounting for specific load reductions as described in the regionally produced report: *Interim Accounting Methodology for TMDL Loads Reduced* (BASMAA, 2017).

After impacts to the Bay were identified, the Permittees, countywide stormwater programs, Bay Area Stormwater Management Agencies Association (BASMAA), and the SFBRWQCB began gathering data and developing an understanding of the sources and pathways for mercury and PCBs runoff to the Bay (e.g., AMS et al., 2001; AMS, 2002; EOA, 2002; Kleinfelder, 2006). These same parties developed a framework to address these pollutants throughout the following decade, as described in the MRP Fact Sheet. The remainder of this section summarizes key regional initiatives to evaluate mercury and PCBs control measures and ACCWP efforts to identify priority areas within Permittee jurisdictions for implementing control measures.

The Regional Stormwater Monitoring and Urban BMP Evaluation: A Stakeholder-Driven Partnership to Reduce Contaminant Loadings (Proposition 13) project funded by a State of California Proposition 13 grant to the San Francisco Estuary Institute (SFEI) defined conceptual

⁵ General Strategy for Sediment-Bound Pollutants (Mercury and PCBs), MRP Attachment A-82.

models of sources and pathways of mercury and PCBs in Bay Area urban watersheds (McKee et al., 2006). The Proposition 13 project compiled PCBs and mercury chemical analysis results from sites predominantly in older industrial areas developed prior to the 1979 ban on PCBs production and open uses. The combined dataset contained about 600 sediment samples collected at over 360 locations throughout the Bay Area from roadways and stormwater drainage infrastructure (e.g., storm drain inlets, pump house wet wells, piping beneath manholes, and open channels) (Yee and McKee, 2010). These data supported the general hypothesis that concentrations of PCBs and mercury are elevated in specific parts of the urban landscape and showed that:

- Pollutant concentrations are highly patchy, even at moderate to small spatial (sub-kilometer) and temporal (approximately annual) scales. This patchiness reflects the episodic nature of many release and transport events and processes.
- Concentrations at sites within three kilometers of one another showed similarities in concentration, which may be due to similarities in land use, activities, or transport of shared pollutant sources.
- Individual sites and areas most contaminated with PCBs are often not those with high mercury, which is a logical finding given the different use histories and original pollutant sources.

Another outcome of the Proposition 13 project was a desktop evaluation of control measures for potential region-wide PCBs and mercury load reductions (Mangarella et al., 2010).

Building upon the efforts of the Proposition 13 project, BASMAA conducted an EPA grant-funded project called Clean Watersheds for a Clean Bay (CW4CB). The CW4CB project, which began in May 2010 and was completed in May 2017, was a collaboration among the MRP Permittees designed to evaluate the effectiveness of stormwater controls for PCBs and mercury. The CW4CB Project implemented a number of pilot projects for various control measures called for by the Bay PCBs and mercury TMDLs and the first term MRP. The CW4CB work products⁶ included:

- Selecting five subwatersheds with relatively high levels of PCBs indicated by Proposition 13 project samples and other data sources for pilot investigations;

⁶ The CW4CB work products can be found on the BASMAA webpage at: <http://basmaa.org/Clean-Watersheds-for-a-Clean-Bay-Project>

- Identifying PCBs and mercury source areas within the project subwatersheds and referring these sites to regulatory agencies for cleanup and abatement;
- Developing methods to enhance removal of sediment with PCBs and other pollutants during Permittee sediment management activities;
- Retrofitting 8 to 10 urban sites with different types of stormwater treatment facilities;
- Facilitating development and implementation of a regional risk communication and exposure reduction program that focuses on educating the public about the health risks of consuming certain species of Bay fish that contain high levels of PCBs and mercury; and
- Creating public education outreach materials, a project web portal, guidance manual, and technical workshops.

The Permittees used the information gathered and lessons learned through the CW4CB project and the earlier projects as the basis to identify the W/MAs and control measures listed in this report.

In FY 2015/16, ACCWP began a countywide Geographic Information System (GIS) project focused on maintaining, analyzing, interpreting, displaying, and reporting relevant municipal stormwater program data and information to address requirements in the following MRP Provisions:

- C.3.j Green Infrastructure (GI) Planning and Implementation,
- C.10 Trash Load Reduction,
- C.11 Mercury Controls, and
- C.12 PCBs Controls.

This project is critical to the Permittees' ongoing work to identify watersheds and management areas where multiple-benefit control measure implementation opportunities have been identified and prioritized for implementation during this permit term and over the coming decades. Additionally, this GIS database is being used to track and map existing C.3 new development and redevelopment projects, allow ease of ongoing review of opportunities for incorporating GI into existing and planned Capital Improvement Projects (CIPs), and assist in the development of GI plans.

The Program's stormwater GIS platform features web maps and applications created using ESRI's ArcGIS Online for Organizations environment. This platform can access GIS data, custom web services, and reports that are hosted within an Amazon cloud service running ESRI's ArcGIS Server technology. The stormwater GIS platform is an important tool for maintaining relevant

stormwater data; reviewing, analyzing, and displaying data geography; accounting for and assessing compliance with load reduction performance goals; and reporting.

1.3.2 Watershed /Management Area Delineation

Each municipal Permittee has created a list of W/MAs and control measures (i.e., a control measure plan that describes what, where, and when control measures are being implemented) for PCBs and mercury, provided in Sections 3 through 19 below.⁷ The ultimate goal for the listed control measures is to achieve the Alameda countywide PCBs load reductions listed in MRP Tables 12.1 and Table 12.2 during this MRP term:

- 160 g/yr PCBs by 6/30/18,
- 940 g/yr PCBs by 6/30/2020, and
- 37 g/yr PCBs and 15 g/yr mercury using green infrastructure by 6/30/2020.

The ACCWP Permittees achieved the required PCBs load reductions in 2018 and 2020, and the PCBs and mercury load reductions using green infrastructure in 2020.

A W/MA is an area where load reduction credit is being sought for PCBs or mercury control measures. The W/MAs identified in this report are based on ACCWP's ongoing source area identification screening program described in the Mercury and PCBs Control Measures Implementation Status Report (ACCWP, 2016). The W/MAs cover all Old Industrial and Old Urban areas but may also include some New Urban areas where appropriate. W/MAs were delineated through review by Program and Permittee staff of updated maps showing:

1. The results of 2015 PCBs source property screening categorizing Old Industrial parcels as high, moderate, or low/no likelihood of ongoing PCBs discharge;
2. Known past or ongoing PCBs source properties from the CW4CB Task 3 referrals and state environmental databases: Department of Toxic Substances Control EnviroStor, and the State Water Resources Control Board (State Water Board) Geotracker; and

⁷ Because Alameda County watersheds generally comprise widely varying land uses with differing potentials for load reductions, W/MAs for ACCWP Permittees are generally based on land use groupings or existing planning zones relevant to implementation and tracking of control measures, rather than hydrological boundaries.

3. Land use classifications (i.e., Old Industrial, Old Urban, New Urban, and Open Space) originally defined and mapped for the Integrated Monitoring Report (ACCWP, 2014) and updated in ACCWP (2016).

These factors were used to create approximate delineations based on the geography within each Permittee’s jurisdiction using best professional judgement and Permittee input. If applicable, W/MA boundaries were aligned with existing delineations in a city’s General Plan, Specific Plans, and/or Redevelopment Plans. Categorical W/MAs were also created for the non-municipally owned electrical utility (i.e., PG&E) and railroad properties (note, the categorical W/MAs can exist within or create “holes” in the other geographically based WM/As).

Details of the W/MAs and identified control measures will evolve over time as the Permittees learn more about these areas through implementation of the control measures.

The two flood control Permittees (ACFCWCD and Zone 7 Water Agency) own and manage specific storm drainage conveyances and related facilities, which may include creeks, channels, levees, pump stations, dams, and reservoirs. Report Sections 18 and 19 show the general locations of key facilities for each of these Permittees, with descriptions of potential opportunities for load reductions that may occur in conjunction with capital projects or maintenance activities. Any documented load reductions from such control measures would be credited to the municipal permittee(s) having jurisdiction over the associated drainage area.

1.3.3 Roles and Responsibilities for Implementation of Control Measures

Table 1-1 below summarizes, for each control measure, the roles and responsibilities of the Permittees, ACCWP, and BASMAA. In a general sense, screening/sampling will primarily be conducted by ACCWP, establishment of regional frameworks is conducted by BASMAA, and adoption and implementation of control measures is conducted by the Permittees.

Table 1-1: Control Measure Roles and Responsibilities

Control Measure Category	Roles and Responsibility		
	Permittee	Program	BASMAA
Source Property Identification and Abatement	<ul style="list-style-type: none"> • Work with Program to design monitoring program. • Prepare referral forms, including identification of enhanced operation and maintenance (O&M). • Implement enhanced O&M for referred properties. 	<ul style="list-style-type: none"> • Design and conduct Pollutants of Concern monitoring. • Compile and submit referrals to SFBRWQCB. • Coordinate with BASMAA on ongoing control measure adaptive management. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at Monitoring / Pollutants of Concern Committee (MPC).
Green Infrastructure / Treatment Control Measures	<ul style="list-style-type: none"> • Prepare a GI Plan. • Implement GI projects. • Gather data on C.3 projects. 	<ul style="list-style-type: none"> • Support GI planning. • Compile data on C.3 projects. 	<ul style="list-style-type: none"> • Coordinate GI planning at Development Committee. • Discuss control measure implementation and adaptive management at MPC Committee.
Managing PCBs in Building Materials	<ul style="list-style-type: none"> • Participate in BASMAA Regional Project. • Adopt Framework. 	<ul style="list-style-type: none"> • Assist BASMAA Regional Project. 	<ul style="list-style-type: none"> • Develop Framework through Regional Project.
Managing PCBs in Infrastructure	<ul style="list-style-type: none"> • Participate in BASMAA Regional Project. 	<ul style="list-style-type: none"> • Assist BASMAA Regional Project. • Conduct monitoring. 	<ul style="list-style-type: none"> • Develop monitoring plan and report monitoring results via Regional Project.
Enhanced O&M	<ul style="list-style-type: none"> • Implement enhanced O&M where identified. 	<ul style="list-style-type: none"> • Coordinate with BASMAA on ongoing control measure adaptive management. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at MPC Committee.
Diversion to Publicly Owned Treatment Works (POTW)	<ul style="list-style-type: none"> • Implement diversion where identified. 	<ul style="list-style-type: none"> • Coordinate with BASMAA on ongoing control measure adaptive management. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at MPC Committee.
Mercury Load Avoidance and Reduction	<ul style="list-style-type: none"> • Conduct collection events. 	<ul style="list-style-type: none"> • Compile and track data. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at MPC Committee.
Illegal Dumping Cleanup	<ul style="list-style-type: none"> • Identify illegal dumping sites. • Conduct/coordinate cleanup. 	<ul style="list-style-type: none"> • Compile and track data. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at MPC Committee.
Stockpiles, Spills, and Disposal of PCBs	<ul style="list-style-type: none"> • Identify facilities through routine inspections. • Conduct/coordinate cleanup. 	<ul style="list-style-type: none"> • Compile and track data. 	<ul style="list-style-type: none"> • Discuss ongoing control measure implementation and adaptive management at MPC Committee.

In addition, the Permittees are tracking control measure implementation and reporting load reductions using the GIS Project Tracking and Load Reduction Accounting Tool, which

incorporates the Interim Accounting Methodology to estimate load reductions. This report compiles and reports the county-wide list of site referrals and overall load reductions as well as the MRP permit area-wide list of site referrals and overall load reductions.

Although each Permittee’s administrative structure is unique, Table 1-2 summarizes, in general, the roles and responsibilities of the main city or county departments that may be related to implementation of selected control measures. For some Permittees, additional departments may share responsibilities for some implementation activities.

Table 1-2: Permittee Department Roles and Responsibilities

Department	Typical Role / Responsibility
Public Works	<ul style="list-style-type: none"> • Creeks, watersheds, and stormwater management • Public facility services and maintenance • Engineering and construction services • Capital improvement projects
Community Development / Planning Department	<ul style="list-style-type: none"> • Planning/zoning/General Plan development • Development project review & approvals • Construction and building inspections

1.3.4 Load Reduction Methodology

MRP Provisions C.11.a and C.12.a require the Permittees to demonstrate cumulative Bay Area-wide and Program area-specific mercury and PCBs load reductions over the current permit term. MRP Provisions C.11.b and C.12.b required the Permittees to develop and implement an assessment methodology and data collection program to quantify mercury and PCBs loads reduced through implementation of pollution prevention, source control, and treatment control measures. The Permittees developed an *Interim Accounting Methodology Report* (BASMAA, 2017) to document the load reduction accounting assessment methodology that is used to demonstrate progress towards achieving the load reductions required in this permit term. This report was approved by the SFBRWQCB in May 2017. The Interim Accounting System is based on relative mercury and PCBs yields from different land use categories. The method involves using default factors for PCBs and mercury load reduction credits resulting from foreseeable control measures implemented during this permit term. This report implements the Interim Accounting System to estimate the mercury and PCBs loads reduced presented in Section 20.

MRP Provisions C.11.b and C.12.b. require the Permittees to submit, in 2018 and subsequent Annual Reports, refinements to the mercury and PCBs load reduction assessment methodology to assess load reductions in the next permit term. Those refinements are documented in the

BASMAA Source Control Load Reduction Accounting for Reasonable Assurance Analysis Report, which was submitted with the Fiscal Year 2019/20 Annual Report. Comments were received from the Regional Water Board on the report in April 2021. A revised report was approved by the Executive Officer in January 2022. The revised accounting system will be used to estimate the mercury and PCBs load reduced in the next permit term (i.e., beginning in Fiscal Year 2022/23).

2 Description of Control Measures

This section provides a general description of the types of control measures that are currently being implemented to control PCBs and mercury. Each Permittee has identified the control measures that are currently being implemented in each watershed/management area in the Permittee-specific sections begin with Section 3.

2.1 Source Property Identification and Abatement

Source property identification and abatement involves investigations of properties located in historically industrial land use or other land use areas where PCBs were used, released, and/or disposed of and where sediment concentrations have been found at levels significantly above urban background levels. The source property identification and abatement control measure begins with performing investigations of these “High Likelihood” areas to identify PCBs sources to the municipal storm drain system. Once a source property is identified, the source of PCBs on the property may be abated or caused to be abated directly by the Permittee or the Permittee may choose to refer the source property to the SFBRWQCB for investigation and abatement by the SFBRWQCB or another appropriate regulatory agency with investigation and cleanup authority. Source properties may include sites that were previously remediated or are currently being remediated but have PCBs soils cleanup levels that are elevated above urban background levels or may be newly identified source properties.

The Permittees will validate the existence of significantly elevated PCBs concentrations through surface soil/sediment sampling in the right-of-way or stormwater sampling in the storm drain system where visual inspections and/or other information suggest that a specific property is a potential source of significantly elevated PCBs concentrations. Where data confirm significantly elevated PCBs concentrations (e.g., a sediment concentration equal to or greater than 1.0 milligram per kilogram (mg/kg) or a concentration greater than 0.5 mg/kg plus other lines of evidence) are present in soil/sediment from a potential source property or in stormwater samples, the Permittees will take actions to cause the property to be abated or will refer that property to the SFBRWQCB to facilitate the issuance of orders for further investigation and remediation of the subject property.

For each confirmed source property, the Permittee will implement or cause to be implemented, where appropriate, one or a combination of interim enhanced operation and maintenance (O&M) measures in the street or storm drain infrastructure adjacent to the source property during the source property abatement process to remove historically deposited sediment and/or to prevent further contaminated sediment from entering the storm drain. These enhanced O&M measures are described in the source property referral that is sent to the SFBRWQCB. If the Permittee finds that enhanced O&M measures are not feasible to implement, the Permittee must discuss these findings with the SFBRWQCB prior to submitting the source property referral. The

SFBRWQCB will review the source property referral and provide comments to the Permittee within 30 days (if needed).

For those source properties that are self-abated (i.e., by the Permittee or the property owner), the Permittee will provide the Regional Water Board with sufficient documentation that source property abatement has effectively eliminated the transport of PCBs or mercury offsite and from entering the MS4 infrastructure for all transport mechanisms that apply to the site (e.g., stormwater runoff, wind, vehicle tracking). This documentation will include information on the type and extent of abatement that has occurred (e.g., have the sources of PCBs to the MS4 been completely eliminated via capping, paving, walls, plugging/removal of internal storm drains, etc.) and any available water or sediment monitoring data that demonstrates the effective elimination of transport of PCBs offsite into the MS4.

ACCWP, in collaboration with the Permittees, is conducting ongoing targeted investigation and monitoring for known or suspected source properties. Source identification is one of five priority Pollutants of Concern (POC) management information needs to be addressed by monitoring required under MRP provision C.8.f. The allocation of sampling effort for POC monitoring is described in the ACCWP POC Monitoring Report, due October 15 of each year, as required by MRP provision C.8.h.iv. Additionally, future source property investigations may be conducted by the Program and/or Permittees as a result of new information (e.g., as a result of industrial inspections, spill reporting, or development activities).

The properties that have been referred to the SFBRWQCB or reported as self-abated through FY 2021/22 are listed in Table 2-1 below. No new site referrals are included for this fiscal year.

Table 2-1: Contaminated Sites Referred to the SFBRWQCB

SITE NAME	LOCATION	PROPERTY SIZE (ACRES)	YEAR REFERRED	REFERRAL OR SELF-ABATEMENT
AMG	3438 Helen Street, Oakland	0.43	FY 2017/18	Referral
Custom Alloy Scrap Sales	2601 Peralta St., Oakland	7.65	FY 2017/18	Referral
Former Giampolini Facility	2838 Hannah St., Oakland	1.93	FY 2017/18	Self-Abatement
General Electric – Oakland (Phase I)	5441 East 14th St., Oakland	10.1	FY 2017/18	Self-Abatement
LBNL Old Town	One Cyclotron Rd., Berkeley	1.0	FY 2017/18	Self-Abatement
OAB Transformer Spill	10th and Maritime St., Oakland	0.02	FY 2017/18	Self-Abatement
Precision Cast Products	1549 32nd Street and 2868 Hannah Street, Oakland	0.79	FY 2017/18	Referral
South SPRR/Novartis	4560 Horton St., Emeryville	0.03	FY 2017/18	Self-Abatement
UPRR – Oakland Coliseum	700 73rd Avenue, Oakland	0.40	FY 2017/18	Referral
Schnitzer Steel	1101 Embarcadero West, Oakland	33.7	FY 2019/20	Referral
General Electric Oakland (Phase 2)	5441 East 14th St., Oakland	13.9	FY 2019/20	Self-Abatement
Kaiser Medical Center	280 West MacArthur Blvd, Oakland	3.6	FY 2019/20	Self-Abatement
OES-21	Wood Street and 15 th Street, Oakland	6.2	FY 2019/20	Self-Abatement
Brownfield Auto Auction (former Nor-Cal Rock)	768 46 th Avenue, Oakland	1.8	FY 2019/20	Referral
Economy Lumber	750 High Street, Oakland	0.4	FY 2019/20	Referral

2.2 Green Infrastructure / Treatment Control Measures

This control measure includes new development and redevelopment projects on private and public properties regulated by Provision C.3, as well as retrofit of existing infrastructure in public right-of-way (ROW) areas and on public properties not subject to Provision C.3. Retrofit includes the installation of full trash capture devices (i.e., hydrodynamic separators (HDS) units or inlet-based devices) for the purposes of compliance with MRP Provision C.10, which capture sediment in addition to trash and therefore remove PCBs and mercury.

Permittees have been identifying existing C.3 projects as part of this control measure and, in compliance with the requirement of MRP Provision C.3.b.i.(2), are tracking development projects that are subject to C.3. over this permit term.

In addition, the Permittees have been conducting an ongoing review of opportunities for incorporating GI into existing and planned capital improvement projects over this permit term (a.k.a., no missed opportunities) in compliance with MRP Provision C.3.j. MRP Provision C.3.j also required the Permittees to submit a Green Infrastructure Plan for the inclusion of low impact development drainage design into storm drain infrastructure on public and private lands with the 2019 Annual Report. These plans summarize the amount of existing impervious surface to be retrofit with GI by 2020, 2030, and 2040; map existing public and private projects that incorporated GI from 2003 – 2019; describe any early implementation projects; and list and map potential public retrofit projects from 2020 – 2040.

2.3 Managing PCBs In Building Materials and Infrastructure

2.3.1 PCBs in Building Materials

During the first three years of the permit term, the Permittees developed, in cooperation with BASMAA, a program and protocol for managing materials with PCBs concentrations of 50 ppm or greater in applicable structures at the time such structures undergo demolition. PCBs from these structures can enter storm drains during and/or after demolition through vehicle track-out, airborne releases, soil erosion, stormwater runoff, or improper waste disposal. For MRP compliance, applicable structures commercial, public, institutional, and industrial structures constructed between the years 1950 and 1980 and with building materials with PCBs concentrations of 50 ppm or greater. Single-family residential and wood frame structures are exempt. Each of the Permittees began implementing the PCBs management program and protocol on July 1, 2019.

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in building materials. This Regional Project developed an implementation framework, guidance materials, and tools for local agencies to ensure that PCBs-containing materials and wastes are properly managed during building demolition. This Regional Project also developed training materials and conducted trainings for municipal staff and outreach workshops for the industry on implementing the framework/protocols developed via the project. The tools and materials developed as part of the project build upon materials and outputs developed in 2010-2011 by

the PCBs in Caulk Project⁸ conducted by the San Francisco Estuary Partnership in partnership with BASMAA, as well as subsequent and parallel activities by BASMAA.

In addition, BASMAA has developed an assessment methodology and data collection program to quantify the PCBs loads reduced through implementation of the protocol developed by the BASMAA Regional Project, summarized below:

1. The municipality informs demolition permit applicants that their projects are subject to the MRP Provision C.12.f requirements, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.
2. For every demolition project, applicants complete and submit a version of BASMAA's model "PCBs Screening Assessment Form" (Screening Form) or equivalent to the municipality.
3. The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
4. The municipality then issues the demolition permit or equivalent, according to its procedures.
5. For Applicable Structures only, the municipality submits completed Screening Forms and any supporting documents (consultant's report from PCBs building survey, QA/QC checklist, and lab reports) to its countywide program; forms for exempt sites need not be submitted. Forms should be submitted to the countywide programs electronically if feasible, and at a minimum annually, but quarterly is preferred.
6. The countywide programs compile the completed Screening Forms and any supporting documents. The countywide program then works with the other MRP countywide programs through BASMAA to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

Data collection started with implementation of the new program on July 1, 2019. When sufficient amounts of new data have been collected, the data will support:

⁸ Initially funded through a State Water Board Proposition 50 grant, and later completed with support from the State Revolving Fund under the American Recovery and Reinvestment Act of 2009.

- Development of a revised estimate of the reduction in PCBs loading to stormwater runoff resulting from implementation of the new program, and
- Evaluation of various aspects of the PCBs management program and the effectiveness of potential future refinements.

To facilitate a regional approach, the countywide programs developed a regional data management system to compile and evaluate all the data generated by the new programs to manage PCBs during building demolition. The data management system also provides a mechanism for Permittees to gather and store the data needed for other closely related reporting requirements, such as tracking the number of applicable structures that applied for a demolition permit that reporting year and a running list of those structures that had materials with PCBs concentrations ≥ 50 ppm, including addresses and demolition dates.

2.3.2 PCBs in Infrastructure

PCBs may also be found in storm drain or roadway infrastructure in public rights-of-way, from use of materials such as caulk and sealants in storm drains and between concrete curbs and street pavement. The Program and Permittees have conducted a study to investigate whether PCBs are present locally in such materials and in what concentrations. A project report prepared by the BASMAA Regional Project was included in the Alameda Countywide Clean Water Program Fiscal Year 2017/18 Annual Report. The results of these investigations will inform the development and implementation of control measures to address this potential source of PCBs into the storm drain system.

2.4 Enhanced Operation and Maintenance

Routine MS4 O&M activities include street sweeping, drain inlet cleaning, and pump station maintenance. In addition, culverts and channels are also routinely maintained (i.e., desilted). Enhancements to routine operations and new actions such as storm drain line and street flushing may enhance the Permittees' ability to reduce PCBs and mercury in stormwater. PCBs load reductions achieved through implementation of enhanced O&M control measures, aside from enhanced O&M control measures associated with source property referrals, may be counted as part of the overall load reductions during this permit term.

Many of the Permittees have installed inlet-based full trash capture devices in response to the trash control requirements of MRP Provision C.10. These devices enhance the capture of sediments that may be contaminated with PCBs. In addition, these inlets are typically cleaned more frequently as a result of the installation of the full trash capture device. Therefore, these Permittees are conducting an enhanced O&M activity for each of these inlets. The load reduction

achieved by this enhanced O&M implementation effort was estimated in the 2017/18 annual report⁹. This estimate does not reflect any increases in enhanced O&M efforts in FY 2021/22.

The following assumptions were used for calculating the reported loads reduced by enhanced O&M control measures:

- Inlet-Based Trash Devices Cleaning
 - Basket, connector pipe screen (CPS), and inlet filters that are listed in the AGOL system were included. The drainage area listed for each device was used for the load reduction calculation. Only operational devices installed since FY 2013-14 were included.
 - If cleanout was stated to occur three times per year, a 'quarterly' frequency was assumed for the purposes of the calculation, as three times per year is not a viable calculation option per the Interim Accounting Methodology. This assumption is assumed to be equivalent to quarterly cleanouts, as a mid-dry season cleanout occurrence is considered superfluous for the purposes of sediment removal.
 - The default trash device cleanout frequency enhancement is from annual to semi-annual, as this cleanout frequency is required by MRP Provision C.10, unless a more frequent frequency was reported by the Permittee (or no enhancement was reported).
- Desilting

Permittees have conducted some desilting; however, the data needed to estimate loads reduced are difficult to collect for these projects. Therefore, there is no desilting load reduction included in the estimate.

2.5 Diversion to POTW

This control measure consists of diverting dry weather and/or first flush events from MS4s to publicly owned treatment works (POTWs) as a method to reduce loads of PCBs and mercury in urban runoff. A feasibility evaluation was prepared during the previous permit term (BASMAA, 2010) that developed selection criteria and information needs for evaluating potential diversion

⁹ The load reduction estimates account only for the change in inlet cleaning frequency, per the Interim Accounting Methodology, and do not estimate loads reduced due to the increase in sediment captured by the inlet-based full trash capture devices.

projects and identified candidate pilot projects in the five counties covered by the MRP. This report also reviewed POTW constraints and concerns regarding diversion projects that were presented in a draft white paper (BACWA, 2009), including:

1. Capacity limits on POTWs and conveyance systems may require restricting diversion flows and limiting attainable load reduction benefits, especially since transport of PCBs loads in the MS4 predominantly occurs during higher flows in wet weather.
2. Potential of stormwater pollutants to disrupt advanced treatment systems or to negatively affect the facility's compliance with NPDES numerical effluent limits or waste discharge requirements to control sanitary sewer overflows.
3. Not all POTWs own the collection and conveyance systems that serve them, which could require additional negotiations with the entity or entities that own the collection system.

The cost scenarios for conceptual examples of diversion projects presented in the feasibility evaluation varied depending on the details of physical diversion and operations. Ongoing costs of diversion may be high in relation to load reduction benefits unless the receiving POTW agrees to waive treatment fees.

The Alameda County Flood Control and Water Conservation District is diverting low flows from the Ettie Street Pump Station to the East Bay Municipal Utility District's main wastewater treatment plant for treatment. See Section 18 for further information.

2.6 Source Controls and Other Control Measures

2.6.1 Mercury Load Avoidance and Reduction

Mercury load avoidance and reduction includes a number of source control measures listed in the California Mercury Reduction Act adopted by the State of California in 2001. These source controls include material bans, reductions of the amount of mercury allowable for use in products, and mercury device recycling. The following source controls bans are included:

- Sale of cars that have light switches containing mercury;
- Sale or distribution of fever thermometers containing mercury without a prescription;
- Sale of mercury thermostats; and
- Manufacturing, sale, or distribution of mercury-added novelty items.

In addition, fluorescent lamps manufacturers continue to reduce the amount of mercury in lamps sold in the U.S. Manufacturers have significantly reduced the amount of mercury in fluorescent linear tube lamps.

Mercury Device Recycling Programs resulting in Mercury load reduction generally include three types of programs that promote and facilitate the collection and recycling of mercury-containing devices and products:

- Permittee-managed household hazardous waste (HHW) drop-off facilities and curbside or door-to-door pickup;
- Private business take-back and recycling programs (e.g., Home Depot); and,
- Private waste management services for small and large businesses.

2.6.2 Illegal Dumping Clean-Up

This source control measure entails clean-up of construction and demolition debris from illegal dumping areas. This control measure will apply to construction and demolition illegal dumping only during this permit term but may be expanded to other types of illegally dumped trash if supported by monitoring data.

2.6.3 Stockpile, Spills, and Disposal of PCBs

This control measure includes the proper clean-up and disposal of stockpiles, spills, and/or improperly disposed quantities of PCBs. The measure would involve, for instance, a concentrated source of PCBs (e.g., a barrel) that is found and cleaned-up or properly disposed and the clean-up of transformer spills by PG&E.

ACCWP and BASMAA representatives have been working with SFBRWQCB staff to ensure thorough documentation and clean-up completion of PG&E PCBs transformer spills. PCBs transformer spill reporting is inconsistent through the California Governor's Office of Emergency Services reporting system and often cases are closed before the municipality or SFBRWQCB staff hear of the spill. This activity could have a significant effect on where PCBs in the public right-of-way are found, as many spills happen in residential areas. Residential areas are not typically considered high likelihood areas for PCBs, so no other control measures have been developed specifically for these areas. SFBRWQCB and BASMAA representatives are working on better defining agency roles and responsibilities in responding to spills, at least for their own agencies, and are working on getting PG&E to cooperate to make a smoother and more transparent process as in order to reduce the loading of PCBs into the San Francisco Bay.

BASMAA conducted a regional Stressor/Source Identification (SSID) project, in compliance with MRP Provision C.8.e, that developed a regional SSID workplan to further understand the magnitude and extent of PCBs released by electrical utility equipment spills, and to identify controls that could be implemented to reduce the water quality impacts of this source. In FY 2018-19, the regional SSID project developed the SSID workplan. As a result of this project,

BASMAA sent a letter to the SFBRWQCB requesting that the Regional Water Board use its authority under Section 13267 of the California Water Code to compel private electrical utilities operating in the Bay Region to provide technical information that is needed to support further investigation of electrical utility equipment and properties as potential sources of PCBs to MS4s in the Bay Region.

3 City of Alameda

3.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Alameda are listed in Table 3-1 below. These W/MAs drain to the Lower segment of the Bay.

Table 3-1: City of Alameda PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Alameda Beltline	272.4	18.4%	77.0%	2.0%	2.6%	0%
Alameda Old Urban	3,077.5	0%	100.0%	0%	0%	0%
Alameda Point	1,706.3	0%	9.3%	1.9%	1.5%	87.3%
Categorical Railroad	182.5	11.1%	64.5%	2.9%	5.5%	16.0%
Northern Waterfront – East	529.7	14.6%	80.1%	4.3%	0.9%	0%
Northern Waterfront – West	846.5	0%	53.3%	1.1%	5.6%	40.0%
Northern Waterfront Planning Area	367.3	30.8%	63.2%	4.1%	1.9%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented during the term of the permit in each of these W/MAs are summarized in Table 3-2 and are described in the sections below.

Table 3-2: City of Alameda Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	343.3	8.2%	6.4%	5.8%	57.1%	22.5%
Trash Full Capture Devices ¹	6.1	45.9%	54.1%	0%	0%	0%
Enhanced O&M Measures	1178.8	1.4%	88.7%	4.5%	1.8%	3.5%

Notes: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

- 1 Includes only Hydrodynamic Separator (HDS) units.

3.2 Scope and Schedule of PCBs Control Measures

3.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Alameda have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

3.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs is subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. On-going development and redevelopment activity completed during the current reporting period within the City of Alameda has resulted in the conversion of old industrial and old urban parcels to renewed urban areas with C.3 stormwater treatment measures. See the City of Alameda's Green Infrastructure Plan for further information.

3.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Alameda began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

3.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Alameda include clean out of inlet-based full trash capture devices on a semi-annual basis.

3.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

3.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The City of Alameda actively implements mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The City of Alameda continues to actively identify and cleanup (or direct private property owners to do so) illegal dumping of construction and demolition debris when and where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs. As noted above, there have not been any source property identifications made or, specifically, any PCBs stockpile or spill response actions within the City this reporting period.

4 City of Albany

4.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Albany are listed in Table 4-1 below. These W/MAs drain to the Central segment of the Bay.

Table 4-1: City of Albany PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Albany Old Industrial	39.2	100%	0%	0%	0%	0%
Albany Old Urban	2,998.2	0%	100%	0%	0%	0%
Categorical PG&E	0.8	6.0%	94.0%	0%	0%	0%
Categorical Railroad	54.6	27.1%	71.1%	0%	1.8%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented during the term of the permit in each of these W/MAs are summarized in Table 4-2 and are described in the sections below.

Table 4-2: City of Albany Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	8.5	20%	80%	0%	0%	0%
Trash Full Capture Devices ¹	--	--	--	--	--	--
Enhanced O&M Measures	384.3	6.7%	91.3%	2.0%	0%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, and FY 21-22.

- 1 Includes only Hydrodynamic Separator (HDS) units.

4.2 Scope and Schedule of PCBs Control Measures

4.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Albany have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

4.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs is subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Albany's Green Infrastructure Plan for further information.

4.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Albany began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

4.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Albany include clean out of inlet-based full trash capture devices on a semi-annual basis.

4.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

4.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

5 City of Berkeley

5.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Berkeley are listed in Table 5-1 below. These W/MAs drain to the Central segment of the Bay.

Table 5-1: City of Berkeley PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Berkeley Old Urban	7,432.3	0%	100%	0%	0%	0%
Categorical PG&E	4.4	63.6%	16.4%	0%	20.0%	0%
Categorical Railroad	71.6	48.2%	50.6%	0.2%	1.0%	0%
West Berkeley	1,501.2	26.1%	60.2%	9.4%	4.3%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 5-2 and are described in the sections below.

Table 5-2: City of Berkeley Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	1.0	100%	0%	0%	0%	0%
Green Infrastructure and Treatment	36.4	17.6%	76.4%	6.0%	0%	0%
Trash Full Capture Devices ¹	-	-	-	-	-	-
Enhanced O&M Measures	1544.3	5.2%	91.9%	2.8%	0.1%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

- 1 Includes only Hydrodynamic Separator (HDS) units.

5.2 Scope and Schedule of PCBs Control Measures

5.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

One property within the City of Berkeley has been referred to the SFBRWQCB as a result of the inspection and monitoring activities conducted by the Program: Lawrence Berkeley National Laboratory (LBNL), Old Town Demolition Phase I (see Table 5-3 below)

Table 5-3: Source Property Referral

SITE NAME	LOCATION	AREA (acres)	YEAR ABATED/REFERRED
Lawrence Berkeley National Laboratory	One Cyclotron Road, Berkeley	1.0	2018

LBNL is located above the UC Berkeley campus. LBNL was known as the California Radiation Laboratory when it began operations in 1931 as an accelerator laboratory at the UC Berkeley campus. In 1939, the Laboratory relocated to the area now known as LBNL's Old Town. Extensive scientific research was conducted and among others, research projects involved the Horton Sphere and the 184-inch cyclotron accelerator. Building 6 housed the accelerator and until the 1940s was the center of the Laboratory. Shops and research laboratories were built around and beyond Building 6 between the 1940s and 1950s. The seven buildings within the Old Town Demolition Phase I Project footprint were Buildings 5, 16, 16A, 40, 41, 52, and 52A. The superstructures of these buildings have been demolished and only the foundation slabs remain. Ancillary outdoor facilities within the Site's footprint include an electrical pad for transformers and switching gear (only the pad remains) and a former waste processing yard.

Ongoing Investigations

Ongoing investigations may result in property referrals in the future.

5.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Berkeley's Green Infrastructure Plan for further information.

5.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Berkeley began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

5.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Berkeley include clean out of inlet-based full trash capture devices on a semi-annual basis.

5.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

5.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

6 City of Dublin

6.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Dublin are listed in Table 6-1 below. These W/MAs drain to the Arroyo de la Laguna branch of the Alameda Creek watershed.

Table 6-1: City of Dublin PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Dublin Old Urban	2,684.3	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 6-2 and are described in the sections below.

Table 6-2: City of Dublin Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	1806.0	0%	5.9%	15.0%	76.4%	2.6%
Trash Full Capture Devices ¹	289.7	0%	76.0%	13.5%	10.5%	0%
Enhanced O&M Measures	1105.4	1.0%	36.0%	38.3%	24.7%	0%

Note: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

- 1 Includes only Hydrodynamic Separator (HDS) units.

6.2 Scope and Schedule of PCBs Control Measures

6.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Dublin have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

6.2.2 Green Infrastructure / Treatment Control Measures

The City of Dublin will evaluate which GI projects it will implement as part of its GI Work Plan. Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Dublin's Green Infrastructure Plan for further information.

6.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Dublin began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

6.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Dublin include clean out of inlet-based full trash capture devices on a semi-annual basis.

6.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

6.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

7 City of Emeryville

7.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Emeryville are listed in Table 7-1 below. These W/MAs drain to the Central segment of the Bay.

Table 7-1: City of Emeryville PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	13.4	99.4%	0%	0%	0.6%	0%
Categorical Railroad	42.6	95.0%	5.0%	0%	0%	0%
Emeryville Old Industrial	808.7	54.1%	37.0%	8.8%	0.1%	0%
Emeryville Old Urban	768.5	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 7-2 and are described in the sections below.

Table 7-2: City of Emeryville Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	0.03	100%	0%	0%	0%	0%
Green Infrastructure and Treatment	11.1	55.0%	41.4%	1.8%	1.8%	0%
Trash Full Capture Devices	--	--	--	--	--	--
Enhanced O&M Measures	48.7	64.1%	28.7%	7.0%	0.2%	0%

Note: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, and FY 21-22.

7.2 Scope and Schedule of PCBs Control Measures

7.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

One property within the City of Emeryville has been referred to the SFBRWQCB as a result of the inspection and monitoring activities conducted by the Program - the Former South Southern Pacific Railroad (SPRR) site (see Table 7-3 below).

Table 7-3: Source Property Referrals

SITE NAME	LOCATION	AREA (acres)	YEAR ABATED/REFERRED
Former South SPRR/Novartis Site	4560 Horton Street	0.03	2018

The Former South SPRR site is a long narrow strip of land approximately 45 feet wide and 1,100 feet long that is used as a parking lot for office buildings located on the Grifols property immediately west of the Former South SPRR. Grifols purchased the Former South SPRR from Novartis Vaccines & Diagnostics, Inc. (Novartis), formerly Chiron Corporation, in 2014. The PG&E Emeryville Materials Facility is located immediately east of the Former South SPRR. The eastern edge of the Former South SPRR is landscaped, including areas of uncovered soil; this area is approximately 5 feet wide. An SPRR railroad spur once extended south from Stanford Avenue, crossed 53rd Street, and continued south to 45th Street. In 2000, the northern portion of this former SPRR spur and the adjacent former PG&E property, also located north of 53rd Street, were redeveloped into Chiron Way and Novartis Building 4, respectively.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

7.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Emeryville’s Green Infrastructure Plan for further information.

7.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Emeryville began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

7.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Emeryville include clean out of inlet-based full trash capture devices on a semi-annual basis.

7.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

7.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

8 City of Fremont

8.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Fremont are listed in Table 8-1 below. These W/MAs drain to the South Bay and Lower South Bay segments of the Bay.

Table 8-1: City of Fremont PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	4,154.4	2.6%	5.0%	17.8%	74.6%	0%
Categorical Railroad	4,465.1	14.2%	19.0%	14.9%	51.9%	0%
Fremont Old Industrial	1,066.3	100%	0%	0%	0%	0%
Fremont Old Urban	12,642.7	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 8-2 and are described in the sections below.

Table 8-2: City of Fremont Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	783.8	0.6%	12.6%	33.4%	53.4%	0%
Trash Full Capture Devices ¹	177.8	7.5%	19.0%	73.5%	0%	0%
Enhanced O&M Measures	3,893.2	1.1%	50.1%	41.0%	7.8%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

- 1 Includes only Hydrodynamic Separator (HDS) units.

8.2 Scope and Schedule of PCBs Control Measures

8.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Fremont have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

8.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Fremont's Green Infrastructure Plan for further information.

8.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Fremont began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

8.2.4 Enhanced Operation and Maintenance Control Measures

No enhanced operation and maintenance control measures are proposed.

8.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

8.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

9 City of Hayward

9.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Hayward are listed in Table 9-1 below. These W/MAs drain to the Lower segment of the Bay.

Table 9-1: City of Hayward PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	390.0	4.6%	12.9%	42.7%	39.7%	0%
Categorical Railroad	908.0	27.5%	2.0%	61.6%	8.9%	0%
East Hayward	17,477.5	3.3%	61.0%	9.1%	23.9%	2.6%
West Hayward	10,201.3	15.9%	44.7%	30.9%	4.0%	4.5%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 9-2 and are described in the sections below.

Table 9-2: City of Hayward Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	365.6	26.6%	37.9%	25.8%	6.4%	3.4%
Trash Full Capture Devices ¹	1367.9	8.3%	86.2%	1.7%	1.5%	2.4%
Enhanced O&M Measures	995.7	7.3%	86.6%	2.8%	2.6%	0.7%

Notes: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

- 1 Includes Hydrodynamic Separator (HDS) and Gross Solids Removal Device (GSRD) units.

9.2 Scope and Schedule of PCBs Control Measures

9.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Hayward have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

9.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application would be made, such as demolition standards and applicable provisions of section C.3. See the City of Hayward's Green Infrastructure Plan for further information.

9.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Hayward began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

9.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Hayward include clean out of inlet-based full trash capture devices on a semi-annual basis.

9.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

9.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

10 City of Livermore

10.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Livermore are listed in Table 10-1 below. These W/MAs drain to the Arroyo de la Laguna branch of the Alameda Creek watershed.

Table 10-1: City of Livermore PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	309.9	0.7%	0%	98.5%	0.8%	0%
Categorical Railroad	470.3	48.8%	0%	10.2%	41.0%	0%
East Livermore	8,611.9	8.5%	0.1%	1.7%	89.7%	0%
Livermore Old Urban	5,594.9	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented are summarized in Table 3-2. These control measures are further described in the sections below.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 10-2 and are described in the sections below.

Table 10-2: City of Livermore Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	478.6	3.6%	9.1%	28.2%	59.0%	0%
Trash Full Capture Devices ¹	423.2	1.7%	86.5%	8.2%	3.7%	0%
Enhanced O&M Measures	1,493.6	0.7%	31.4%	49.4%	18.2%	0.4%

Notes: Control measure implementation data may be incomplete for FY 13-14 ,FY 14-15, and FY 21-22.

- 1 Includes only Hydrodynamic Separator (HDS) units.

10.2 Scope and Schedule of PCBs Control Measures

10.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Livermore have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

10.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Livermore's Green Infrastructure Plan for further information.

10.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Livermore began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

10.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Livermore include clean out of inlet-based full trash capture devices on a semi-annual basis.

10.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

10.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

11 City of Newark

11.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Newark are listed in Table 11-1 below. These W/MAs drain to the Lower and South Bay segments of the Bay.

Table 11-1: City of Newark PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	69.6	100%	0%	0%	0%	0%
Categorical Railroad	359.8	41.5%	35.9%	15.2%	7.4%	0%
Newark Industrial Area	747.0	38.6%	7.2%	52.3%	1.9%	0%
Newark Old Urban	2,897.4	0%	100%	0%	0%	0%

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 11-2 and are described in the sections below.

Table 11-2: City of Newark Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	172.2	31.4%	8.9%	39.5%	20.2%	0%
Trash Full Capture Devices	--	--	--	--	--	--
Enhanced O&M Measures	704.7	6.5%	55.7%	30.3%	7.5%	0%

Note: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

11.2 Scope and Schedule of PCBs Control Measures

11.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Newark have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

11.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Newark's Green Infrastructure Plan for further information.

11.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Newark began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

11.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Newark include clean out of inlet-based full trash capture devices on an annual basis.

11.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

11.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

12 City of Oakland

12.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Oakland are listed in Table 12-1 below. These W/MAs drain to the Central and lower segments of the Bay.

Table 12-1: City of Oakland PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical Railroad	1,700.0	42.8%	52.3%	2.8%	2.1%	0%
Oakland Army Base	994.5	69.0%	29.9%	1.0%	0.1%	0%
Oakland Old Industrial	1,766.4	100%	0%	0%	0%	0%
Oakland Old Urban	22,489.2	0%	100%	0%	0%	0%
Planned Redevelopment Areas (Includes Lake Merritt BART Station Area, Brooklyn Basin, International Boulevard TOD Plan, Central Estuary Area Plan, and Coliseum Area Specific Plan)	7,202.2	11.9%	79.2%	6.5%	2.4%	0%
Port-Related	5,023.3	32.8%	8.1%	5.1%	11.8%	42.2%
West Oakland	2,113.0	19.7%	69.3%	9.1%	1.8%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 12-2 and are described in the sections below.

Table 12-2: City of Oakland Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	79.0	100%	0%	0%	0%	0%
Green Infrastructure and Treatment	178.5	42.2%	52.0%	2.7%	3.1%	0%
Trash Full Capture Devices ¹	65.9	0%	94.4%	3.9%	1.7%	0%
Enhanced O&M Measures	255.9	1.0%	94.6%	3.4%	0.9%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, and FY 21-22.

- 1 Includes Hydrodynamic Separator (HDS) and Gross Solids Removal Device (GSRD) units installed since 2014.

12.2 Scope and Schedule of PCBs Control Measures

12.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

Thirteen properties within the City of Oakland have been referred to the SFBRWQCB as a result of the inspection and monitoring activities conducted by the Program (see Table 12-3 below).

Table 12-3: Source Property Referrals

SITE NAME	LOCATION	AREA (acres)	YEAR ABATED/REFERRED
AMG	3438 Helen Street	0.43	2018
CASS	2711 Peralta	7.2	2018
Former Giampolini	2847 Peralta Street and 2847 Peralta Street	1.9	2018
GE Oakland	5441 East 14th Street	10.1	2018
OAB Transformer Spill	10th and Maritime Street	0.02	2018
Precision Cast Products	1549 32nd Street and 2868 Hannah Street	0.79	2018
UPRR Oakland Coliseum	700 73rd Avenue	0.40	2018
Schnitzer Steel	1101 Embarcadero West	33.7	2020
General Electric – Oakland Phase 2	5441 East 14th Street	13.9	2020
Kaiser Medical Center	280 West MacArthur Blvd	3.6	2020
OES-21	Wood Street and 15 th Street	6.2	2020
768 46 th Avenue	768 46 th Avenue	1.8	2020
Economy Lumber	750 High Street	0.4	2020

Asbestos Management Group of California, Inc. (AMG) provides general construction services (abatement services) to remove hazardous materials (lead, asbestos, PCBs) from buildings that will be or have been demolished. AMG conducts both interior demolition and exterior demolition. AMG removes caulk and tiles (containing asbestos and PCBs) using hand tools, contains it in plastic, and stores it in an enclosed container onsite.

CASS is a large scrap metal recycling facility operating on four adjacent city blocks. The central facility is the main receiving and sorting area where individuals and small wholesalers deliver metal scrap loads. The eastern facility is where aluminum is taken to be melted down to ingots. The western facility is where large scrap is cut down to manageable sizes and bailed scrap is stored. The northern facility is their parking, machine shop, and community workspace.

The former Giampolini property is an irregularly shaped property bordered by Hannah Street on the west; Peralta Street to the south and Helen Street to the east. Residential and industrial properties border the site to the north. A paint facility was present on the south half of the Site from at least 1939 until the mid-1960s. The paint factory included a varnish kitchen operation. During this time period, the covered storage building on the northwest side of the site was

occupied by a reinforcing steel (rebar) bending and storage facility. Foreign Auto Wreckers operated an automobile dismantling business at the Site from the 1980s until 2000.

General Electric Company – Oakland, located in East Oakland, was a transformer manufacturing facility between 1924 and 1975. Between 1975 and the mid-1990s, GE Apparatus Service Department operated an electrical equipment maintenance and repair operation in portions of the site. After that time, the site was used for temporary storage of mobile office trailers. Since 2005, the site has not been in use, but has been undergoing remediation. Phase I of the remediation was performed from August 2013 through March 2015 and was submitted as a self-abatement in FY2017/18. Phase II includes demolition and remediation associated with the eight remaining buildings on the site. After building demolition and remediation, which is planned for completion prior to December 31, 2020, a new industrial building will be constructed with landscaping. This site is being reported as a self-abatement.

A transformer oil spill containing 17 mg/kg of PCBs was cleaned-up at an Oakland Army Base site in October 2014, as described in section 12.2.6.

The Precision Cast Products site (parcels 7-589-1 and 7-589-24) has addresses for 1549 32nd Street and 2868 Hannah Street. From the 1940's to 1983, the site heat-treated metal products, and operated as a steel foundry from 1983 to 2002. A putty and paint factory also operated at the site until 1985. The site is currently a vacant lot. The City of Oakland has approved building permit plans for the proposed "Hannah Street Lofts" redevelopment project contingent upon clearance of environmental conditions at the site.

The Union Pacific Railroad (UPRR) site is located in the vicinity of the Oakland Coliseum Complex. The property is divided into a "northern" and a "southern" portion. The "northern" portion currently serves as a parking lot for the adjacent Oakland Intercity Rail Station. The "southern" portion (defined as the site) is located southeast of 73rd Avenue and is an unpaved vacant lot enclosed by fencing. The site was acquired by Central Pacific Railroad in 1895 and used as a station depot between 1895 and 1933. From 1959 to 1992, the site was leased to two successive tenants and operated as an auto salvage yard. Since 1992, the site has been vacant and unoccupied.

Schnitzer Steel Industries, Inc. is a scrap metal recycling facility located in West Oakland with a long history of soil and groundwater contamination. The SFBRWQCB issued Cleanup and Abatement Orders Nos. 88-023 and R2-2013-1001 to Schnitzer Steel Industries, Inc. in 1988 and 2013 and waste discharge requirements (WDRs; Order No. R2-2016-0045, NPDES Permit CA0030228) for discharges of treated process water, cooling water, dust suppression water, wash water, and stormwater to the facility in 2016. The RWB issued a Water Code Section 13267 Technical Report Requirement order in February 2017. This site is being referred to the SFBRWQCB.

The Kaiser Permanente Oakland Legacy Hospital Tower was a 14-story hospital building with a basement constructed in various phases between the 1940s and 1980s. Sources of PCBs in the facility included caulk, rubber gaskets, and certain metal panels on the building façade that were in contact with PCBs-containing materials. The building was demolished, and the site was landscaped in 2019. This site is being reported as a self-abatement.

OES-21, located at Wood Street and 15th Street, was historically associated with railroad activity. Field sediment sampling performed in the right-of-way adjacent to the property in 2015 measured a PCBs concentration of 2.149 mg/kg. The site has since been redeveloped into a residential housing complex.

Brownfield Auto Auction (former Nor-Cal Rock), located in East Oakland, is currently a storage yard for used automobiles sold for auto auction, was previously operated as a concrete and asphalt recycling business, and prior to that as a scrap metal yard. Seven samples collected from six soil boring locations contained concentrations greater than 1.0 mg/kg. As the site drains directly to an open channel section of Peralta Creek, there is no opportunity for the City of Oakland to implement enhanced O&M measures. Therefore, no load reduction credit has been taken for this source property referral.

The Economy Lumber site is located in East Oakland along the Union Pacific Railroad tracks, extending southeast from High Street to an open channel section of Peralta Creek. The parcel has been used historically for railroad operations, scrap metal operations, and an auto body repair shop. A small portion of the site is unpaved; a work plan for paving has been approved, but as of June 2020, the paving had not yet been completed. As the site drains directly to an open channel section of Peralta Creek, there is no opportunity for the City of Oakland to implement enhanced O&M measures. Therefore, no load reduction credit has been taken for this source property referral.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

12.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure project within each of the W/MAs is subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Oakland's Green Stormwater Infrastructure Plan for further information.

C.3/Redevelopment

A W/MA has been designated for the Oakland Army Base and one W/MA has been designated for the other planned redevelopment areas combined, based on existing Specific Plan and/or

Redevelopment Plan boundaries. The planned redevelopment in these W/MAs is described below.

Oakland Army Base

The Oakland Army Base is a 360-acre area bounded by Interstate 80, East Bay Municipal Utility District wastewater treatment plant, Oakland Inner, Middle and Outer Harbor (Port of Oakland), Interstate 880, and 7th Street. The Army Base served as a U.S. Army facility until it closed in 1999. In 2000, the Oakland City Council designated the Base and surrounding properties as a Redevelopment Project Area. The 1,800-acre Army Base Project Area was divided into three major sub-districts: 16th and Wood, Maritime, and Oakland Army Base (OARB). The OARB was further divided into two areas - the Gateway Development Area owned by the Oakland Redevelopment Agency, and the Port Development Area owned by the Port of Oakland. Following the dissolution of the Redevelopment Agency in 2012, the Gateway Development Area was transferred to the City by deed, and the City assumed all of the environmental obligations attached to the entire former OARB sub-district, and all of the redevelopment obligations for the Gateway Development Area.

On July 3, 2012, the Oakland City Council approved a master plan for the development of a mixed-use project of commercial, maritime, rail, and open space uses on the former Army Base and adjacent Port property (the "Oakland Army Base Project"). Since then, the City has accomplished the following major milestones:

- On October 23, 2012, the City executed a Lease Disposition and Development Agreement (LDDA) with Prologis CCIG Oakland Global to develop the public infrastructure and approximately 120 acres of the former Army Base. The LDDA spells out the financial terms, the scope of development, and other considerations for developing the Army Base. Construction of the public infrastructure, the first phase of the multi-phased project, was completed on June 14, 2019. In this redevelopment phase, the City, with the support of the Port and CCIG, is delivering public improvements, which include:
 - Soil stabilization;
 - Remediation of hazardous substances; and
 - Construction of all new public infrastructure, including roadways, utilities, rail improvements, 21 bioretention facilities designed to treat roadway runoff, and landscaping.
- On May 7, 2013, the California Transportation Commission (CTC) executed a grant agreement to provide the City with approximately \$176.3 million from the Trade Corridor Improvement Fund (TCIF) for the construction of public improvements.

- On May 7, 2013, and again on April 2, 2014, the City extended the Exclusive Negotiation Agreement (ENA) with California Waste Solutions (CWS) and Custom Alloy Scrap Sales (CASS) for the development of approximately 22 acres in the North Gateway Area of the Army Base. The ENA expired in December 2014.
- On July 30, 2014, the City executed a Lease Disposition and Development Agreement (LDDA) with OMSS, LLC to develop approximately 17 acres of the Army Base for Ancillary Maritime Support (AMS) services. The LDDA spells out the financial terms, scope of development, and other considerations for developing the AMS project.
- As of June 2021, 60% of the project was complete.

Lake Merritt BART Station Area

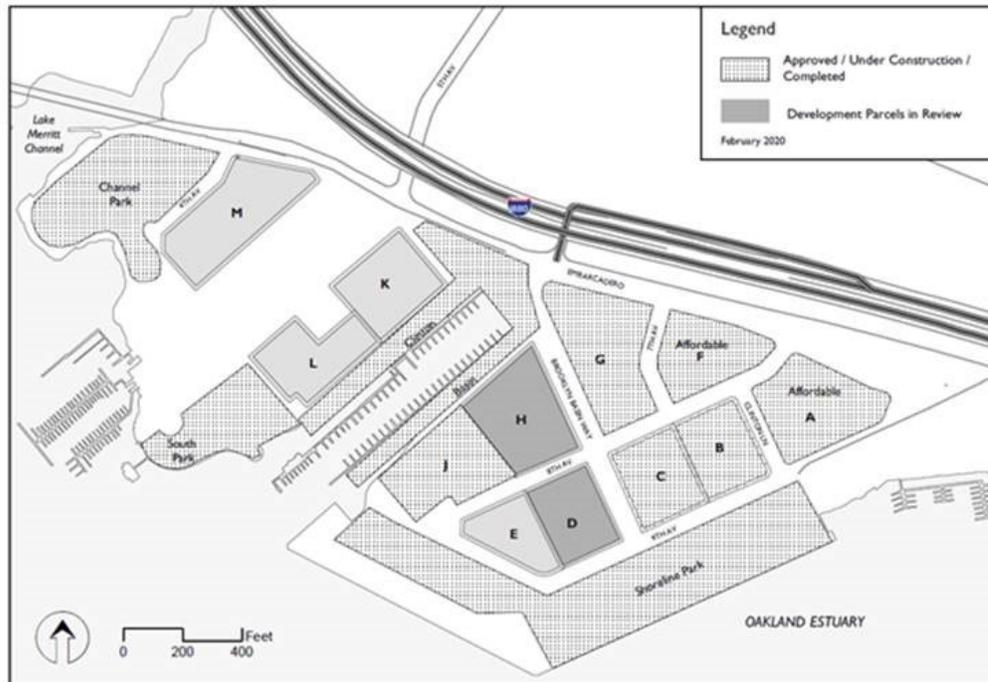
The Lake Merritt Station Area Plan, a Specific Plan for the area around the Lake Merritt BART Station in Downtown Oakland, was adopted in December 2014. The Plan envisions a high-intensity neighborhood around a rejuvenated Lake Merritt BART station. It seeks to reinforce and integrate the cultural and recreational resources that make the area around the transit station unique. The Plan identifies ways in which streets, open spaces, and other infrastructure in the area can be enhanced and establishes regulations for development projects that further the area's vibrancy.

Brooklyn Basin

The Brooklyn Basin (formerly "Oak to Ninth Mixed Use Development") project was approved by the Oakland City Council on July 18, 2006. The project site is approximately 64 acres of waterfront property bounded by Embarcadero Road, Fallon Street, Tenth Avenue, and the Estuary. The project includes up to 3,100 residential units including 465 affordable housing units, 200,000 square feet of ground-floor commercial space, a minimum of 3,950 parking spaces, approximately 32 acres of parks and public open space, two renovated marinas (total 170 boat slips), and an existing wetlands restoration area. The existing buildings on the site will be demolished with the exception of the Jack London Aquatic Center, a portion of the Ninth Avenue Terminal shed building, and a portion of the Ninth Avenue Terminal wharf structure. The project does not include approximately six acres of privately held property along the east of Fifth Avenue that contain a mix of commercial and industrial uses, as well as a small community of work/live facilities. The project will be constructed in four phases over a seventeen-year period.

The City of Oakland approved the Phase 1 Streets & Infrastructure Final Development Permit in March 2015 and roadway construction activities got underway. Construction activities included site remediation for hazardous materials. Construction on the first phase of the project, 241 apartments, began in 2017. Additional construction on affordable units for families and seniors

began in spring of 2018, with the units available for lease in fall 2019. The map below describes project status as of February 2020:



Brooklyn Basin Status

International Boulevard Transit Oriented Development Plan

The International Boulevard Transit Oriented Development (TOD) Plan explores opportunities for developing TODs at select locations along International Boulevard. The impetus for the International Boulevard TOD Plan is to leverage a planned Bus Rapid Transit (BRT) system – which would extend across multiple cities and run along the full length of International Boulevard on its route, with multiple stops along the corridor – to improve conditions along the street itself and in surrounding neighborhoods. Construction of the BRT system is expected to bring millions of dollars of new investment in infrastructure to the corridor and result in significant physical improvements to the street. The TOD Plan assesses opportunities for developing TOD projects along International Boulevard, identifies possible strategies for realizing TOD projects in these areas, and develops a menu of options for implementing the strategies. The TOD Plan also supports the City’s current land use framework that encourages higher-density developments near transit hubs and along major commercial corridors, promotes high-quality urban design in the city’s neighborhoods, and encourages economic development within targeted neighborhoods.

Central Estuary Area Plan

The City of Oakland adopted the Central Estuary Area Plan (CEAP) in 2013 to guide future development in the Central Estuary Area which encompasses 19th Ave. to 54th Ave and I-880 to the Estuary. The Plan focuses on ten sub-districts where the intensification of commercial/industrial uses is anticipated. The CEAP includes design guidelines and zoning regulations for the various sub-districts. The development contemplated as part of the CEAP would allow for an increase of 390 residential units, 30 live/work units, 370,000 square feet of industrial area, 700,000 square feet of commercial area, and 10 acres of new park space. Additionally, transportation and infrastructure improvements are recommended to address infrastructure deficiencies.

Coliseum Area Specific Plan

The Coliseum Area Specific Plan, which was adopted in March 2015, will guide the future development of the Oakland-Alameda County Coliseum site and the area across I-880 (Oakland Airport Edgewater Business Park). The Plan seeks to transform the underutilized land around the Oakland-Alameda County Coliseum and Arena into a world-class sport, entertainment, and science & technology district that boasts a dynamic and active urban setting with retail, entertainment, arts, culture, live and work uses. The Plan provides both a short-term development plan for the accommodation of up to three new venues for the City's professional sports teams, and a longer term, 25-year planning document providing a roadmap for land use policy, regulatory requirements and public and private investment that coordinates future development in the Coliseum Area. The Plan covers approximately 800 acres, bounded by 66th Avenue to the north, San Leandro Street on the east, Hegenberger Road on the south, and San Leandro Bay and the Oakland International Airport to the west.

Green Street Retrofit Projects

A few of Oakland's implemented or planned green street retrofit projects (not Regulated Projects) are summarized below.

Latham Square

The approximately ¼ acre Latham Square project was completed in July 2016. The project reconstructed the Latham Square Plaza and neighboring roadways and intersections. The Project area is Telegraph Avenue from Broadway to 17th Street, Broadway from 14th Street to 17th Street, and 16th Street from Telegraph to San Pablo Avenue. The improvements include expansion of the Latham Square Plaza, improved intersections, traffic signal upgrades, new roadway surfacing, bulb-outs, restoration of the historic Latham fountain, informational panels, landscaping, and pedestrian and decorative lighting. Green infrastructure components include raingardens along Broadway.

San Pablo Avenue Green Stormwater Spine

The San Pablo Avenue Green Stormwater Spine is a San Francisco Estuary Partnership pilot project and model for Bay Area municipalities implementing green infrastructure projects as part of their stormwater management efforts. The Spine Project has included the design, building, and monitoring an array of low impact development (LID) projects distributed along 12.5 miles of San Pablo Avenue, in partnership with a number of East Bay cities. Within the City of Oakland, the project includes:

- Installation of a rain garden, new bike lane, and wider sidewalk on one acre between 16th and 17th. Project construction was completed in June 2019.
- Installation of a rain garden on one acre at West Macarthur. This project is 20% in Oakland and 80% in Emeryville. Project construction was underway at the end of June 2020.

Lakeside Green Street Project

The intersection of 20th Street, Lakeside Drive, and Harrison Street adjacent to Snow Park has been reconfigured to calm traffic, create safer pedestrian crossings, add bike lanes, and increase park space. The project includes rain gardens and swales to treat roadway runoff and was completed in June 2019.

Broadway/Keith Avenue to Golden Gate Way Bike/Pedestrian Project

This project incorporated a raingarden (bioretention area) to treat roadway runoff.

7th Street Streetscape

Phase I of this streetscape improvement project, which extends on 7th Street from Peralta to Union, is complete. Phase II, which extends from Wood to Peralta, is currently under construction, and includes the installation of widened sidewalks, corner bulb-outs, planted medians, reduced traffic lanes, new lighting, trees, and bicycle lanes. In addition, the project contains several art features, including a gateway element, dancing lights, and sidewalk medallions as part of a Blues Walk of Fame.

Laurel Access to Mills, Maxwell Park & Seminary (LAMMPS) Streetscape Project

LAMMPS is a community-driven, community-based plan designed to improve transportation conditions along MacArthur Boulevard between High Street and Seminary Avenue. This project includes several bioretention facilities and is under construction.

Lake Merritt Improvement Project

This project, located at the entrance to Lakeside Park, Children’s Fairyland, and the Garden Center, improved pedestrian safety, accessibility, and pathways. Three bioretention facilities were installed at Bellevue and Grand Avenues to collect street and sidewalk runoff.

12.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

Oakland implements its Construction and Demolition Debris Waste Reduction and Recycling Ordinance by assigning an access code to each building permit application for online reporting and tracking of debris recycling and disposal via Green Halo Systems. City staff use the Green Halo data and BASMAA assessment materials to work closely with applicants on compliance with the city’s ordinance and MRP, and require that applicants sample for PCBs-containing materials on applicable projects.

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Oakland began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

12.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Oakland include clean out of inlet-based full trash capture devices on a semi-annual basis. Enhanced inlet cleaning has been implemented for all inlet-based full trash capture devices (i.e., CPS units) as well as a few inlets in the West Oakland/ESPS Watershed W/MA.

12.2.5 Diversion to POTW

No diversion to POTW control measures are proposed by the City of Oakland, although the Alameda County Flood Control and Water Conservation District is operating an Urban Runoff Diversion Project at the ESPS to direct dry weather discharges from the ESPS watershed to the East Bay Municipal Utility District’s main wastewater treatment plant for treatment. See Section 18.1.5 below for further information.

12.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The City of Oakland has an extensive illegal dumping program and devotes significant resources to abating dump sites. In fiscal year 2020/2021, Oakland responded to over 35,000 service requests for illegal dumping and removed over 72,310 cubic yards of debris. Oakland will continue to identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

In October 2014, a pole-mounted transformer that had been removed from a utility pole at the Oakland Army Base tipped over and spilled transformer oil. The concentration of PCBs in the spilled oil was measured to be 17 mg/kg. The impacted asphalt and soils were excavated and removed from the site (Terraphase Engineering, 2014).

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

13 City of Piedmont

13.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Piedmont are listed in Table 13-1 below. These W/MAs drain to the Lower segment of the Bay.

Table 13-1: City of Piedmont PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	0.4	0%	0%	0%	100%	0%
Piedmont Old Urban	2,232.4	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 13-2 and are described in the sections below.

Table 13-2: City of Piedmont Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	--	--	--	--	--	--
Trash Full Capture Devices	--	--	--	--	--	--
Enhanced O&M Measures	--	--	--	--	--	--

Note: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

13.2 Scope and Schedule of PCBs Control Measures

13.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Piedmont have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

13.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Piedmont's Green Infrastructure Plan for further information.

13.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Piedmont began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

13.2.4 Enhanced Operation and Maintenance Control Measures

No enhanced operation and maintenance control measures are proposed.

13.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

13.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

14 City of Pleasanton

14.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Pleasanton are listed in Table 14-1 below. These W/MAs drain to the Arroyo de la Laguna branch of the Alameda Creek watershed.

Table 14-1: City of Pleasanton PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	204.1	0%	0%	100%	0%	0%
Categorical Railroad	770.1	6.3%	33.2%	25.0%	35.5%	0%
Pleasanton Old Urban	4,317.1	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 14-2 and are described in the sections below.

Table 14-2: City of Pleasanton Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	283.3	3.0%	11.5%	82.3%	3.2%	0%
Trash Full Capture Devices	--	--	--	--	--	--
Enhanced O&M Measures	4.0	0%	5%	95%	0%	0%

Note: Control measure implementation data may be incomplete for FY 13-14 and FY 14-15.

14.2 Scope and Schedule of PCBs Control Measures

14.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Pleasanton have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

14.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Pleasanton's Green Infrastructure Plan for further information.

14.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Pleasanton began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

14.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Pleasanton include clean out of inlet-based full trash capture devices on a semi-annual basis.

14.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

14.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

15 City of San Leandro

15.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of San Leandro are listed in Table 15-1 below. These W/MAs drain to the Lower segment of the Bay.

Table 15-1: City of San Leandro PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	464.8	27.7%	29.1%	33.7%	9.5%	0%
Categorical Railroad	897.6	74.2%	2.2%	22.4%	1.3%	0%
San Leandro Old Industrial	1,333.6	100%	0%	0%	0%	0%
San Leandro Old Urban	6,017.7	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 15-2 and are described in the sections below.

Table 15-2: City of San Leandro Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	88.4	88.6%	6.9%	3.8%	0.7%	0%
Trash Full Capture Devices ¹	968.6	3.4%	92.9%	1.0%	2.6%	0%
Enhanced O&M Measures	3,322.1	16.4%	76.4%	6.4%	0.9%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, and FY 21-22.

- 1 Includes Hydrodynamic Separator (HDS) and Gross Solids Removal Device (GSRD) units.

15.2 Scope and Schedule of PCBs Control Measures

15.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of San Leandro have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

15.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of San Leandro's Green Infrastructure Plan for further information.

15.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of San Leandro began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

15.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of San Leandro include clean out of inlet-based full trash capture devices on a semi-annual basis.

15.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

15.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

16 City of Union City

16.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within the City of Union City are listed in Table 16-1 below. These W/MAs drain to the Lower segment of the Bay.

Table 16-1: City of Union City PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Alvarado Business Park	2,227.1	6.8%	32.9%	36.9%	23.4%	0%
Categorical PG&E	824.9	0.9%	0%	0.1%	99.1%	0%
Categorical Railroad	740.8	30.8%	0%	63.6%	5.6%	0%
Central Bay Industrial Park	1,867.1	40.3%	34.3%	23.4%	2.1%	0%
Union City Old Urban	4,437.2	0%	100%	0%	0%	0%
Union City Station District	917.7	14.0%	66.5%	7.0%	12.5%	0%
Alvarado Business Park	2,227.1	6.8%	32.9%	36.9%	23.4%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 16-2 and are described in the sections below.

Table 16-2: City of Union City Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	213.0	39.3%	39.2%	18.0%	3.5%	0%
Trash Full Capture Devices ¹	204.3	14.5%	24.6%	24.1%	36.8%	0%
Enhanced O&M Measures	1,283.0	10.2%	43.0%	44.4%	2.4%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, and FY 21-22.

- 1 Includes only Hydrodynamic Separator (HDS) units.

16.2 Scope and Schedule of PCBs Control Measures

16.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within the City of Union City have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

16.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the City of Union City's Green Infrastructure Plan for further information.

16.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. The City of Union City began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The City of Union City recently conducted an investigation of the caulk in the existing curb and gutter at two locations along H Street as part of their design for the H Street Green Street project and the caulk was found to contain an insignificant amount of PCBs (part per billion). The City of Union City also participated in the BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

16.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the City of Union City include clean out of inlet-based full trash capture devices on a semi-annual basis.

16.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

16.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

17 Unincorporated Alameda County

17.1 List of Watersheds / Management Areas and Control Measures

The Watersheds / Management Areas (W/MAs) within Unincorporated Alameda County are listed in Table 17-1 below. These W/MAs drain to the Central and Lower segments of the Bay and to the Arroyo de la Laguna branch of the Alameda Creek watershed.

Table 17-1: Unincorporated Alameda County PCBs and Mercury Watershed Management Areas (W/MAs) and Associated Land Uses

W/MA Identifier	Total Area ¹ (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Categorical PG&E	2,504.7	0.2%	4.9%	0%	94.9%	0%
Categorical Railroad	17,066.4	2.0%	2.0%	0.1%	95.9%	0%
Eden Area	5,690.2	4.3%	91.5%	2.1%	2.1%	0%
Unincorporated Old Urban	11,028.3	0%	100%	0%	0%	0%

Notes:

1. Land use breakdown as of IMR land use year 2013.

The control measures that are currently being implemented in each of these W/MAs are summarized in Table 17-2 and are described in the sections below.

Table 17-2: City of Unincorporated Alameda County Areas with Load Reductions or Treatment by Control Measure Category (FY 2013/14 through FY 2021/22)

Control Measure Category	Total Area Treated (Acres)	% Old Industrial	% Old Urban	% New Urban	% Open Space	% Other
Source Property Identification and Abatement	--	--	--	--	--	--
Green Infrastructure and Treatment	417.7	0.9%	35.0%	0%	64.2%	0%
Trash Full Capture Devices ¹	2,655.5	3.6%	84.4%	0.9%	10.8%	0.2%
Enhanced O&M Measures	179.1	0.5%	82.5%	1.7%	15.3%	0%

Notes: Control measure implementation data may be incomplete for FY 13-14, FY 14-15, FY 21-22.

- 1 Includes Hydrodynamic Separator (HDS) and Gross Solids Removal Device (GSRD) units.

17.2 Scope and Schedule of PCBs Control Measures

17.2.1 Source Property Identification and Abatement

PCBs-Contaminated Properties Referred to the Regional Water Board

No properties within Unincorporated Alameda County have been referred to the SFBRWQCB as a result of implementation of the Source Property Identification and Abatement control measure to date.

Ongoing Investigations

Ongoing investigations may result in a property referral in the future.

17.2.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3. See the Alameda County Green Infrastructure Plan for further information.

17.2.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1. Unincorporated Alameda County began implementing the PCBs management program and protocol on July 1, 2019.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

17.2.4 Enhanced Operation and Maintenance Control Measures

Enhanced Operation and Maintenance (O&M) control measures that have been implemented by the Unincorporated Alameda County include clean out of inlet-based full trash capture devices on a semi-annual basis.

17.2.5 Diversion to POTW

No diversion to POTW control measures are proposed.

17.2.6 Source Controls and Other Control Measures

Mercury Load Avoidance and Reduction

The Permittees are actively implementing mercury recycling programs in all W/MAs in order to reduce mercury loading to the Bay.

Illegal Dumping Cleanup

The Permittees will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed as they are identified through industrial facility inspection and spill notification programs.

18 Alameda County Flood Control and Water Conservation District

Alameda County Flood Control and Water Conservation District (District) manages flood control infrastructure for flood protection of most of the urbanized portions of Western Alameda County, which include the W/MAs described above for the following Permittees:

- Emeryville
- Fremont
- Hayward
- Newark
- Oakland
- San Leandro
- Union City
- Parts of unincorporated Alameda County

The District is divided into "zones of benefit" which are based on major watershed areas and treated as separate financial entities for the purposes of maintaining and constructing facilities, and for the levying of assessments based on needs within that zone's watershed area. For nine District zones, the Alameda County Board of Supervisors is the governing body, and the Alameda County Public Works Agency provides engineering, technical, and administrative staff for the District. Zone 7 of the District, located in eastern Alameda County and commonly known as Zone 7 Water Agency, has a separately elected Board of Directors and staffing and is a distinct Permittee under the MRP (see Section 19).

18.1 Scope and Schedule of PCBs Control Measures

Since the District is not a municipal government, a limited range of potential control measures are applicable to its facilities. The scope of control measures that are currently being implemented or may be implemented by the District during the term of the permit is discussed in the sections below.

18.1.1 Source Property Identification and Abatement

While some District-owned facilities lie within areas dominated by Old Industrial land use, none have been identified as source properties during initial screening. Site investigations may be initiated as a result of new information that may result in a property referral in the future.

18.1.2 Green Infrastructure / Treatment Control Measures

Any development, redevelopment, and infrastructure projects within each of the W/MAs are subject to the development standards in effect at the time an application is made, such as demolition standards and applicable provisions of section C.3.

The District will evaluate its capital projects for potential C.3 compliance and other opportunities to implement treatment.

18.1.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

18.1.4 Enhanced Operation and Maintenance Control Measures

In September 2014, the District conducted enhanced desilting of the ESPS wet wells, which have normally been cleaned on an “as needed” basis. CW4CB-funded monitoring estimated removal of mercury and PCBs through this activity, but listed issues and constraints to quantifying load reduction benefits. There has been large variation in annual sediment deposition and removal since the District acquired the ESPS from the city of Oakland in 1999.

18.1.5 Diversion to POTW

The District has executed an agreement with the East Bay Municipal Utility District (EBMUD) for operation of an Urban Runoff Diversion Project (URDP) at the ESPS to direct dry weather discharge to EBMUD’s main wastewater treatment plant for treatment. The URDP is designed to divert up to 0.5 million gallons per day (mgd) of dry-weather flow during the dry season (i.e., approximately April 16th through November 30th). EBMUD completed the installation of its pump and control system and new 6-inch diameter conveyance pipe in 2016 and implementation is in progress. District staff coordinated with and provided assistance to EBMUD staff in FY 2018/19 to ensure proper operation and maintenance of the diversion pump.

EBMUD agreed to make provision in its piping design for possible future connection by the District to the URDP’s new force main pipe which allows for a future project wherein stormwater flows could be detained and stored until after the end of peak flows when they could be diverted to the EBMUD plant for treatment. The District does not have available space for such detention

at the ESPS and has no active plans to pursue this concept after initial conversations with state and city representatives about potential access to adjacent street and freeway right-of-way.

Load reductions for PCBs and mercury were computed based on influent and effluent sampling data obtained by EBMUD between 2008 and 2010 (Borisova, Johannesson, and Horenstein, 2012) and flow data from FY 2016/17 through FY 2021/22 obtained through email correspondence with EBMUD staff.

18.1.6 Source Controls and Other Control Measures

Illegal Dumping Cleanup

The District will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs on District property.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed if they are identified on District property.

19 Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency)

Zone 7 Water Agency owns and maintains 37 miles of flood-protection channels located within a 425-square-mile area in eastern Alameda County, which include the W/MAs described above for the following permittees:

- Dublin
- Livermore
- Pleasanton

19.1 Scope and Schedule of PCBs Control Measures

Since the Zone 7 Water Agency is not a municipal government, a limited range of potential control measures are applicable to its facilities. The scope of control measures that are currently being implemented or may be implemented by Zone 7 during the term of the permit is discussed in the sections below.

19.1.1 Source Property Identification and Abatement

Flood control facilities owned by Zone 7 do not occur in significant areas of Old Industrial land use and offer little or no potential to be identified as PCBs source properties.

19.1.2 Green Infrastructure / Treatment Control Measures

The District will evaluate its capital projects for potential C.3 compliance and other opportunities to implement treatment.

19.1.3 Managing PCBs in Building Materials and Infrastructure

Managing PCBs in Building Materials

The Program and Permittees are participated in the BASMAA Regional Project to address PCBs in building materials as described in Section 2.3.1.

Managing PCBs in Infrastructure

The Program and Permittees participated in a BASMAA Regional Project to address PCBs in infrastructure as described in Section 2.3.2.

19.1.4 Enhanced Operation and Maintenance Control Measures

No enhanced operation and maintenance control measures are proposed.

19.1.5 Diversion to POTW

No diversion to POTW control measures are proposed.

19.1.6 Source Controls and Other Control Measures

Illegal Dumping Cleanup

The District will identify and cleanup illegal dumping of construction and demolition debris where illegal dumping of construction and demolition debris occurs on District property.

Stockpiles, Spills, and Disposal of PCBs

Stockpiles and spills of PCBs will be addressed if they are identified on District property.

20 Loads Reduced

This section presents estimates of the loads reduced by the control measures that are reported in the preceding sections of this report (Sections 3 through 19) for each Permittee and county-wide for FY 2013/14 through FY 2021/22. The loads reduced reported in this section reflect previous fiscal years' reporting, although previously reported load reductions may have been revised.

20.1 Loads Reduced – PCBs

Table 20-1 and Table 20-2 report the estimated PCBs loads reduced for each Permittee and county-wide. Note that these tables reflect the load reduction achieved through implementation of the program and protocol for managing materials with PCBs concentrations of 50 ppm or greater in applicable structures at the time such structures undergo demolition. This load reduction is equivalent to 626.7 g/yr, which was allocated to each Permittee in FY2018/19 based on their population in the year 2000.

Table 20-2 shows that the required load reduction for GI and the overall PCBs load reduction by 2020 have been achieved.

Table 20-1: PCBs Loads Reduced by the Permittees (FY 2013/14 through FY 2021/22)

Permittee	PCBs Loads Reduced (g/yr)									Cumulative Load Reduced
	FY2013-2014	FY2014-2015	FY2015-2016	FY2016-2017	FY2017-2018	FY2018-2019	FY2019-2020	FY2020-2021	FY2021-2022	
Alameda	0.01	0.15	0.17	0.70	0.48	33.57	0.27	0.03	0	35.38
Albany	0.19	0	0.03	0.23	0.26	7.16	0	0	0	7.87
Berkeley	0.20	0.11	0.71	0.53	4.17	44.75	0.01	0.16	0.37	51.01
Dublin	0.60	0.09	1.69	1.18	0.58	13.25	0.34	0.20	0.40	18.33
Emeryville	0.13	0.11	0.09	0	0.26	2.98	0	0.04	0.12	3.73
Fremont	0.34	0.33	2.09	0.37	0.46	88.27	0.73	0.30	0.63	93.52
Hayward	0.37	7.21	1.70	6.81	1.29	62.67	0.00	0.24	0.02	80.31
Livermore	0.23	1.26	0.04	0.19	0.46	34.68	0.38	0.11	0.05	37.40
Newark	0.00	2.00	0.33	2.03	0.61	18.69	0.00	0.01	0	23.67
Oakland	0.54	0.52	0.17	0.29	69.09	175.48	164.35	1.96	1.09	413.49
Piedmont	0	0	0	0	0	4.77	0	0	0	4.77
Pleasanton	0	0.75	0.12	0.01	0.28	27.63	0.29	0.11	0	29.19
San Leandro	0	1.38	0.42	2.41	0.59	39.02	3.62	0.39	0	47.83
Union City	0.05	0.26	1.62	7.47	0.46	29.34	0	0	0	39.20
Unincorporated County	0.35	1.68	1.82	0.88	0.84	68.83	0.01	0.23	0	74.64
ACFCWCD	0	0	0	0.97	1.98	1.22	1.05	1.23	1.33	7.78
TOTAL - All Permittees	3.0	15.8	11.0	24.1	81.8	652.3	171.1	5.0	4.0	968.1

Table 20-2: PCBs Loads Reduced Within Alameda County (FY 2013/14 through FY 2021/22)

Control Measure Category	PCBs Loads Reduced (g/yr)									Cumulative Load Reduced	Required PCBs Load Reduction by June 30, 2020
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22		
Source Property Identification and Abatement ¹	0	0	0	0	71.47	0	163.44	0	0	234.91	--
Green Infrastructure and Treatment ²	2.59	14.24	5.38	13.37	6.92	6.70	6.52	3.75	2.66	62.13	37
Trash Full Capture Devices ³	0.33	1.53	2.41	6.64	0.08	16.91	0	0	0.02	27.92	--
Enhanced O&M ⁴	0.10	0.07	3.22	3.07	1.36	0.81	0.03	0.03	0.01	8.70	--
Manage PCBs in Building Materials	0	0	0	0	0	626.67	0	0	0	626.67	--
Manage PCBs in Infrastructure ⁴	0	0	0	0	0	0	0	0	0	0.00	--
Diversion to POTW ⁴	0	0	0	0.97	1.98	1.22	1.05	1.23	1.33	7.78	--
TOTAL - All Permittees	3.0	15.8	11.0	24.1	81.8	652.3	171.1	5.0	4.0	968.1	940

Notes:

1. Load Reduced = (Source Property Area (ac)) x (4.065 – 0.0303 (g/ac/yr)). Load reduced is halved for referral rather than self-abatement. Acres associated with this control measure can be found in each Permittee section of this report.
2. For parcel-based projects, Load Reduced = (Project Area (ac)) x (Existing Yield – 0.0035 (g/ac/yr)). For green street or regional retrofit projects, Load Reduced = (Project Drainage Area (ac)) x (area-weighted PCBs yield (g/ac/yr)) x 0.70. Acres associated with this control measure can be found in each Permittee section of this report.
3. Load Reduced = (Project Drainage Area (ac)) x (area-weighted PCBs yield (g/ac/yr)) x 0.20. Acres associated with this control measure can be found in each Permittee section of this report.
4. See individual Permittee sections for how loads were estimated.

20.2 Loads Reduced – Mercury

Table 20-3 and Table 20-4 report the estimated mercury loads reduced for each Permittee and county-wide. The mercury load performance criterion via green infrastructure implementation for Alameda County is 15 g/yr by June 30, 2020; the results in Table 20-4 indicate that this performance criterion has been exceeded.

Table 20-3: Mercury Loads Reduced by the Permittees (FY 2013/14 through FY 2021/22)

Permittee	Mercury Loads Reduced (g/yr)									Cumulative Load Reduced
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
Alameda	0.09	1.04	1.20	9.68	2.86	28.28	1.85	0.27	0	45.27
Albany	2.35	0	0.25	1.70	2.28	0	0	0	0	6.58
Berkeley	2.16	0.79	6.75	4.48	2.02	0.28	0.09	1.09	4.82	22.48
Dublin	4.08	0.60	9.55	8.13	2.81	2.84	2.27	0.47	2.69	33.44
Emeryville	1.77	1.57	1.08	0	2.09	0	0	0.31	1.72	8.54
Fremont	2.56	2.08	17.54	2.05	3.36	0.42	4.72	1.91	5.61	40.25
Hayward	2.52	92.03	24.82	59.89	17.65	18.01	0	2.17	0.15	217.24
Livermore	1.51	18.57	0	1.08	3.00	21.52	3.58	1.15	0.36	50.77
Newark	0	30.30	2.99	29.76	9.37	1.85	0	0	0	74.27
Oakland	5.12	4.28	1.21	2.21	42.83	22.85	55.13	26.97	16.14	176.74
Piedmont	0	0	0	0	0	0	0	0	0	0.00
Pleasanton	0	11.00	0.78	0.06	1.89	0.14	1.97	0.73	0	16.57
San Leandro	0	20.82	5.64	27.40	5.75	38.14	55.25	5.80	0	158.80
Union City	0.32	1.80	16.80	103.65	6.57	5.00	0	0	0	134.14
Unincorporated County	3.08	16.26	11.51	6.35	5.71	72.91	0.07	2.50	0	118.39
ACFCWCD	0	0	0	2.30	4.70	2.89	2.50	2.92	3.16	18.47
TOTAL - All Permittees	25.6	201.1	100.1	258.8	112.9	215.1	127.4	46.3	34.7	1,122.0

Table 20-4: Mercury Loads Reduced Within Alameda County (FY 2013/14 through FY 2021/22)

Control Measure Category	Mercury Loads Reduced (g/yr)									Cumulative Load Reduced
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
Source Property Identification and Abatement ¹	0	0	0	0	19.22	0	43.95	0	0	63.17
Green Infrastructure and Treatment ²	22.15	185.10	49.06	170.46	76.99	74.32	80.69	43.08	31.34	733.19
Trash Full Capture Devices ³	2.35	15.26	23.33	57.88	0.55	131.13	0	0	0.11	230.61
Enhanced O&M Measures ⁴	1.05	0.76	27.71	28.12	11.42	6.79	0.28	0.30	0.04	76.47
Manage PCBs in Building Materials	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0
Manage PCBs in Infrastructure	--	--	--	--	--	0	0	0	0	0
Diversion to POTW	0	0	0	2.30	4.70	2.89	2.50	2.92	3.16	18.47
Source Controls/ Other	--	--	--	--	--		0	0	0	0
TOTAL - All Control Measures	25.6	201.1	100.1	258.8	112.9	215.1	127.4	46.3	34.7	1,122.0

Notes:

1. Load Reduced = (Source Property Area (ac)) x (1.300 – 0.215 (g/ac/yr)). Load reduction is halved for referral rather than self-abatement. Acres associated with this control measure can be found in each Permittee section of this report.
2. For parcel-based projects, Load Reduced = (Project Area (ac)) x (Existing Yield – 0.033 (g/ac/yr)). For green street or regional retrofit projects, Load Reduced = (Project Drainage Area (ac)) x (area-weighted mercury yield (g/ac/yr)) x 0.70. Acres associated with this control measure can be found in each Permittee section of this report.
3. Load Reduced = (Project Drainage Area (ac)) x (area-weighted mercury yield (g/ac/yr)) x 0.20. Acres associated with this control measure can be found in each Permittee section of this report.
4. See individual Permittee sections for how loads were estimated.

21 References

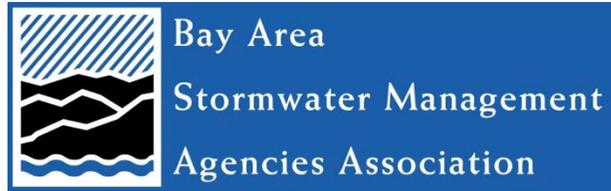
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SOURCE CONTROL LOAD REDUCTION ACCOUNTING FOR REASONABLE ASSURANCE ANALYSIS

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ACRONYMS AND ABBREVIATIONS

ACCWP	Alameda Countywide Clean Water Program
BASMAA	Bay Area Stormwater Management Agencies Association
CCCWP	Contra Costa Clean Water Program
GSI	Green Stormwater Infrastructure
GIS	Geographic Information System
IMR	Integrated Monitoring Report
mg/ac/yr	milligram per acre per year
mg/kg	milligram per kilogram
MPC	Monitoring and Pollutants of Concern Committee
MRP	Municipal Regional Permit
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
OFEE	Oil-Filled Electrical Equipment
PCBs	Polychlorinated Biphenyls
PG&E	Pacific Gas and Electric Company
POC	Pollutants of Concern
POTW	Publically Owned Treatment Works
RAA	Reasonable Assurance Analysis
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFEI	San Francisco Estuary Institute
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
TMDL	Total Maximum Daily Load
WY	Water Year

1. INTRODUCTION

1.1 Background

Municipal Regional Permit (MRP; SFBRWQCB, 2015¹) Provisions C.11.b and C.12.b required the Permittees to develop and implement an assessment methodology and data collection program to quantify mercury and polychlorinated biphenyls (PCBs) loads reduced through implementation of pollution prevention, source control, and treatment control measures in 2016. BASMAA prepared the report *Interim Accounting Methodology for TMDL Loads Reduced* (BASMAA, 2017a), which was approved by the Water Board for use during the MRP permit term from January 1, 2016 through June 30, 2022 (known as “MRP 2.0”). The Permittees have used this assessment methodology to demonstrate progress towards achieving the load reductions required in MRP 2.0. This report has been prepared to address the requirements of MRP 2.0 Provisions C.11.b.iii.(3) and C.12.b.iii.(3), which require the Permittees to submit, for Executive Officer approval, refinements to the Interim Accounting Methodology to assess mercury and PCBs load reductions in the next permit term (i.e., MRP 3.0).

MRP 2.0 Provisions C.11.d. and C.12.d. required the Permittees to prepare plans and schedules for mercury and PCBs control measure implementation and a reasonable assurance analysis (RAA) demonstrating that those control measures will be sufficient to attain the mercury total maximum daily load (TMDL) wasteload allocations by 2028 and the PCBs TMDL wasteload allocations by 2030. The *Bay Area RAA Guidance Document* (BASMAA, 2017b) establishes a regional framework and guidance for conducting RAAs in the Bay Area, including the types of modeling and data inputs that may be used by the Programs and Permittees for estimating loads reduced by green stormwater infrastructure (GSI). Section 4.2 of the *Bay Area RAA Guidance Document* states that load reductions for source control measures should be calculated based on methods provided in an approved refinement of the *Interim Accounting Methodology for TMDL Loads Reduced* (BASMAA, 2017a). This report refines the Interim Accounting Methodology for the purposes of source control load reduction accounting in the RAAs and during MRP 3.0.

This document does not describe the methods used to predict the loads reduced through the implementation of GSI in the RAAs. The RAA methodologies for GSI are described in the countywide RAA reports that were submitted to the SFBRWQCB in September 2020 (ACCWP, 2020; CCCWP, 2020; FSURMP, 2020; SMCWPPP, 2020; and SCRURPPP, 2020). The accounting that will be used for assessing compliance with MRP 3.0 Provision C.12.c, Program for Treatment Control Measures in Old Industrial Areas, is provided in this document.

1.2 Report Overview

The load reduction accounting methodologies are presented in Sections 2 through 10 of this document for the following mercury and PCBs source control measure programs:

- Source Property Identification and Abatement;

¹ Reissued November 19, 2015 with effective date January 1, 2016, to 77 Phase I municipal stormwater Permittees in five Bay Area counties which are among over 90 local agencies comprising the Bay Area Stormwater Management Agencies Association (BASMAA).

- Treatment Control Measures in Old Industrial Areas, including
 - Treatment control measures,
 - Trash Full Capture Systems Implementation,
 - Enhanced Operations and Maintenance Control Measures, and
 - Diversion to Publicly Owned Treatment Works (POTW);
- Management of PCBs in Stormwater Infrastructure;
- Management of PCBs in Electrical Utilities;
- Management of PCBs-Containing Materials and Wastes During Building Demolition; and
- Mercury Load Avoidance and Reduction.

The appendices present:

- A summary of how the land used-based PCBs and mercury yields were developed;
- A statistical summary of the observed urban sediment concentrations;
- Large, non-inlet-based trash capture device efficiency factor data analysis;
- Enhanced inlet cleaning efficiency factor data analysis for storm drain inlets with and without inlet-based full trash capture devices;
- Enhanced street sweeping efficiency factors;
- An estimate of load reductions for the Management of PCBs in Stormwater Infrastructure Program; and
- A summary of the analysis that was conducted to develop the data inputs for use in the accounting method for the PCBs in Electrical Utilities Management Program.

1.3 Source Control Load Reduction Accounting Basis

The source control load reduction accounting methodology outlined in this report is based on relative mercury and PCBs yields from different land use categories. This methodology was first outlined in the 2014 Integrated Monitoring Reports (IMRs) (ACCWP, 2014; CCCWP, 2014; SCVURPPP, 2014; SMCWPPP, 2014) and was described in the MRP 2.0 Fact Sheet. The method involves using default factors for PCBs and mercury load reduction credits resulting from foreseeable control measures. This report updates and refines the accounting system to account for new information; justifies the assumptions, analytical methods, sampling schemes, and parameters used to quantify the load reduction for each type of control measure; and indicates what information will be collected and submitted to confirm the calculated load reduction for each unit of activity for each control measure.

As described in the MRP 2.0 Fact Sheet, a land use-based yield is an estimate of the mass of a contaminant contributed by an area of a particular land use per unit time. Essentially, different types of land uses yield different amounts of pollutants because land use types differ in their

degree of contamination resulting from differing intensities of historic or ongoing use of pollutants. The land use categories used to calculate land use-based yields were identified from studies conducted to identify potential POC sources and source areas, as described below.

The Regional Watershed Spreadsheet Model (RWSM) was developed as part of the Regional Monitoring Program’s Small Tributaries Loading Strategy as a regional-scale planning tool primarily for the purpose of estimating long-term average annual pollutant loads from the small tributaries surrounding San Francisco Bay, and secondarily to provide supporting information for prioritizing watersheds or areas within watersheds for management actions (Wu et al, 2016). The RWSM is structured with three stand-alone empirical models: the hydrology model, sediment model, and pollutant models. The hydrology model uses runoff coefficients based on land use-soil-slope combinations to estimate annual runoff from a watershed. The sediment model uses a function of geology, slope, and land-use to simulate suspended sediment transport in the landscape while adjusting for watershed storage factors. The pollutant model is essentially a “concentration map” that can be driven by either the hydrology model (for pollutant concentrations in water) or the sediment model (for pollutant concentrations on fine sediment particles as particle ratios² for specific land use or source areas). Starting in 2010, a multi-year effort was undertaken to systematically develop and calibrate the RWSM. Calibration was completed³ and the model was released in 2018.

A PCBs source property yield was derived as the product of a representative PCBs concentration in shallow surface soils at known source properties and a representative soil/sediment yield for Old Industrial land use areas. The derivation of the estimated PCBs source property yield is described in Appendix A.

PCBs were more heavily used in older industrial areas so older industrial land use areas yield a much higher mass of PCBs per unit area than newer urban land use areas. The estimated average PCBs and mercury yields from the RWSM are summarized for six land use yield categories in Table 1-1 below. These yields are assigned based on land use but may also be assigned by the Permittees based on monitoring data and/or inspection results (e.g., to assign the Source Property yield to a parcel mapped as Old Industrial). These yield values have been developed using the best available data and technical approach at this time. The Permittees may re-evaluate these yields in the future as more information becomes available.

² Particle ratios = pollutant concentration in water (ng/L) / suspended sediment concentration (mg/L), equivalent to mg/kg.

³ The calibration for PCBs is “reasonable” but there remains a lower confidence in the calibration for mercury (SFEI, 2017).

Table 1-1: Land Use-Based Yields for PCBs and Mercury

Land Use Category	Assumed Average PCBs Yield (mg/ac/yr)	Assumed Average Mercury Yield ¹ (mg/ac/yr)
Source Property	5,078	53
Old Industrial	259	53
Old Commercial / Old Transportation	49	57
Old Residential	2.8	57
New Urban	0.4	4
Agriculture/Open Space	0.4	81

mg/ac/yr – milligrams per acre per year

Source: RWSM Toolbox v1.0 Pollutant Model, Pollutant Spreadsheet Model Calculations – Region. Spreadsheet dated 6/9/2017.

1. The model calibration for PCBs is “reasonable” but there remains a lower confidence in the calibration for mercury (Wu et al., 2017).

Appendix B presents concentration statistics for PCBs and mercury observed in street, storm drain, and private property sediment samples collected by BASMAA from 1999 through 2019. The data are summarized by the predominant land use within the vicinity of where the sediment was collected.

2. PROGRAM FOR SOURCE AREA IDENTIFICATION AND ABATEMENT

2.1 Program Description

The Source Area Identification and Abatement Program involves investigations of properties located in historically industrial land use or other land use areas where PCBs were used, released, and/or disposed of and/or where sediment concentrations are significantly elevated above urban background levels⁴ and are being transported to the municipal separate storm sewer system (MS4). Once a source property is identified, the source of PCBs on the property may be abated or caused to be abated directly by the Permittee or the Permittee may choose to refer the source property to the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for investigation and abatement by the SFBRWQCB.

2.2 Loads Reduced Accounting Methodology

The amount of PCBs loads (i.e., annual mass or milligrams per year (mg/yr)) reduced will be assessed for source properties using the following accounting method:

$$\text{Load of PCBs Reduced} = SP_A \cdot (SP_Y - OCOT_Y)$$

Where:

- SP_A = Source property area (acres (ac))
- SP_Y = Source property PCBs yield (mg/ac/yr)
- $OCOT_Y$ = Old Commercial/Old Transportation land use PCBs yield (mg/ac/yr)

Thus, the PCBs load reduced in mg/yr will be calculated as the area of the source property in acres multiplied by 5,029 mg/ac/yr (i.e., 5,078 – 49 mg/ac/yr).

There is no mercury load reduction credit given to PCBs source property referrals, as there is not a significant difference between the estimated source property, old industrial, old residential, and old commercial/old transportation mercury yield values.

Fifty percent of this load reduction will be credited to the Permittee for properties that are referred to the SFBRWQCB for abatement at the time of referral provided that enhanced O&M measures or stormwater treatment are implemented or caused to be implemented in the vicinity of the referred source property to prevent further contaminated sediment from being discharged from the storm drain system. The remaining 50% load reduction for referred properties will be credited to the Permittee upon completion of the abatement process or at ten years, whichever occurs first. The SFBRWQCB will notify the Permittee when the abatement process is complete.

If a source property has been abated without referral to the SFBRWQCB, either through voluntary actions by the property owner or the use of municipal enforcement powers, then all of the load reduction calculated using the methodology above will be credited to the Permittee at

⁴ See Appendix B for a statistical summary of urban sediment concentrations.

the time that the abatement is complete. The Permittee shall provide documentation to the SFBRWQCB that abatement has effectively eliminated the transport of PCBs or mercury to the MS4 or directly to the Bay for all transport mechanisms that apply to the site (e.g., stormwater runoff, wind, vehicle tracking). The documentation shall include information on the type and extent of abatement that has occurred (e.g., have the sources of PCBs to the MS4 been eliminated via soil removal, capping, paving, walls, plugging/removal of internal storm drains, etc.). Documentation may be from a cleanup regulatory agency such as the US Environmental Protection Agency (USEPA) or the California Department of Toxic Substances Control (DTSC). For sites with ongoing industrial activities, water or sediment monitoring data that demonstrates the effective elimination of transport of PCBs offsite into the MS4 or to the Bay should be provided.

For source properties that include a combination of industrial area and area that is not likely to be a source of PCBs (e.g., unimpacted open space area), the source property yield will only be applied to the portion of the property that is an industrial area.

3. PROGRAM FOR CONTROL MEASURES IN OLD INDUSTRIAL AREAS

3.1 Program Description

This program includes a variety of control measures that may be implemented to reduce loads of PCBs and mercury within old industrial areas, known or suspected source areas, or areas with evidence of moderate to high PCBs soil concentrations (generally soil/sediment concentrations greater than 0.2 mg PCBs/kg) pursuant to MRP 3.0 Provision C.12.c. These control measure include:

- Implementation of GSI through new development and redevelopment activities and retrofit of treatment controls (including GSI) into existing developed areas on private and public properties and within the public right-of-way,
- Full trash capture systems,
- Diversion to publicly owned treatment works (POTW),
- Enhanced operations and maintenance, and
- Other control measures.

3.2 Loads Reduced Accounting Methodology

The following load reduction accounting methodologies will be used to calculate the PCBs and mercury loads reduced by control measures implemented under MRP 3.0 Provisions C.11.c and C.12.c.

3.2.1 Parcel-Based Redevelopment or Retrofit Projects

When contaminated areas are redeveloped or retrofit⁵, the pollutant yield of the area will be reduced through a variety of mechanisms (i.e., removal, capping, or paving of contaminated sediment and treatment of the post-development runoff). The amount of PCBs and mercury load reduction can be obtained by multiplying the area of the project by the difference in land use-based yield (either Old Industrial minus New Urban or Old Urban minus New Urban, whichever pre-development land use is applicable).

The Permittees will quantify and report the amount of PCBs and mercury loads reduced from implementation of post-development treatment measures (as well as land use change and abatement) for redevelopment and parcel-based retrofit projects using the following accounting method:

$$\text{Load of POC Reduced} = P_A \cdot (P_Y - NU_Y)$$

Where:

P_A = New development/redevelopment/parcel-based retrofit project area (ac)

⁵ These projects provide treatment control for existing developed areas without redeveloping the tributary area.

P_Y = Existing PCBs or mercury yield (mg/ac/yr)

NU_Y = New Urban PCBs or mercury yield (mg/ac/yr)

3.2.2 Green Street Projects, Regional Retrofit Projects, Large Full Trash Capture Devices, and Diversion to POTW

The Permittees will quantify and report the amount of PCBs and mercury loads reduced from implementation of green street projects, regional retrofit projects, large (non-inlet based) full trash capture devices (i.e., hydrodynamic separators (HDS) units, gross solids removal devices (GSRDs), and baffle boxes), and diversion to POTW using the following accounting method:

$$\text{Annual Mass of PCB Reduced} = P_A \cdot P_Y \cdot E_f$$

Where:

P_A = Tributary area treated by stormwater green infrastructure/retrofit treatment measure (acres)

P_Y = Area-weighted PCBs or mercury yield (mg/acre/year)

E_f = Efficiency factor for green infrastructure/retrofit treatment control measures (assumed to be 70%)⁶, large full trash capture devices (assumed to be 20%)⁷, or diversion to POTW (assumed to be 91%)⁸

3.2.3 Enhanced Operations and Maintenance Activities

Routine MS4 operation and maintenance (O&M) activities include street sweeping, drain inlet cleaning, and pump station maintenance. In addition, culverts and channels are also routinely maintained (i.e., desilted). Enhancements to routine operations and new actions such as storm drain line and street flushing may enhance the Permittees' ability to reduce PCBs and mercury in stormwater.

Enhanced Inlet Cleaning (With and Without Small Full Trash Capture Devices) and Street Sweeping

Load reductions for enhanced inlet cleaning and street sweeping will be calculated as follows:

$$\text{Annual Load of PCB Reduced} = P_A \cdot P_Y \cdot EE_f$$

Where:

P_A = Catchment area for enhanced O&M measure (acres)

P_Y = Area-weighted PCBs yield (mg/acre-year) for the enhanced O&M catchment area based on land use yield

⁶ BASMAA, 2014.

⁷ See Appendix C for large trash capture device unit efficiency factor data analysis.

⁸ SFBRWQCB, 2021.

EE_f = Enhancement Efficiency factor for enhanced O&M control measure (See Appendix D for enhanced inlet cleaning with and without small full trash capture devices and Appendix E for enhanced street sweeping).

Pump Station Cleanout, Storm Drain Line Cleanout, Street Flushing, and Culvert/Channel Desilting

Load reductions for enhanced pump station cleanout, storm drain line cleanout, street flushing, and culvert/channel desilting will be calculated as follows:

$$Enhanced_{LR} = Current_{LR} - Baseline_{LR}$$

Where:

- $Current_{LR}$ = $Vol_{Current} \cdot \%Sed \cdot \rho \cdot Conc$
- $Baseline_{LR}$ = $Vol_{Baseline} \cdot \%Sed \cdot \rho \cdot Conc$
- $Vol_{Current}$ = Average volume of material collected via the enhanced O&M control measure in current year(s) (post-Fiscal Year 2001-02) (m^3/yr)
- $Vol_{Baseline}$ = Average volume of material collected via the O&M control measure in baseline years (prior to and including Fiscal Year 2001-02) (m^3/yr) (assumed to be zero for storm drain line cleanout and street flushing)
- $\%Sed$ = Percent of material collected (by volume) by the enhanced O&M control measure that is sediment < 2mm in diameter (measured)
- ρ = Sediment density of the material collected by the enhanced O&M control measure (weight per unit volume) (measured)
- $Conc$ = Average concentration of PCBs in sediments collected by the enhanced O&M control measure (mg/kg; see Appendix B for land use-based sediment concentrations to calculate area-weighted concentrations or alternatively use project-specific measurements).

3.2.4 Other Control Measures

Properties with elevated levels of PCBs or mercury that are not source properties (i.e., old industrial properties or properties with evidence of moderate to high PCBs soil concentrations (generally soil/sediment concentrations greater than 0.2 mg PCBs/kg)) may be abated through voluntary actions by the property owner or the use of municipal enforcement powers. The abatement should effectively eliminate the transport of PCBs or mercury to the MS4 or directly to the Bay for all transport mechanisms that apply to the site (e.g., stormwater runoff, wind, vehicle tracking). The Permittee should document the type and extent of abatement that has occurred (e.g., have the sources of PCBs to the MS4 been eliminated via soil removal, capping, paving, walls, plugging/removal of internal storm drains, etc.). For sites with ongoing industrial

activities, water or sediment monitoring data that demonstrates the effective elimination of transport of PCBs offsite into the MS4 or to the Bay should be obtained.

The amount of PCBs loads reduced will be calculated for other control measures using the following accounting method:

$$\text{Load of PCBs Reduced} = P_A \cdot (OI_Y - OCOT_Y)$$

Where:

P_A = Property area (acres (ac))

OI_Y = Old Industrial PCBs yield (mg/ac/yr)

$OCOT_Y$ = Old Commercial/Old Transportation land use PCBs yield (mg/ac/yr)

Thus, the PCBs load reduced in mg/yr will be calculated as the area of the controlled property in acres multiplied by 210 mg/ac/yr (i.e., 259 – 49 mg/ac/yr).

There is no mercury load reduction credit given to other control measures, as there is not a significant difference between the estimated old industrial and old commercial/old transportation mercury yield values.

4. PROGRAM FOR MANAGING PCBs IN STORMWATER INFRASTRUCTURE

4.1 Program Description

For this control measure, Permittees will track development of a Caltrans specification for managing PCBs-containing caulks and sealants on bridges or roadway overpasses during bridge replacement or joint maintenance. The Caltrans standard specifications for removal, handling, and disposal of caulk or sealant materials during infrastructure replacement or joint maintenance projects will be used to prevent the release of PCBs to the MS4. The Caltrans specification will be applied to all applicable public bridges or roadway overpass structures when the bridge infrastructure undergoes replacement or joint maintenance.

4.2 Loads Reduced Accounting Methodology

A detailed load reduction accounting methodology is provided in Appendix F and summarized here.

Total PCBs load contained in bridges built and/or reconstructed prior to 1981 within the jurisdictions subject to the MRP was estimated using the following equation:

$$\text{Total Load}_{\text{PCBs, Bridges}} = \text{Density}_{\text{sealant}} * \text{Concentration}_{\text{PCBs}} * \sum \text{Volume}_{\text{sealant, bridges}}$$

Where:

$$\text{Density}_{\text{sealant}} = \text{average sealant density [kg/m}^3\text{]}$$

$$\text{Concentration}_{\text{PCBs}} = \text{empirically derived concentration of PCBs [mg/kg]}$$

$$\sum \text{Volume}_{\text{sealant, bridges}} = \text{Volume of sealant in all applicable bridges [m}^3\text{]}$$

The volume of joint sealant was calculated using an assumed cross-section of sealant, multiplied by the assumed length of applied sealant:

$$\text{Volume}_{\text{sealant, bridges}} = \text{Cross-Section}_{\text{sealant}} * \text{Length}_{\text{sealant}}$$

Where:

$$\text{Cross-Section}_{\text{sealant}} = \text{Cross-section of applied sealant}$$

$$\text{Length}_{\text{sealant}} = \text{Length of applied sealant}$$

A summary of the data inputs is provided in Table 5-1 below. The derivation of the values presented in Table 5-1 is described in Appendix F.

Table 5-1: Bridge Load Calculation Data Inputs

Input	Result	Units	Source
Density of Sealant	1,100	kg/m ³	Takhar, 2013
Cross-Section of Sealant	1	square inch	Caltrans, 2007
PCBs Concentration	184	mg/kg	See Section 2.2.1

The estimated total PCBs load contained in bridges built and/or reconstructed prior to 1981 within the jurisdictions subject to the MRP is provided in Table 5-2.

Table 5-2: Total Calculated Loads for Bridges within the MRP Area, Built and/or Reconstructed Prior to 1981

County	Total Sealant PCBs Mass - Joints Only (kg)	Total Sealant PCBs Mass - Joints and Longitudinal Seal (kg)	Number of Bridges ¹
Alameda	3.8	11.2	340
Contra Costa	1.7	7.3	277
San Mateo	2.5	7.2	254
Santa Clara	3.7	10.1	473
Solano	0.9	3.2	133
Total	12.6	39.0	1,477

1. U.S. Department of Transportation Federal Highway Administration, 2019. National Bridge Inventory. Visited 24 March 2020.

To estimate the load reduction associated with long-term bridge or expansion joint replacement, it is assumed that an ongoing PCBs release rate from bridge joints is mitigated through bridge joint maintenance and whole bridge replacement projects. The load reduction estimation is based on the assumption that PCBs in caulk are leaching from bridge joints and longitudinal seals over their lifetime. When that PCBs-containing caulk is replaced or removed through maintenance or replacement projects, the source of PCBs release is removed, and the associated annual released load is also removed. PCBs leaching from the material could occur through incremental wear or through larger damage (e.g., pieces of caulk torn out) over the lifetime of the caulk.

Lacking a literature-based release rate of sealant over time, two potential average annual release rates (i.e., average over the life of the seal) were assumed to calculate an estimated load reduction from removing the joint seal –0.5% and 1.0%. These average annual release rates were applied to the estimated mass for the 1,477 bridges meeting the identified age criteria (Table 5-3). These releases would be eliminated through removal of the joint seal through joint replacement or bridge replacement.

Table 5-3: Long-Term Load Reduction (i.e., Replacement of PCBs-Containing Joints in All Older Bridges)

County	Total Sealant PCBs Load Reduced - Joints Only (g/year)		Total Sealant PCBs Load Reduced - Joints and Longitudinal Seal (g/year)	
	0.5% annual loss rate over life	1% annual loss rate over life	0.5% annual loss rate over life	1% annual loss rate over life
Alameda	19	38	56	112
Contra Costa	8	17	37	73
San Mateo	12	25	36	72
Santa Clara	19	37	50	101
Solano	5	9	16	32
Total	63	126	195	390

This load reduction would occur no later than 2080, based on the assumption that all older joints will be removed/replaced within 100 years of installation.

5. PROGRAM FOR MANAGING PCBs FROM ELECTRICAL UTILITIES

5.1 Program Description

The Electrical Utilities Management Program includes improved procedures for documenting removal and disposal of PCBs-containing electrical equipment (i.e., oil-filled electrical equipment, or OFEE) as part of ongoing equipment maintenance practices.

For this control measure, Permittee owned electrical utilities will document the removal of PCBs-containing OFEE since the start of the TMDL and in the future until all PCBs-containing OFEE have been removed from active service and provide data to support calculations of the associated stormwater load reductions due to these efforts. Additionally, it is anticipated that non-municipally owned regional electrical utilities that are not currently subject to PCBs load reduction requirements (i.e., PG&E) have been and will continue to remove PCBs-containing OFEE and document these efforts, past and present, consistent with methods used by applicable MRP permittees.

5.2 Loads Reduced Accounting Methodology

The load of PCBs reduced through implementation of the Electrical Utilities Management Program will be assessed using the following accounting method:

$$[1] \text{ Total Load of PCBs Reduced } (LR_T) = \left[\sum_{i=1}^n (LR_i) \right]$$

Where:

LR_i = Load of PCBs reduced for PCBs-containing OFEE removal during year i (kg/yr).

The PCBs loads reduced each year will be assessed using the following equations:

$$[2] \text{ Load of PCBs Entering MS4 in Year } i (L_i) = [L_0 \cdot (1 - F)^x]$$

and

$$[3] \text{ Load of PCBs Reduced during year } i (LR_i) = L_i \cdot F$$

Where:

L_i = Estimated annual load of PCBs entering the MS4 from OFEE in Year i (kg/yr).

L_0 = The initial annual load of PCBs that enters the MS4 from OFEE at the start of the PCBs TMDL (approximately 2005).

F = Estimated fraction of PCBs load prevented from entering the Bay each year due to OFEE removal (dimensionless fraction).

x = Number of years since the start of the PCBs TMDL (approximately 2005) and the year i (i.e., year $i - 2005$).

The above equations assume the fraction of PCBs load prevented from entering the MS4 each year is approximately equivalent to the annual OFEE removal rate.

Reasonable values were developed for each of the terms shown in equations [2] and [3] in order to calculate the total load reductions achieved for implementing the Electrical Utilities Management Program (Table 4-1, see Appendix G for further detail). The initial load of PCBs from OFEE at the start of the TMDL in approximately 2005 (L_0) was estimated as described in Appendix G as 1.1 kg/yr. This value is the TMDL-normalized annual load of PCBs that were entering the MS4 from OFEE in the San Francisco Bay area for data reported in McKee et al. (2006). The fraction of PCBs-containing OFEE removed annually (F) was estimated from data provided by municipally-owned electrical utilities in the MRP area. These data indicated that between 2005 and 2020, PCBs-containing OFEE were removed from service at a rate of 1.3% to 4.8% per year (average = 2.3% per year). These values are assumed to represent the range of annual OFEE removal rates since 2005 and into the future. The derivation of each of the terms shown in Table 4-1 is presented in detail in Appendix G. These values may be updated based on new data.

Table 4-1: Range of Values used to Estimate the PCBs Load Reductions due to the Electrical Utilities Management Program Since the Start of the PCBs TMDL in Approximately 2005.

Term	Description	Estimated Values	Units
L_0	Annual load of PCBs to MS4 from OFEE at the start of the PCBs TMDL; this value is assumed to be the TMDL-normalized McKee et al. (2006) estimated load to stormwater from transformers and large capacitors in 2005 (see Appendix G for details on how this value was developed).	1.1	kg/yr
F	Fraction of PCBs prevented from entering MS4 due to ongoing OFEE removals; these values are assumed equivalent to the annual rate of OFEE removal achieved by municipally owned electrical utilities in the Bay Area between 2005 and 2020 (see Appendix G for details on how these values were developed).	1.3 - 4.8 (Average=2.3)	%/year

Using the inputs provided in Table 4-1, the outputs of equations [2] and [3] were calculated to provide the range of annual loads to the MS4 from OFEE each year (L_i) and the associated range of loads reduced each year (LR_i) between 2005 and 2040 (Table 4-2). The total loads reduced during any given time period is calculated using equation [1] by summing the annual loads reduced (LR_i in Table 4-2) for all years within the time period of interest. For MRP 3.0, the time period of interest is assumed to be the five years of the permit term from 2022 to 2026. Therefore, the total loads reduced through the Electrical Utility Management Program during MRP 3.0 range from 0.056 kg/yr to 0.104 kg/yr (average 0.081 kg/yr).

All Permittees will receive a share of the total PCBs load reductions achieved as a result of program implementation based on the accepted countywide apportionment method (e.g., population).

Table 4-2: The calculated annual loads of PCBs to the MS4 from PCBs-containing OFEE (L_i) and the annual loads of PCBs reduced due to removal of PCBs-containing OFEE for the time period between 2005 and 2040. The values for L_i and LR_i were calculated using equations [2] and [3] and inputs provided in Table 4-2.

Year i	x = number of years since the start of the TMDL in 2005	L_i = Annual Load of PCBs (kg/yr) to the MS4 from OFEE (kg/yr)			LR_i = Annual Load of PCBs Reduced in Year i due to OFEE Removal (kg/yr)		
		Low F = 1.3%	Average F = 2.3%	High F = 4.8%	Low F = 1.3%	Average F = 2.3%	High F = 4.8%
2005	0	1.1	1.1	1.1	0.014	0.025	0.053
2006	1	1.086	1.075	1.047	0.014	0.025	0.050
2007	2	1.072	1.050	0.997	0.014	0.024	0.048
2008	3	1.058	1.026	0.949	0.014	0.024	0.046
2009	4	1.044	1.002	0.904	0.014	0.023	0.043
2010	5	1.030	0.979	0.860	0.013	0.023	0.041
2011	6	1.017	0.957	0.819	0.013	0.022	0.039
2012	7	1.004	0.935	0.780	0.013	0.021	0.037
2013	8	0.991	0.913	0.742	0.013	0.021	0.036
2014	9	0.978	0.892	0.707	0.013	0.021	0.034
2015	10	0.965	0.872	0.673	0.013	0.020	0.032
2016	11	0.953	0.852	0.640	0.012	0.020	0.031
2017	12	0.940	0.832	0.610	0.012	0.019	0.029
2018	13	0.928	0.813	0.580	0.012	0.019	0.028
2019	14	0.916	0.794	0.552	0.012	0.018	0.027
2020	15	0.904	0.776	0.526	0.012	0.018	0.025
2021	16	0.892	0.758	0.501	0.012	0.017	0.024
2022	17	0.881	0.741	0.477	0.011	0.017	0.023
2023	18	0.869	0.724	0.454	0.011	0.017	0.022
2024	19	0.858	0.707	0.432	0.011	0.016	0.021
2025	20	0.847	0.691	0.411	0.011	0.016	0.020
2026	21	0.836	0.675	0.392	0.011	0.016	0.019
2027	22	0.825	0.659	0.373	0.011	0.015	0.018
2028	23	0.814	0.644	0.355	0.011	0.015	0.017
2029	24	0.804	0.629	0.338	0.010	0.014	0.016
2030	25	0.793	0.615	0.322	0.010	0.014	0.015
2031	26	0.783	0.601	0.306	0.010	0.014	0.015
2032	27	0.773	0.587	0.291	0.010	0.013	0.014
2033	28	0.763	0.573	0.277	0.010	0.013	0.013
2034	29	0.753	0.560	0.264	0.010	0.013	0.013
2035	30	0.743	0.547	0.251	0.010	0.013	0.012
2036	31	0.733	0.535	0.239	0.010	0.012	0.011
2037	32	0.724	0.522	0.228	0.009	0.012	0.011

Year <i>i</i>	<i>x</i> = number of years since the start of the TMDL in 2005	<i>L_i</i> = Annual Load of PCBs (kg/yr) to the MS4 from OFEE (kg/yr)			<i>LR_i</i> = Annual Load of PCBs Reduced in Year <i>i</i> due to OFEE Removal (kg/yr)		
		Low F = 1.3%	Average F = 2.3%	High F = 4.8%	Low F = 1.3%	Average F = 2.3%	High F = 4.8%
2038	33	0.714	0.510	0.217	0.009	0.012	0.010
2039	34	0.705	0.499	0.207	0.009	0.011	0.010
2040	35	0.696	0.487	0.197	0.009	0.011	0.009

6. PROGRAM FOR MANAGING PCBs-CONTAINING MATERIALS AND WASTE DURING BUILDING DEMOLITION

6.1 Program Description

The MRP Permittees have developed and implemented a process, beginning in July 2019, for managing materials with PCBs concentrations of 50 ppm or greater in applicable structures at the time such structures undergo demolition. Applicable structures include commercial, public, institutional, and industrial buildings constructed or remodeled between the years 1950 and 1980 undergoing full-building demolition. Single-family residential and wood frame structures are exempt.

6.2 Loads Reduced Accounting Methodology

The load of PCBs reduced through implementation of the PCBs in Building Materials Management Program will be assessed using the following accounting method:

$$\text{Load of PCBs Reduced} = \left[\sum_{i=1}^n (N_i \cdot M_i \cdot SW_i) \right] \cdot E_f$$

Where:

- N_i = Number of applicable buildings demolished each year (units/yr)
- M_i = Average mass of PCBs per applicable building (mg/unit)
- SW_i = Average fraction of PCBs that enters the MS4 due to demolition without controls (%)
- E_f = Average fraction of PCBs prevented by controls from entering MS4 (%)

Reasonable values were used to assign the load reduction for this control measure in MRP 2.0. Permittees received a total of 2,000 g/yr (2 kg/yr) PCBs load reduction value in 2019 when protocols for managing PCBs-containing materials during demolition, as required in MRP 2.0 Provision C.12.f., were developed and implemented. Table 3-1 below lists the four terms and the assumed values used to derive the 2 kg/yr credit. These values may be updated based on data gathered in the future, as described below.

Table 3-1: Terms Used to Estimate the Loading of PCBs in Building Materials for MRP 2.0

Term	Estimated Value	Units
1. Number of applicable buildings ¹ demolished per year	50	buildings/year
2. Average mass of PCBs per applicable building	5	kg
3. Average fraction of PCBs that enters MS4s due to demolition without controls ²	0.01	dimensionless fraction
4. Average fraction of PCBs prevented by controls ² from entering MS4	0.8	dimensionless fraction

¹Applicable buildings: constructed from 1950 through 1980 with PCBs concentration in caulks/sealants greater than 50 ppm, excluding single family residential and wood frame buildings.

²The term “controls” refers to the proposed new demolition management program, not existing construction controls.

The 2 kg/yr PCBs load reduction stipulated during MRP 2.0 will be retained. During the MRP 3.0 permit term, Permittees may, with the necessary supporting data, request an increase in the credit received for the current program and/or expand the scope of the program to increase loads reduced. Any proposed revision of load reduction credit and/or program expansion would be submitted to the Regional Water Board for Executive Officer approval.

7. PROGRAM FOR MERCURY LOAD AVOIDANCE AND REDUCTION

7.1 Program Description

Mercury load avoidance and reduction includes a number of source control measures listed in the California Mercury Reduction Act adopted by the State of California in 2001. These source controls include material bans, reductions of the amount of mercury allowable for use in products, and mercury device recycling. The following source controls bans are included:

- Sale of cars that have light switches containing mercury;
- Sale or distribution of fever thermometers containing mercury without a prescription;
- Sale of mercury thermostats; and,
- Manufacturing, sale, or distribution of mercury-added novelty items.

In addition, fluorescent lamps manufacturers continue to reduce the amount of mercury in lamps sold in the U.S. Manufactures have significantly reduced the amount of mercury in fluorescent linear tube lamps and streetlamps. The use of mercury containing bulbs has also decreased through replacement of these bulbs with LED lamps.

Mercury Device Recycling Programs resulting in Mercury load reduction generally include three types of programs that promote and facilitate the collection and recycling of mercury-containing devices and products:

1. Permittee-managed household hazardous waste (HHW) drop-off facilities and curbside or door-to-door pickup;
2. Private business take-back and recycling programs (e.g., Home Depot); and,
3. Private waste management services for small and large businesses.

7.2 Loads Avoided/Reduced Accounting Methodology

The load avoidance/reduction methodology for this control measure is:

$$HgReduction_{L/S/T} = BaseLoad_{LST} - CurLoad_{LST}$$

Where:

BaseLoad_{LST} = Baseline load of mercury in urban stormwater in 2002 from lamps (L), switches (S), and thermostats (T)

CurLoad_{LST} = Current load of mercury in urban stormwater in year of interest from lamps (L), switches (S), and thermostats (T)

And:

BaseLoad_{LST} = BaseMass_{L/S/T} • BaseNum_{L/S/T} • T

CurLoad_{LST} = CurMass_{L/S/T} • CurNum_{L/S/T} • T

Where:

BaseMass _{LST}	=	Average mass of total mercury in each lamp (L), switch (S), and thermostat (T) in 2002 (Assume: 93mg per kilogram of linear fluorescent lamp or Compact Fluorescent Lamp (CFL); 2.9g per switch; and 4g per thermostat).
CurMass _{LST}	=	Average mass of total mercury in each lamp (L), switch (S), and thermostat (T) recycled in year of interest (Assume: 35mg per kilogram of linear fluorescent lamp or CFL; 2.9g per switch; and 4g per thermostat).
BaseNum _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) improperly discarded into the environment in 2002.
CurNum _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) discarded into the environment improperly in year of interest.
T	=	% of total mercury in lamps (L), switches (S), and thermostats (T) that when improperly discarded are transported to the Bay via urban stormwater (Assume 4.8%).

And:

BaseNum _{LST}	=	BaseSpent _{L/S/T} - BaseRecycle _{L/S/T}
CurNum _{LST}	=	CurSpent _{L/S/T} - CurRecycle _{L/S/T}

Where:

BaseSpent _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) that reached their end-of-life in 2002
BaseRcy _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) recycled in 2002
CurSpent _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) that reached their end-of-life in year of interest
CurRecycle _{LST}	=	Number or weight of lamps (L), switches (S), and thermostats (T) recycled in year of interest

Table 9-1 below provides conversion factors and references for the assumed values used in these calculations.

Table 9-1: Mercury Recycling Conversion Factors and References

Item	Conversion and Citation
Fluorescent Lamps	<p>The average mercury content for a four-foot linear fluorescent lamp is 8.3 milligrams (mg). This is equal to 2.075 mg (2.075 X 10⁻⁶ kilograms (kg)) per linear foot.</p> <p>Source: NEMA 2005. Fluorescent and Other Mercury-Containing Lamps and the Environment: Mercury Use, Environmental Benefits, Disposal Requirements. National Electrical Manufacturers Association. March 2005. 14p.</p>
Compact Fluorescent Lamps (CFLs)	<p>The National Electrical Manufacturers Association (NEMA) announced that under the new voluntary commitment, effective October 1, 2010, participating manufacturers will cap the total mercury content in CFLs that are under 25 watts at 4 mg per unit, and CFLs that use 25 to 40 watts of electricity will be capped at 5 mg per unit. Each CFL recycled is assumed to have an average mass of 4.5 mg (4.5 X 10⁻⁶ kg). New CFLs are also assumed to have 4.5 mg on average.</p> <p>Source: NEMA 2010. NEMA Lamp Companies Agree to Reduction in CFL Mercury Content Cap. Available at http://www.nema.org/media/pr/20101004a.cfm. Accessed April 11, 2012.</p>
High Intensity Discharge (HID) Lamps	<p>The average content of a HID bulb is .5 milligrams of mercury (0.5 x 10⁻⁶ kg).</p> <p>Source NEMA Opposition to Ban on Mercury Containing Headlamps, 2004 http://www.nema.org/Policy/Environmental-Stewardship/Lamps/Documents/HID%20Headlamps%2010%2004.pdf</p>
Thermostats	<p>The amount of mercury in a thermostat is determined by the number of ampoules. There are generally one or two ampoules per thermostat (average is 1.4) and each ampoule contains an average of 2.8 grams (g) of mercury. Therefore, each thermostat recycled is assumed to contain approximately 4.0 g (0.004 kg) of mercury.</p> <p>Source: TRC 2008. Thermostat Recycling Corporation's Annual Report for the U.S. Prepared by the Thermostat Recycling Corporation. http://www.thermostat-recycle.org/files/u3/2008 TRC Annual Report.pdf.</p> <p>Each thermostat recycled is assumed to contain approximately 4.0 g (0.004 kg) of mercury. The average weight of one thermostat is 12 ounces. There are 1.3333 thermostats in a pound of thermostats (1 pounds/0.75 pounds = 1.33 thermostats). It is estimated that 0.005333 kg of mercury is recycled for every pound of thermostat recycled (1.333*0.004= 0.005333).</p> <p>Source: Average weight of thermostat obtained from retail websites - www.amazon.com.</p>
Switches	<p>The Recycling Corporation reports that one mercury switch contains 2.87 g (0.00287 kg) of mercury.</p> <p>Source: TRC 2010. Thermostat Recycling Corporation's Annual Report for California. Prepared by the Thermostat Recycling Corporation. Prepared for the State of California's Office of Pollution Prevention and Green Technology, Department of Toxic Substances Control. March 31, 2010.</p>

8. PROGRAM UPDATES AND REFINEMENTS

The accounting methodology outlined in this report may be updated and refined to account for significant new information as it becomes available. If needed, the proposed updates will be submitted as an addendum to this report for Executive Office approval during the MRP 3.0 permit term.

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APPENDIX A

Land Use-Based Yield Analysis

A.1 METHODOLOGY

The methodology presented in this appendix was developed to assist the MRP Permittees in identifying which watershed characteristics correlate well with areas that have high, moderate, and low rates of pollutant of concern (POC) (i.e., mercury and PCBs) loading to receiving waters via stormwater runoff. The methodology was developed using the collective local understanding of the types of land areas, facilities, and activities that generate POCs, with a focus on PCBs. The ultimate goal of the analysis was to provide first order estimates of POC loading rates from high, moderate, and low likelihood source areas and to assist Permittees in identifying areas for implementing POC load reduction measures that would have the greatest load reduction benefit.

A.1.1 Source Area Mapping

Documented uses and sources of PCBs and mercury in the urban environment and the results of PCBs source identification and abatement studies described in the 2014 Integrated Monitoring Report (IMR) Part B (BASMAA, 2014) have been used to identify PCBs source areas. Findings demonstrate that PCBs (and to a lesser extent mercury) sources are generally associated with watershed areas where equipment containing POCs were transported or used and facilities that recycle POCs or POC-containing devices and equipment. These sources include current and historic metal, automotive, and hazardous waste recycling and transfer stations; electrical properties and power plants; and rail lines. These sources are typically located in areas that were industrialized between the late 1920's and the late 1970's, the timeframe when PCBs and mercury production were the greatest in the U.S.

To assist Permittees in identifying potential POC sources and source areas, a number of preliminary GIS data layers were developed using existing and historical information on land use and facility types that were located in the Bay Area during the early to mid-20th century. GIS data layers included a revised "Old Industrial" land use layer that attempted to depict industrial areas that were present in the year 1968; an "Old Urban" land use layer that depicts urban areas developed by 1974, other than those depicted as Old Industrial; points depicting current facilities that have the potential to have or have had PCBs on-site; and historical and current rail lines where PCBs may have been transported.

A.1.1.1. Old Industrial Land Areas

Three sets of data layers were acquired and served as the primary sources of information used to create the Old Industrial data layer: 1) the 2005 version of the Association of Bay Area Governments (ABAG) land use data layers for the five Bay Area counties, which depicts current industrial land use areas; 2) 1968 aerial photographs for the Bay Area at 30,000 scale acquired from the United States Geological Survey's (USGS) Earth Explorer website; and 3) the most currently available County Assessor parcel data layers for Bay Area counties. Through the development of the Old Industrial layer, two data layers were created. The first depicts industrial land areas in 1968 that are not currently characterized as industrial by ABAG. This data layer was created by panning through 1968 aerial photography and identifying industrial land areas outside of the areas characterized as industrial land use in roughly 2005 by ABAG. The purpose of this layer was to identify potential industrial facilities that were present in 1968, but possibly redeveloped or incorrectly identified within the ABAG land use data. The second data layer that

was created depicts areas characterized by ABAG in 2005 as industrial land uses that were clearly not industrial in the 1968 aerial photographs. Most of these areas were developed into industrial land uses after 1968 and are most commonly agricultural in the aerial photographs. All parcels that were identified as at least partially industrial in 1968 were visually checked in the data layer to provide greater confidence in its accuracy. Minor edits were then made based on this quality assurance check. If there was uncertainty as to whether a parcel in the 1968 photographs was industrial, then the parcel was classified based on the ABAG land use data. As a final check, the 1968 aerial photographs were also compared to current aerial photographs and each parcel that had been redeveloped was attributed with the current land use, even if that land use remained industrial.

A.1.1.2. Old and New Urban Land Areas

Old Urban and New Urban land use data layers that depict areas urbanized prior to and after 1974, respectively, were developed using an urban extents data layer from 1974, the closest year to 1968 that the data were available. All areas that were within the urban extent in 1974 were defined as Old Urban; those areas that fell outside of this definition were classified as New Urban. Old Urban areas have been further divided into residential and parks areas versus commercial areas in the current land use classification schema.

A.1.1.3 Identification of Potential POC Associated Facilities

Point data were collected for a number of facility types that may be associated with either PCBs or mercury. These facility types include those associated with electrical generation, known mercury emitters, metal manufacturing, drum recycling, metal recycling, shipping, automotive recycling, general recycling, and those known to have or historically have had PCBs in use. This information was primarily gathered by the San Francisco Estuary Institute (SFEI) as part of the Urban Stormwater Best Management Practices (BMPs) Proposition 13 Grant project and contains data from a variety of sources, including the California Air Resources Board, EnviroStor, Superfund, Department of Toxic Substances Control, and the State Water Resource Control Board.

Certain facility types for which point data were developed were mapped in greater detail to develop polygons to allow area calculations to be performed. Of particular interest for PCBs were the several hundred electrical substations in the Bay Area. Areas for these facilities were delineated using current and 1968 aerial photographs to attribute whether each facility was built prior to or after 1968. Additionally, military, port, and railroad land use areas were developed using ABAG 2005 land use data and the latest assessor's parcel data. Military parcels were further edited to only include developed areas.

Land use and facility data layers created as part of this effort were then combined to create one contiguous data layer. This data layer was attributed with additional information such as city, county, and watershed.

A.2 Regional Watershed Spreadsheet Analysis

A.2.1 Background

The Regional Watershed Spreadsheet Model (RWSM) was developed as part of the Regional Monitoring Program’s (RMP) Small Tributaries Loading Strategy as a regional-scale planning tool primarily for the purpose of estimating long-term average annual loads from the small tributaries surrounding San Francisco Bay, and secondarily to provide supporting information for prioritizing watersheds or areas within watersheds for management actions (Wu et al., 2016).

The RWSM is structured with three stand-alone empirical models: the hydrology model, the sediment model, and the pollutant model (Wu et al., 2016). The hydrology model uses runoff coefficients based on geospatially identified land use-soil-slope combinations along with rainfall based on PRISM average precipitation¹ to estimate annual runoff from a defined watershed area. The sediment model uses a function of geology, slope, and land-use to simulate suspended sediment transport in the landscape of a defined watershed while adjusting for watershed storage factors. The pollutant model is a spreadsheet model that combines land use-based pollutant concentrations (i.e., pollutant concentrations in water or pollutant concentrations on fine sediment particles as particle ratios² corresponding with specific land use types or source areas) with land use-based hydrology model output or sediment model output. Land use-based loading results are compiled to obtain pollutant loading across a defined watershed.

Starting in 2010, a multi-year effort was undertaken to systematically develop and calibrate the RWSM for San Francisco Bay watersheds using RMP data. Calibration was completed³ and the model was released in 2018 (SFEI, 2018). For further detail about each component of the model, see the RWSM User Manual (SFEI, 2018).

A.2.2 RWSM Results

The estimated average PCBs and mercury yields from the RWSM Toolbox v1.0 Pollutant Model, “Pollutant Spreadsheet Model Calculations – Region” for the modeled land use yield categories are provided in Table A-1 below. The “Region” spreadsheet results were developed using RMP data from well-sampled watersheds to calibrate pollutant concentration coefficients and applying the resulting coefficients to the region to get average pollutant yield results (Gilbreath, 2019).

¹ 800-m grid, from PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>.

² Particle ratios = pollutant concentration in water (ng/L) / suspended sediment concentration (mg/L), equivalent to mg/kg.

³ The calibration for PCBs is “reasonable” but there remains a lower confidence in the calibration for mercury (Wu et al., 2017).

Table A-1: RWSM Land Use-Based Yields for PCBs and Mercury

Land Use Category	Average PCBs Yield (mg/ac/yr)	Average Mercury Yield ¹ (mg/ac/yr)
Old Industrial and Source Areas	259	53
Old Commercial and Old Transportation	49	57
Old Residential	2.8	57
New Urban	0.4	4
Agriculture/Open Space	0.4	81

mg/ac/yr – milligrams per acre per year

Note: RWSM Toolbox v1.0 Pollutant Model, Pollutant Spreadsheet Model Calculations - Region. Spreadsheet dated 6/9/2017.

1. The model calibration for PCBs is “reasonable” but there remains a lower confidence in the calibration for mercury (Wu et al., 2017).

Table A-2 below presents the RWSM Toolbox v1.0 Pollutant Model, “Pollutant Spreadsheet Model Calculations – Region” results for PCBs and mercury average concentrations in runoff for the five RWSM modeled land use categories (SFEI, 2018).

Table A-2: Regional Watershed Spreadsheet Model PCBs and Mercury Concentrations in Runoff

Land Use Category	Total PCBs (ng/L)	Total Mercury ¹ (ng/L)
Old Industrial and Source Areas	204	40
Old Commercial and Old Transportation	40	63
Old Residential	4	63
New Urban	0.2	3
Agriculture/Open Space	0.2	80

1. The model calibration for PCBs is “reasonable” but there remains a lower confidence in the calibration for mercury (Wu et al., 2017).

A.3 Source Area/Property PCBs Yield

The derivation of the estimated PCBs source property yield is described below. The PCBs source property yield was derived as the product of a representative PCBs concentration in surface soils at known source properties and a representative soil/sediment yield for old industrial areas.

Table A-3 and Table A-4 present descriptive statistics for measured concentrations of PCBs from source properties located in Alameda, Contra Costa, Santa Clara, and San Mateo Counties. This dataset includes 670 PCBs surface soil samples from twelve source property locations as well as on-site source property data identified in the street and storm drain sediment dataset that has been compiled by BASMAA to-date (see Appendix B). All soil samples included in the analysis were collected from the 0 to 0.5-foot depth interval, with the exception those collected at one site, based on the assumption that the top six inches of soil would have the most potential to mobilize offsite via wind or rainfall erosion. Data collected from the 0 to 1.0-foot depth interval were included for the General Electric site in Oakland, as this represented the shallowest reported depth for that site. The range of PCBs concentration (mg/kg) in surface soils for individual Bay Area source properties are provided in Table A-3 and the summary statistics for all sites combined are provided in Table A-4.

Table A-3: Site specific PCBs concentration in surface soil collected on-site from source properties located in Alameda, Contra Costa, Santa Clara, and San Mateo Counties.

Site Location	Minimum (mg/kg)	Average (mg/kg)	Maximum (mg/kg)	Count	Reference
1411 Industrial Rd, San Carlos	1.66	236.31	418.00	5	EKI Environment and Water, 2018. Letter from EKI to Mark Johnson, RWQCB, October 8, 2018. Subject: PCB Storm Drain Sediment Sampling Results 1411 Industrial Road, San Carlos, CA (EKI B80090.00)
270 Industrial Road and 495 Bragato Rd, San Carlos (Delta Star Inc./Tiegel Manufacturing Co.)	3.40	28.36	122.00	14	GHD, 2016. Incremental Sampling Investigation Report. August 4.
335 Brokaw Road, Santa Clara	3.56	3.56	3.56	1	SCVURPPP POC Monitoring
1645 Old Bayshore Highway, San Jose	11.91	11.91	11.91	1	SCVURPPP POC Monitoring
1695 and 1775 Monterey Highway, San Jose	5.47	6.26	7.06	2	SCVURPPP POC Monitoring
1800 South Monterey Road, San Jose	1.79	2.70	3.61	2	SCVURPPP POC Monitoring
Union Pacific Railroad at Schallenberger Road, San Jose	2.80	2.80	2.80	1	CW4CB Final Report/database (http://basmaa.org/Clean-Watersheds-for-a-Clean-Bay-Project)
Union Pacific Railroad Leo Avenue, San Jose	0.02	12.86	127.00	45	GHD, 2017. Remedial Investigation Report. Union Pacific Railroad Property, Leo Avenue ROW, San Jose, CA. September.
ETT111, Oakland	3.70	3.70	3.70	1	Kleinfelder, 2006. Private Property Sediment Sampling Report: Ettie Street Watershed, Oakland, California. Kleinfelder West, Inc.
3430 Wood Street, Oakland (Granite Expo)	93.41	93.41	93.41	1	ibid
1797 12 th St, Oakland (Cole Brothers Auto Wrecker)	1.67	1.67	1.67	1	ibid
3015 Adeline St, Oakland (California Electric)	6.08	6.08	6.08	1	ibid
1266 14 th St, Oakland (Amtech Lighting)	5.70	5.70	5.70	1	ibid
3425 Ettie St, Oakland (Allied Painter)	1.75	1.75	1.75	1	ibid
2838 Hannah St, Oakland (Former Giampolini)	0.74	9.23	17.73	2	ibid
3428-3434 Helen Street, Oakland (ACM)	10.62	10.62	10.62	1	ibid

Site Location	Minimum (mg/kg)	Average (mg/kg)	Maximum (mg/kg)	Count	Reference
1639 18 th St, Oakland (Martinez Bros Trucking)	1.95	1.95	1.95	1	ibid
2601-2812 Peralta St, Oakland (Custom Alloy Scrap Sales)	1.78	7.09	14.73	4	ibid
280 West MacArthur Blvd, Oakland (Kaiser Oakland)	0.01	1.67	27.20	101	Forensic Analytical Environmental Health Consultants, 2017. PCB Soil and Sediment Waste Characterization and Disposal Plan, Kaiser Permanente Medical Center Oakland Legacy Tower Demolition Project, 280 West MacArthur Boulevard, Oakland, CA. Revised April 21, 2017.
710 73 rd Avenue, Oakland (Former Aero Plating)	0.01	101.42	790.00	8	Fugro Consultants, Inc. 2016. Limited Soil Sampling Investigation, 710 73 rd Avenue, Oakland, CA. January.
700 73 rd Avenue, Oakland (Union Pacific Railroad)	0.92	88.16	1,100	14	CDM Smith, 2014. Report of Findings for Data Gaps Investigation Phase B - On-site Investigations, Union Pacific Railroad Company Property, 700 73 rd Avenue Oakland, CA. November 14.
5441 International Boulevard, Oakland (General Electric)	0.03	248.36	11,000	134	Geosyntec Consultants, 2009. Feasibility Study Report for the GE Site at 5441 International Boulevard, Oakland, CA. June.
4560 Horton Street, Emeryville (Former South Southern Pacific Railroad)	0.03	0.40	1.91	6	EKL, 2016. Corrective Action Work Plan – Shallow Soil Excavation, Former SPRR Parcel South of 53 rd Street, Emeryville, CA. June 29.
One Cyclotron Rd, Berkeley (Lawrence Berkeley National Laboratory)	0.0019	3.23	135.0	227	Lawrence Berkeley National Laboratory, 2016. Quarterly and Semiannual Progress Reports, for the LBNL Hazardous Waste Facility Permit. Environmental Restoration Program. August 1993 through February 2016.
CC-SPL-600-P	1.29	1.29	1.29	1	Contra Costa County 2015 POC Sampling
San Diego St, Richmond (San Diego St)	0.03	0.12	1.20	14	Arcadis, 2016. San Diego Street Transformer Oil Release Cleanup and Closure Report, West End of San Diego Street Richmond, CA, February.
1014 Chesley Ave, Richmond (World Oil)	0.01	0.79	6.50	70	APEX, 2018. PCB Characterization Report, World Oil Corporation Property, 1014 Chesley Avenue, Richmond, California. July 13.
1215 Willow Pass Road, Pittsburg (Molino)	0.02	1.19	5.60	10	Ground Zero Analysis, 2016. Phase II Investigation at 1215 Willow Pass Road, Pittsburg, November 11.
Average for All Properties		31.88			

Table A-4: Summary of PCBs concentration in surface soil collected on-site from source properties located in Alameda, Contra Costa, Santa Clara, and San Mateo Counties.

Statistic	PCBs (mg/kg)
Maximum	11,000
90 th Percentile	36.90
75 th Percentile	4.80
Average	57.71
Median	0.57
25 th Percentile	0.069
10 th Percentile	0.0020
Minimum	0.0019
N	670

Based on the data reviewed, the Bay Area wide average of PCBs in surface soil from known source properties based on individual property averages is 31.9 mg/kg (Table A-3) and the average based on individual sample concentrations is 57.7 mg/kg (Table A-4). An average concentration is the appropriate metric to use for the yield estimate as it is representative of the total expected loading, which is affected by very high concentrations.

A sediment yield for Old Industrial land uses within the Santa Clara Basin watersheds was estimated based on a Loading Simulation Program – C++ (LPSC) watershed model developed for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) as part of their reasonable assurance analysis (Paradigm Environmental, 2019 (attached)). The sediment yield estimated from the LPSC watershed model represents baseline hydrology and water quality, specifically sediment and solids. The median, LPSC-modeled sediment yield from Old Industrial land uses in the Santa Clara Basin is 39 grams/m²/year or 157.8 kg/acre/year. Using the average PCBs concentration, estimated in two different approaches, of 31.9 mg/kg and 57.7 mg/kg from surface soils on Bay Area source properties presented above and the median Old Industrial sediment yield of 157.8 kg/acre, the estimated PCBs yield from source properties is 5,031 mg/acre/year and 9,108 mg/acre/year, respectively.

For mercury, the RWSM yield value for old industrial/source areas will be used for load reduction accounting.

A.4 LIMITATIONS AND UNCERTAINTY

Land use is used as a surrogate for actual PCBs and mercury sources, and although the types of potential sources have been identified, the actual locations and sizes of sources are difficult to determine at this level of analysis. While categorized the same for modeling and analysis purposes, similar land use in different locations may have very different sources and thus distinctly different PCBs and mercury concentrations in runoff.

It is difficult to quantitatively assess the implications of these limitations on the projected magnitude of loads, especially as analysis shifts from regional to more refined spatial scales. The projected loads should be considered first order approximation and reflective of the central tendency of the data for the Bay Area as a whole.

A.5 REFERENCES

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APPENDIX B

Urban Sediment Concentration Statistics

B.1 Descriptive Statistics

Tables B-1 and B-2, and Figures B-1 and B-2 presents descriptive statistics for the PCBs and mercury street and storm drain sediment dataset that has been compiled by BASMAA to-date. This dataset includes 1,535 PCBs samples and 1,350 mercury samples taken within the street right-of-way, storm drain conveyance system, and private properties from 1999 through 2019. Data are summarized by the predominant land use within the vicinity of where the sediment was collected.

Table B-1: PCBs concentrations in sediment (mg/kg) collected from streets, stormwater conveyance systems, and private properties located in Alameda, Contra Costa, Santa Clara, San Mateo, and Solano Counties between 1999 and 2019.

Statistic	Old Industrial	Old Urban (Not Residential/Parks)	Old Urban (Residential/Parks)	New Urban	Open Space	All Samples
Maximum	193	17	5.7	0.72	1.1	193
90 th Percentile	1.1	0.18	0.30	0.27	0.19	0.77
75 th Percentile	0.21	0.08	0.10	0.047	0.054	0.16
Mean	0.79	0.22	0.20	0.066	0.067	0.65
Geometric Mean	0.26	0.09	0.12	0.059	0.058	0.22
Median	0.05	0.03	0.023	0.016	0.009	0.041
25 th Percentile	0.01	0.01	0.006	0.001	0.002	0.009
10 th Percentile	ND	ND	ND	ND	ND	ND
Minimum	ND	ND	ND	ND	ND	ND
<i>n</i>	1,205	110	98	69	53	1,535

Table B-2: Mercury concentrations in sediment (mg/kg) collected from streets, stormwater conveyance systems, and private properties located in Alameda, Contra Costa, Santa Clara, San Mateo, and Solano Counties between 1999 and 2015.

Statistic	Old Industrial	Old Urban Not Res/Parks	Old Urban Res/Parks	New Urban	Open Space	All Samples
Maximum	21	1.7	4.5	13	4.3	21
90 th Percentile	0.80	0.41	0.78	0.63	0.35	0.74
75 th Percentile	0.30	0.22	0.40	0.27	0.20	0.29
Mean	0.43	0.20	0.43	0.46	0.29	0.41
Geometric Mean	0.29	0.13	0.19	0.27	0.11	0.28
Median	0.15	0.11	0.18	0.14	0.11	0.15
25 th Percentile	0.088	0.071	0.082	0.100	0.046	0.086
10 th Percentile	0.057	0.051	0.045	0.056	0.030	0.054
Minimum	ND	0.015	0.015	ND	0.020	ND
<i>n</i>	1,069	80	91	62	48	1,350

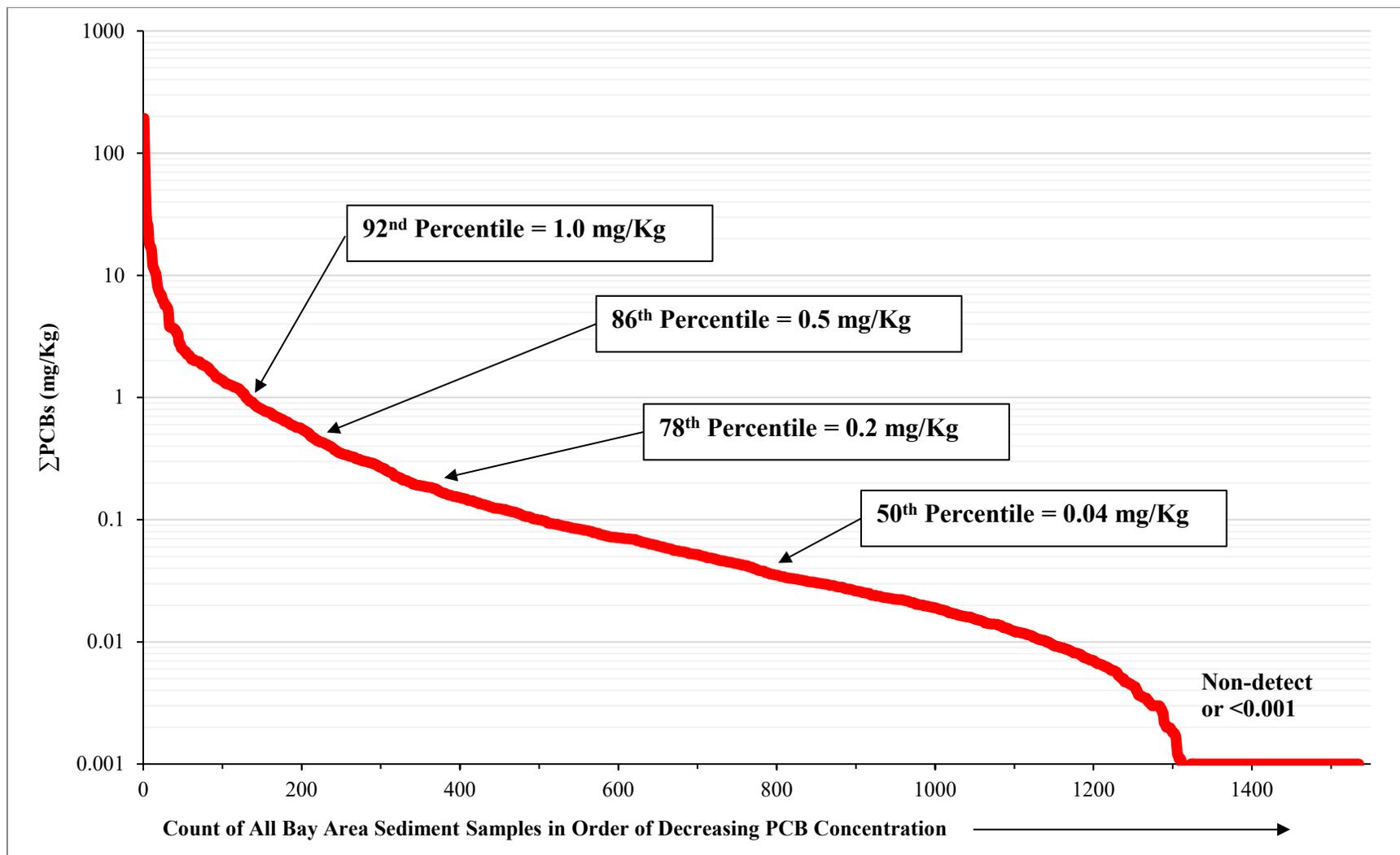


Figure B.1: Total PCB concentrations in sediment collected from streets, stormwater conveyance systems, and private properties located in Alameda, Contra Costa, Santa Clara, San Mateo, and Solano Counties between 1999 and 2019.

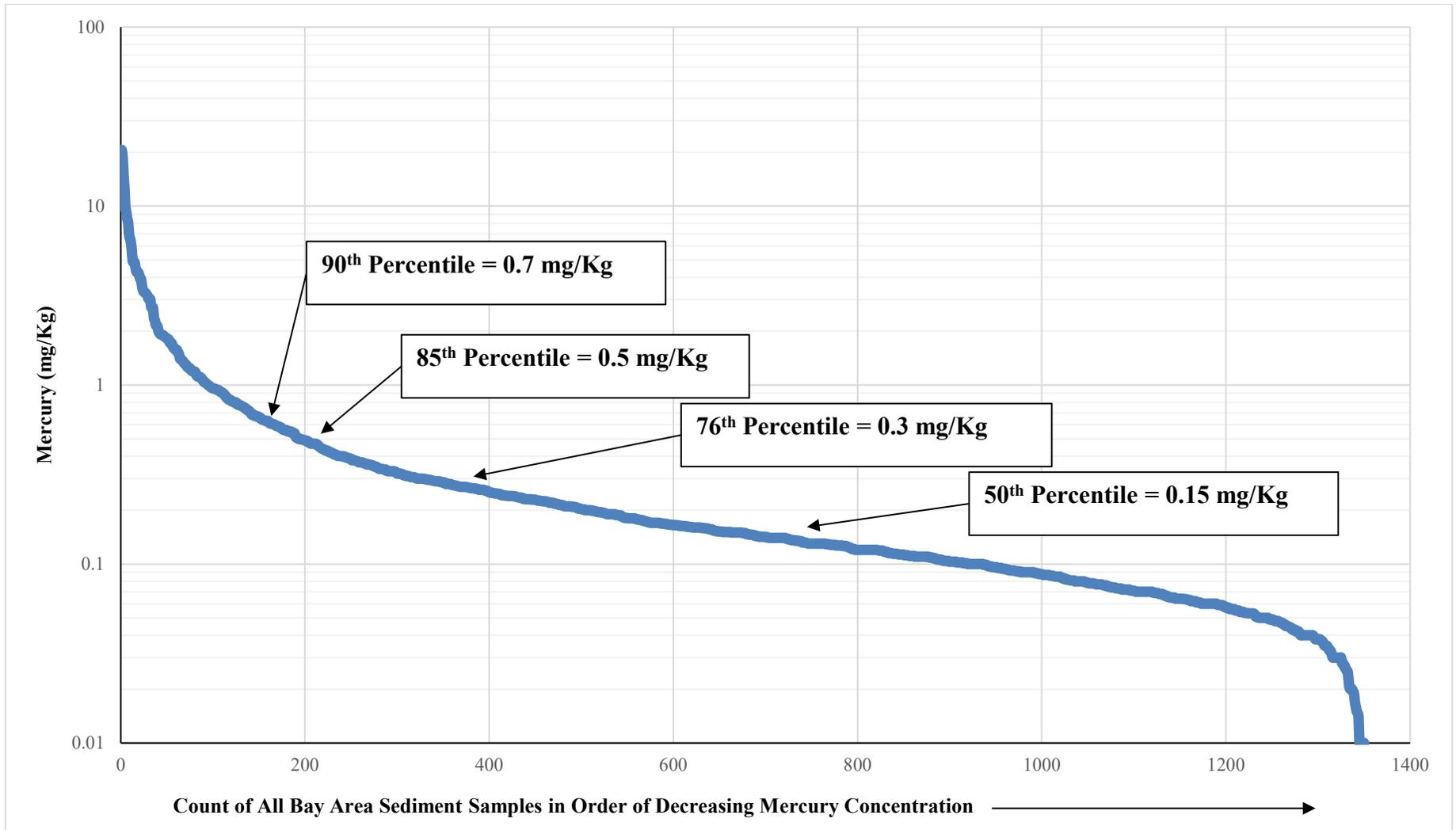


Figure B.2: Total mercury concentrations in sediment collected from streets, stormwater conveyance systems and private properties located in Alameda, Contra Costa, Santa Clara, San Mateo, and Solano Counties between 1999 and 2019.

APPENDIX C
Large Full Trash Capture Device Efficiency
Factor Data Analysis

C.1 Purpose and Approach

The purpose of this appendix is to document findings of studies and analyses conducted to determine the effectiveness for removing total suspended solids (TSS), PCBs, and mercury by large (non-inlet-based) trash capture devices, including hydrodynamic separator (HDS) units, gross solids removal devices (GSRDs), and baffle boxes. Other types of non-inlet-based trash capture devices, such as trash netting devices and trash booms, are assumed to remove negligible amounts of sediment, PCBs, and mercury, so are not included in this appendix. Inlet-based devices, including inlet baskets and connector pipe screens, are discussed in Appendix G. For the purposes of load reduction accounting, the method assumes that HDS units, GSRDs, and baffle boxes reduce PCBs and mercury concentrations in direct proportion to TSS reduction.

C.2 HDS Units

Percent Removal of TSS. Percent removal of TSS in HDS units was calculated from the BASMAA Clean Watersheds for a Clean Bay (CW4CB) Task 5 Leo Avenue pilot project data (BASMAA 2017a). For this project, a prefabricated Contech HDS unit called the Continuous Deflective Separator (CDS) was retrofitted into the existing storm drain system in the Leo Avenue Watershed in San Jose.

Influent and effluent water quality was sampled at four events as summarized in Table C-1 below. The CDS unit removed an average of 30% of TSS coming into the unit.

Table C-1: Percent Removal of TSS at Leo Ave CDS Unit

Event	Date	Sample Location	TSS (mg/L)	% Removal
1	28-Feb-14	Inflow	110	17%
		Outflow	91	
2	29-Mar-14	Inflow	230	17%
		Outflow	190	
3	31-Oct-14	Inflow	62	88%
		Outflow	7.5	
4	02-Dec-14	Inflow	82	-3%
		Outflow	84.5	
Average				30%

The International Stormwater BMP Database (<http://bmpdatabase.org/>) was evaluated for potentially useful studies. Twenty studies of manufactured devices were identified as useful for analysis. These studies had a total of 334 paired inflow/outflow data points for TSS. Percent removal was calculated for each paired data point and then averaged for the BMP. The results for these studies along with descriptions of land use type and watershed size and imperviousness are presented in Table C-2 below. Average percent removal ranged from -85% (i.e., an increase in

TSS concentration in outflow compared to inflow) to 73% and averaged 19% across all studies (including the City of San Jose’s Leo Avenue unit).

The dataset was also analyzed by removing BMPs that were treating just roads or highways, parking lots, or college campuses. In this scenario, ten studies remained that had mixed, other, or unknown land use type. The average percent removal of TSS from the BMPs evaluated in this group of studies was slightly higher at 22%.

Table C-2: Percent Removal of TSS for Studies in BMP Database

Site and BMP	Device Model	Land Use Type	Watershed % impervious	Watershed Area (ac)	Average TSS % Removal ¹
OP Soccer Complex: PMSU56_40_40	Contech CDS, Model PMSU56_40_10	Parking lots adjacent to soccer fields.	90	3.98	-85%
NW Birch Place CDS unit: Continuous Deflective Separation unit	CDS Unit	Low Density Residential: 47.4% Office Commercial: 42.2% Multi-Family Residential: 10.3%	--	45.0	-14%
Broadway Outfall: CDS Unit	CDS			132	-6%
University of New Hampshire F3: Continuous Deflective Separation	CDS	College Campus: 100%	100	0.32	-5%
Lake O Sediment Demo: CDS Unit	PSW56_53		--	--	-3%
I-210 / Orcas Ave: Orcas	CDS	Roads/Highway: 100%	100	1.11	-3%
USGS_WI_HSD_DD: Hydrodynamic Settling Device	Downstream Defender®, manufactured by Hydro International.		84	1.90	-1%
I-210 / Filmore Street: Filmore CDS	CDS	Roads/Highway: 100%	100	2.50	2%
University of New Hampshire F2: Environment 21 V2B1	Environment 21 V2B1	College Campus: 100%	100	0.32	5%
University of New Hampshire F1: Vortechinics	Vortechinics	College Campus: 100%	100	0.32	13%
USGS_WI_HSD: HSD	Hydrodynamic Settling Device, Contech	The HSD treats a 0.25-acre deck section of the westbound I-794 freeway	100	0.25	26%
Harrisburg Public Works Yard: PAYardTerreKleene	Terre Kleen	--	90	3.21	28%

Site and BMP	Device Model	Land Use Type	Watershed % impervious	Watershed Area (ac)	Average TSS % Removal ¹
SC_StructBMP3: BMP3	Vortechnics	BMP3 is located along the westbound lane of S.C. Highway 802	--	--	29%
Indian River Lagoon CDS Unit: CDS Unit	CDS	Open Space: 38% Light Industrial: 32% Office Commercial: 19%	11	61.5	30%
Leo Avenue: HDS Unit ²	Contech CDS	--	--	--	30%
SC_StructBMP1&2: BMP2	CDS Technologies	BMP2 is located along the southbound lane of U.S. Highway 21	100	1.11	39%
University of New Hampshire E1: Aqua Swirl	Aqua Swirl	College Campus: 100%	100	0.99	40%
Timothy Edwards Middle School: Vortechs No 5000	Vortechs	--	80	1.95	45%
VC: VC	Vortcapture	Residential area with lots of organic matter/leaf litter loading	--	--	53%
Marine Village Watershed: VortechsTM Stormwater Treatment System	Vortechs	Office Commercial: 50% Medium Density Residential: 45% Unknown: 5%	95	9.34	72%
NJ Manasquan Bank: NJManasquanCDS	High Efficiency Continuous Deflective Separator (CDS), Model 20 25	--	79	0.89	73%

Notes: -- indicates information was not provided.

1. Based on analysis of paired inflow/outflow results.
2. Leo Ave CW4CB study. Not a BMPDB Study.

The manufacturer's removal efficiency claims and the tested removal efficiencies of six of the BMPs evaluated in the studies were summarized as reported in the Massachusetts Stormwater Technology Evaluation Project (MASTEP) clearinghouse database (Table C-3).

Table C-3: Percent Removal of TSS for Six Manufactured Devices from MASTEP

Product (BMP)	Manufacturer	Manufacturer's Removal Efficiency claim	Tested Removal Efficiency
Aqua-Swirl	Aqua Shield	85%	84-87%
CDS	Contech	70%	65-95%
Vortechs	Contech	35-85%	35-64%
Downstream Defender	Hydro International	90%	70%
V2B1	Environment 21	80%	65%
Terre Kleen	Terre Hill	78%	17-50%
Average ¹			56%

Notes: 1. Average based on low end of reported efficiency range.

Based on the above findings, 20% is a conservative estimate of the average percent removal of TSS by HDS units.

Percent Removal of PCBs and Mercury. To further evaluate the pollutant removal performance of HDS units, BASMAA (2019) conducted a combined monitoring and modeling study in 2017 and 2018 based on the removal of solids captured within HDS unit sumps. The Project collected samples of the solids captured and removed from eight different HDS unit sumps during cleanouts. The solid samples were analyzed for PCBs and mercury concentrations. Maintenance records and construction plans for these HDS units were reviewed to develop estimates of the average volume of solids removed per cleanout and the typical number of cleanouts per year. This information was combined with the measured pollutant concentrations to calculate the annual mass of PCBs and mercury captured in the sumps and removed during cleanouts. Next, the annual pollutant loads discharged from each HDS unit catchment were estimated using two different load calculation methods. Method #1 used the land use-based pollutant yields described in the BASMAA Interim Accounting Methodology (BASMAA 2017b) to estimate catchment loads. Method #2 used the Regional Watershed Spreadsheet Model (RWSM, Wu et al. 2017) to estimate runoff volumes and stormwater concentrations and calculate catchment-specific loads. Finally, HDS unit performance was evaluated for both catchment load estimates by calculating the average annual percent removal of PCBs and mercury due to the annual mass removal of solids from the HDS unit sumps. Results are presented in Table C-4.

For catchment loads calculated using Method #1 (land use-based yields), the median percent PCBs removal across all eight units ranged from 5% to 10%, while the mean ranged from 17% to 28%. For catchment loads calculated using Method #2 (RWSM runoff volume x concentration), the median percent PCBs removal ranged from 15% to 32%, while the mean ranged from 23% to 36%. Variability in removal rates was high between individual units, ranging from almost no removal to 100% removal of the estimated loads. For mercury, across all eight units, the median percent removal for catchment loads calculated using Method #1 (land use-based yields) ranged from 3% to 4%, while the mean ranged from 5% to 8%. For all units under Method #1, the removal rates were lower for mercury than for PCBs. For catchment loads calculated using

Method #2 (RWSM runoff volume x concentration) the median removal ranged from 13% to 19%, while the mean ranged from 28% to 35%. Similar to PCBs, removal rates for mercury in individual HDS units were highly variable (Table C-4).

Table C-4. HDS Unit Performance - Annual Percent Removal Calculated for Two Catchment Load Estimates.

HDS Unit ID	PCBs Removal				Mercury Removal			
	Method #1		Method #2		Method #1		Method #2	
	Low	High	Low	High	Low	High	Low	High
1	80%	100%	100%	100%	26%	40%	100%	100%
2	8%	18%	10%	22%	4%	6%	65%	98%
3	4%	9%	21%	45%	2%	3%	8%	12%
4	38%	83%	27%	59%	5%	7%	17%	26%
5	0.06%	0.13%	0.21%	0.46%	0.1%	0.2%	1.1%	1.6%
6	5%	11%	20%	43%	0.01%	0.02%	0.1%	0.2%
7	0.6%	1.4%	0.5%	1.1%	0.06%	0.09%	2%	3%
8	1.4%	3.1%	7%	16%	3%	4%	27%	41%
Median	5%	10%	15%	32%	3%	4%	13%	19%
Mean	17%	28%	23%	36%	5%	8%	28%	35%

The BASMAA study results were highly variable and limited by the small sample size. However, pollutant load reductions achieved by HDS units, on average, approach or even exceed 20%, the value identified as a conservative estimate of TSS removal by HDS units in the analysis presented previously. These results support the continued use of a 20% efficiency factor for calculating the annual average PCBs and mercury loads reduced by HDS units.

I.3 Gross Solids Removal Devices

Caltrans conducted the Gross Solids Removal Devices (GSRDs) Pilot Program to develop and evaluate the performance of non-proprietary, full trash capture devices that could be retrofitted into existing highway drainage systems or incorporated into new highway projects (Sobelman et al.). The GSRD Pilot Program consisted of multiple phases with each phase representing one pilot study. The pilot studies consisted of one or more devices that were developed from concept through design and installation, with two years of pilot testing of overall performance. Five phases were constructed and monitored covering eleven designs. Four general types of GSRDs were developed and studied: linear, inclined screen, baffle box, and v-screen. Of the many configurations tested, the most promising devices, based on considerations of particle capture, clogging, passing design flow, drainage, stage capacity and maintenance requirements, were the Linear Radial (louvered modular well casing), the Inclined Screen (parabolic wedgewire screen) and the Inclined Screen (sloped flat wedge-wire screen). The linear radial and inclined screen devices have been certified by the Los Angeles Regional Water Quality Control Board as being full capture devices. Standard designs were developed for these screen systems that provided the best solids removal performance in the pilot tests.

The results of the first phase of the pilot program, which tested the linear radial and inclined screen devices, are summarized in Table C-5 below.

Table C-5. GSRD Unit Performance Observed by Caltrans (2003)

Device Type	Gross Solids Capture Efficiency by Wet Weight (%)	
	2000 – 2001	2001 – 2002
Linear Radial 1 (I-10)	100 ¹	100
Linear Radial 2 (I-210)	97	87
Linear Radial 2 (I-5)	94	100
Inclined Screen 1 (SR-170)	100	100
Inclined Screen 2 (I-210)	83 ²	100
Inclined Screen 2 (US-101)	86 ²	73 ²
Average	93%	93%

Notes:

¹ Material collected in the bypass bag was presumed to be windblown.

² GSRD overflowed. Gross solids escaped the overflow structure and were unaccounted for. As a result, the calculated capture efficiencies are overstated.

Source: Caltrans, 2003.

Based on the above findings and assuming that the mass fraction of material associated with PCBs and mercury yields (i.e., sediment <63 µm) is approximately 15% on average of the captured debris (McKee et al., 2006), then the percent removal of PCBs and mercury by GSRDs is approximately 14% (93% gross solids removal x 15% of captured debris that is associated with PCBs and mercury).

C.4 Baffle Boxes

Baffle boxes are subsurface rectangular vaults that are placed inline in the stormwater system to reduce pollutant loadings by capturing sediments, gross solids, and associated pollutants. Treatment mechanisms typically include filtration, hydrodynamic separation, and adsorption. Several different types of baffle boxes are available commercially and have footprints that vary in size from approximately 10 square feet to over 200 square feet. These subsurface vaults are commonly subdivided into a series of chambers by vertical baffles that interrupt the stormwater flow and promote capture of suspended particles by sedimentation.

The treatment effectiveness of the Nutrient Separating Baffle Box ® (NSBB) by Suntree Technologies has been recently evaluated by the manufacturer to assess the suspended sediment removal efficiency under controlled conditions (Suntree Technologies, 2018). The NSBB contains an additional basket screen that is located above the top of the chamber baffles. The screen captures floating and suspended solids and holds them out of the water column during nonflow periods (Suntree Technologies, 2018). The performance evaluation was conducted on the NSBB model 3-6-72, which has an effective sedimentation area (i.e., footprint) of 18 square feet (6 feet by 3 feet). Additional details of this and other models can be found on the Suntree Technologies, Inc. website. Influent suspended sediment concentrations were measured at 200 mg/L with a median particle size of 100 µm; influent flow rates ranged from 0.35 to 1.75 cfs. Resulting annualized TSS removal efficiency ranged from approximately 51 to 68 percent, with

a weighted annualized TSS removal efficiency of 62.9%. The annualized TSS removal efficiency for different flow rates is shown in Table C-6 below.

Table C-6: Nutrient Separating Baffle Box (Model 3-6-72) TSS Removal Efficiency

Mean Flow Rate Tested (cfs)	Measured Removal Efficiency	Annual Weighting Factor	Weighted Removal Efficiency
0.35	67.9%	0.25	16.98%
0.70	65.8%	0.3	19.74%
1.05	63.1%	0.2	12.62%
1.40	56.4%	0.15	8.46%
1.75	50.6%	0.1	5.06%
Weighted Annualized TSS Removal Efficiency			62.9%

Source: Suntree Technologies, Inc., 2018

A similar baffle box, the Debris Separating Baffle Box, is sold by Bio Clean. It is assumed that the unit processes in the two proprietary baffle box devices are similar, thus the expected removal efficiencies would be the same.

Based on the above study and assuming that the mass fraction of material associated with PCBs and mercury yields (i.e., sediment <63 µm) is approximately 63% of the captured sediment, then the percent removal of PCBs and mercury by baffle boxes is approximately 40% (63% TSS removal with a median particle size of 100 µm x 63% of material that is associated with PCBs and mercury). Given the limited data available on the effectiveness of baffle boxes in reducing PCBs and mercury, however, and the similarity of the baffle box to the mechanistic removal processes used in HDS systems, a conservative estimate is being used for PCB and mercury reduction for baffle boxes. The pollutant removal efficiency that will be used for baffle boxes is 20%, the same as HDS systems.

C.5 References

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APPENDIX D
Enhanced Inlet Cleaning Efficiency Factor Data
Analysis for Storm Drain Inlets with and without
Inlet-based Full Trash Capture Devices

D.1 PURPOSE AND APPROACH

The purpose of this appendix is to document findings of analysis conducted to determine the enhanced efficiency factors (EE_f) for sediment removal associated with enhanced storm drain inlet maintenance, including increasing the frequency of storm drain inlet cleaning, and the use of small (inlet-based) full trash-capture (FTC) devices, that are expected to capture larger amounts of trash, sediment and vegetation. First, the pollutant removal efficiency was calculated for the baseline control measure, which was assumed to be annual cleanout of storm drain inlets without FTC devices. The efficiency factors were then developed for the following enhancements: (1) increased frequency of cleanouts at inlets without FTC devices; and (2) twice yearly cleanouts at inlets with FTC devices.

Based on a review of available literature, there are limited data available on the reductions of pollutants (including sediment) associated with different storm drain inlet maintenance frequencies. No studies were found that assessed the reduction of either PCBs or mercury due to enhanced inlet cleaning frequencies. Two studies in particular, Woodward Clyde (1994) and Caltrans (2003), however evaluated the increase in the removal of material (i.e., sediment, vegetation, and trash) from inlets under different cleaning frequencies. Results from both studies indicated that the annual volume of material removed from inlets increased with cleaning frequency.

The Caltrans (2003) *Drain Inlet Cleaning Efficacy Study* was designed to measure the potential increases in material volume/mass and water quality benefits due to increased inlet cleaning frequencies on freeways. The study was conducted from 1996 through 2000. The volume and mass of material removed under annual, biannual, and three times per year cleaning frequencies at 55 to 90 inlets, depending on the year, were measured.

The Woodward Clyde (1994) *Storm Inlet Pilot Study* was conducted in Alameda County in 1993. This study was also designed to measure the potential increases in material volume and mass due to increased inlet cleaning frequencies. A total of 15 inlets draining residential, industrial, or commercial land uses were monitored. The volume and mass of material removed under annual, biannual, quarterly, and monthly cleaning frequencies were measured.

None of the inlets in the two studies identified above were equipped with FTC devices. To evaluate pollutant reductions associated with cleanouts of storm drain inlets equipped with small FTC devices, a recent study (SCVURPPP, 2016) documented cleanout volumes of materials removed from inlets equipped with FTC devices. The SCVURPPP (2016) *Storm Drain Trash Monitoring and Characterization* study focused on litter/trash, but also removed and measured other debris (defined as sediment and vegetation) from 119 inlets equipped with small FTC devices. These devices typically require cleaning frequencies of at least twice per year. Each of the 119 inlets was initially cleaned at the start of the project. The volume of trash and debris that accumulated within the inlets was removed and measured during two subsequent monitoring events. The accumulation period between each monitoring event ranged from four to five months. The data were used to estimate the annual average volumes of trash and debris captured in each inlet. The annual volume of debris removed was converted to a mass using the average density of debris removed from inlets during the Woodward Clyde (1994) study, which was 38 pounds per cubic foot.

The percent increase of annual mass of debris removed from storm drain inlets during cleanouts, as measured in each of the three studies described above, is presented in Figure D-1. Caltrans removals for inlet cleaning without FTC devices appear to be much greater than removal efficiencies measured during the Woodward Clyde study, and therefore may not be realistic for the purposes of developing conservative efficiency factors for load reduction accounting. The Woodward Clyde study results were used to represent the enhanced efficiency due to increased cleanout frequency of storm drain inlets without FTC devices. The results of the SCVURPPP (2016) study indicate that the use of inlet-based FTC devices, combined with an increased cleaning frequency of twice annually, appears to substantially increase the annual mass of debris that is captured and removed from these storm drain inlets during cleanouts.

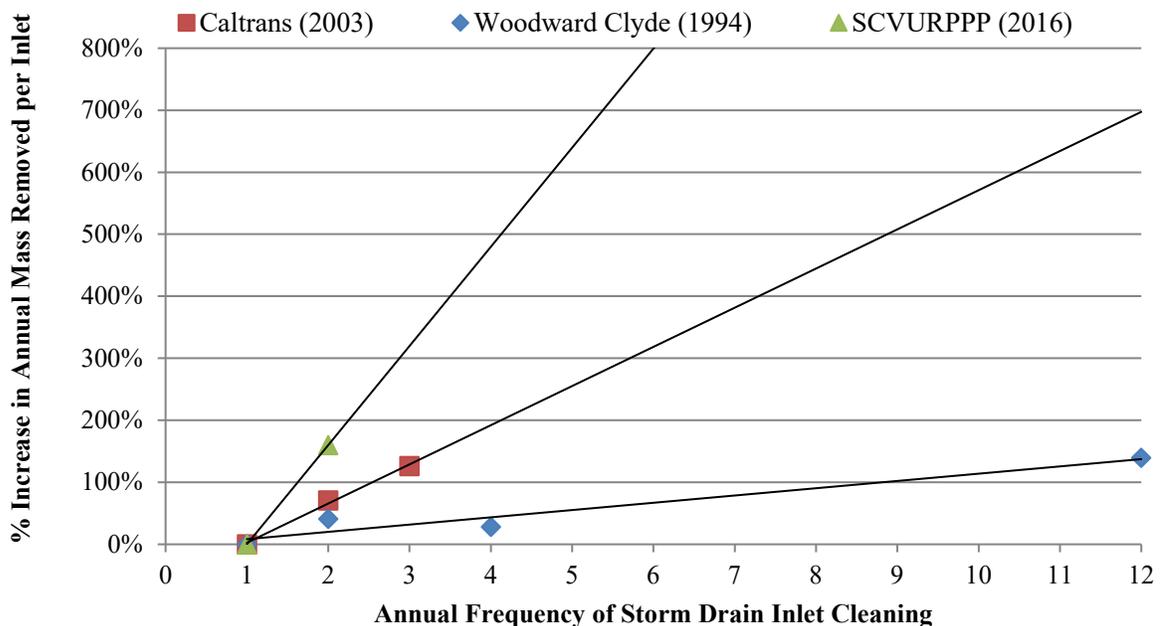


Figure D.1: Reported results of increases in annual mass of debris (e.g., sediment and vegetation) removed as a result of increased cleaning frequency for storm drain inlet with and without small full trash-capture (FTC) devices.

Based on the above findings, Table D-1 presents a conservative estimate of the enhanced efficiency factors for more frequent cleaning of storm drain inlets without FTC devices, and the enhanced efficiency factors for cleaning storm drain inlets equipped with inlet-based FTC devices at least twice per year. For the purposes of load reduction accounting, the method assumes the following:

- Based on an analysis of 36 Alameda County and San Mateo Permittee storm drain inlet cleaning datasets from 1996 through 2009, on average, municipalities clean their inlets once per year (annually);

- Based on the same dataset, an average of 100 kg of material (sediment, vegetation, and litter) is removed from each inlet annually (see descriptive statistics below);

Statistic	Mass (Kg) of Material Removed Annually per Inlet
Maximum	4,049
90 th Percentile	476
75 th Percentile	284
Mean	268
Geometric Mean	100
Median	91
25 th Percentile	41
10 th Percentile	21
Minimum	5
# of Municipalities in Dataset	36

- Each inlet (on average) receives drainage from a catchment of 1 acre (BASMAA, 2014), equating to a unit material removal rate of 100 kg per acre per year;
- The mass fraction of material associated with PCBs and mercury yields (i.e., sediment <63um) is approximately 15% on average (McKee et al., 2006);
- The annual suspended sediment load to each inlet is roughly 134 kg per year on average based on the modeled value for Old Urban land use (Paradigm Environmental, 2020, see attachment to Appendix A); and
- Based on the assumptions above, roughly 15 kg of sediment associated with PCBs and mercury is removed from each inlet cleaned on an annual frequency, equating to about a 11% reduction of PCBs and mercury via annual cleaning (i.e., 15 kg / 134 kg). This is the control measure effectiveness of annual cleaning of storm drain inlet without FTC devices.

Assuming the baseline control measure effectiveness for annual cleaning of 11%, data from the studies cited above were used to calculate the enhanced efficiency factors for storm drain inlet cleaning at increasing frequencies for inlets without FTC devices, and twice-yearly cleaning of inlets that have been equipped with small FTC devices, as shown in Table D-1.

Table D-1: Enhanced efficiency factors (EE_f) for increased storm drain inlet cleaning frequencies for storm drain inlets both with and without small full trash-capture (FTC) devices.

		Enhanced Cleaning Frequency for Inlets without FTC devices				Enhanced Cleaning Frequency for Inlets with FTC Devices
		Annually	Biannually	Quarterly	Monthly	Biannually
Original Cleaning Frequency	No Cleaning or New Inlet	0.11	0.16	0.16	0.27	0.29
	Annually		0.05	0.05	0.16	0.18

D.2 References

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APPENDIX E

Enhanced Street Sweeping Efficiency Factors

E.1 DESCRIPTION OF THE ANALYSIS

The Clean Watersheds for Clean Bay (CW4CB)⁴ Task 4 pilot projects evaluated enhancements of municipal operation and maintenance activities that remove sediments and associated pollutants, including PCBs and mercury. This objective coincided with Municipal Regional Stormwater NPDES Permit (MRP, Order R2-2009-0074) Provision C.12.d, which required MRP Permittees to evaluate at the pilot scale in five drainages, ways to enhance existing sediment removal and management practices such as municipal street sweeping, curb clearing parking restrictions, inlet cleaning, catch basin cleaning, stream and stormwater conveyance system maintenance, and pump station cleaning via increased effort and/or retrofits. MRP Provision C.12.d also required Permittees to evaluate existing information on high-efficiency street sweepers, with the goal of evaluating the cost-effectiveness of high-efficiency street sweeping relative to reducing pollutant loads.

Appendix B-1 of the CW4CB Final Report summarizes the results of the Task 4 enhanced street sweeping pilot project that occurred in four pilot study areas (two sites in Richmond and one each in San Jose and Sunnyvale). This study entailed collecting monitoring data in each pilot study area representative of the baseline sweeping condition. The monitoring data were then used to calibrate the Windows Source Loading and Management Model (WinSLAMM) to evaluate sediment, PCBs, and mercury in the pilot study areas. Once WinSLAMM calibrated using the pilot study data, it was used to model street sweeping performance in the pilot study areas during the baseline condition for sediment, PCBs, and mercury. WINSLAMM was also used to model the effectiveness of various street sweeping scenarios for the pilot study areas for removing sediment, PCBs, and mercury. The modeled scenarios included (1) different sweeper types, (2) sweeping frequencies, and (3) street roughness values. The modeled scenarios assumed parking controls were in effect.

The results of the scenario analysis are presented in Tables E-1 and E-2 below for PCBs and mercury, respectively.

⁴ For more information, see: <http://basmaa.org/Clean-Watersheds-for-a-Clean-Bay-Project>.

Table E-1: Change in PCBs Mass Removal Efficiency (%) from Initial Street Sweeping Scenario to Final Scenario

			Final Scenario								
			Sweeper Type	Vacuum							
			Street Roughness	Rough	Intermediate	Rough	Intermediate	Rough	Intermediate	Intermediate	Rough
Initial Scenario	Sweeper Type	Street Roughness	Frequency	Once per 4 weeks	Once per 4 weeks	Once per 2 weeks	Once per 2 weeks	Once per week	Once per week	Twice per week	Twice per week
	None	None	None	9.9%	14%	15%	18%	19%	21%	21%	22%
	Vacuum	Intermediate	Once per week	-11%	-7%	-6%	-3%	-2%	0%	0%	1%
		Intermediate	Once per 2 weeks	-8%	-4%	-3%	0%	1%	3%	3%	3%
		Intermediate	Once per 4 weeks	-4%	0%	1%	4%	5%	7%	7%	8%
		Intermediate	Twice per week	-11%	-7%	-6%	-3%	-2%	0%	0%	1%
		Rough	Once per week	-9%	-5%	-4%	-1%	0%	2%	2%	2%
		Rough	Once per 2 weeks	-5%	-1%	0%	3%	4%	6%	6%	6%
		Rough	Once per 4 weeks	0%	4%	5%	8%	9%	11%	11%	12%
Rough	Twice per week	-12%	-8%	-6%	-3%	-2%	-1%	-1%	0%		

Notes:
 1. Change in efficiency resulting from change in sweeping scenario shown in red (reduction in efficiency) and blue (increase in efficiency).

Table E-2: Change in Mercury Mass Removal Efficiency (%) from Initial Street Sweeping Scenario to Final Scenario

			Final Scenario								
			Sweeper Type	Vacuum							
			Street Roughness	Rough	Intermediate	Rough	Intermediate	Rough	Intermediate	Intermediate	Rough
Initial Scenario	Sweeper Type	Street Roughness	Frequency	Once per 4 weeks	Once per 4 weeks	Once per 2 weeks	Once per 2 weeks	Once per week	Once per week	Twice per week	Twice per week
	None	None	None	9.1%	10%	10%	10%	10%	11%	11%	11%
	Vacuum	Intermediate	Once per week	-1%	0%	0%	0%	1%	2%	2%	2%
		Intermediate	Once per 2 weeks	0%	0%	0%	0%	1%	2%	2%	2%
		Intermediate	Once per 4 weeks	0%	0%	1%	1%	1%	2%	2%	2%
		Intermediate	Twice per week	-1%	0%	0%	0%	1%	2%	2%	2%
		Rough	Once per week	-2%	-2%	-2%	-2%	-1%	0%	0%	0%
		Rough	Once per 2 weeks	-2%	-2%	-2%	-2%	-1%	0%	0%	0%
		Rough	Once per 4 weeks	-1%	-1%	-1%	-1%	0%	1%	1%	1%
Rough	Twice per week	-2%	-2%	-2%	-2%	-1%	0%	0%	0%		

Notes:
 Change in efficiency resulting from change in sweeping scenario shown in red (reduction in efficiency) and blue (increase in efficiency).

APPENDIX F
Load Reduction Credit for PCBs in Stormwater
Infrastructure Management Program

F.1 BACKGROUND

The BASMAA study *Evaluation of PCBs in Caulk and Sealants in Public Roadway and Storm Drain Infrastructure* (BASMAA, 2018) sampled caulk and sealant materials from public roadway and storm drain infrastructure around the Bay Area. The overall approach to the sampling program was to work cooperatively with multiple Bay Area municipal agencies to identify public right-of-way locations where PCBs were potentially used in caulk or sealant applications on roadway and storm drain infrastructure. These locations were identified primarily based on the time period that the infrastructure was originally constructed and/or repaired, with a focus on the 1970's - the most recent time period PCBs were still in widespread use. The project team collected 54 caulk or sealant samples from public infrastructure in these locations; 11 of these were collected from concrete bridges or overpasses. The Project Team then reviewed the information collected about each sample to determine how to group the samples for compositing prior to PCBs analysis. A total of 20 composite samples were then analyzed for PCBs concentrations. Ten of these composites were associated with concrete roadways, sidewalks, or bridges.

F.2 TOTAL ESTIMATED PCBs LOAD IN OLDER BRIDGES

The U.S. Department of Transportation Federal Highway Administration National Bridge Inventory (USDOT, 2019) was used to estimate the total potential PCBs load contained in older bridges located within the jurisdictions subject to the MRP.

F.2.1 Equations Used to Estimate PCBs Load

The equation used to estimate the total PCBs load contained in bridges built and/or reconstructed prior to 1981 within the jurisdictions subject to the MRP is as follows:

$$\text{Total Load}_{\text{PCBs, Bridges}} = \text{Density}_{\text{sealant}} * \text{Concentration}_{\text{PCBs}} * \sum \text{Volume}_{\text{sealant, bridges}}$$

Where:

$$\text{Density}_{\text{sealant}} = \text{average sealant density [kg/m}^3\text{]}$$

$$\text{Concentration}_{\text{PCBs}} = \text{empirically derived concentration of PCBs [mg/kg]}$$

$$\sum \text{Volume}_{\text{sealant, bridges}} = \text{Volume of sealant in all applicable bridges [m}^3\text{]}$$

The volume of joint sealant was calculated using an assumed cross-section of sealant, multiplied by the assumed length of applied sealant:

$$\text{Volume}_{\text{sealant, bridges}} = \text{Cross-Section}_{\text{sealant}} * \text{Length}_{\text{sealant}}$$

Where:

$$\text{Cross-Section}_{\text{sealant}} = \text{Cross-section of applied sealant}$$

$$\text{Length}_{\text{sealant}} = \text{Length of applied sealant}$$

F.2.2 Data Used to Estimate Load

Data used to estimate load were obtained from BASMAA, 2018; a study of Bay Bridge sealant summarized by Hardeep Takhar of the California Department of Transportation (Caltrans) in 2013; and bridge dimensional information available from the National Bridge Inventory (USDOT, 2019). A summary of the data inputs is provided in Table F-1 below.

Table F-1: Bridge Load Calculation Data Inputs

Input	Result	Units	Source
Density of Sealant	1,100	kg/m ³	Takhar, 2013
Cross-Section of Sealant	1	square inch	Caltrans, 2007
PCBs Concentration	184	mg/kg	See Section 2.2.1

The derivation of the representative concentration of PCBs in sealant applied to bridges is described below.

F.2.2.1 PCBs Concentration

In order to compute a reasonable estimate of the expected PCBs concentration in caulking material in bridges in the MRP area, a data set consisting of 20 composite samples from BASMAA (2018) and four grab samples from the demolition of the Bay Bridge (Takhar, 2013) was analyzed.

Of the 20 BASMAA composite samples, 10 were identified as representative of caulking used on bridges based on the location from which the samples were taken (i.e., five of the composite samples were taken from bridges and five were from concrete roadway surfaces, sidewalks, and curbs and gutters). The remaining composite samples were judged to be non-representative, as they were taken from storm drain structures, asphalt roadways, metal pipes, and electrical utility poles and boxes. Table F-2 below summarizes the BASMAA study results for the concrete roadway, sidewalk, and bridge composite samples (BASMAA, 2018). Table F-3 summarizes the Bay Bridge caulk measurements (Takhar, 2013).

Table F-2: Sample Descriptions and PCBs Concentrations for Roadway and Bridge Composite Samples from the BASMAA Regional Infrastructure Caulk and Sealant Sampling Program (BASMAA, 2018)

Composite ID	Total PCBs (mg/kg)	Type of Structure(s) Sampled	Caulk/Sealant Application	Sample Appearance (Color/Texture)	# of samples in composite	Sample ID's in composite	Structure Construction Date
A	4,967	Concrete Bridge	Caulk between expansion joints	Black Pliable Foam	2	10	1960-70's
						13	<1960
B	4,150	Concrete Bridge	Caulk between expansion joints	Black Pliable	3	9	1960-70's
						30	1960-70's
						31	<1960

Composite ID	Total PCBs (mg/kg)	Type of Structure(s) Sampled	Caulk/Sealant Application	Sample Appearance (Color/Texture)	# of samples in composite	Sample ID's in composite	Structure Construction Date
C	0.78	Concrete Bridge	Caulk between expansion joints	Brown Fibrous	2	20	1960-70's
						26	1960-70's
D	0.70	Concrete Bridge	Sealant between concrete surfaces or between concrete and wood surface	Black Hard/Brittle	3	27	<1960
						29	1960-70's
						32	<1960
E	ND	Concrete Roadway Surface	Caulk between expansion joints	Black Hard/Brittle	5	35	<1980
						36	<1980
						37	<1980
						38	<1980
						39	<1980
F	ND	Concrete Sidewalk	Caulk between expansion joints	Black Hard/Brittle	3	2	<1960
						7	<1960
						46	<1980
G	ND	Concrete Sidewalk	Caulk between joints	Brown Fibrous	2	16	1960-70's
						17	1960-70's
H	ND	Concrete Sidewalk /Curb/Gutter	Caulk between joints	White/Gray Hard/Brittle or Pliable	3	1	<1980
						8	1960-70's
						18	1960-70's
I	0.06	Concrete Sidewalk /Curb/Gutter	Crack Sealant	White Hard/Brittle or White Pliable	2	23	<1980
						24	<1980
S	2.5	Concrete Bridge	Prefabricated joint filler	Black Pliable	1	12	<1960

A photo log of the samples taken from concrete bridges is provided in Attachment 1.

Table F-3: Concentrations of PCBs in Caulks Measured from the Bay Bridge

Description	Result (mg/kg)
PCBs Concentration (Bay Bridge Upper Roadway Sample)	1.01
PCBs Concentration (Bay Bridge Upper Roadway Sample)	1.65
PCBs Concentration (Bay Bridge Upper Roadway Sample)	0.705
PCBs Concentration (Bay Bridge Roadway Barrier Wall)	3.71
Bay Bridge Average Concentration	1.77

Source: Takhar, 2013

The complete dataset (i.e., results summarized in Table F-2 and F-3 and other non-representative samples) contains 10 non-detect (all in the BASMAA (2018) dataset) and 14 detected values.

After removing the 10 data points considered unrepresentative of bridges, the representative dataset contains 4 non-detect and 10 detected values (i.e., Table F-2 and Table F-3 summarized values). For the purposes of this analysis, both the complete and the presumed representative subset of the PCBs-in-caulk datasets were analyzed independently.

The non-detect values were imputed using a regression-on-order statistics method prior to estimating summary statistics using a maximum likelihood estimation approach as described in the sections below.

F.2.2.2 Handling Censored (Non-Detect) Results

Since estimation of common descriptive statistics of censored datasets can be heavily biased with simply substituted values, a robust regression-on-order statistics (ROS) method, as described by Helsel and Cohn (1988), was utilized to provide probabilistic estimates of non-detects (NDs). When applying the ROS method, ND values are imputed based on their plotting positions relative to the probability distribution estimated from the detected data. Imputed values are always less than their detection limits, but if the dataset includes multiple detection limits, some imputed values may be larger than some of the detected values. For the PCBs-in-caulk dataset, method detection limits (MDLs) for individual samples were not reported, but an overall MDL of 0.05 µg/kg was included in the BASMAA report and NDs are only reported for samples when every individual congener was not detected.

Maximum Likelihood Estimation

The lognormal probability distribution is often used to represent positively skewed contaminant concentrations (Singh et al., 1997). As such, the PCBs-in-caulking dataset has been assumed to arise from a population that is lognormally distributed, which implies that the standard deviation is proportional to the mean and the data are bounded by zero. A random variable, x , is said to be lognormally distributed if the distribution of $y = \ln(x)$ is normally distributed with a mean, μ_y , and variance, σ_y^2 . The mathematical equation for lognormal distribution is:

$$f_x(x) = \frac{1}{\sqrt{2\pi}\sigma x} \exp\left[-\frac{1}{2}\left(\frac{\ln x - \mu}{\sigma}\right)^2\right] \quad x > 0 \quad \text{Equation 1}$$

Where:

- μ is mean of the untransformed random variable x ,
- σ^2 is the variance of the untransformed random variable x , and
- x is the variable of interest.

The lognormal distribution parameters of x are related to the normal parameters of y with the following equations:

$$\mu_x = \exp(\mu_y + 0.5\sigma_y^2) \quad \text{Equation 2}$$

$$\sigma_x^2 = \mu \sqrt{\exp(\sigma_y^2) - 1} \quad \text{Equation 3}$$

When a dataset is a random sample from a lognormal distribution, the Maximum Likelihood Estimate (MLE) of the parameter, μ_y , is simply the sample mean of the log-transformed data

(Singh et al., 1997). Similarly, the MLE of the parameter, σ_y^2 , is the sample variance of the log-transformed data. However, for small sample datasets with a few extreme values, such as the PCB-in-caulk dataset, severe transformation bias can occur when estimating the arithmetic mean, μ_x , and arithmetic standard deviation, σ_x . Because of this, an alternative method for computing the expected value is needed as described below.

Advancing the assumption that the sample data arise from a lognormal distribution, a probability weighted mean can be computed as:

$$\hat{\mu}_x = \frac{\sum_{i=1}^n (x_i * w_i)}{\sum_{i=1}^n w_i} \quad \text{Equation 4}$$

Where:

- $\hat{\mu}_x$ is probability-weighted mean of the untransformed random variable x ;
- x_i is the i th sample value; and
- w_i is weight of the i th sample value, which is assumed equal to the probability of occurrence, $p(x_i)$, and can be computed by fitting the data to a lognormal probability density function (PDF).

The lognormal PDF can be constructed by computing the theoretical percentiles and plotting against the probability of a standard lognormal PDF. Any percentile, P_k , of x can be computed using the parameters of y as follows:

$$P_k = \exp(\mu_y + z_k \sigma_y) \quad \text{Equation 5}$$

Where:

- z_k is the k th percentiles of the standard normal distribution.

Results and Conclusions

As stated above, the available data was evaluated in two separate dataset configurations:

1. All data including the potentially unrepresentative values ($N = 24$)
2. Roadway and bridge-only data excluding the potentially unrepresentative values ($N = 14$).

In both configurations, lognormal distributions were fit to datasets where the non-detect values had been imputed with ROS. Figure F-1 below shows lognormal probability plots along with a best-fit line demonstrating the lognormality of the data.

Table F-4 provides summary statistics after applying ROS to the datasets. As shown, the data mean and data median are significantly different, which again supports the lognormal distribution assumption. The arithmetic mean values computed from Equation 2, however, are unrealistic considering the values are larger than any of the sample values – this is a result of transformation bias. The probability weighted mean values are believed to be the most accurate representation of the central tendency of PCBs in caulk for bridges in the MRP area based on the

two datasets because this adjusts for the likely probability of occurrence of the extreme values observed in the data while preserving all sample data in the calculation.

Figure F-2 and Figure F-3 show the PDFs of the best-fit lognormal distributions. Each observed or imputed value drawn along the PDF is used to indicate the probabilities of occurrence, which were used to determine the weights for the probability weighted mean values.

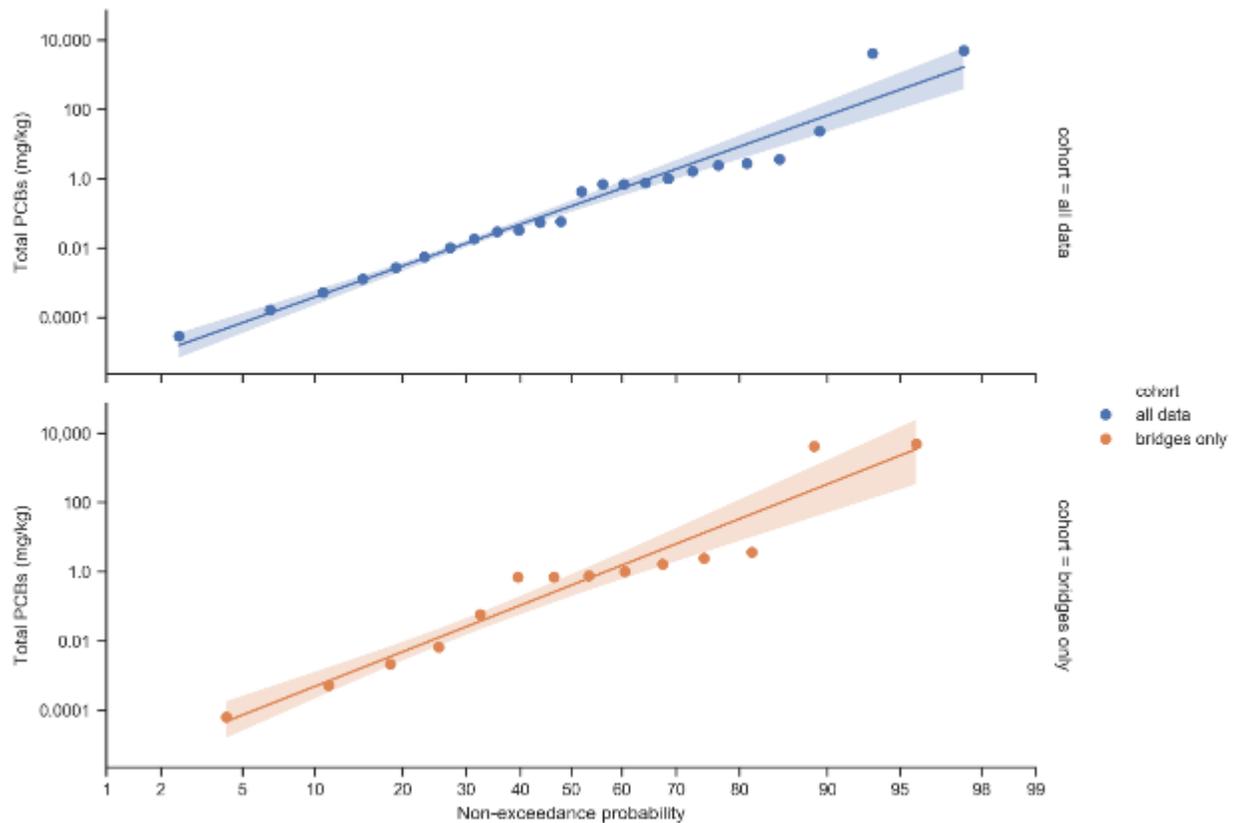


Figure F-1 - Lognormal probability plots. The shaded bands indicate the 95% confidence interval around the best-fit lines.

Table F-4: Summary Statistics

Statistic	Dataset	
	All Data	Roadway/Bridge Only
Sample Count (Total; NDs)	24; 10	14; 4
Data Mean, mg/kg	381	652
Data Standard Deviation, mg/kg	1292	1663
Data Median, mg/kg	0.25	0.74
Lognormal Mean (μ_y)	-1.82	-0.891
Lognormal Standard Deviation(σ_y)	4.57	5.02
Arithmetic Mean (μ_x), mg/kg	8,927	334,514
Probability Weighted Mean ($\hat{\mu}_x$), mg/kg	49.5	184

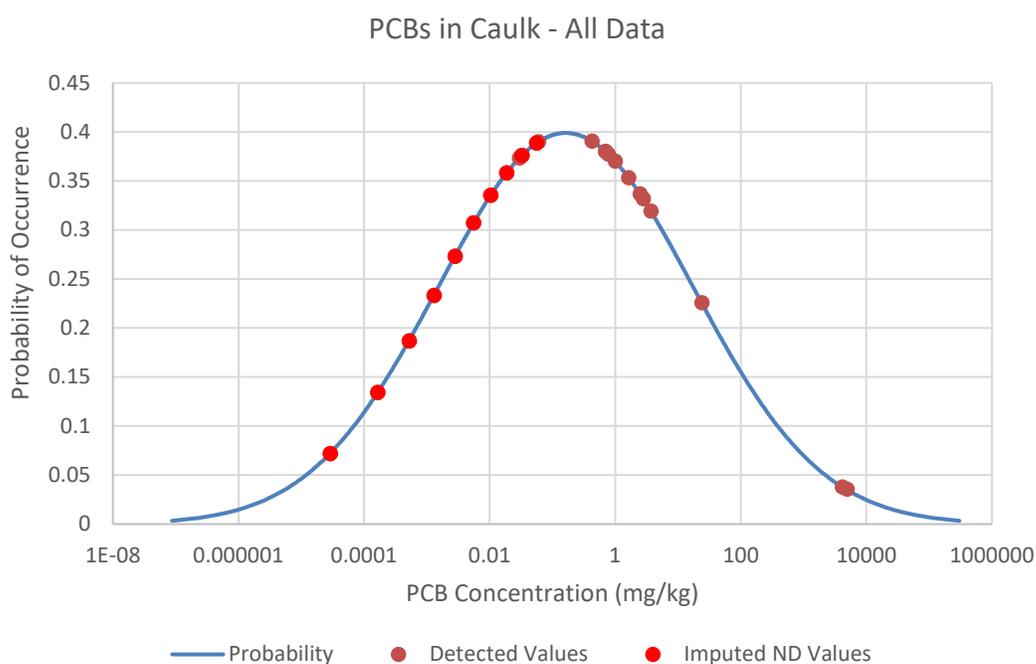


Figure F-2: Lognormal distribution plot for all available Total PCBs data, showing the weights of the detected and imputed values

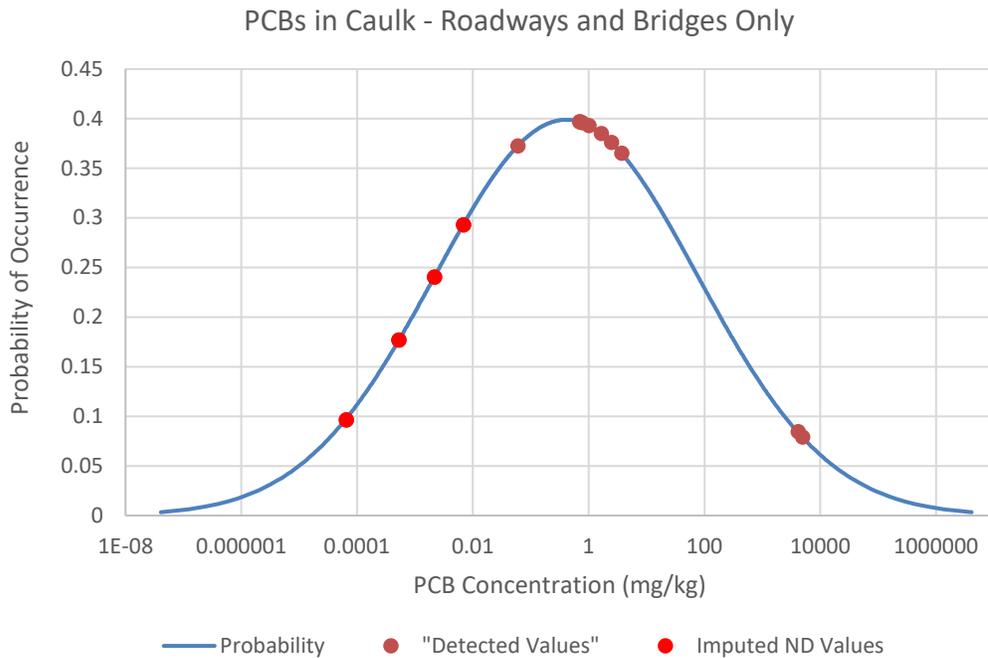


Figure 3: Lognormal distribution plot for Total PCBs data from roadways and bridges only, showing the weights of the detected and imputed values

F.2.2.2 Length of Applied Sealant

While it is evident from the BASMAA (2018) study photos that sealant may be applied to many concrete connections within any given bridge, this estimate focuses on the locations most exposed to weather and traffic and therefore most likely to leach into the environment. The sealant application locations of focus in this study include the bridge expansion joints (e.g., at connections between bridge spans), and the longitudinal seam between the bridge deck and the sidewalk and/or bridge side rail.

The federal bridge database used for this analysis contains information about dimensions of bridges located within the MRP jurisdictions. The length of sealant used to calculate total potential PCBs mass was estimated using database values as follows:

$$\text{Length}_{\text{sealant, joints}} = (N_{\text{span}} + 1) * \text{Width}_{\text{deck}}$$

Where:

N_{span} = The number of bridge spans

$\text{Width}_{\text{deck}}$ = Bridge deck width

Assuming there are seams along either side of the bridge at the sidewalk or wall, the longitudinal seam was calculated as:

$$\text{Length}_{\text{sealant, longitudinal seam}} = 2 * \text{Length}_{\text{bridge}}$$

F.2.3 Total Estimated PCBs Load in Bridges

A summary of the total calculated loads for bridges within the MRP coverage boundary, built and/or reconstructed prior to 1981, and specific bridge types⁵, per the Nation Bridge Inventory, is provided in Table F-5.

Table F-5: Total Calculated Loads for Bridges within the MRP Area, Built and/or Reconstructed Prior to 1981

County	Total Sealant PCBs Mass - Joints Only (kg)	Total Sealant PCBs Mass - Joints and Longitudinal Seal (kg)	Number of Bridges
Alameda	3.8	11.2	340
Contra Costa	1.7	7.3	277
San Mateo	2.5	7.2	254
Santa Clara	3.7	10.1	473
Solano	0.9	3.2	133
Total	12.6	39.0	1,477

The average mass of PCBs in MRP bridges with the characteristics described, based on the calculation, is approximately 8.5 grams, accounting for joint sealant only, and 26 grams, accounting for both joint and longitudinal sealant.

F.3 LONG TERM LOAD REDUCTION ESTIMATE

F.3.1 Methodology

To estimate the load reduction associated with long-term bridge or expansion joint replacement, it is assumed that an ongoing PCBs release rate from bridge joints is mitigated through bridge joint maintenance and whole bridge replacement projects. The load reduction estimation is based on the assumption that PCBs in caulk are leaching from bridge joints and longitudinal seals over their lifetime. When that PCBs-containing caulk is replaced or removed through maintenance or replacement projects, the source of PCBs release is removed, and the associated annual released load is also removed. PCBs leaching from the material could occur through incremental wear or through larger damage (e.g., pieces of caulk torn out) over the lifetime of the caulk.

While volumetric or mass-based losses of joint seals over time were not found in literature, publications that describe joint maintenance and failure were reviewed to justify the assumption of leaching over time. Compression and strip seal type joints, which could potentially be expected to consist of PCBs-containing material, have an expected lifetime of 8 to 16 years, according to a survey conducted for an NCHRP study on bridge joints (NCHRP, 2016). Despite this recommended lifetime, an extrapolated rate of joint replacement in the Bay Area demonstrates that joints are being replaced at a much lower frequency. According to three

⁵ 0 – Other; 01 – Slab; 02 – Stringer/Multi-beam or Girder; 03 – Girder and Floorbeam System; 04 – Tee Beam; 05 – Box Beam or Girders – Multiple; or 06 – Box Beam or Girders – Single or Spread.

Permittee preventative maintenance plans available on Caltrans' Highway Bridge Program funding website (Caltrans, 2019), approximately 3% of bridges meeting the characteristics described above are scheduled for joint replacement over the next five-year funding period. An additional 1.5% of bridges are scheduled for replacement over the same five-year period (presumptively replacing the joints). At this rate, replacing the joints via joint maintenance or bridge replacement projects in all 1,477 bridges would take over 110 years.

The concept that older, likely PCBs-containing joints persist in the older MRP bridges is borne out through the findings of the BASMAA (2018) study, which found very high PCBs concentrations in composite samples from a random selection of representative bridge infrastructure. This outcome is also consistent with a finding from a 2003 NCHRP report (NCHRP, 2003), which found through interviews with transportation agencies that “agencies indicated that they tend not to respond to joint problems unless there is a safety hazard or when the deck is being rehabilitated or replaced. Other than reactive efforts, joint repair and rehabilitation, in most agencies, is associated with deck rehabilitation.” Additionally, while guidance documents typically define joint replacement needs in terms of visual degradation of the joint, along with other factors, the NCHRP study stated that agencies often defined failure of a deck joint as leakage, physical damage, or traffic hazard. These conditions could be taken to interpret that agencies are only replacing severely damaged or degraded joints (NCHRP, 2003).

Older joints could be considered more likely to leach into the environment, as the sealant material accumulates damage over time. Typical types of joint seal damage described by the Wyoming Department of Transportation, Aeronautics Division Airport Pavement Management Program (2020) include: (1) stripping of joint sealant, (2) extrusion of joint sealant, (3) weed growth, (4) hardening of the filler (oxidation), (5) loss of bond to the slab edges, and (6) lack or absence of sealant in the joint. These damage types are also consistent with those described in NCHRP (2016). Most of these damage types either directly refer to stripping of the sealant from the joint or create a condition in which the sealant is more likely to be released from the joint when subjected to traffic loads (i.e., conditions such as extrusion, hardening/becoming more brittle, loss of bond). Examples of damaged joint seals from this source are provided in Attachment 2.

F.3.2 Load Reduction Calculation

Lacking a literature-based release rate of sealant over time, two potential annual release rates are provided for the load reduction calculation. Based on the assumption that the joint seal may become degraded over time, it is possible that the sealant releases little during the initial operation period and more as the joint sealant ages. Another possible release pathway is through leaching into surrounding concrete and subsequent degradation of the concrete. Two potential average annual release rates (i.e., average over the life of the seal) were assumed to calculate an estimated load reduction from removing the joint seal – 1% and 0.5%. These average annual release rates were applied to the estimated mass for the 1,477 bridges meeting the identified age criteria (Table F-6). These releases would be eliminated through removal of the joint seal through joint replacement or bridge replacement.

Table F-6: Long-Term Load Reduction (i.e., Replacement of PCBs-Containing Joints in All Older Bridges)

County	Total Sealant PCBs Load Reduced - Joints Only (g/year)		Total Sealant PCBs Load Reduced - Joints and Longitudinal Seal (g/year)	
	1% annual loss rate over life	0.5% annual loss rate over life	1% annual loss rate over life	0.5% annual loss rate over life
Alameda	38	19	112	56
Contra Costa	17	8	73	37
San Mateo	25	12	72	36
Santa Clara	37	19	101	50
Solano	9	5	32	16
Total	126	63	390	195

This is the assumed load reduction by 2080, based on the assumption that all older joints will be removed/replaced within 100 years of installation (this is consistent with recent Caltrans replacement frequency calculated above).

F.4 REFERENCES

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<https://www.appliedpavement.com/hosting/wyoming/pavement-inspection/pci-review/distresses-pcc/joint-sealant-damage.html>. Visited 9 April 2020.

Attachment 1: BASMAA Bridge Sample Photos

Composite A



Composite B



Composite S



Composite C



Composite D



Attachment 2: Images of Joint Seal Damage

Joint sealant damage is any condition that enables soil or rocks to accumulate in the joints or allows significant infiltration of water. Accumulation of incompressible materials prevents the slabs from expanding and may result in buckling, shattering, or spalling. A pliable joint filler bonded to the edges of the slabs protects the joints from accumulation of materials and also prevents water from seeping down and softening the foundation supporting the slab. Typical types of joint seal damage are: (1) stripping of joint sealant, (2) extrusion of joint sealant, (3) weed growth, (4) hardening of the filler (oxidation), (5) loss of bond to the slab edges, and (6) lack of absence of sealant in the joint..

Source: Wyoming Department of Transportation, Aeronautics Division Airport Pavement Management Program (<https://www.appliedpavement.com/hosting/wyoming/pavement-inspection/pci-review/distresses-pcc/joint-sealant-damage.html>)

Severity	Distress Example	Description
Low		<p>Joint sealer is in generally good condition throughout the sample. Joint seal damage is at low severity if a few of the joints have sealer which has debonded from but is still in contact with the joint edge. This condition exists if a knife blade can be inserted between sealer and joint face without resistance.</p>
Medium		<p>Sealant needs replacement within two years. Joint seal damage is at medium severity if a few of the joints have any of the following conditions: (a) joint sealer is in place, but water access is possible through visible openings no more than 1/8 in (3 mm) wide. If a knife blade cannot be inserted easily between sealer and joint face, this condition does not exist; (b) pumping debris are evident at the joint; (c) joint sealer is oxidized and "lifeless" but pliable (like a rope), and generally fills the joint openings; or (d) vegetation in the joint is obvious, but does not obscure the joint opening.</p>

Severity	Distress Example	Description
High		<p>Joint sealer is in generally poor condition over the entire surveyed sample. Sealant needs immediate replacement. Joint seal damage is at high severity if 10% or more of the joint sealer exceeds limiting criteria listed above, or if 10% or more of sealer is missing.</p>

APPENDIX G
Load Reduction Credit for Managing PCBs from
Electrical Utilities Program

G.1 INTRODUCTION

Monitoring conducted over the past 15+ years by Bay Area stormwater programs demonstrates municipal stormwater runoff is a source of PCBs to the Bay. PCBs were historically used in many applications, including electrical utility equipment and caulks and sealants used in building materials. However, the greatest use by far was in electrical equipment such as transformers and capacitors (McKee et al. 2006). Existing electrical utility equipment, which is often located in the public right-of-way (ROW), may still contain PCBs that can be released to the MS4 when spills and leaks occur. Due to past leaks or spills of PCBs oil from electrical equipment, properties owned and operated by electrical utilities may potentially have elevated concentrations of PCBs in surrounding surface soils that can be released to the MS4. Because the cumulative releases of PCBs-laden soils from these properties, and spills or leaks of PCBs oils from electrical equipment to MS4s across the Bay Area may occur at levels that exceed the 2 kg per year TMDL waste load allocation, this potential source of PCBs may limit the ability of municipalities to meet the goals of the PCBs TMDL for the Bay.

Electrical utility equipment in both the transmission and distribution systems are distributed across the MRP region. In the past, PCBs were routinely used in electrical utility equipment that contained dielectric fluid as an insulator. This is because prior to the 1979 PCBs ban, dielectric fluid was typically formulated with PCBs due to a number of desirable properties (e.g., high dielectric strength, thermal stability, chemical inertness, and non-flammability). Electrical equipment containing dielectric fluid is typically identified as Oil-Filled Electrical Equipment (OFEE). McKee et al. (2006) estimated that between 1950 and 1990, roughly 8 million kg of PCBs were used in electrical transformers and large capacitors in the Bay Area (McKee et al. 2006). How much of this mass was released to the environment and how much remains in electrical equipment distributed across the Bay Area today is unknown. Any OFEE that contained PCBs in the past could still potentially contain PCBs today because the 1979 ban of PCBs did not require the immediate removal of PCBs from current applications. Electrical utilities have made substantial efforts over the past 35+ years to reduce the amount of PCBs still used in their applications in the Bay Area. But despite these removal efforts, PCBs may still be found in older and refurbished OFEE, and particularly OFEE located throughout the distribution system.

There are hundreds of thousands of pieces of OFEE in public rights-of-way and at hundreds of electrical sub-station facilities across the MRP region. Some portion of these OFEE that are older and/or refurbished may contain (or contained in the past) dielectric fluids with PCBs at concentrations that are of concern if released to MS4s. Due to their large quantity, dispersed nature, and the difficulty in tracking and monitoring discharges, Permittees are limited in their ability to implement and/or enforce consistent and appropriate control measures to reduce releases of PCBs from this source category. This creates a potential missed opportunity to account for past and ongoing removal of PCBs-containing OFEE which has been and continues to reduce loads of PCBs from MS4s to the Bay.

G.2 DESKTOP ANALYSIS OF MUNICIPALLY-OWNED ELECTRICAL UTILITY DATA

In 2019-2020, BASMAA conducted a desktop analysis to better understand the extent and magnitude of municipally-owned electrical utility equipment as a source of PCBs to urban stormwater runoff, and document measures already taken or underway to remove PCBs-containing oils and electrical equipment from active service across the Bay Area. The data analysis and major results are summarized here. Additional details are available in the full BASMAA report (BASMAA 2020).

G.2.1 Overview of Municipally-Owned Electrical Utilities

In the MRP Area, there are five municipally-owned (public) electrical utilities, including:

1. Alameda Municipal Power
2. City of Palo Alto Utilities
3. Pittsburg Power Company, doing business as (dba) Island Energy – City of Pittsburg
4. Port of Oakland
5. Silicon Valley Power - City of Santa Clara

Three of these public utilities participated in the BASMAA project and submitted data on their OFEE inventories and spill response protocols for evaluation, including: City of Palo Alto Utilities (CPAU), Pittsburg Power Company dba Island Energy (Island Energy) – City of Pittsburg, and Silicon Valley Power (SVP) – City of Santa Clara.

Additional information about each of the three participating municipally-owned electrical utilities and the information provided on OFEE in their systems is presented below.

G.2.1.1 City of Palo Alto Utilities

The City of Palo Alto Utilities (CPAU) have been operating a municipal electric power system in that city for over 100 years. CPAU serves the City of Palo Alto with an area of approximately 16,640 acres (including ~11,000 acres of urban area and ~5,500 acres of open space) and a population of approximately 67,082 people.

CPAU provided data on their inventory of OFEE through December 2019, including counts of equipment that are currently active in the system and equipment that have been removed from the system. OFEE counts were provided by the following equipment types:

- Poletop transformers
- Padmount single phase transformers
- Padmount three phase transformers
- Padmount substation transformers
- Underground commercial and residential distribution transformers

- Regulators
- Padmount switches
- Vault/box switches

For each type of equipment, CPAU provided an average volume of oil in each piece of equipment. The OFEE counts were further divided into the following categories:

- All active OFEE (equipment that are currently in active service within electrical transmission or distribution systems);
- Active OFEE that were purchased or installed prior to 1985 (pre-1985 OFEE);
- All inactive OFEE (equipment that have been removed from service);
- Inactive pre-1985 OFEE that were removed from service prior to 2002;
- Inactive pre-1985 OFEE that were removed from service in 2002 or later.

CPAU did not provide any data on measured PCBs concentrations in their OFEE inventory. However, they did identify OFEE that were labeled as “Non-PCBs” by the manufacturer.

G.2.1.2 Silicon Valley Power

Silicon Valley Power (SVP) has been operating in the City of Santa Clara for more than 100 years. As of December 2019, SVP includes 25 substations, 55 miles of transmissions lines, and 186 miles of overhead distribution lines. The total coverage area is 11,782 acres, and the population served is 129,488 people.

SVP provided data on their inventory of OFEE through December 2019, including counts of equipment that are currently active in the system and equipment that have been removed from the system. OFEE counts were provided by the following equipment types:

- Poletop transformers
- Padmount single phase transformers
- Padmount three phase transformers
- Padmount substation transformers
- Underground commercial and residential distribution transformers
- Regulators
- Padmount switches
- Vault/box switches

For each type of equipment, SVP provided an average volume of oil in each piece of equipment. The OFEE counts were further divided into the following categories:

- All active OFEE (equipment that are currently in active service within the electrical transmission or distribution systems);
- Active OFEE that were purchased or installed prior to 1985 (pre-1985 OFEE);
- All inactive OFEE (equipment that have been removed from service);
- Inactive pre-1985 OFEE that were removed from service prior to 2002;
- Inactive pre-1985 OFEE that were removed from service in 2002 or later.

SVP also provided equipment counts and oil volumes for a number of OFEE that comprised approximately 12% of the oil mass in their inventory, for which no information on equipment status (active or inactive) and no information on equipment age (pre-1985 or post-1985) were available at the time this report was prepared. These data were excluded from the main analysis. However, a sensitivity analysis was conducted in order to understand potential implications of excluding these data. The results of the sensitivity analysis are presented in Section G.2.3.4. Based on those results, the unknown data were included in the estimated ranges of PCBs mass and stormwater loads.

SVP did not provide any data on measured PCBs concentrations in their OFEE inventory.

G.2.1.3 Pittsburg Power Company, Island Energy

Pittsburg Power Company is a joint powers authority and department within the City of Pittsburg, California. Since 1997, Pittsburg Power has been operating an electric utility distribution system at Mare Island in Vallejo under the name “Island Energy”. Mare Island was formerly the location of a US Naval shipyard that was decommissioned in 1996. Following decommissioning, the Pittsburg Power Company acquired the electrical utility distribution rights on Mare Island from the US Navy. The distribution system on Mare Island that is operated by Island Energy consists of one substation and approximately 11 miles of distribution lines that serve an area of ~1,200 acres. The Mare Island zip code has a population of approximately 900 people.

Island Energy provided detailed inventories for the transformers that were part of both the historic (US Navy) inventory and the current (Island Energy) inventory of OFEE on Mare Island. The historic inventory documents each piece of OFEE that was part of the US Naval shipyard on Mare Island until 1996. At that time, the US Navy removed the bulk of pre-1985 OFEE and sent them to hazardous waste facilities for proper disposal. However, some pre-1985 OFEE remained on the island. The current inventory identifies each piece of OFEE on Mare Island that has been operated by Island Energy since 1997 through December 2019. The data provided in both the current and historic inventories includes the volume of oil, installation date, and (if applicable) removal date for each transformer in the historic or current system on Mare Island. In addition, measured concentrations of PCBs were provided for most OFEE in these inventories. Island Energy noted that there are gaps in the historic records, and the data provided may be incomplete. The current inventory identifies all OFEE that have been or are currently active and operated by Island Energy on Mare Island between 1997 and 2019 (i.e., since Island Energy began operating the electrical distribution system on Mare Island). The data analysis focused on the PCBs-containing OFEE in the historic and current inventories.

G.2.2 Overall Approach and Methods

The overall goal of the analysis of municipally-owned electrical utility OFEE inventories was to develop improved estimates of both the load of PCBs to stormwater from OFEE, and the load reductions that have been achieved over time due to ongoing equipment maintenance and replacement programs. The data analysis was also intended to provide data inputs that could be used to calculate the PCBs load reductions achieved since the start of the PCBs TMDL, and the expected PCBs load reductions in the future due to the ongoing removal and proper disposal of PCBs-containing OFEE. To accomplish these goals, the project evaluated the OFEE inventories provided by participating municipally-owned electrical utilities to characterize the magnitude of PCBs-containing OFEE in these systems and document the rate of removal of PCBs-containing OFEE over time. The data were used to calculate the annual average removal rates of PCBs-containing OFEE from participating municipally-owned electrical utility systems since the start of the PCBs TMDL (i.e., 2002). This information was then scaled-up to the larger MRP area in order to provide a rough, first-order estimate of the potential magnitude of the current OFEE load of PCBs to stormwater across the area.

G.2.2.1 OFEE Inventory Data Analysis Approach and Assumptions

The OFEE inventory data were analyzed to generate estimates of the following:

- The potential mass of PCBs in active OFEE within each municipally-owned electrical utility system at the start of the PCBs TMDL (i.e., 2002) and currently (i.e. 2020).
- The potential mass of PCBs in OFEE that has been removed from each of these systems due to ongoing maintenance and replacement programs before and after 2002.
- The annual average reduction rate achieved since the start of the PCBs TMDL due to removal of PCBs-containing OFEE from these systems.
- The potential PCBs stormwater load from OFEE in these systems at the start of the PCBs TMDL and currently.
- The expected PCBs stormwater load reductions in the future due to continued removal of PCBs-containing OFEE from these systems.

Because information on measured PCBs in these OFEE was limited, the mass of oil in OFEE was used as the primary metric to characterize OFEE within each system, to estimate the magnitude of potentially PCBs-containing OFEE in each system, and to calculate equipment removal rates. The age of the OFEE, based on the purchase or installation date provided, was used as the primary metric to identify potentially PCBs-containing equipment as follows:

- Pre-1985 OFEE. All equipment that was installed prior to 1985 (i.e., pre-1985 OFEE) were assumed to potentially contain PCBs. 1985 was selected as the appropriate cut-off date to identify equipment that may contain PCBs because the

installation of PCBs-containing equipment that had been stockpiled prior to the 1979 PCBs ban continued for several years after the ban⁶.

- Post-1985 OFEE. All equipment installed after 1985 (i.e., post-1985 OFEE) were assumed to contain zero PCBs.

The potential mass of PCBs in pre-1985 OFEE was calculated from the mass of oil in these OFEE multiplied by a range of assumed PCBs concentrations in that oil. The PCBs concentrations in all pre-1985 OFEE were based on the following assumptions:

- Measured PCBs concentrations were used, if available.
- If no PCBs measurement data were provided, the range of PCBs concentrations was estimated as follows:
 - Pre-1985 OFEE with “PCBs” labels are assumed to have PCBs concentrations \geq 500 ppm (i.e., PCBs Transformers). However, because PCBs transformers must be registered with the US EPA transformer registry, and none of the participating municipally-owned utilities have registered any PCBs transformers in this database, all PCBs concentrations in any equipment in the current OFEE inventories were assumed to be less than 500 ppm.
 - Pre-1985 OFEE with “Non-PCBs” on the label have PCBs concentrations $<$ 50 ppm. All OFEE with these labels were assumed to have PCBs between 1 and 49 ppm, unless otherwise noted.
 - Pre-1985 OFEE that were not labeled, or that did not have measured PCBs concentrations were assumed to contain PCBs between 50 and 499 ppm.

Because this report is focused on OFEE that contain or may contain PCBs, the data analysis focused primarily on pre-1985 OFEE.

G.2.2.2 Data Analysis Methods

Analysis of the OFEE inventory data proceeded through the following seven steps:

1. Calculate the total mass of oil in all active OFEE within each system and the total mass of oil in active pre-1985 OFEE. Use this information to estimate the mass of oil and current abundance of potentially PCBs-containing OFEE within each system.

The total mass of oil in all active OFEE was calculated from the volume of oil in each piece of equipment multiplied by the density of the oil. The OFEE inventories provided by the participating municipally-owned electrical utilities provided either the actual volume of oil in each piece of equipment in their inventory, or the average volume of oil per piece of equipment for each type of equipment and the total counts of active equipment of that type. The density of

⁶ Personal communication, Sanchez 2016. This assumption is based on statements made to Regional Water Board staff at a meeting with PG&E representatives that equipment stockpiled prior to the 1979 ban continued to be put into service after the ban until voluntary replacement programs were instituted around 1985.

the oil in all OFEE was based on the density of highly refined mineral oil used as a dielectric fluid in transformers of 0.9 mg/l⁷.

Pre-1985 OFEE were identified based on information provided by the municipally-owned electrical utilities on either the installation date for each piece of equipment in their inventory, or the counts of all equipment within each category that were installed before 1985 and are currently active in their system.

2. Calculate the mass of oil in pre-1985 OFEE that has been removed from active service since the start of the PCBs TMDL in 2002.

Only pre-1985 OFEE were included in this calculation because this category comprises all OFEE that may contain PCBs. Each participating municipally-owned electrical utility provided slightly different data on equipment removal dates. Both CPAU and SVP provided direct counts of pre-1985 OFEE within each equipment category that were removed from service in 2002 or later. Island Energy identified all pre-1985 OFEE in their current inventory as either active or inactive as of 2019 but did not provide removal dates for inactive equipment. However, Island Energy's current OFEE inventory only includes OFEE that were active in 1997. At this step in the process, in order to simplify this calculation and provide information needed for Step #3, this calculation assumed all equipment in Island Energy's current inventory were active until at least 2002 (i.e., all inactive OFEE were removed from service in 2002 or later).

3. Calculate the overall equipment removal rate and annual average equipment removal rate for pre-1985 OFEE since the start of the PCBs TMDL in 2002. Use this estimate to calculate the future date by which all pre-1985 OFEE will be removed from each participating municipally-owned electrical utility system.

The overall equipment removal rates for pre-1985 OFEE that were achieved between 2002 and 2019 were calculated based on the total mass of oil in pre-1985 OFEE that were removed from each system during that time period, divided by the total mass of oil in all pre-1985 OFEE that were active in 2002. The annual average removal rates were then calculated by dividing the overall removal rate by the number of years between 2002 and 2019 (17 years).

For CPAU and SVP, the overall removal rates since the start of the PCBs TMDL in 2002 were calculated directly from the data provided on removals between 2002 and 2019. However, because of the way the data were provided for Island Energy, an additional step was needed to estimate the overall removal rate since 2002. Island Energy identified all equipment in their current inventory, which spans the time period between 1997 and 2019, as active or inactive in 2019. However, specific removal dates for inactive equipment in the current inventory were not provided. Therefore, in order to estimate the overall removal rate since 2002, first, the annual average removal rate between 1997 and 2019 was calculated by dividing the overall removal rate for this period by the number of years between 1997 and 2019 (22 years). This annual average

⁷ Based on the reported density of Shell Diala Oil AX manufactured by SOPUS Products. Island Energy identified this as the dielectric oil used in the large transformers at their substation and provided a Material Safety Data Sheet (MSDS) for this product in their Spill Prevention, Control and Countermeasure (SPCC) plan.

removal rate was then multiplied by the number of years between 2002 and 2019 (17 years) to estimate the overall removal rate since the start of the PCBs TMDL in 2002.

Both the annual average removal rates and the overall removal rates since 2002 were compared across participating municipally-owned utilities. These data were also compared with the rates proposed in the accounting methodology for calculating the load reductions due to ongoing removal of PCBs-containing OFEE since the start of the PCBs TMDL and into the future. These removal rates were also used to estimate the future date by which all pre-1985 OFEE will be removed from each system. This calculation assumes the annual average removal rate for each system that has been achieved since 2002 will continue until all pre-1985 OFEE have been removed from each system. The starting point for this calculation was the mass of oil in all pre-1985 OFEE that were active in each system in 2020 (calculated in step #1). This 2020 value was then multiplied by the annual average removal rate for each system to estimate the total mass of pre-1985 OFEE oil removed each year. The number of years to reduce this mass to zero was then estimated by dividing the total mass of oil in active pre-1985 OFEE in 2020 by the mass of oil that would be removed each year.

4. Calculate the potential range of PCBs mass in active OFEE in 2020.

The potential range of PCBs mass (kg) in currently active pre-1985 OFEE was estimated for each system based on the total mass of oil in active pre-1985 OFEE in 2020 multiplied by the measured or assumed PCBs concentrations based on previously described assumptions (see Section 4.2.1).

5. Calculate the 2002 and 2020 loads of PCBs to stormwater from OFEE in the participating municipally-owned electrical utility systems and load reductions achieved over time due to equipment removals.

The starting point for this calculation was the current PCBs mass in active OFEE (step #5 above) for each participating municipally-owned electrical utility system. The following assumptions used by McKee et al., (2006) were then applied to estimate the fraction of PCBs in OFEE that are released to MS4s annually.

- 0.05% was estimated to leak from transformers and 0.35% from large capacitors each year (Harrad 1994, EIP Associates 1997); For this analysis, the value for transformers was used for all OFEE;
 - When leaks occur, 99% of the materials leaked are cleaned up and only 1% remain on erodible surfaces and available for wash off.
6. Estimate the stormwater loads from OFEE across the larger MRP area and the potential load reductions that can be achieved through continued equipment removal.

This calculation extrapolated the stormwater loads estimated for the participating municipally-owned electrical utility system OFEE (developed in step #5) to the larger Bay Area.

G.2.3 Data Analysis Results

G.2.3.1 Summary of Municipally-Owned Electrical Utility Data

Figure G.1 presents a summary of the distribution of OFEE in each of the participating municipally-owned electrical utility systems' inventories. Additional information about these distributions is provided in the following sections.

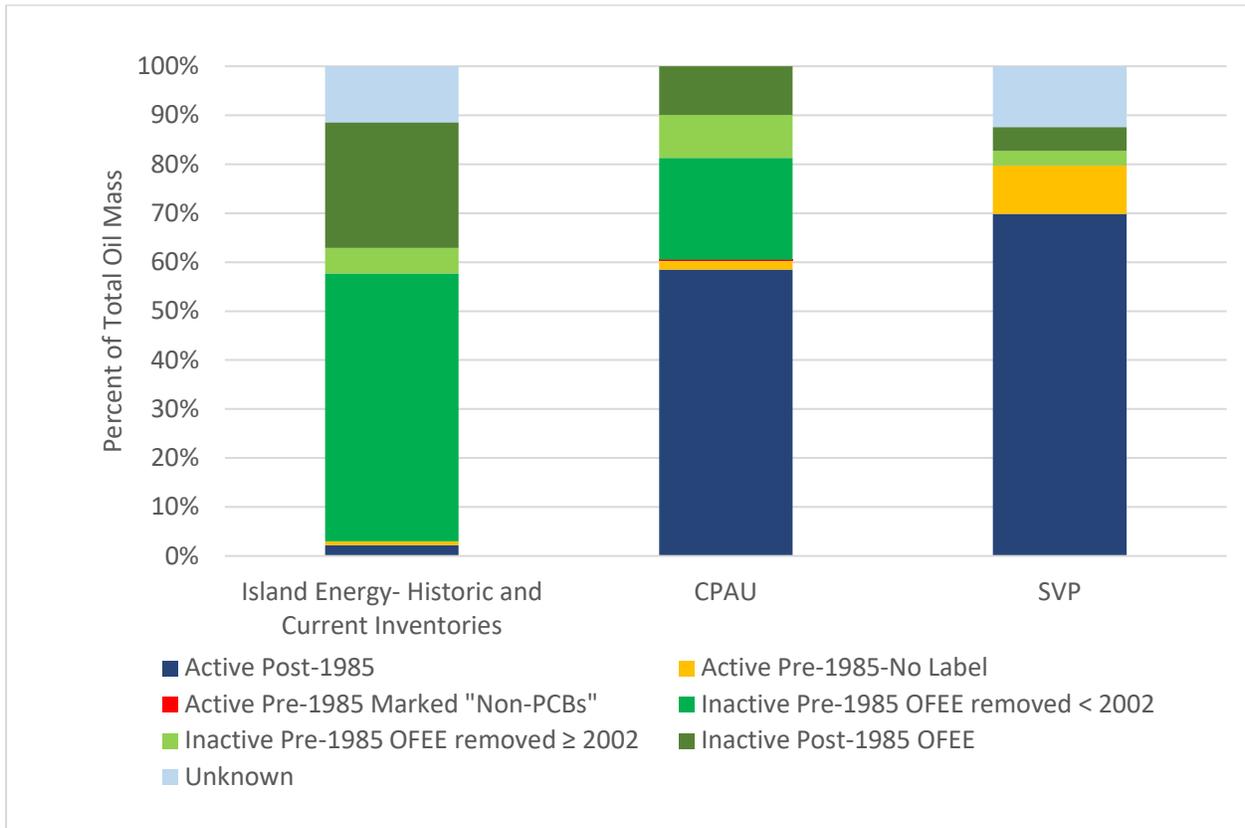


Figure G-1: Distribution of the mass of oil in oil-filled electrical equipment (OFEE) in three municipally-owned electrical utility systems.

G.2.3.2 Active Equipment - including both Pre-1985 and Post-1985 OFEE

Table G-1 presents the mass of oil in all OFEE that are currently active in each participating municipally-owned electrical utility system, divided between pre-1985 OFEE and post-1985 OFEE. Where available, the data are also presented by equipment type. Across all 3 systems, there are more than 4.8 million kilograms (kg) of oil in active OFEE.

Combined, there are nearly 500,000 kg of oil in active pre-1985 OFEE in these systems, which is 10% of the oil in active OFEE (Table G-1). CPAU has the lowest abundance of active pre-1985 OFEE oil, which comprises 3.4% of their OFEE. Approximately 12% of SVP's active equipment, and 25% of Island Energy's active equipment are comprised of pre-1985 OFEE. Additional pre-1985 OFEE may be active in the system that cannot be verified at this time. Detailed equipment type was not provided by Island Energy, but for both CPAU and SVP, 64% of the pre-1985 OFEE oil is contained in padmount transformers, and about 25% is contained within pole-top transformers. The remainder is either in underground transformers or switches.

Table G-1: Mass of dielectric oil in oil-filled electrical equipment (OFEE) that are currently active in three municipally-owned electrical utility systems.

Utility System	Equipment Type	Oil in ACTIVE OFEE (kg)			Percent of Active OFEE that are pre-1985
		Pre-1985 OFEE	Post-1985 OFEE	TOTAL	
City of Palo Alto Utilities (CPAU)	Padmount Single Phase Transformer	988	57,798	58,786	1.7%
	Padmount Three Phase Transformer	33,336	609,353	642,689	5.2%
	Poletop Transformer	4,923	121,608	126,531	3.9%
	Regulator	0	920	920	0%
	Underground Commercial Distribution Transformer	0	108,560	108,560	0%
	Underground Residential Distribution Transformer	204	62,584	62,789	0.3%
	Padmount Oil Switch	0	1,090	1,090	0%
	Padmount Vacuum Switch	0	99,038	99,038	0%
	Vault/Box Oil Switch	0	0	0	0%
	Vault/Box Vacuum Switches	0	63,027	63,027	0%
	Subtotal - CPAU	39,452	1,123,977	1,163,429	3.4%
Silicon Valley Power (SVP) – City of Santa Clara ¹	Padmount Single Phase Transformer	2,044	23,201	25,245	8.1%
	Padmount Three Phase Transformer	189,333	1,147,357	1,336,690	14%
	Poletop Transformer	111,551	139,338	250,889	44%
	Underground Residential Distribution Transformer	0	1,635	1,635	0%
	Padmount Oil Switch	7,645	9,444	17,089	45%
	Padmount Vacuum Switch	51,880	154,999	206,879	25%
	Padmount Vacuum-Disconnect Switch	0	249,764	249,764	0%
	Padmount Substation Transformer	91,985	1,460,593	1,552,578	6%
	Subtotal - SVP	454,439	3,186,330	3,640,76	12%
Island Energy ²	Current Inventory of Transformers	3,669	10,882	14,551	25%
TOTAL (All Systems Combined)		497,560	4,321,189	4,818,749	10%

¹SVP identified incomplete records for OFEE that contain approximately 566,000 kg of oil. The current status of these OFEE (active or removed) and the installation dates were unavailable at the time of this report. Therefore, these OFEE were not included in any of the totals above.

²Since 1997, Pittsburg Power Company has been operating the electrical distribution system on Mare Island in the City of Vallejo under the name Island Energy.

G.2.3.3 Pre-1985 OFEE Removed from Active Service

Table G-2 presents the total mass of oil in all pre-1985 OFEE that have been removed from service since they were originally installed, divided between the pre-1985 OFEE that were removed before 2002, and those that were removed in 2002 or later (i.e., since the start of the PCBs TMDL). Across the three systems, nearly 1 million kilograms of oil in pre-1985 OFEE have been removed from active service due to ongoing equipment removal and maintenance programs. This represents approximately 67% of the oil from all pre-1985 OFEE in these inventories.

Both CPAU and Island Energy have already removed the bulk of their pre-1985 OFEE from active service (94% and 88%, respectively). When the pre-1985 OFEE in the historic inventory on Mare Island were factored into the calculation, the removal rate on Mare Island increased to over 99% removal of all pre-1985 OFEE. SVP has removed at least 23% of their documented pre-1985 OFEE from active service. Additional removals from the SVP system may have occurred that cannot be verified at this time (see Section 4.1.2 on SVP OFEE identified as “unknown status and age”).

In addition, since the start of the PCBs TMDL in 2002, more than 320,000 kg of oil in pre-1985 OFEE have been removed from service across all three systems (Table G-2). This represents an overall 39% removal rate, and an average removal rate of 2.3% per year. The overall removal rates for each individual system over this same time period were 81% (CPAU), 68% (Island Energy) and 23% (SVP). These overall removal rates equate to average removals of 4.8% (CPAU), 4.0% (Island Energy), and 1.3% (SVP) per year. Based on these annual average removal rates, the project estimates it will take between 21 and 75 years for all pre-1985 OFEE to be removed from these systems due to continued equipment maintenance and removal programs.

Table G-2: Mass of dielectric oil in oil-filled electrical equipment (OFEE) that have been removed from active service in three municipally-owned electrical utility systems.

Utility System	Equipment Type or	Pre-1985 OFEE Oil in Inactive/Removed OFEE (kg)			Pre-1985 OFEE Removed Between 2002 and 2019		Pre-1985 OFEE removed since installation	Estimated time to remove all pre-1985 OFEE (years)
		Removed prior to 2002	Removed in 2002 or Later	TOTAL REMOVED	Overall Removal Rate	Annual Average Removal Rate		
City of Palo Alto Utilities	Padmount Single Phase Transformer	2,998	3,475	6,473	81%	4.8%	94%	21
	Padmount Three Phase Transformer	98,953	79,431	178,384				
	Poletop Transformer	204,165	47,100	251,265				
	Regulator	0	0	0				
	Underground Commercial Dist. Transformer	39,162	19,879	59,041				
	Underground Residential Dist. Transformer	54,374	17,971	72,345				
	Padmount Oil Switch	0	0	0				
	Padmount Vacuum Switch	0	0	0				
	Vault/Box Oil Switch	0	0	0				
	Vault/Box Vacuum Switches	0	0	0				
	Subtotal - CPAU	399,651	167,856	567,508				
Silicon Valley Power - City of	Padmount Single Phase Transformer	0	1,635	1,635	23%	1.3%	23%	75
	Padmount Three Phase Transformer	944	108,642	109,585				
	Poletop Transformer	327	21,801	22,128				
	Underground Residential Dist. Transformer	0	664	664				

Utility System	Equipment Type or	Pre-1985 OFEE Oil in Inactive/Removed OFEE (kg)			Pre-1985 OFEE Removed Between 2002 and 2019		Pre-1985 OFEE removed since installation	Estimated time to remove all pre-1985 OFEE (years)
		Removed prior to 2002	Removed in 2002 or Later	TOTAL REMOVED	Overall Removal Rate	Annual Average Removal Rate		
Santa Clara ¹	Padmount Oil Switch	0	0	0				
	Padmount Vacuum Switch	0	0	0				
	Padmount Vacuum-Disconnect Switch	0	0	0				
	Padmount Substation Transformer	0	0	0				
	Subtotal - SVP	1,271	132,742	134,013				
Island Energy ²	Current Inventory	5,276	21,161	26,437	68%	4.0%	88%	25
	Historic Inventory	266,192	NA³	266,192	NA³		100%	
TOTALS (All Systems Combined)		672,391	321,759	994,150	39%	2.3%	67%	43

¹SVP identified incomplete records for OFEE that contain approximately 566,000 kg or oil. The current status of these OFEE (active or removed) and the installation dates were unavailable at the time of this report. Therefore, these OFEE were not included in any of the totals above.

²Since 1997, Pittsburg Power Company has been operating the electrical distribution system on Mare Island in the City of Vallejo under the name Island Energy.

³NA=not applicable; the historic inventory only covers the period up to 1996.

G.2.3.4 Sensitivity Analysis – SVP Data

About 12% of the equipment in the SVP inventory did not have information on the status (active or inactive) or age (pre- or post-1985) of the OFEE. In order to evaluate the potential impact of excluding these unknown data, additional analyses were conducted to account for the following three scenarios:

1. All “unknown” OFEE are assumed to be active, pre-1985 OFEE;
2. All “unknown” OFEE are assumed to be pre-1985 OFEE that were removed from service after the start of the PCBs TMDL in 2002;
3. All “unknown” OFEE are assumed to be pre-1985 OFEE that were removed from service prior to 2002.

The results of the sensitivity analysis conducted under each of these three scenarios are shown in Table G-3. The default scenario excluded all “unknown” oil from all calculations. For each alternative scenario, the mass of “unknown” oil was added to the value for the cell highlighted in blue in the table. The minimum and maximum values calculated for each of the percentage columns are bolded in the table.

This analysis indicates that under Scenario 1, the percent of active OFEE that are pre-1985 increases from 12% to 24%, and the percent of pre-1985 OFEE that have been removed since installation decrease from 23% to 12%.

Under Scenarios 2 and 3, the percent of active pre-1985 OFEE remain the same, but the percent of pre-1985 OFEE that have been removed since installation increases from 23% to 61%, which is more in line with the rates observed for the other two systems. Scenario 3 also increases the annual average removal rate since the start of the TMDL from 1.3% to 3.6% per year.

The primary impacts of these alternative scenarios include the following:

- Under Scenario 1, the pre-1985 OFEE currently in the system more than doubled, which would result in an increase in the current PCBs loads to stormwater from this source;
- Under Scenario 3, the mass of pre-1985 OFEE removed since the start of the TMDL was nearly tripled, which would result in an increase in the PCBs stormwater loads reduced during this time period accordingly. Also under Scenario 3, because of the increased annual removal rate, all pre-1985 OFEE would be removed within 28 years (compared to 75 years in the default scenario).

Because these impacts are potentially large, the results for SVP presented in the next section used the ranges presented in Table G-3 for Scenario 1 and Scenario 2. The results for these two scenarios provide the upper and lower limits for all values across the default and alternative scenarios.

Table G-3: Sensitivity analysis conducted to evaluate the impacts of unknown status and age of oil-filled electrical equipment (OFEE) identified in the Silicon Valley Power (SVP) OFEE inventory on the evaluation of pre-1985 as a source of PCBs to urban stormwater.

Scenario	Oil in Active OFEE (kg)		Oil in Inactive/Removed OFEE (kg)			Oil in OFEE with Unknown Status and Age (kg)	Total Oil in OFEE Inventory (kg)	Percent of all Active OFEE that are Pre-1985	Percent of Pre-1985 OFEE Removed Since Installation	Pre-1985 OFEE Removed Between 2002 and 2019	
	Post-1985 OFEE	Pre-1985 OFEE	Pre-1985 OFEE removed before 2002	Pre-1985 OFEE removed in 2002 or later	Post-1985 OFEE					Overall Removal Rate	Annual Average Removal Rate
Default: "Unknown" not included in calculations	3,186,330	454,439	1,271	132,742	221,460	566,026	4,562,268	12%	23%	23%	1.3%
1. All "unknown" = Active, Pre-1985 OFEE	3,186,330	1,020,465	1,271	132,742	221,460		4,562,268	24%	12%	12%	0.7%
2. All "unknown" = Pre-1985 OFEE Removed in 2002 or Later	3,186,330	454,439	1,271	698,768	221,460		4,562,268	12%	61%	61%	3.6%
3. All "unknown" = Pre-1985 OFEE Removed Prior to 2002	3,186,330	454,439	567,296	132,742	221,460		4,562,268	12%	61%	23%	1.3%

G.2.4 Potential PCBs Mass in Active OFEE and Estimated Stormwater Loads

Table G-4 provides the calculated PCBs mass in the Island Energy historic and current OFEE inventories and estimates of the potential PCBs mass in the CPAU and SVP OFEE inventories. Only Island Energy provided data on measured PCBs concentrations in their OFEE oil. Concentrations of PCBs in Island Energy's current inventory of OFEE ranged from 1 to 37 ppm. Concentrations in the historic inventory ranged from <1 up to nearly 900 ppm. About 20% of the OFEE in the historic inventory had PCBs concentrations > 500 ppm. Based on these measured PCBs concentrations and the volumes of oil in each piece of equipment, the historic inventory documents OFEE containing more than 70 kg of PCBs. By comparison, Island Energy's current inventory of both active and inactive OFEE had 0.088 kg of PCBs. Of that total, 0.040 kg of PCBs remain in active OFEE, and 0.048 kg of PCBs were from OFEE that have been removed from active service. This represents a three-order of magnitude decrease in PCBs mass from the historic inventory. One interesting detail about the PCBs concentration data was that nearly one-third of the PCBs in the current inventory were contained in post-1985 equipment. All of these equipment were from 1986 or 1987. PCBs concentrations were generally low in these OFEE, ranging from 1 to 4 ppm. However, the potential contribution from these OFEE could still be important. For example, in the Island Energy current inventory, there is one piece of equipment from 1987 that contains 600 gallons of oil at 1 ppm PCBs, or 2 g of PCBs in total. If this quantity of PCBs were released to the environment, this could have a detrimental impact on stormwater quality.

Because CPAU and SVP did not provide measured PCBs concentrations for OFEE in their inventories, the potential PCBs mass in pre-1985 OFEE was estimated based on the assumptions described previously. For CPAU, these estimates suggest active pre-1985 OFEE may contain between 1.7 and 17 kg of PCBs, while pre-1985 OFEE that have been removed potentially contained between 28 kg and 284 kg. These estimates suggest an order of magnitude reduction in PCBs mass in the active OFEE inventory. For SVP, active pre-1985 OFEE may contain between 23 kg and 227 kg. If the "unknown" OFEE were assumed to be active pre-1985 OFEE, then the total estimated mass of PCBs in active OFEE doubles to 51 kg to 510 kg. PCBs in pre-1985 OFEE that have been removed were estimated to range from 6.7 to 67 kg, which would increase up to 35 kg to 350 kg if the "unknown" OFEE were assumed to be pre-1985 OFEE that have been removed from service. Across all three systems, the total potential mass of PCBs in active OFEE ranged from 24 kg up to 527 kg. The upper value assumes the "unknown" mass is contained within active, pre-1985 OFEE.

Table G-4: Estimated potential mass of PCBs in municipally-owned electrical utilities oil-filled electrical equipment (OFEE) inventories

OFEE Category	PCBs (kg)				
	CPAU	SVP	Island Energy - Current	Island Energy - Historic	TOTAL (All Systems)
All Active	1.7 - 17	23 - 227	0.040		24 - 244
All Removed	28 - 284	6.7 - 67	0.048	70	105 - 421
Removed since 2002	8.4 - 84	6.6 - 66	0.048		15 - 150
Removed prior to 2002	20 - 200	0.1 - 0.6		70	90 - 271
Unknown		28 - 283			28 - 283

Based on the approximate population of the MRP area of ~6 million people, if the active OFEE in all the participating municipally-owned electrical utility systems were representative of the PCBs contained in OFEE across the larger MRP area (i.e., 24 to 527 kg), the estimated mass of PCBs would range from roughly 730 kg up to 16,000 kg of PCBs. Based on acres, the estimated mass of PCBs across the larger MRP area of nearly 3 million acres would range from 2,400 kg up to 53,000 kg of PCBs in active OFEE.

Table G-5 presents the estimated loads of PCBs to stormwater from active OFEE in the three participating municipally-owned electrical utility systems. Across all three systems, the estimated PCBs stormwater load in 2002 from active OFEE was between 197 mg/yr to 3,390 mg/yr. The low end of this range is the sum of the minimum values for all active OFEE and all OFEE removed since 2002. The upper end of this range is the sum of the maximum values for all active OFEE, all OFEE removed since 2002, and all unknown OFEE. In 2020, the total estimated PCBs stormwater loads from active OFEE were estimated to range from 122 mg/yr up to 2,640 mg/yr. The low end of this range is the sum of the minimum value for all active OFEE. The upper end of this range is the sum of the maximum values for all active OFEE and all unknown OFEE. Scaling these estimates up to the MRP area of roughly 3 million acres gives a stormwater load of between 20,000 mg/yr up to 340,000 mg/yr in 2002, and 12,000 mg/yr up to 260,000 mg/yr in 2020. These estimates are highly uncertain due to all the assumptions that were used in the calculations.

Table G-5: Estimated range of PCBs loads to stormwater from oil-filled electrical equipment within three municipally-owned electrical utility systems.

OFEE Category	PCBs Stormwater Loads (mg/yr)				
	CPAU	SVP	Island Energy - Current	Island Energy - Historic	TOTAL
All Active OFEE	8.3 - 84	114 - 1,136	0.199	0	122 - 1,220
All Active OFEE - assume "unknown" = active	8.3 - 84	255 - 2,551	0.199	0	264 - 2,636
All Removed OFEE	142 - 1,419	34 - 335	0.241	352	527 - 2,106
Removed since 2002	42 - 420	33 - 332	0.241	0	75 - 752
Removed prior to 2002	100 - 999	0.3 - 3.2		352	452 - 1,354
All Removed OFEE - assume "unknown" = removed	142 - 1,419	175 - 1,750	0.241	352	317 - 3,169
Unknown		142 - 1,415			142 - 1,415

G.3 DATA INPUTS NEEDED TO CALCULATE PCBs LOADS REDUCED FOR THE PCBs IN ELECTRICAL UTILITIES MANAGEMENT PROGRAM

The proposed new Electrical Utilities Management Program identifies actions to document PCBs load reductions that have occurred since the start of the TMDL and will continue to occur in the future due to removal of PCBs-containing OFEE, until all of these equipment have been removed from active service in electrical utility systems in the Bay Area. The data inputs needed to calculate the loads reduced due to ongoing removal of PCBs-containing equipment as described in Section 5.0 of the BASMAA SCLRA report (BASMAA 2021) include the following terms:

Term 1 (L_0) = Initial annual load of PCBs that enters MS4 from OFEE at the start of the PCBs TMDL (approximately 2005), kg/yr.

Term 2 (F) = Estimated fraction of PCBs loads prevented from entering the MS4 each year due to OFEE removal (dimensionless fraction).

Based on the analysis presented in this appendix, and described in greater detail in BASMAA 2020, the values that are recommended for each of these terms are presented in Table G-6.

Table G-6: Recommended values for each of the terms required to account for the PCBs load reductions achieved through the PCBs in Electrical Utilities Management Program.

Term	Description	Value	Units	Source
1	Annual PCBs Stormwater Load in 2005 (i.e., the assumed load at the start of the PCBs TMDL)	1.1	kg/yr	McKee et. al. (2006)
2	Fraction of PCBs loads prevented from entering MS4 due to equipment removals.	0.013 to 0.048 (average = 0.023)	dimensionless fraction	BASMAA 2020

G.3.1 Term 1: Initial Load of PCBs to MS4 from OFEE at the Start of the PCBs TMDL

For Term 1 the estimated PCBs load of 1.1 kg/yr in 2005 is the recommended starting value for the annual load of PCBs to stormwater at the start of the PCBs TMDL. This value is currently the best available estimate of PCBs loads to the Bay from electrical utility equipment at that time.

This value was derived from the McKee et al. (2006) PCBs mass balance model that estimated the total loads to stormwater from all major sources during the peak period of PCBs production and use (i.e., 1950 – 1990), and in the period of the study (i.e., 2005). The mass balance model started with the total mass of PCBs that was used in the region between 1950 and 1990 and apportioned that mass to the major source categories. The largest PCBs-use category was transformers and large capacitors (i.e., oil-filled electrical equipment, OFEE). The total mass used in transformers and large capacitors between 1950 and 1990 was estimated at 7,600 metric tons (MT). Although most of this PCBs mass remains contained within the equipment, a small percentage of PCBs are released each year due to spills and leaks. These releases are the primary source of PCBs to stormwater conveyances from OFEE. Using literature values and the assumptions outlined below, McKee et al. (2006) estimated the following:

- Between 1950 and 1990 (the peak period of production and use of PCBs in the U.S.) 120 – 520 kg of PCBs entered stormwater conveyances due to releases from transformers and large capacitors. On average, this equated to a stormwater load of 8 kg/yr to the San Francisco Bay from electrical utility equipment during that time period.
- In 2005, the mass of PCBs entering stormwater conveyances due to releases from transformers and large capacitors was 1.2 to 4.3 kg/year (average = 2.8 kg/yr). The assumptions and literature data that were used to calculate the 2005 load included the following:
 - 0.05% was estimated to leak from transformers and 0.35% from large capacitors each year over an assumed 30-year service life (Harrad 1994, EIP Associates 1997).

- When spills occur, 99% of the spilled PCBs are cleaned up and only 1% of the remaining PCBs are left on erodible surfaces and available for wash off;
- Assumed runoff coefficients based on land-use classifications were used to approximate the fraction of PCBs on erodible surfaces that can enter local storm drains each year; and
- A small fraction (0.3%) of PCBs released to the environment enter the atmosphere (Keeler et al. 1993); McKee et al. (2006) estimated 2% to 6% of these PCBs are subsequently captured in stormwater through wet deposition.

McKee et al. (2006) estimated a stormwater load of 2.8 kg/yr to the Bay from transformers and large capacitors in 2005. This value (2.8 kg/yr) is the starting point for estimating load reductions that have been achieved since the PCBs TMDL was established. As shown in Table G-7, the McKee et al. (2006) mass balance model presents the best estimate for the total PCBs stormwater load from all sources in 2005 as 52 kg/yr. The PCBs TMDL for the San Francisco Bay identifies the total stormwater load at that time as 20 kg/yr (SFBRWQCB 2008). For consistency with the TMDL, the McKee et al. (2006) best estimate for stormwater loads from various sources were normalized to a total stormwater load of 20 kg/yr (Table G-7). As shown in Table G-7, the TMDL-normalized PCBs load to stormwater conveyances in 2005 from electrical utility equipment is assumed to be 1.1 kg/yr. This value is one to two orders of magnitude larger than the estimated stormwater loads that were developed in this project based on extrapolation of the municipally-owned electrical utility data presented in Section 4.0 to the larger Bay Area (0.02 – 0.34 kg/yr). However, the stormwater load estimates extrapolated from the participating municipally-owned electrical utility data have some important limitations. There is currently no information available to determine if these estimates, representative of electrical utilities operating across small service areas, would be appropriate as representative of the OFEE and associated PCBs mass across the much larger MRP area. These utility systems service a population of less than 200,000 people, again a tiny fraction (about 3%) of the larger MRP area population of nearly 6 million people. These utility systems also serve an area of less than 30,000 acres, which is (1%) of the entire MRP area of nearly 3 million acres. Almost all of the remaining area is served by PG&E, a large private company that may not be well-represented by data from the three small municipally-owned electrical utilities that participated in this project. There are likely substantial differences between PG&E equipment, operations, and practices, especially in the past, that preclude extrapolating the municipally-owned utility data from this project to PG&E service areas across the Bay Area. The number, type and range of transmission and distribution OFEE that make up a small service area system may not be representative or scalable to the number, type and range of transmission and distribution OFEE that make up a large service area system where electricity must be delivered over larger distances.

There was also considerable variability in the quality and quantity of the OFEE inventory data provided across the three participating municipally-owned utility systems that was used to develop the load estimates from municipally-owned electrical utility data. Island Energy provided complete information on their current inventory but acknowledged there were gaps in the historic data and they could not verify the accuracy or completeness of those data. Neither CPAU nor SVP had information on measured PCBs concentrations in any of their OFEE. SVP, the largest among the three participating utilities, had large uncertainty in their data because of

the “unknown” OFEE category. SVP indicated it may be possible in the future to resolve some of these uncertainties. However, within the time frame of this project, SVP provided the data they were able to access. One of the limitations was that compiling these data, especially during the COVID-19 pandemic and shelter-in-place orders, was extremely challenging for the utility staff. This was especially true for data that were limited to hard copies or available only on computer servers located at the electrical utility offices. Under these conditions, SVP was still able to provide useful data on a large portion of their OFEE inventory.

Given the limitations described here, the use of the municipally-owned electrical utility OFEE inventory data to represent OFEE beyond the boundaries of each of the participating systems may not be appropriate. The McKee et al. (2006) TMDL-normalized stormwater load estimate of 1.1 kg/yr remains the best currently available estimate of the PCBs load from electrical utility equipment to the Bay at the start of the PCBs TMDL.

Table G-7: PCBs mass input to stormwater conveyances in the San Francisco Bay Area from all sources based on the mass balance model presented in McKee et al. (2006). Transformers and Large Capacitors represent the oil-filled electrical utility equipment source.

Source	McKee et al., (2006) PCBs Load (kg/yr)	PCBs Load Normalized to TMDL Stormwater Load (kg/yr)
Watershed Surface Sediment Erosion	30	12
Building Demolition and Remodeling	4.1	1.6
PCBs Still in Use	4	1.5
Bed and Bank Erosion	2.9	1.1
Transformers and Large Capacitors	2.8	1.1
Atmospheric Deposition	2.8	1.1
Identified Industrial Contaminated Areas	2	0.77
Plasticizers	1.1	0.43
Railway Lines	1.1	0.43
Small Capacitors	0.5	0.19
Auto-Recycling	0.4	0.15
Other Dissipative Uses	0.06	0.023
Lubricants	0	0
Landfills	0	0
Total Stormwater Load (kg/yr)	52	20

G.3.2 Term 2 –Fraction of PCBs Loads Prevented from Entering MS4 Annually

For Term 2, the recommended value for the annual fraction of PCBs prevented from entering the MS4 due to OFEE removal ranges from 0.013 to 0.048 per year, with an average value of 0.023 per year (Table G-6). These values are based on the annual average equipment removal rates that were calculated for Bay Area municipally-owned electrical utilities of 1.3% to 4.8% annually, as described above and in full detail in BASMAA, 2020.

These values were calculated based on the mass of oil in pre-1985 OFEE that was removed from service between 2002 and 2019. Use of these values for Term 2 assumes the rate of load reduction achieved over the time period of interest is approximately equivalent to the equipment removal rate achieved during that same time period. Further, these values also assume the equipment removal rates for the municipally-owned electrical utilities reasonably represent the equipment removal rates at other Bay Area electrical utilities (i.e., PG&E). As a check on these

assumptions, the load reduction rate between 1990 and 2005 based on the estimate in the McKee et al (2006) mass balance models was compared with the equipment removal rates calculated for municipally-owned electrical utilities. The McKee et al. (2006) mass balance models provide PCBs stormwater load estimates for electrical utilities in 2005, and during the peak period of PCBs production and use (1950 – 1990). Based on these estimates, the PCBs load to stormwater from OFEE in 2005 was 65% lower than the average annual load in 1990. That equates to a PCBs load reduction of 4.33% per year during the fifteen-year period between 1990 and 2005. This annual average PCBs load reduction rate compares well with the equipment removal rates calculated for Bay Area municipally-owned electrical utilities. This finding supports the assumption that most of this load reduction was likely the result of the removal and proper disposal of PCBs-containing OFEE. During the late 1980s and 1990s, electrical utilities implemented voluntary equipment replacement programs specifically designed to remove PCBs-containing OFEE. Past statements provided to the Regional Water Board by PG&E support the assertion that the majority of PCBs-filled equipment had been replaced by the early 2000's (PG&E 2000). Additional removals have continued to occur, albeit at a slower pace, due to routine maintenance programs that replace older electrical equipment that is more likely to contain PCBs with newer equipment that does not contain PCBs. Information provided to the Regional Water Board by PG&E on maintenance records from their Emeryville processing facility supports this assertion (PG&E 2000). Those data indicate that in 1999, approximately 10% of the 22,000 pieces of OFEE that were dismantled and disposed of at the Emeryville site had PCBs at concentrations at or above 50 ppm. This information further supports the assertion that a large mass of PCBs that were in use during the peak period have since been removed. However, this information also indicates there are still large numbers of equipment that contain PCBs at high concentrations in active service across the Bay Area. Although no information was provided on the percent of equipment that contained PCBs at lower concentrations (i.e., below 50 ppm), equipment with these lower concentrations are also potential sources to stormwater. As reported in BASMAA 2020, current spill reports in Cal OES records (Cal OES 2017) further corroborate that PCBs-containing equipment are still in use across the Bay Area, both at concentrations above and below 50 ppm.

G.4 REFERENCES

- Bay Area Stormwater Management Agencies Association (BASMAA) 2020. PCBs from Electrical Utilities in San Francisco Bay Area Watersheds Stressor/Source Identification (SSID) Project. Prepared by EOA, Inc. June 30, 2020.
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Memorandum

Date: August 26, 2022
To: Sandy Mathews, Alameda Countywide Clean Water Program
From: Lisa Austin, Senior Principal, Lisa Welsh, Project Scientist, Grace Yao, Staff Engineer
Subject: PCBs in Building Materials Management Program – Fiscal Year 2021/22 Data Summary
Geosyntec Project Number: CWR0649A

1. BACKGROUND

Municipal Regional Stormwater Permit (MRP; Order No. R2-2015-0049) Provision C.12.f requires Permittees to manage polychlorinated biphenyls (PCBs) containing materials and wastes during building demolition activities. The MRP Permittees have developed and implemented a process, beginning in July 2019, for managing materials with PCBs concentrations of 50 ppm or greater in applicable structures when applicable structures undergo demolition. Applicable structures include commercial, public, institutional, and industrial buildings constructed or remodeled between 1950 and 1980 undergoing full-building demolition. Single-family residential and wood frame structures are exempt.

This technical memorandum documents the following items for the Alameda County Permittees, as required by MRP Provision C.12.f.iii.(4):

- a. The number of applicable structures that applied for a demolition permit during the reporting year; and
- b. A running list of the applicable structures that applied for a demolition permit (since the date the PCBs control protocol was implemented) that had material(s) with PCBs at 50 ppm or greater, with the address, demolition date, and a brief description of the PCBs control method(s) used.

2. NUMBER OF APPLICABLE STRUCTURE APPLICATIONS

Table 1 below lists the number of applicable structures that applied for a demolition permit within Alameda County during Fiscal Year 2021/22 (i.e., from July 1, 2021 – June 30, 2022) and the number of samples in those buildings that were equal to or greater than 50 ppm.

Table 1: Number of Applicable Structures that Applied for a Demolition Permit in FY 2021/22

Permittee	# Applicable Structures	# Applicable Structures With At Least One Sample ≥ 50 ppm PCBs	# Samples ≥ 50 ppm PCBs
Alameda	0	0	0
Albany	0	0	0
Berkeley	4	1	10
Dublin	0	0	0
Emeryville	0	0	0
Fremont	5	0	0
Hayward	2	2	5
Livermore	0	0	0
Newark	0	0	0
Oakland	6	1	1
Piedmont	0	0	0
Pleasanton	0	0	0
San Leandro	2	1	3
Union City	0	0	0
Alameda County	0	0	0
Alameda County Total	19	5	19

3. LIST OF APPLICABLE STRUCTURES

A list of the applicable structures that applied for a demolition permit since July 1, 2019, that had materials with PCBs at 50 ppm or greater, with the address and estimated demolition date, is provided in Attachment 1.

4. DESCRIPTION OF PCBs CONTROL METHOD

4.1 Permittee Control Method

On behalf of the MRP Permittees, the Bay Area Stormwater Management Agencies Association (BASMAA) conducted a regional project that developed an implementation framework, guidance materials, and tools for local agencies to ensure PCBs-containing materials and wastes are appropriately managed during building demolition. The Regional Project also provided training materials and a workshop for municipal staff, and an outreach workshop for the industry on implementing the framework/protocols developed via the project.

Permittees have implemented the following process for this control measure:

- The municipality informs applicable demolition permit applicants that their projects are subject to the program for managing materials with PCBs, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.
- For every applicable demolition project, applicants implement the BASMAA protocol for identifying building materials with PCBs concentrations of 50 ppm or greater and then complete and submit a version of BASMAA’s model “PCBs Screening Assessment Form” (Screening Form) or equivalent to the municipality.
- The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
- The municipality then issues the demolition permit or equivalent, according to its procedures.
- The municipality sends each completed Screening Form for applicable structures and any supporting documents to its countywide program. The countywide program compiles the forms and works with the other MRP countywide programs to manage and evaluate the data and assist Permittees with associated MRP reporting requirements.

4.2 Building Demolition Applicant Control Method

Applicants that determine that PCBs exist in priority building materials must follow applicable federal and state laws for handling and disposal, such as reporting to the U.S. Environmental Protection Agency (USEPA), the San Francisco Bay Regional Water Quality Control Board, and the California Department of Toxic Substances Control (DTSC). These agencies may require additional sampling and abatement of PCBs.

The Toxic Substances Control Act (TSCA) regulates the disposal of PCBs waste. Depending on the approach for sampling and removing building materials containing PCBs, the applicant may need to notify or seek advance approval from USEPA before building demolition. For example, TSCA requires manifesting the waste for transportation and disposal. (See 40 Code of Federal Regulations (CFR) 761 and 40 CFR 761, Subpart K.) Regulation under TSCA is not limited to materials containing PCBs at or above 50 ppm. There are circumstances in which materials containing PCBs below 50 ppm are subject to regulation under TSCA. (See 40 CFR 761.61(a)(5)(i)(B)(2)(ii).) 40 CFR 761.3 provides information relative to the disposal of PCBs-containing building materials, including definitions of PCBs bulk product wastes and PCBs remediation wastes. The memorandum “PCB Bulk Product Waste Reinterpretation” from the Office of Resource Conservation and Recovery, EPA,¹ provides more information.

¹ Located here: https://www.epa.gov/sites/production/files/2016-01/documents/wste-memo_102412.pdf.

Additionally, the disposal of PCBs waste is subject to California Code of Regulations (CCR) California Code of Regulations (CCR) Title 22, Section Division 4.5, Chapter 12, Standards Applicable to Hazardous Waste Generators.

Attachment 1
List of Applicable Structure Applications for
Alameda County Permittees with PCBs at 50
ppm or Greater

ACCWP PCBs in Building Materials Management Program –Data Summary (2019-2022)

Permittee	Building ID	Address	Estimated Demo Date	# Samples ≥ 50 ppm PCBs	PCBs Concentration Range (mg/kg)
Oakland	AC - 14	5441 International Boulevard, Oakland, CA, 94601	June 2020	5	54 - 174
Oakland	AC - 15	5441 International Boulevard, Oakland, CA, 94601	June 2020	1	139.4
Oakland	AC - 16	5441 International Boulevard, Oakland, CA, 94601	June 2020	2	66.1 - 85
Oakland	AC - 17	5441 International Boulevard, Oakland, CA, 94601	June 2020	1	56
Oakland	AC - 18	5441 International Boulevard, Oakland, CA, 94601	June 2020	2	53 - 64
Oakland	AC - 19	5441 International Boulevard, Oakland, CA, 94601	June 2020	1	61
Oakland	AC - 21	5441 International Boulevard, Oakland, CA, 94601	June 2020	2	58 - 104
Oakland	AC - 26	5441 International Boulevard, Oakland, CA, 94601	June 2020	1	125
Oakland	AC - 31	7200 Earhart Rd, Oakland, CA, 94621	November 2019	4	190 - 537,000
Fremont	AC -32	39150 Fremont Bank, Fremont, CA, 94539	Jan 2020	1	50
Hayward	AC -34	22300 City Center Drive, Hayward, CA, 94541	April 2020	3	66 - 9,600
Dublin	DUB-1	6700 Golden Gate Drive, Dublin, CA, 94568	To be determined	6	51 - 740
Fremont	FRE-1	3820 Peralta Blvd, Fremont, CA, 94536	September 2020	1	1,800
Fremont	FRE-3	37887 Shinn St, Fremont, CA, 94536	March 2021	2	76 - 670
Fremont	FRE-5	37343 Blacow Rd, Fremont, CA, 94536	April 2021	2	110-28,000
Hayward	22300 City Center Dr.	22300 City Center Drive, Hayward, CA, 94541	April 2021	8	66 – 9,600
Hayward	411 Industrial Pkwy	411 Industrial Pkwy, Hayward, CA, 94544	August 2020	1	1,300
Hayward	Hay-01	24493 Clawiter Road, Hayward, 94545	November 2021	2	0.97 to 330
Hayward	Hay-02	603 A Street, Hayward, CA, 94541	August 2021	3	76-140
Oakland	B2105059	2400 Engineer Rd, Oakland, CA 94612	March 2022	1	21.7-56
Berkeley	BER-3	2001 Ashby Ave, Berkeley 94703	February 2022	10	1.0-170,000
San Leandro	AC-1	1188 E. 14th Street, San Leandro 94577	August 2022	3	1.9 - 75