



An Innovative Approach to Generate Funding and Promote Stormwater Capture and Use: Stormwater Credit Programs

2025 Public Works Officers Institute
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Panelists

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Your Distinguished Panelists



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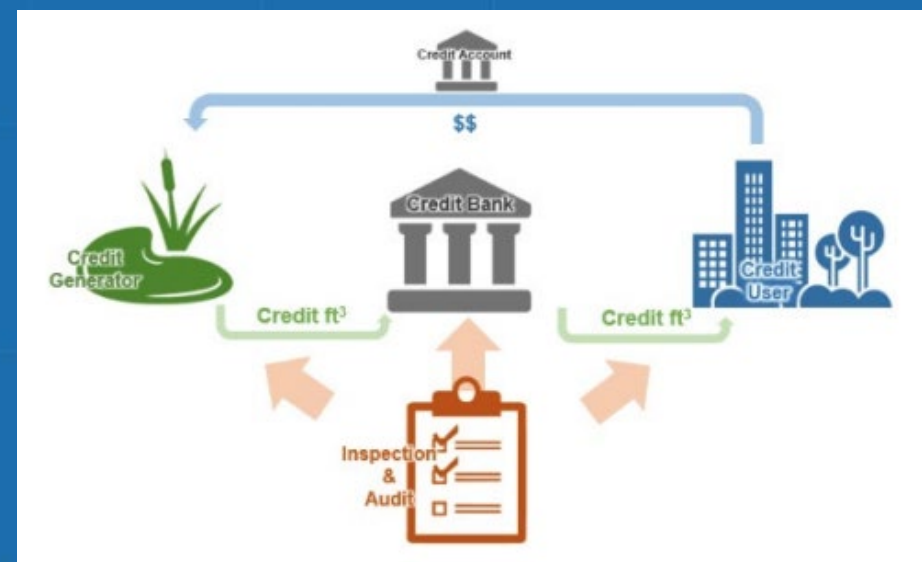


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Outline

- › Introduction - What Are We Talking About?
- › Panelists
 - › City of Anaheim Stormwater Credit Program
 - › Contra Costa RAC Program
 - › Building Industry Perspective
- › Open Discussion



Where do These Programs Fit in the Regulations?

- › “Option” under MS4 NPDES Permits, specifically the New Development Programs
 - › Not all MS4 Permits have a clear path for these programs
- › Ties into New Development Project Documents (e.g., WQMPs, SUSMPs, etc.) and requirement to build onsite structural BMPs



What is the Problem?

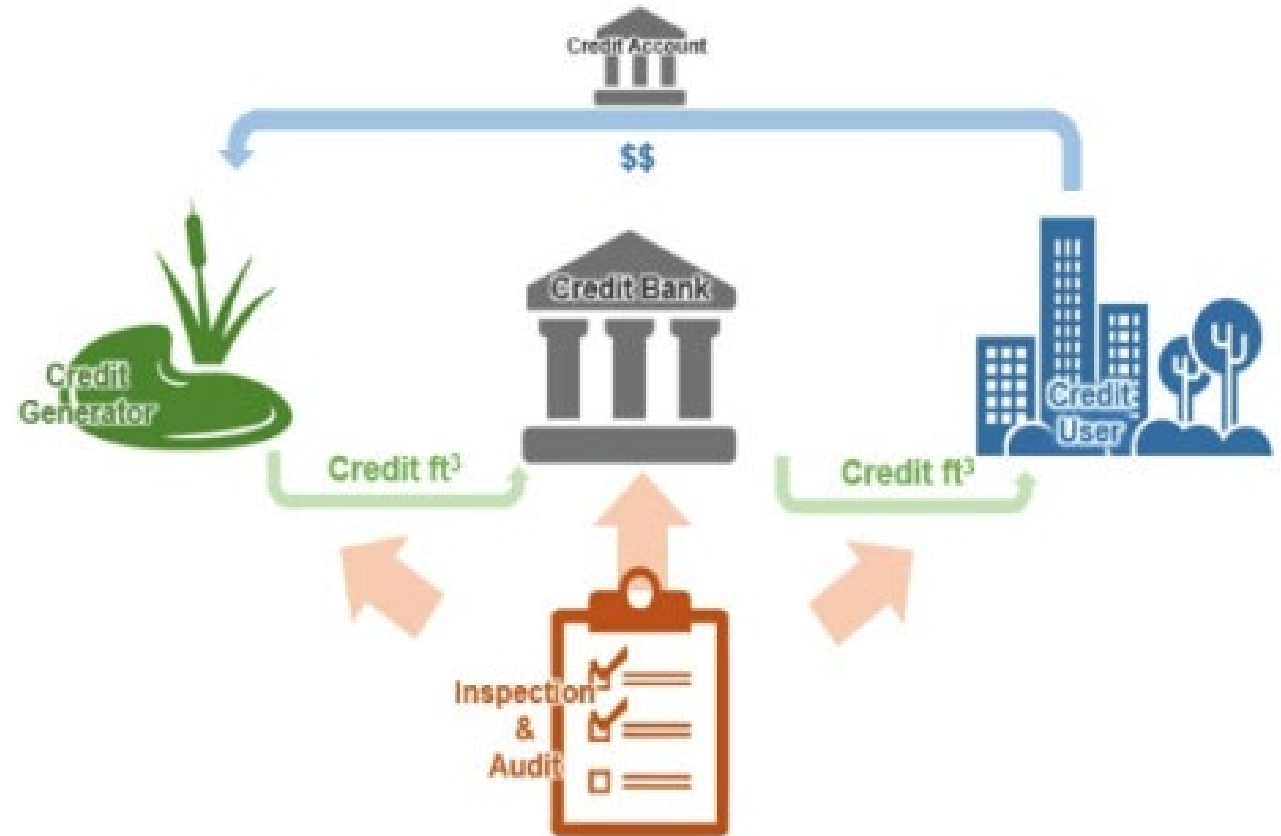
- › 1000s of “distributed” BMPs across the state
- › Expensive to Design, Construct and Maintain (smaller BMPs especially)
- › Municipal oversight/enforcement required to review and approve Design, Construction and Maintenance



How does a Stormwater Credit or Alternative Compliance Program Work?



- › Similar to Habitat or Wetland Mitigation Programs
- › Credit Programs allow for large centralized BMPs in place of onsite BMPs
- › Provides flexibility for new development projects



What is a Credit Generator?



Municipality builds a large centralized BMP to generate credit

14-acre feet captured from 220-acre tributary area

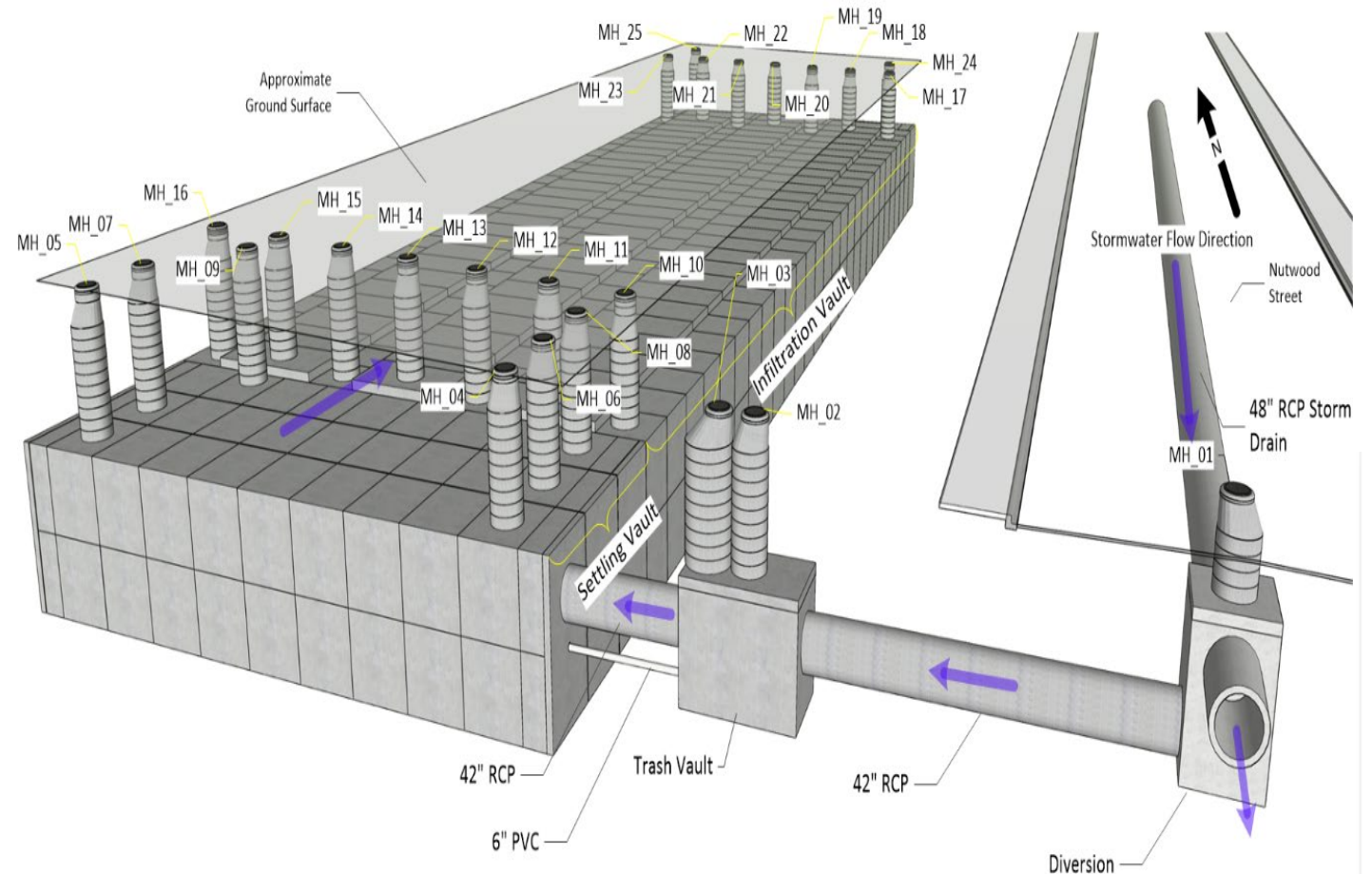


How does a Credit Generator work?

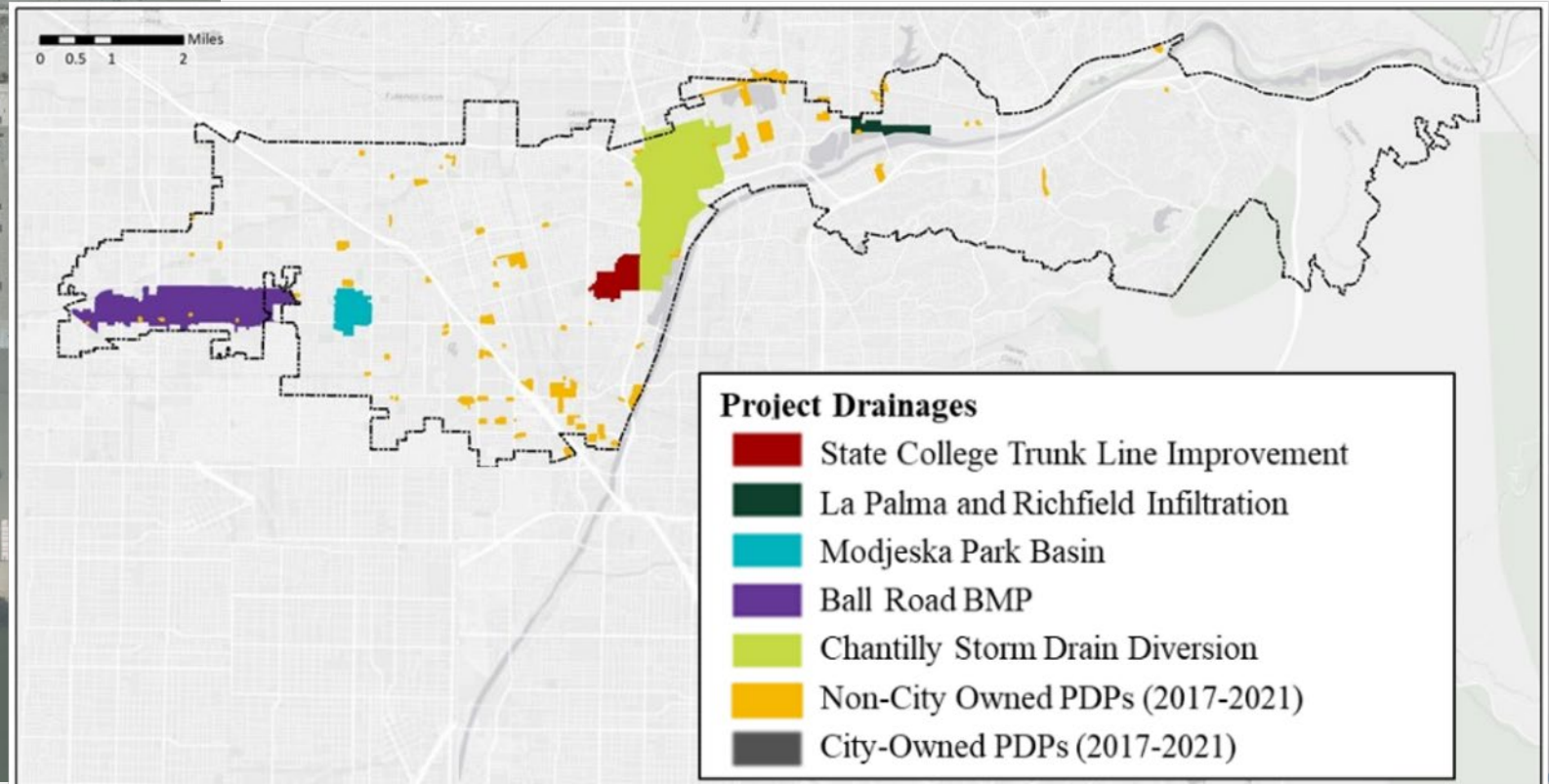
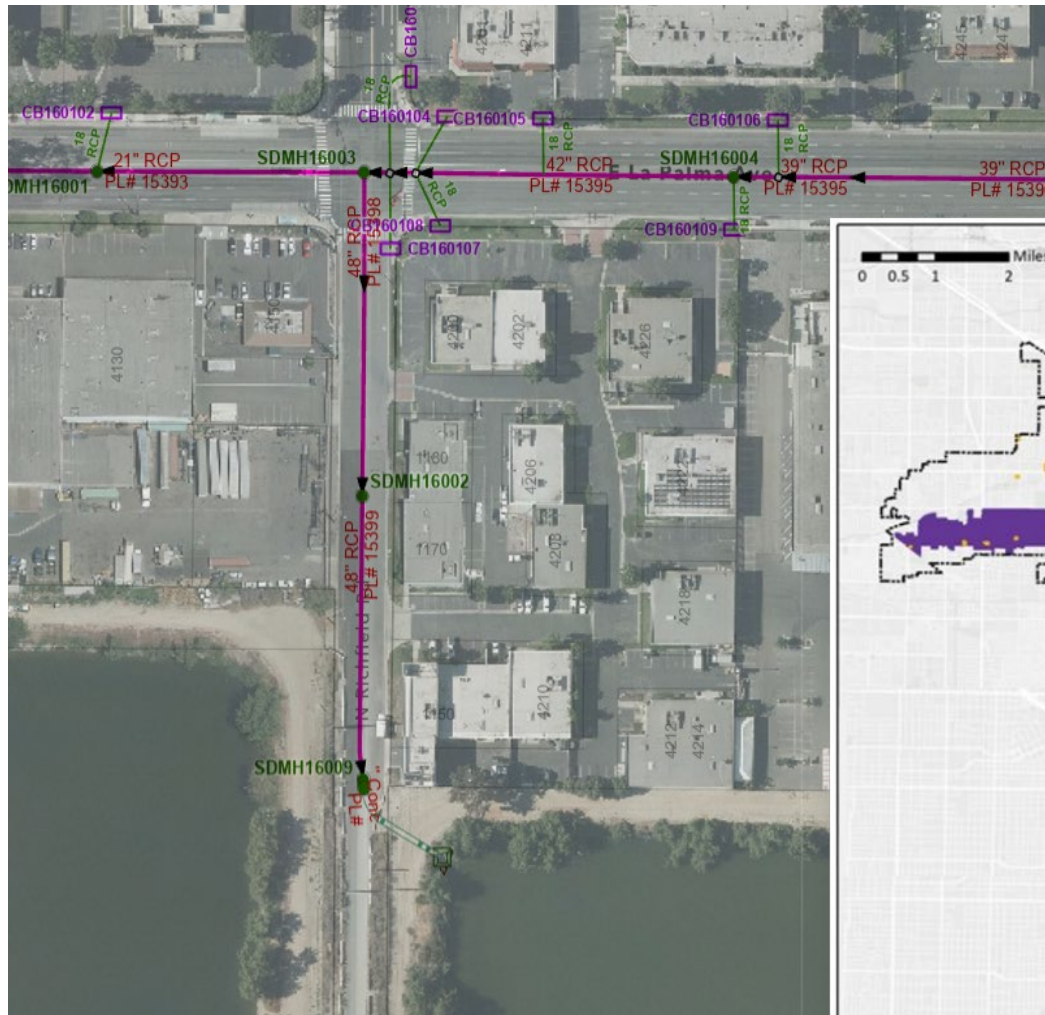


Pollutant capture from upstream watershed generates credit, but volume is a proxy

Cost of Construction and Maintenance divided by the number of Credits results in Cost per Credit



How many Credit Generators are there today?

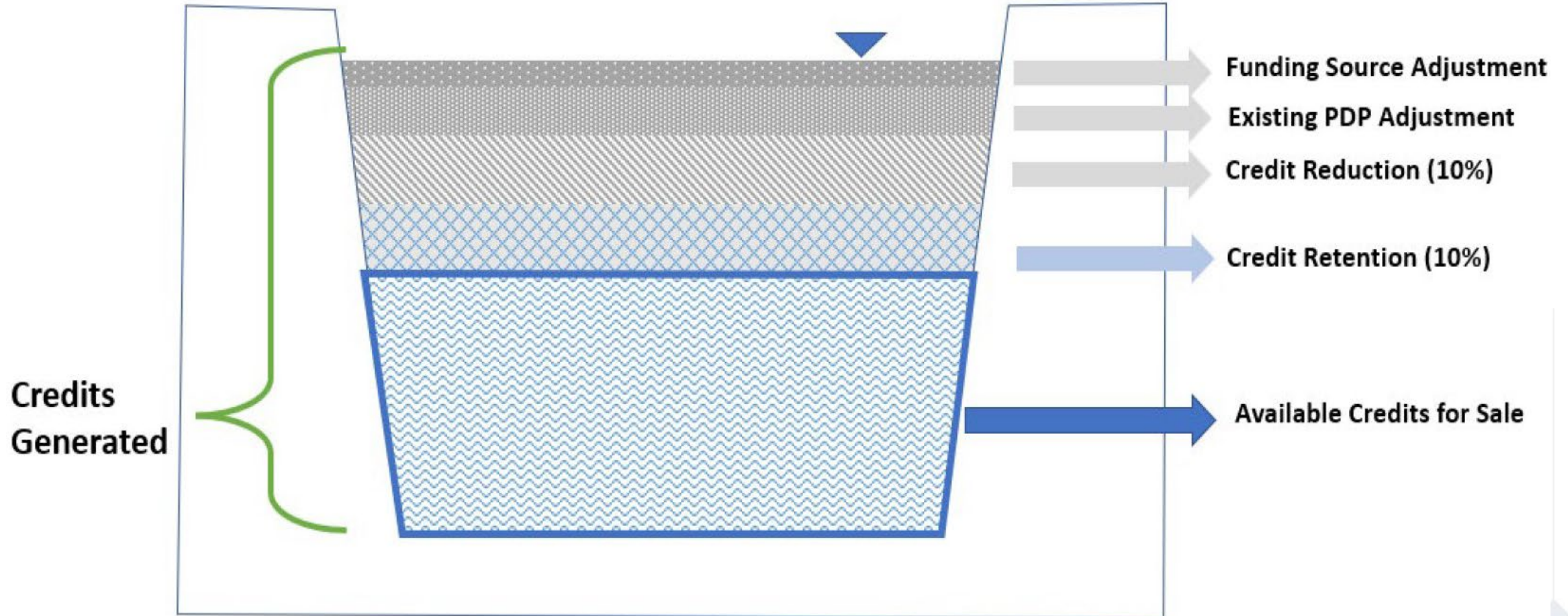


How difficult is establishing a Credit Program?



- › 2017 – 2019: Internal Stakeholders Meetings & Develop Program Documents
- › 2019 – 2021: External Outreach to Solicit Support
- › July 2020 – Dec 2022: RWQCB Outreach, Meetings
- › August 2022 – Presentation to RWQCB Board Members
- › December 15, 2022 – Regional Board public posting period
- › **April 3, 2023 - RWQCB Executive Officer Approval**
- › June 27, 2023 – Anaheim City Council adopt Ordinance, Credit Price
- › **June 27, 2023 – April 2024 – RWQCB Pilot Phase (1-year)**
- › February 1, 2024 – Applications Accepted
- › **April 4, 2024 – Credit available for Sale to Public**

Are there other concerns?



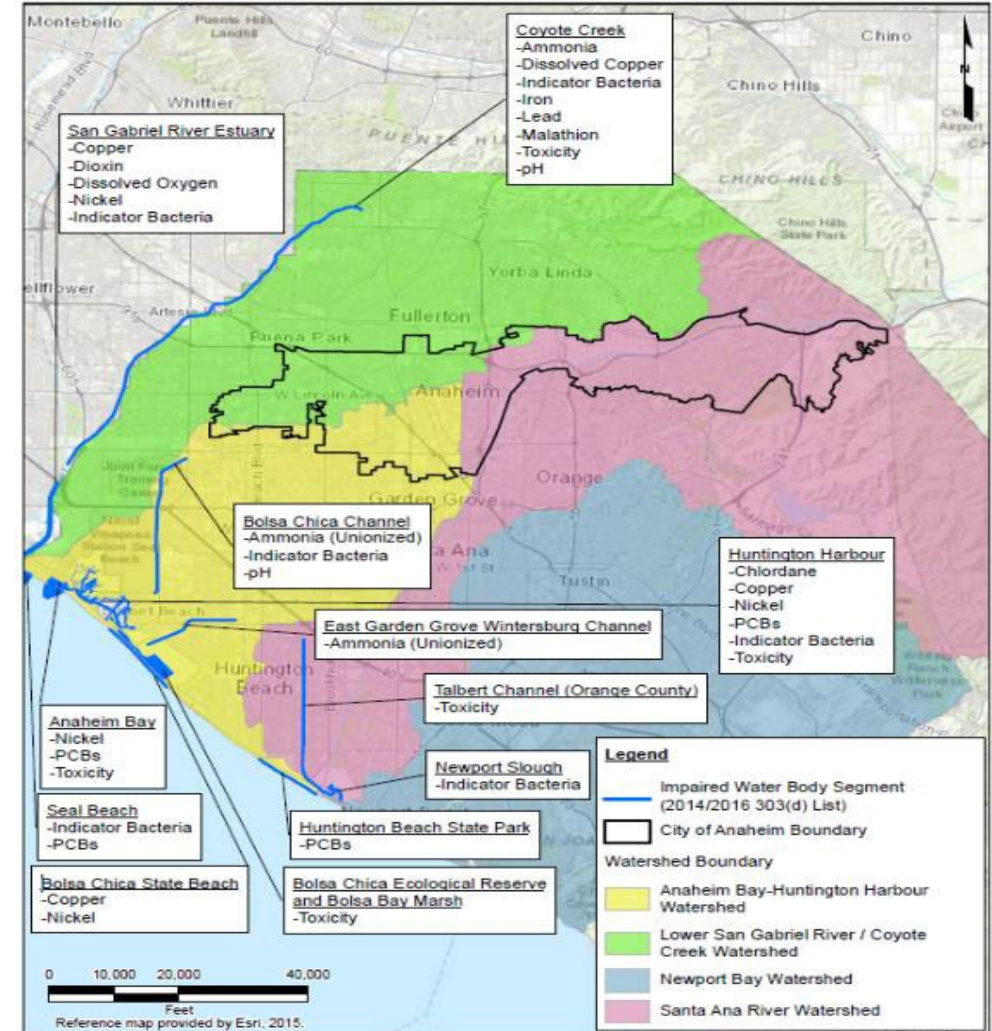
Are there other concerns?



Watershed = Trading Area

Bigger Trading Area =

- › Sooner credit is available
- › More buyers
- › Greater redundancy





Contra Costa County Regional Alternative Compliance (RAC) System



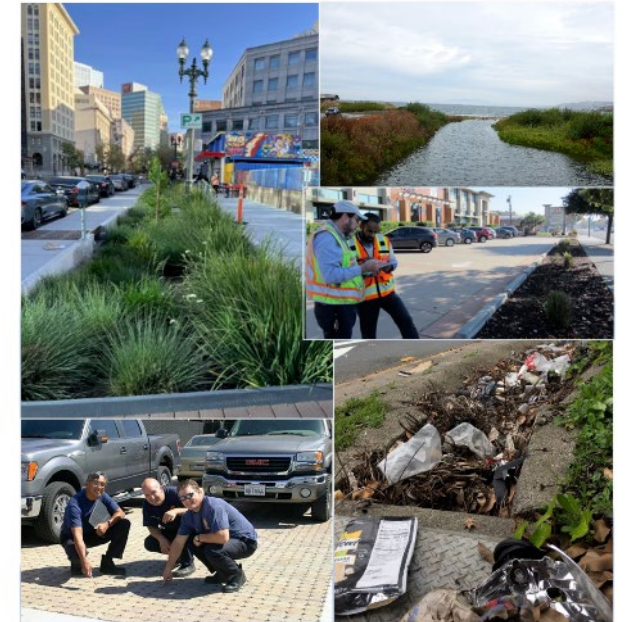
Bay Area Stormwater Requirements



- › New development and redevelopment requirements
- › Stormwater permit requirement for acres of impervious area treated
- › Trash Capture
- › TMDL (Hg and PCBs) requirements

California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

Order No. R2-2022-0018
NPDES Permit No. CAS612008
May 11, 2022



Bay Area – Physical Constraints with Stormwater Facility Siting



Subsurface contamination



High groundwater and tidally influenced areas



Dense urban area with land use constraints



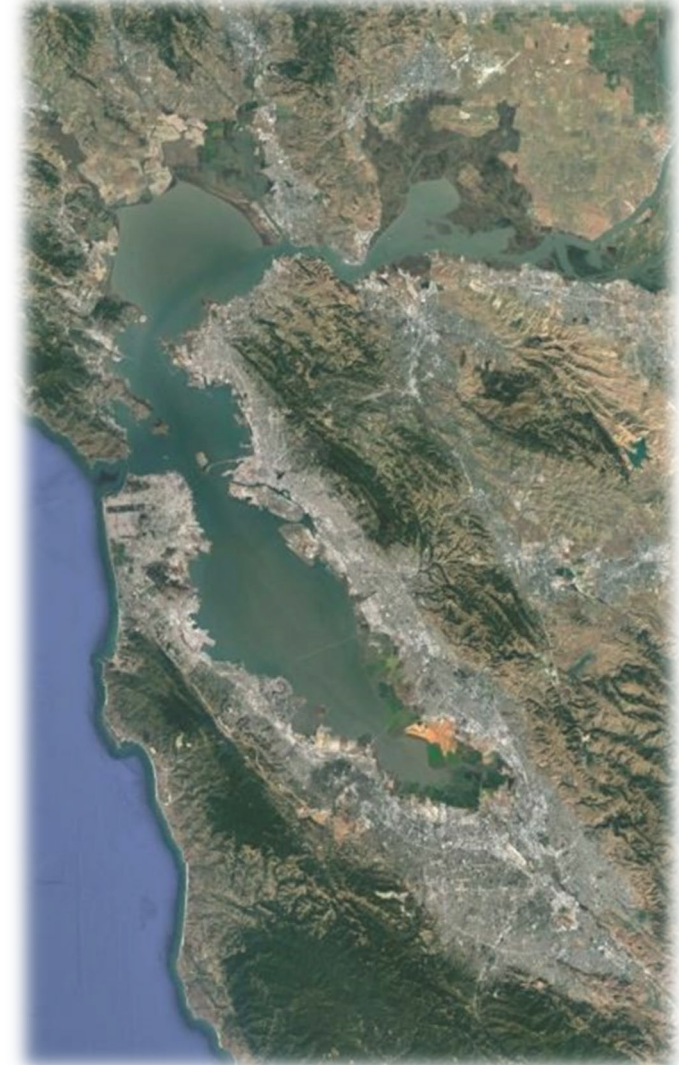
Challenges obtaining community support



Soils not conducive to infiltration



Funding constraints



Regional Alternative Compliance System (RAC System) Objectives



Flexible compliance with the stormwater Permit (MRP)



Cost efficiencies through implementation of larger stormwater capture projects



Targeted facility implementation to provide higher load reduction for TMDLs

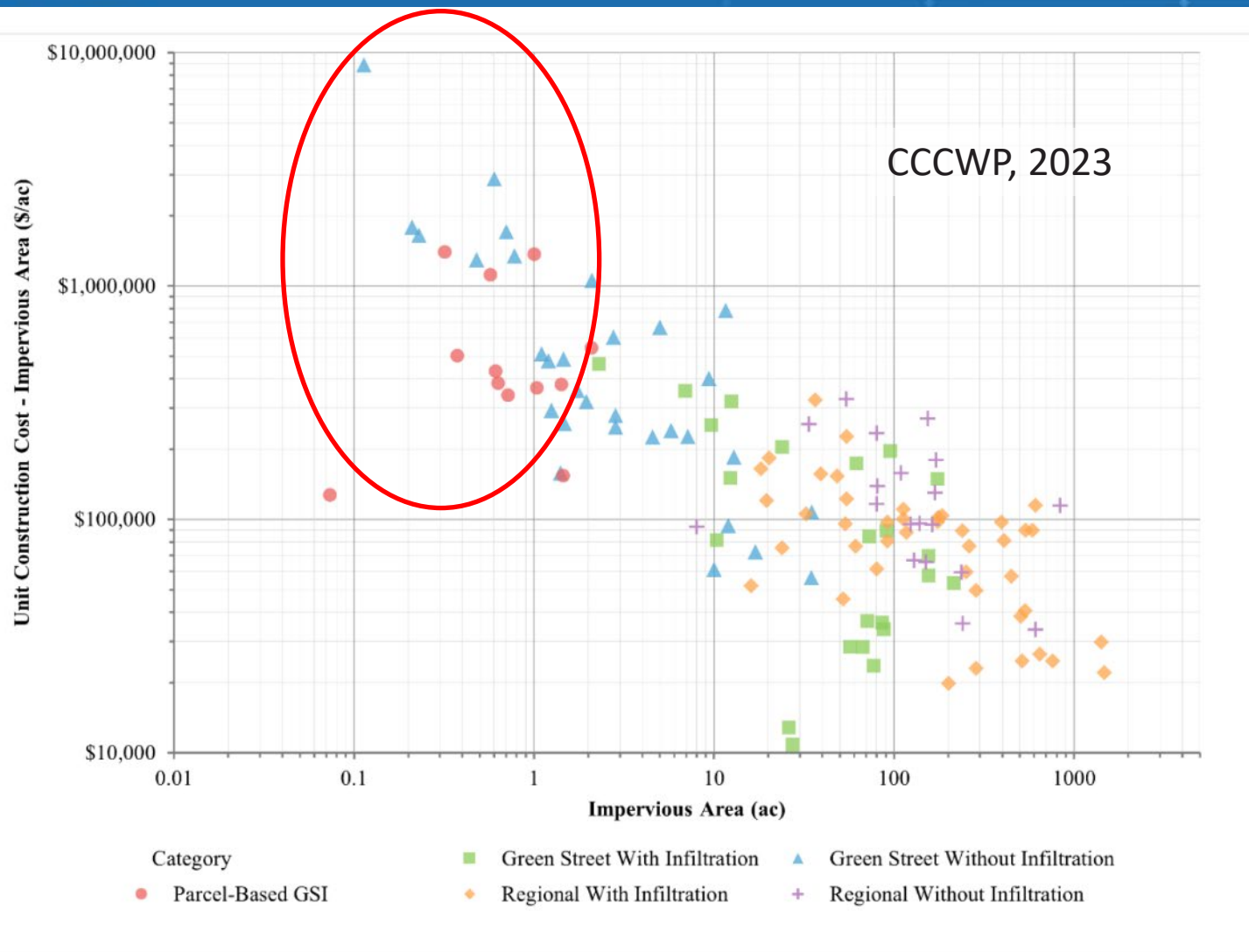


Implementation of projects that provide multiple benefits



Flexibility to adapt the System to meet future water quality needs.

Cost Efficiencies



Category	Construction Cost Per Impervious Acre Treated	
	Median	Mean
Green Street with Infiltration	\$78,000	\$137,000
Green Street without Infiltration	\$419,000	\$841,000
Parcel-Based GSI	\$460,000	\$612,000
Regional with Infiltration	\$74,000	\$92,000
Regional without Infiltration	\$112,000	\$138,000

Figure 2: Unit Construction Cost per Impervious Drainage Area based on Impervious Drainage Area (acres)

Contra Costa County – PCBs Load

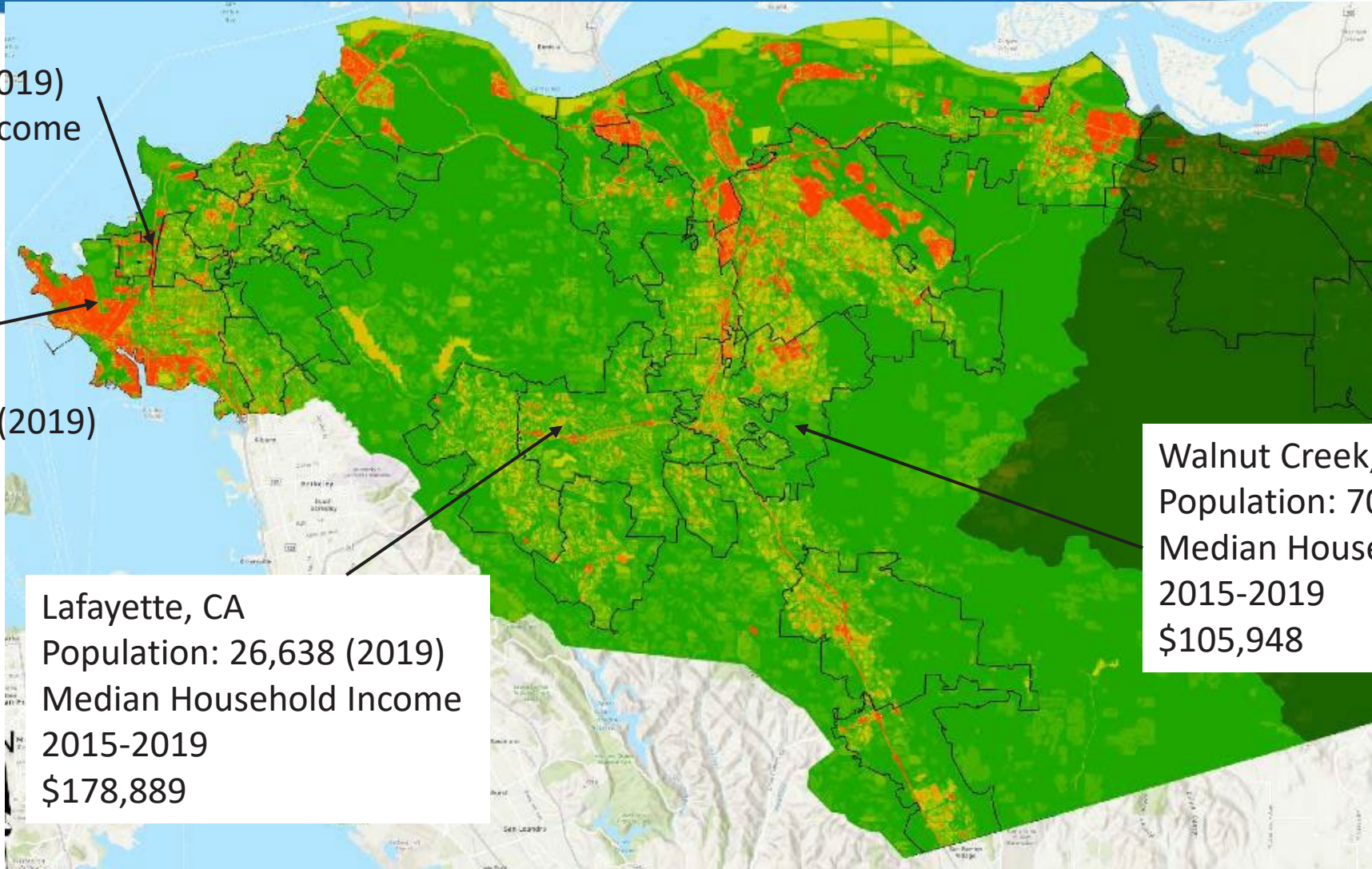


San Pablo, CA
Population: 30,990 (2019)
Median Household Income
2015-2019
\$53,198

Richmond, CA
Population: 110,567 (2019)
Median Household
Income 2015-2019
\$68,472

Lafayette, CA
Population: 26,638 (2019)
Median Household Income
2015-2019
\$178,889

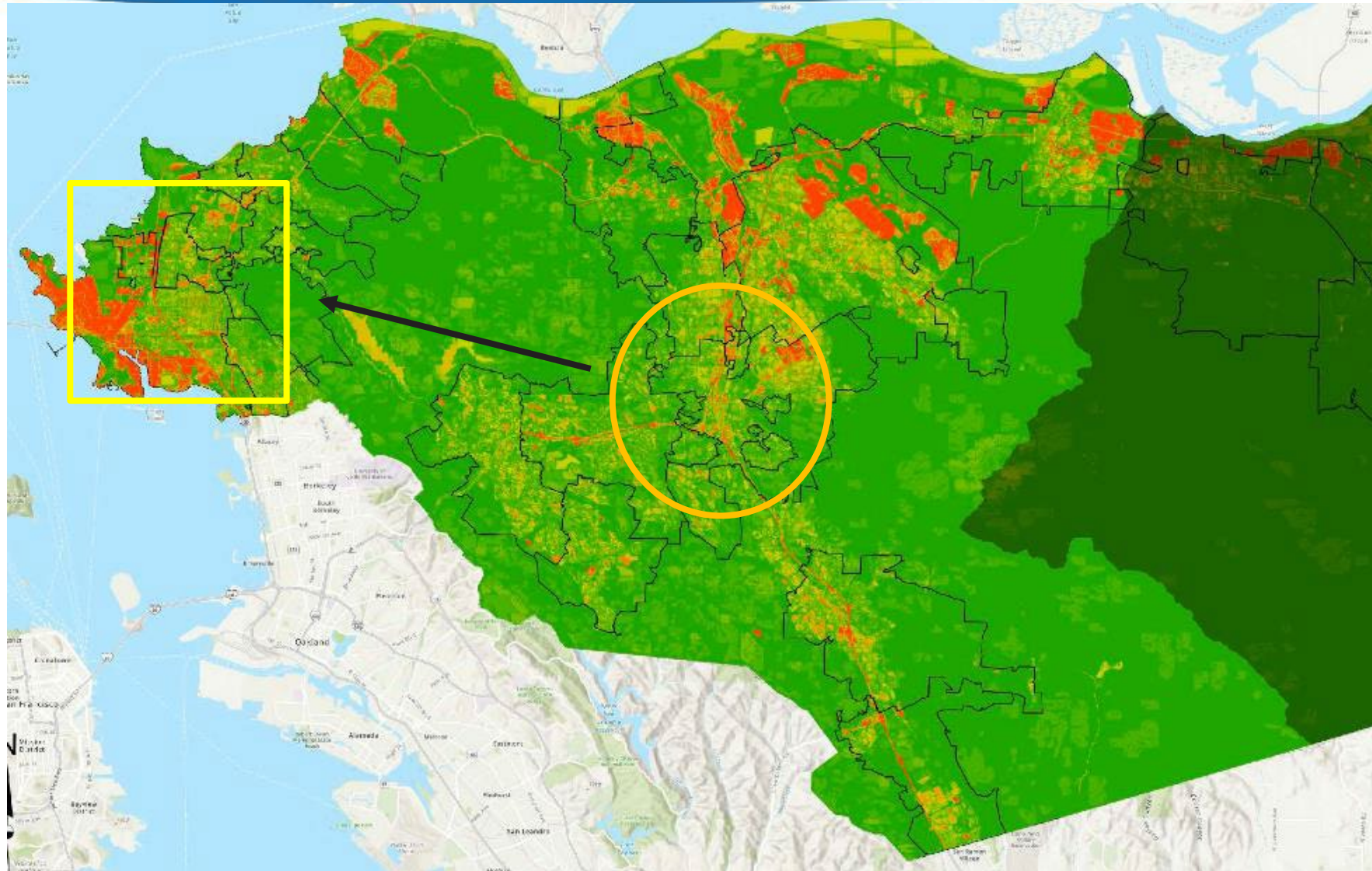
Walnut Creek, CA
Population: 70,166 (2019)
Median Household Income
2015-2019
\$105,948



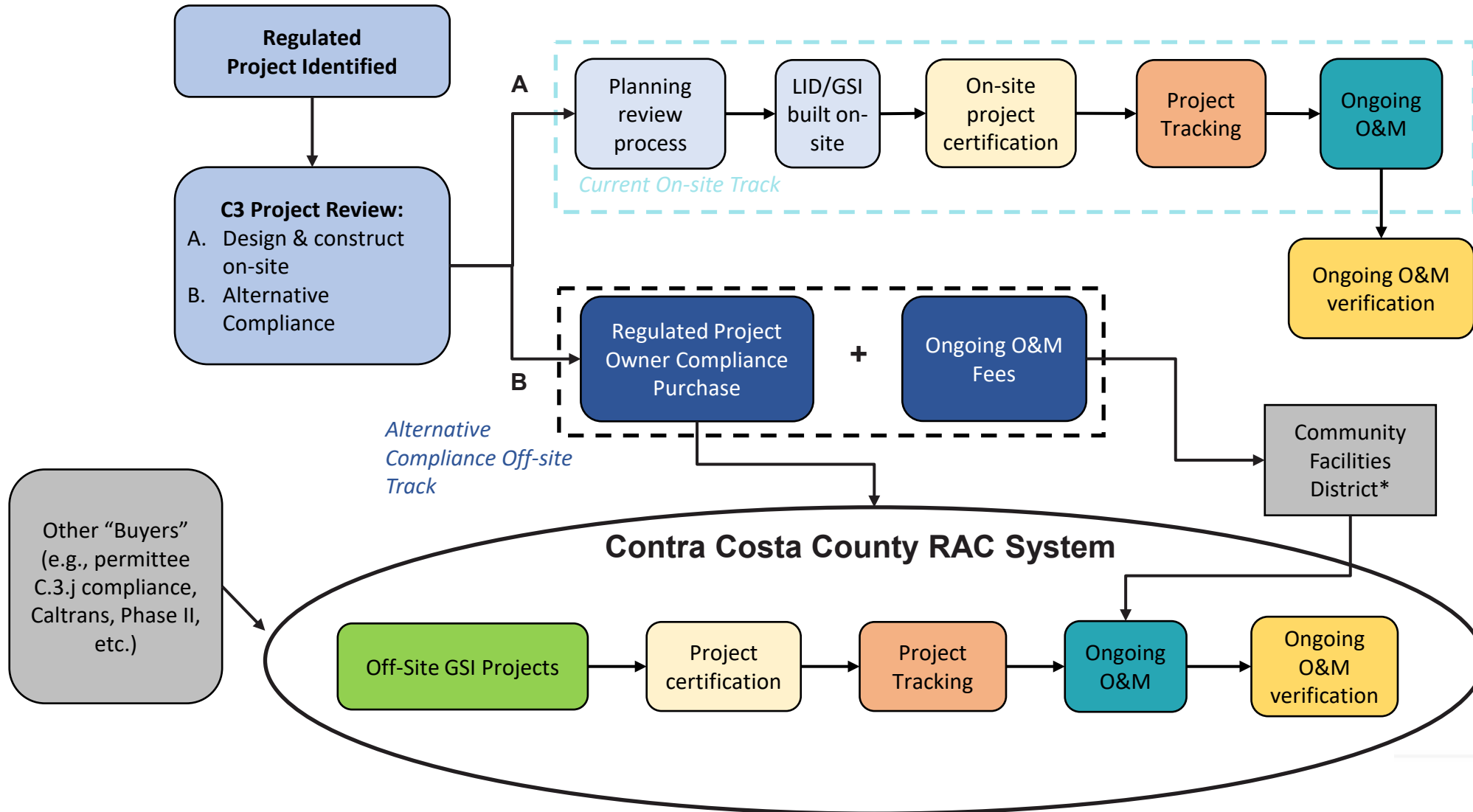
Obtained from <https://www.census.gov/quickfacts>

PCBs load distribution based on RAA Results

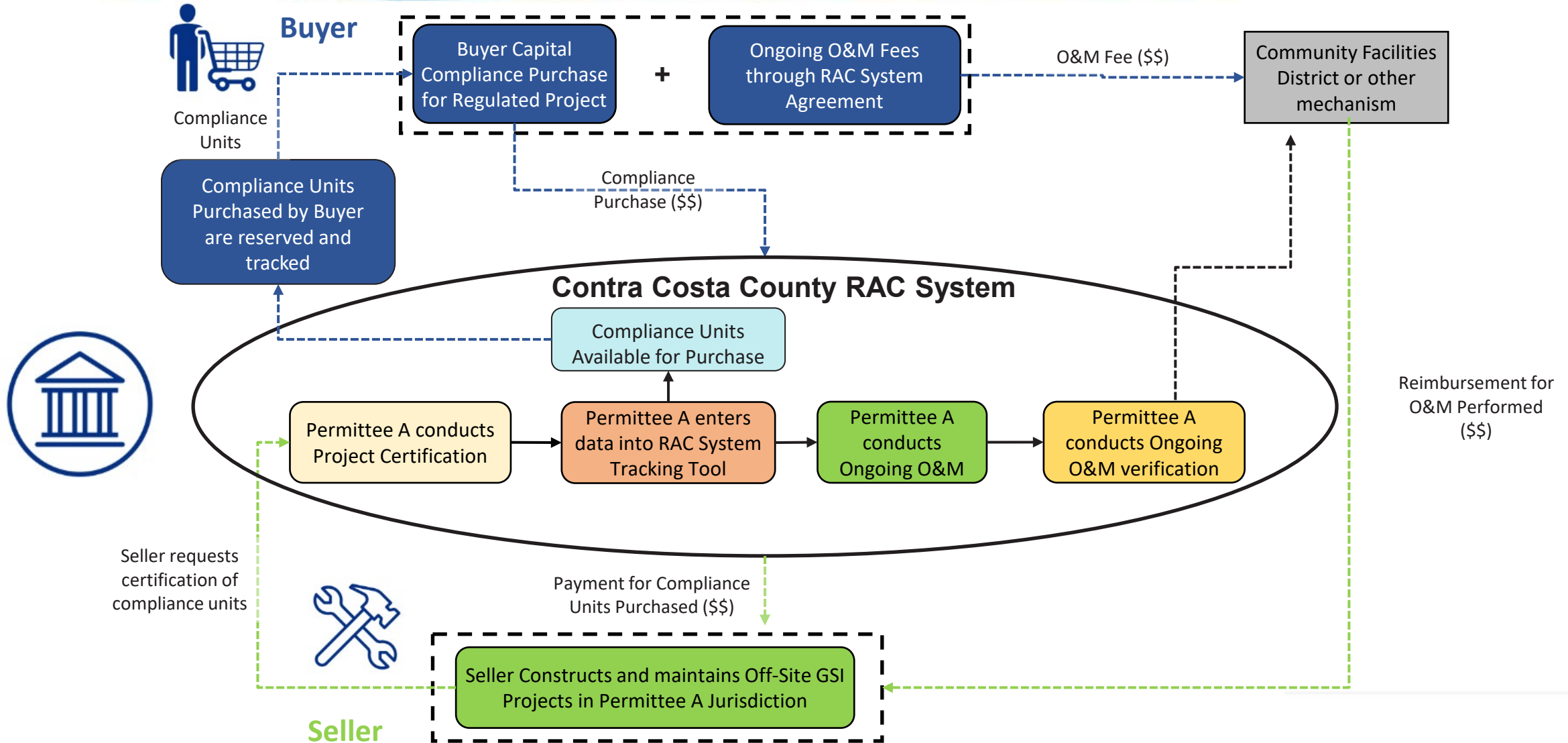
RAC Water Quality Goals



Final RAC System



How An Exchange Works





Difficulties in Building A System

- › Technical approval from Water Boards
- › Legal approval from jurisdictions, Water Board and EPA
- › Takes time to develop
- › Need key stakeholder input
- › Build first or sell first?
- › Determining price setting (market vs set price)
- › Ongoing O&M payments systems take a lot of thought

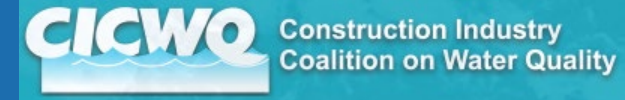
Where are we at?



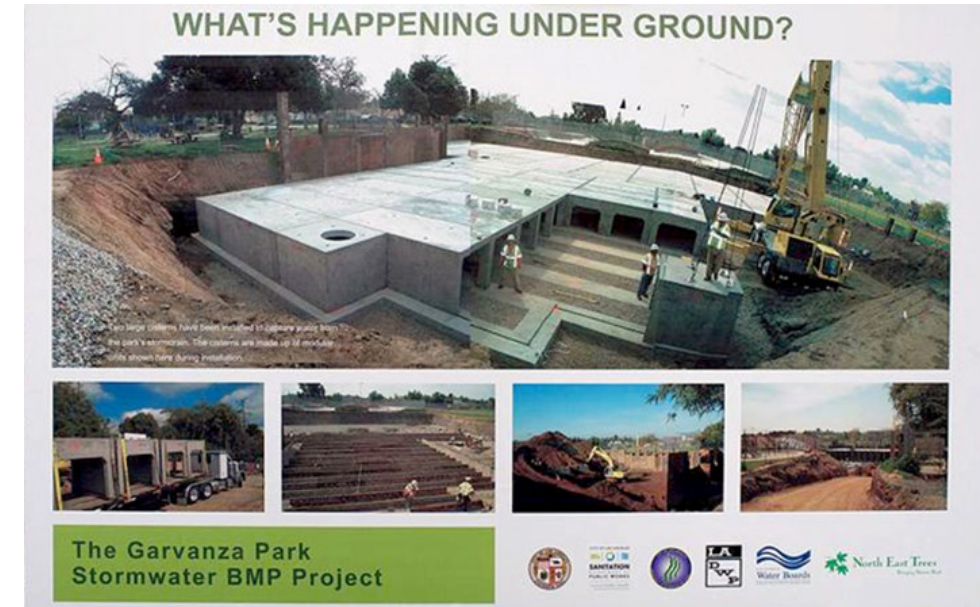
- › First project is currently completing construction
 - › All available credits are sold- currently finalizing agreements
 - › Next two projects going into design
- › Working on the final development of the CFD
- › Have more buyers interested than credits
- › Looking to scale up



Building Industry Perspective - Role



- › Support Regional Urban Stormwater Capture to Improve Water Quality
- › Participation: Need and Why?
- › Opportunities and Scale of Credit Trading
- › Hydraulic - Engineering – Benefit Cost Analysis
- › Advantages to Participation



Support Regional Stormwater Capture



- › **Foundation of CICWQ's water quality improvement policy advocacy and research since its founding in 2001**
- › **Policy advancement involves extensive collaboration and drawing brainpower together**
- › **Who's included: public works, cities, water districts, regional water boards, environmental NGOs and CBOs, product manufacturers, academics**

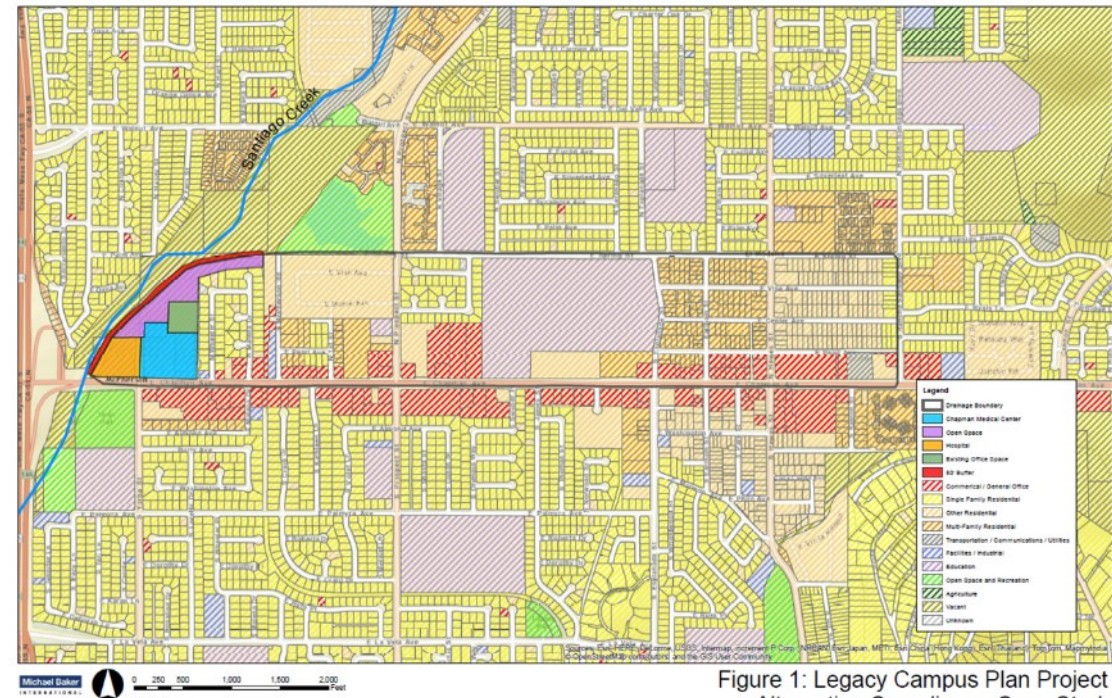
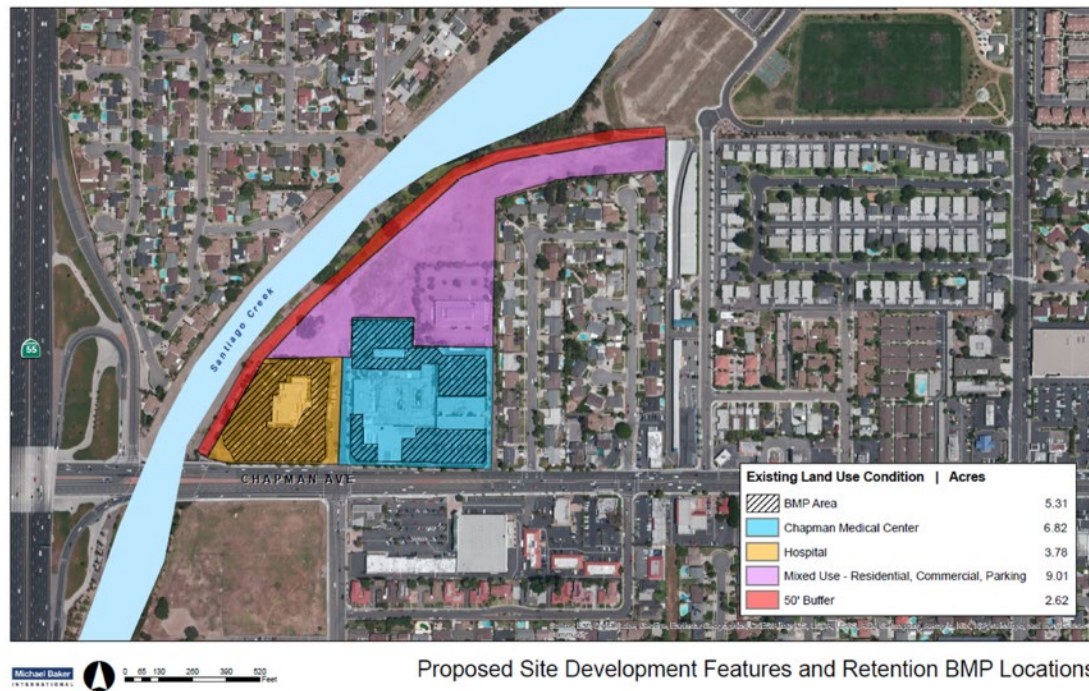
Participation: Need and Why?



- › Create more housing, especially in existing urban areas where space to infiltrate stormwater can be limited
- › Credit user surveys done in early years (2014-2020) of program research suggested a need and willingness to participate by property developers, of all types
- › Utility/Infrastructure development fee and fee-in-lieu familiarity and acceptance

Opportunities and Scale of Program Development – Redevelopment

- Examined private parcel (23 ac) redevelopment to accept urban runoff in underground chambers – 241 ac





-
- LEGEND**
- Single Family Residential
 - Multi-Family Residential
 - Other Residential
 - Commercial Office
 - Commercial and Services
 - Public
 - Educational
 - Military Installations
 - Industrial
 - Transportation, Communications, and Utilities
 - Mixed Commercial and Industrial
 - Mixed Urban
 - Open Space and Recreation
 - Agriculture
 - Wetland
 - Water
 - Under Construction
 - Undevelopable
 - Unknown
- PALMDALE GROUND WATER BASIN**
HYDROLOGY MAP
SUBMITTAL PALMDALE
- | USGS | Lat/Lng | Area (sq ft) | Volume (cu ft) | Depth (ft) | Notes |
|------|---------------------------------|--------------|----------------|------------|-------|
| A-1 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-2 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-3 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-4 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-5 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-6 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-7 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-8 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-9 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-10 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-11 | 34° 38' 00" N
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| A-12 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-13 | 34° 38' 00" N
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| A-14 | 34° 38' 00" N
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| A-15 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-16 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-17 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-18 | 34° 38' 00" N
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| A-19 | 34° 38' 00" N
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| A-20 | 34° 38' 00" N
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| A-21 | 34° 38' 00" N
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| A-22 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-23 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-24 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-25 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-26 | 34° 38' 00" N
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| A-27 | 34° 38' 00" N
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| A-28 | 34° 38' 00" N
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| A-29 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-30 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-31 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-32 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-33 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-34 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-35 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-36 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-37 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-38 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-39 | 34° 38' 00" N
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| A-40 | 34° 38' 00" N
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| A-41 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-42 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-43 | 34° 38' 00" N
118° 05' 00" W | 124 | 124 | 100 | 100% |
| A-44 | 34° 38' 00" N
118° 0 | | | | |

Hydraulic – Engineering – Benefit Cost Analysis Modelling Results



- › **Underground infiltration systems are favored over surface-based systems for generating credits. Hydraulic routing a key factor**
- › **Deeper and larger systems generally are less expensive than shallow systems spread across a project site, reducing credit “cost” on \$/cubic foot retained basis**
- › **Water quality benefits of regional infiltration are greater than distributed, due to time of project delivery (10 v. 200 yrs)**
- › **Site constraints influence costs to construct; geotechnical and soils considerations are key factors**

Advantages to Participation and Program Development



- › **Streamline Water Quality Management Plan (WQMP) compliance process – speeds-up project delivery**
- › **Increases allowable building space**
- › **Building industry and its workforce supports local public infrastructure development – creates jobs and builds community**
- › **Public-owned credit generation offers security, longevity, financial certainty, and regulatory support**

How Can I Get More Information?



CREDIT THINK TANK

- Forum for discussion, learning, and to promote and develop stormwater credit programs and capacity in California
 - Lead by Daniel Apt, David Smith, Chris Crompton
- Brings together regulators, permittees, building industry, NGOs, and consultants
- Outreach at state and national meetings to publicize stormwater credit concept
- Work products:
 - Stormwater Credit Basic Principles and Conceptual Model White Paper
 - Glossary of standardized stormwater credit terminology
 - Roadmap of Future Actions to Build Stormwater Credit Trading Capacity in California
- Interest in joining the Stormwater Credit Think Tank:
 - Contact Daniel Apt: dapt@olaunu.com, (949) 533-9785