Regional Wastewater Facility

Council Study Session | January 31, 2025

San José-Santa Clara Regional Wastewater Facility

Presenting

- Mariana Chavez-Vazquez – General Manager, ESD
- Kapil Verma – Deputy Director, ESD
- Eric Dunlavey – Deputy Director, ESD
- Kevin Ice – Assistant to the City Manager
- Lori Mitchell – Acting Director, ESD
- Jeff Provenzano – Assistant Director, ESD

San José-Santa Clara Regional Wastewater Facility

Agenda

- Regional Wastewater Facility (RWF) – History and Purpose
- Capital Improvement Program (CIP) – Ten Years in Review
- Regulatory Changes - 2024 Permit Nutrient Limit Regulations
- Technical Update to the Plant Master Plan (PMP)
- Next Steps for CIP
- Land Use Component

Council Study Session Objectives

- **Provide Background**
  - *Inception of CIP and original assumptions and how the RWF protects the public and environment.*
- **Give a Status Update**
  - *Where we are after 10 years of CIP work.*
- **Acknowledge**
  - *Accomplishments of the Program.*
- **Inform**
  - *Share challenges and changes in legislation that will impact the future implementation of the CIP.*

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RWF and CIP Program Showcase

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Regional Wastewater Facility – History and Purpose

What is Wastewater

Potable water

Uses : Residential, industrial, commercial, services

Wastewater

From the Oxford Dictionary:
“Water that has been used in the home, in a business, or as part of an industrial process”

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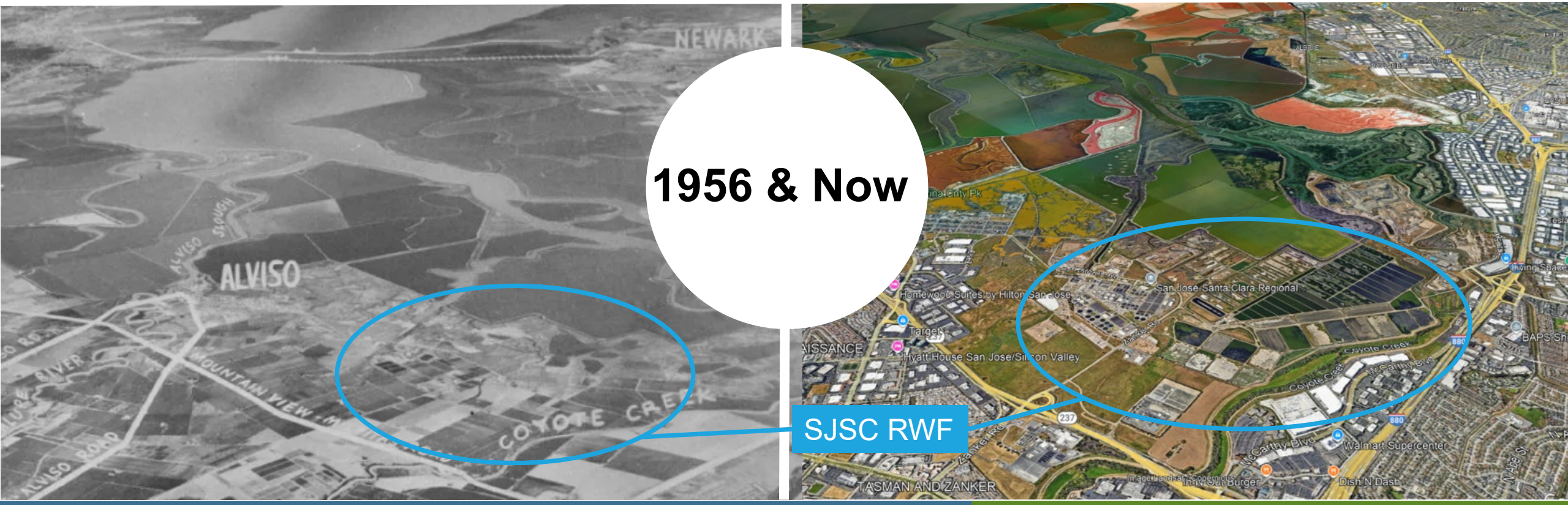
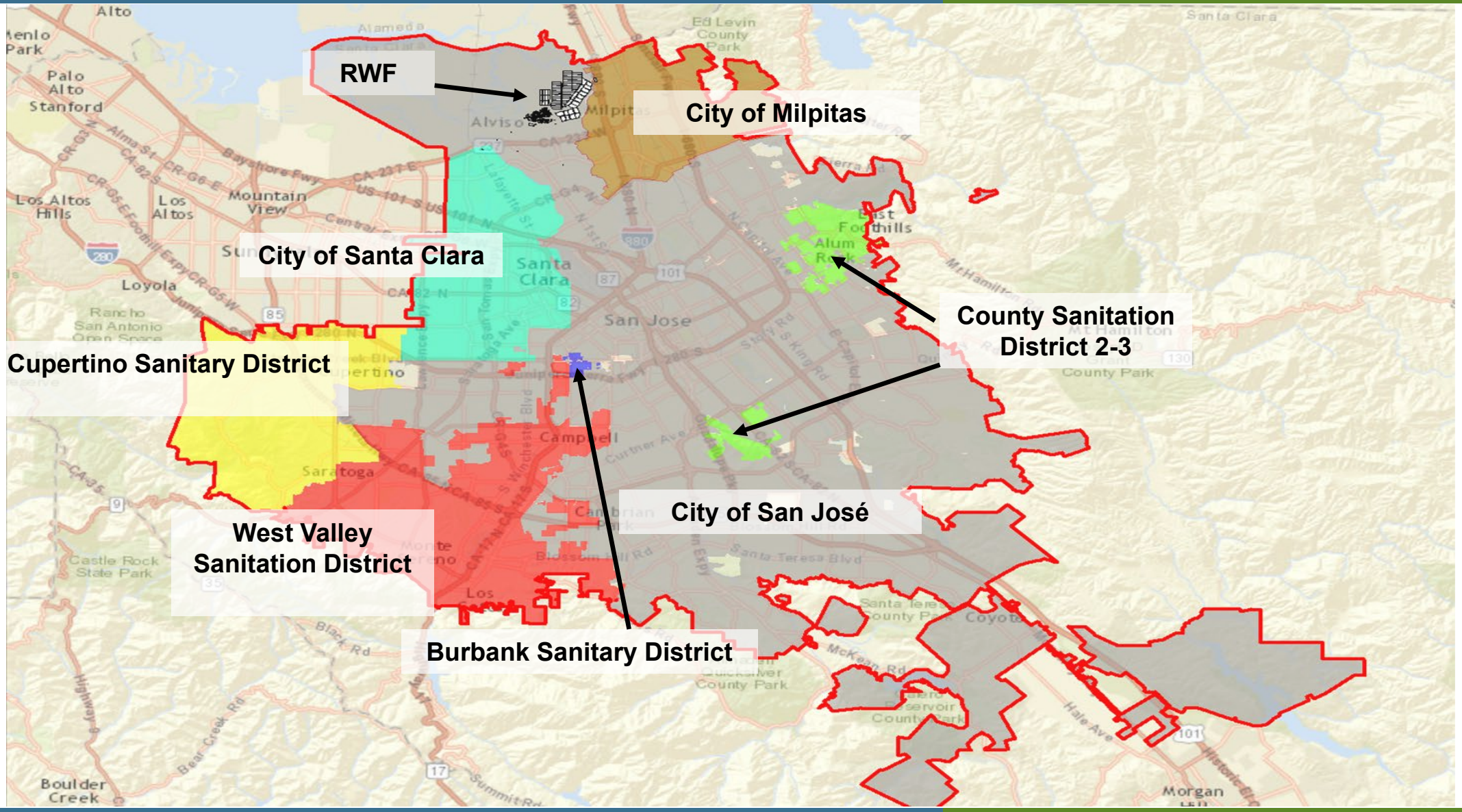
What does the RWF do?

Nearly 69 years of uninterrupted operation, continuously meeting environmental requirements and safely returning over 110 million gallons of treated wastewater to the south San Francisco Bay daily



Who We Serve



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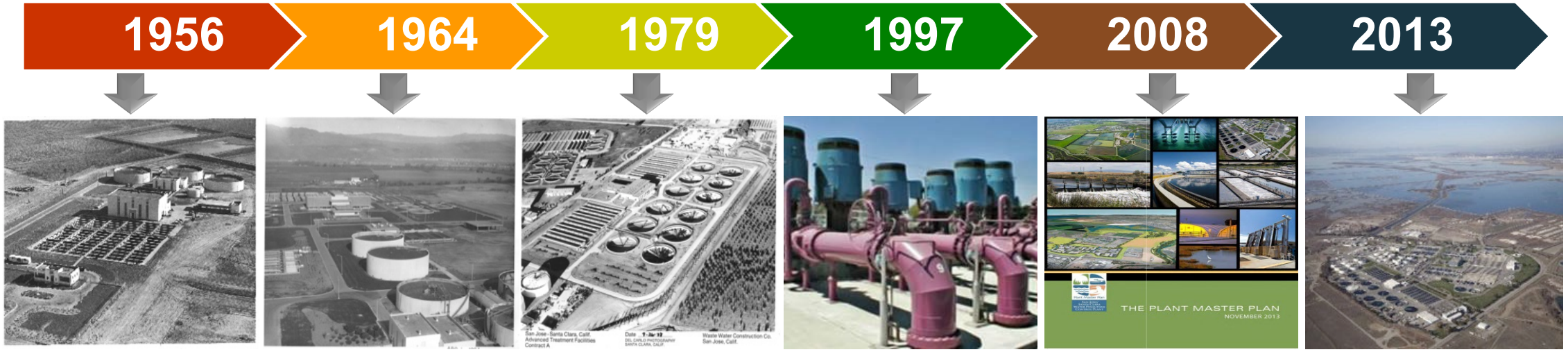
Major RWF Expansions/Rebuilds



1956	1964	1979	1997	2008	2013
Primary Treatment	Secondary Treatment	Tertiary / Advanced Treatment	Biological Nutrient Removal / South Bay Water Recycling	Plant Master Plan Planning and Env. Review	Plant Master Plan Adopted

- **2008-2013:** Plant Master Plan Planning and Environmental Review
- **2013-2025**: CIP Implementation

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RWF Ownership and Governance

Owners

San José (approx. 80%*)

Santa Clara (approx. 20%*)

*allows for yearly fluctuations

Customers

West Valley Sanitation District Milpitas

Cupertino Sanitary District

County Sanitation District 2-3

Burbank Sanitary District

Treatment Plant Advisory Committee

(4) San José

(2) Santa Clara

(3) Tributary Agencies

Councils

San José City Council approves all RWF items

Santa Clara City Council approves items related to land use and CWFA financing

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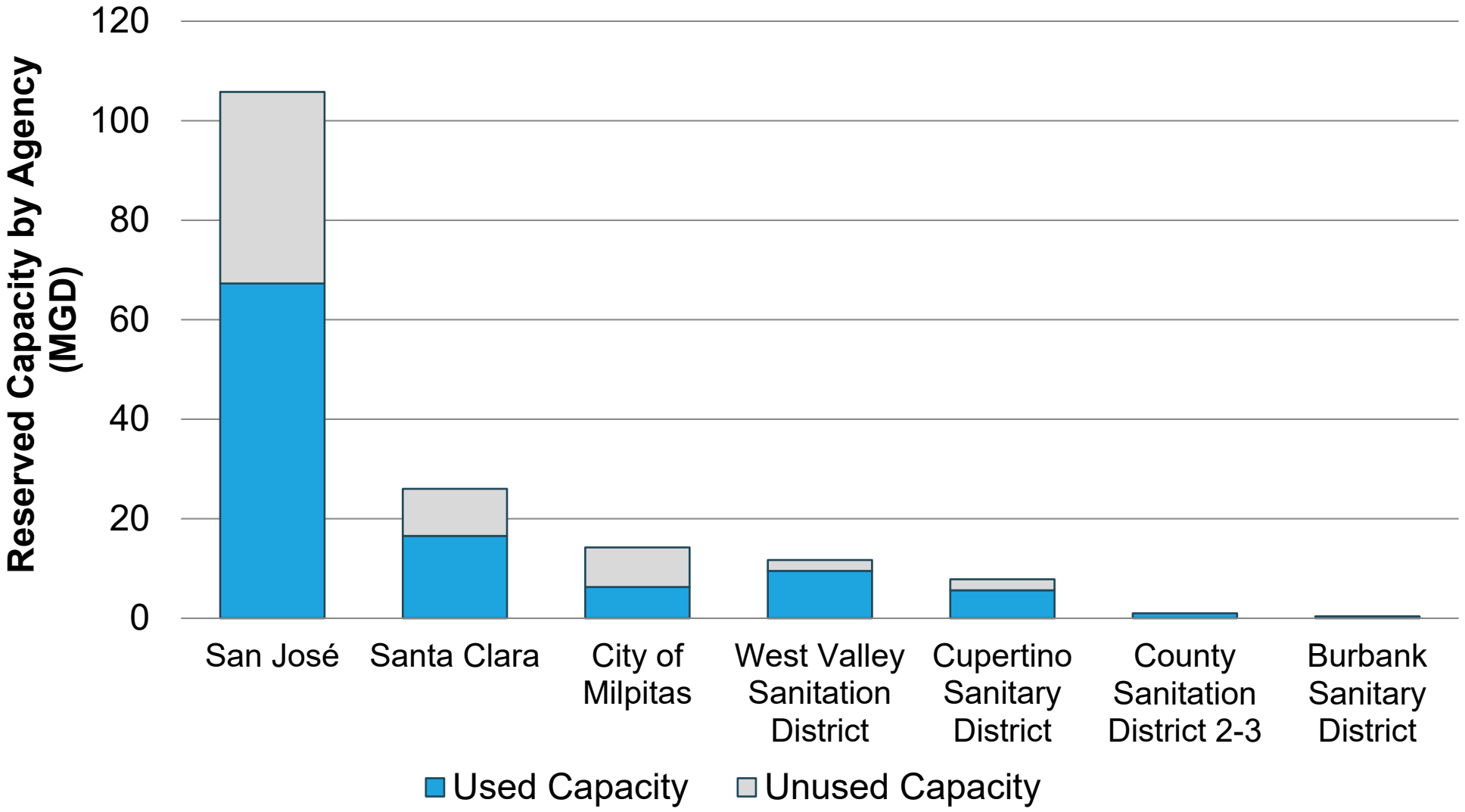
RWF Treatment Capacity (167 MGD)



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Sewer (RWF + collection system) rates San José & Other Agencies 24-25

- Single family residence monthly rate - **$49.59**
- Daily cost to collect and treat sewage - **$1.65**

Agency	Monthly Rate
Sunnyvale	$67.95
Milpitas	$66.79
Cupertino Sanitary District	$64.27
West Valley Sanitation District	$57.65
Palo Alto	$55.93
Mountainview	$54.60
Santa Clara	$52.37
San José	**$49.59**

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RWF in Numbers

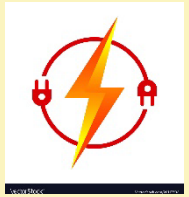
- Operated by the Environmental Services Department – **326 Full Time Equivalents** (Operations, CIP, and Laboratory)
- **Operational 24/7** and in compliance with all regulations
- Process overs **25,000 lab samples** per year (60,000+ Analysis)
- Generates green energy, fulfilling **80% of current energy demands**
- **Largest CIP in the history of San José – $2.2 Billion Program**

1.5 Million Residents 17,000 Businesses

110 MGD Wastewater Treated per year

16 MGD Recycled water

No Permit Violations since 2011



All biogas used for power production

275 wet TPD biosolids beneficially reused by 2025

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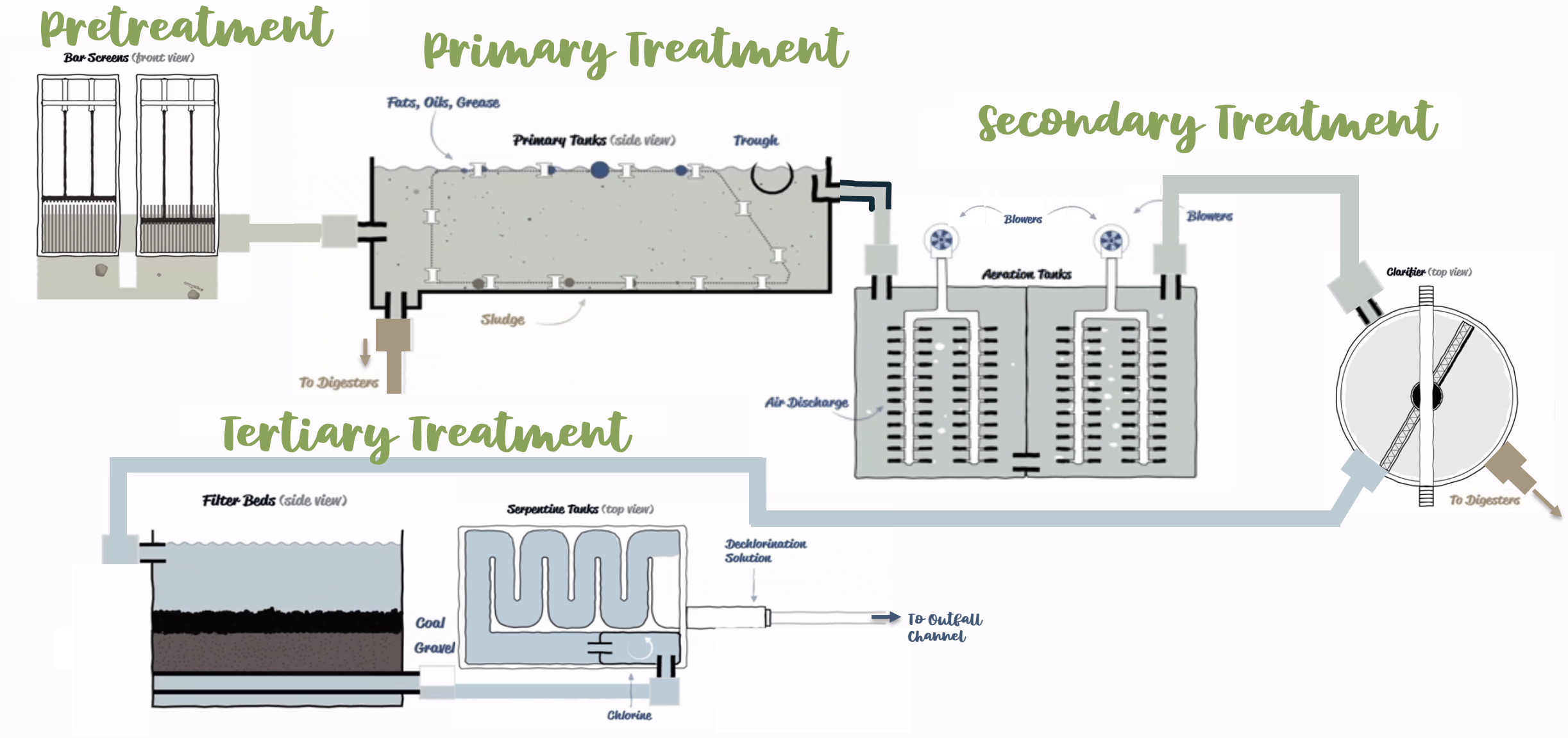
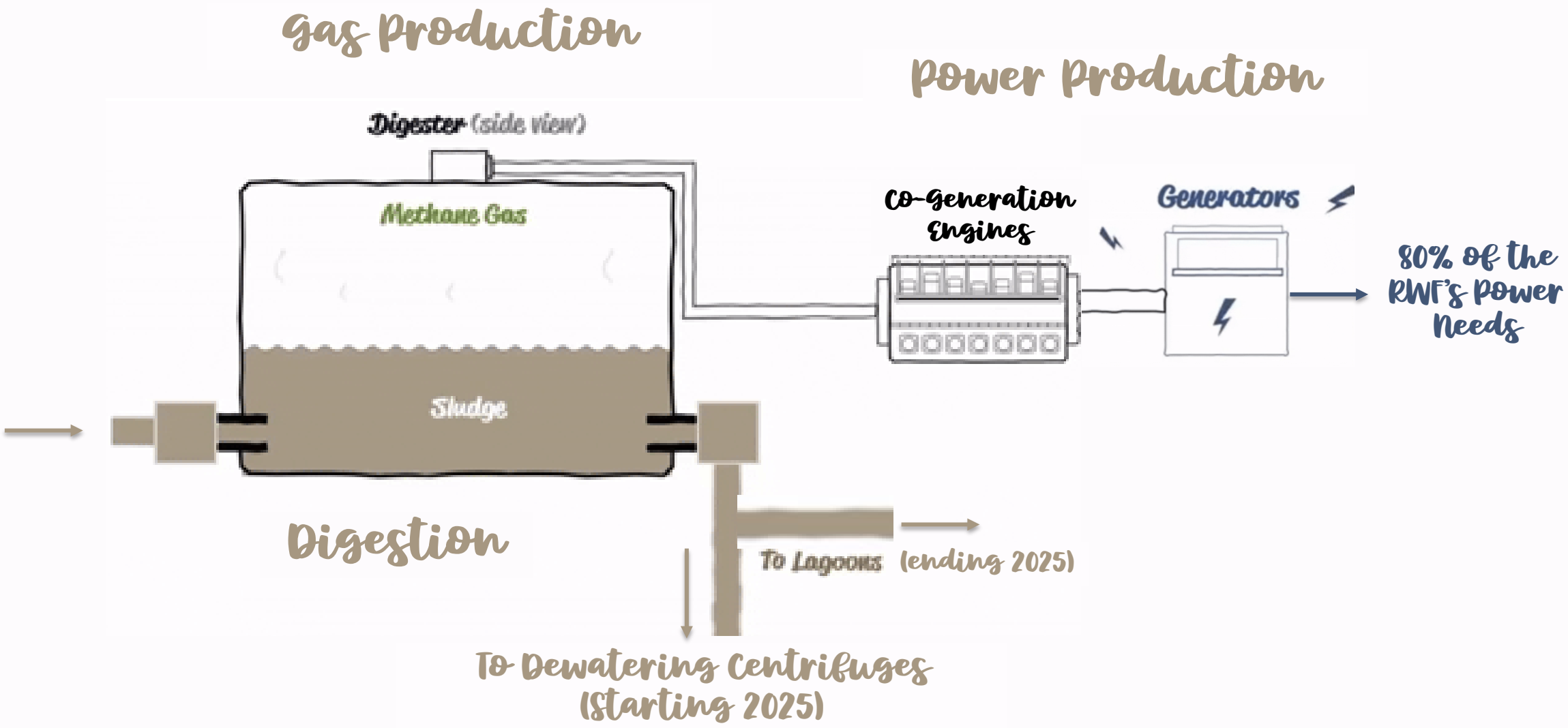
RWF – Liquids Treatment Processes



RWF – Solids Treatment Processes



A Healthier Lower South Bay

1972 — 50 Years Improving the Environment — 2022

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Thriving Ecosystem – Fish Diversity


Bat Ray


Longfin Smelt


Staghorn Sculpin


American Shad

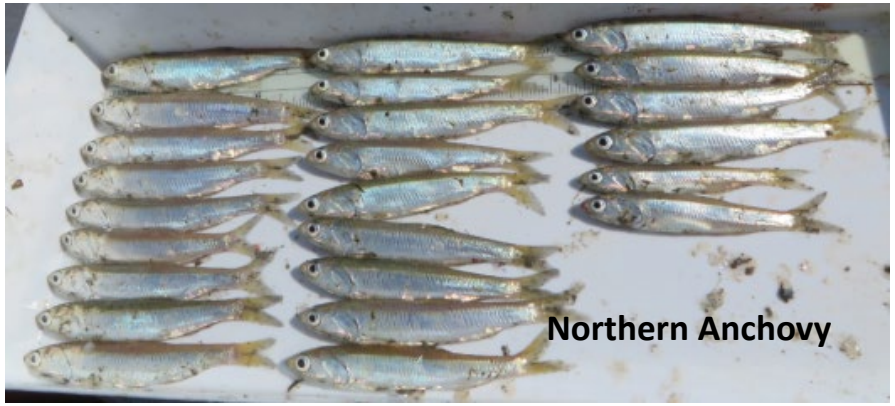

California Halibut


Plainfin Midshipman


Starry Flounder


Striped Bass

- ☑ Warm Freshwater Habitat
- ☑ Cold Freshwater Habitat
- ☑ Rare & Endangered Species


Northern Anchovy

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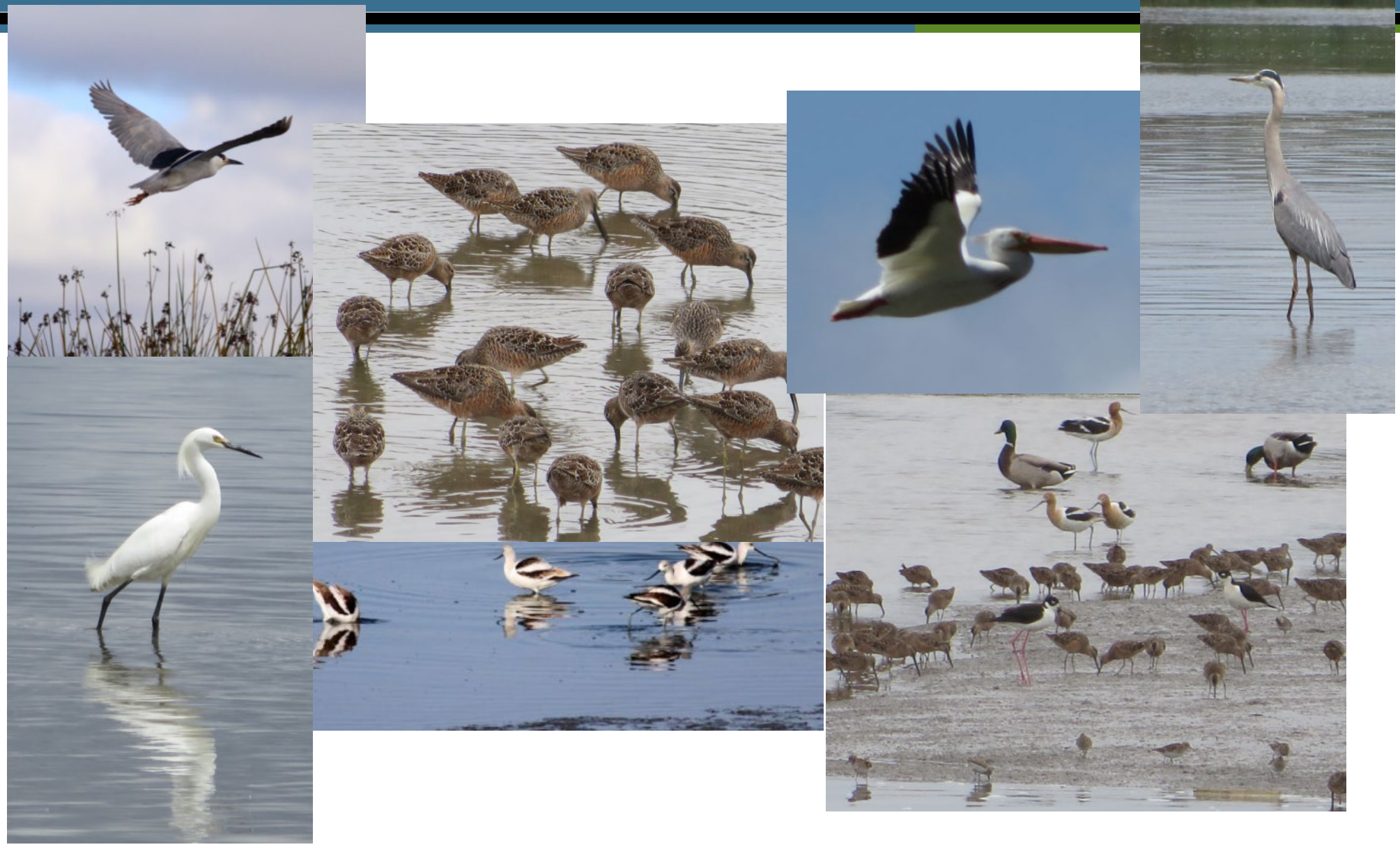
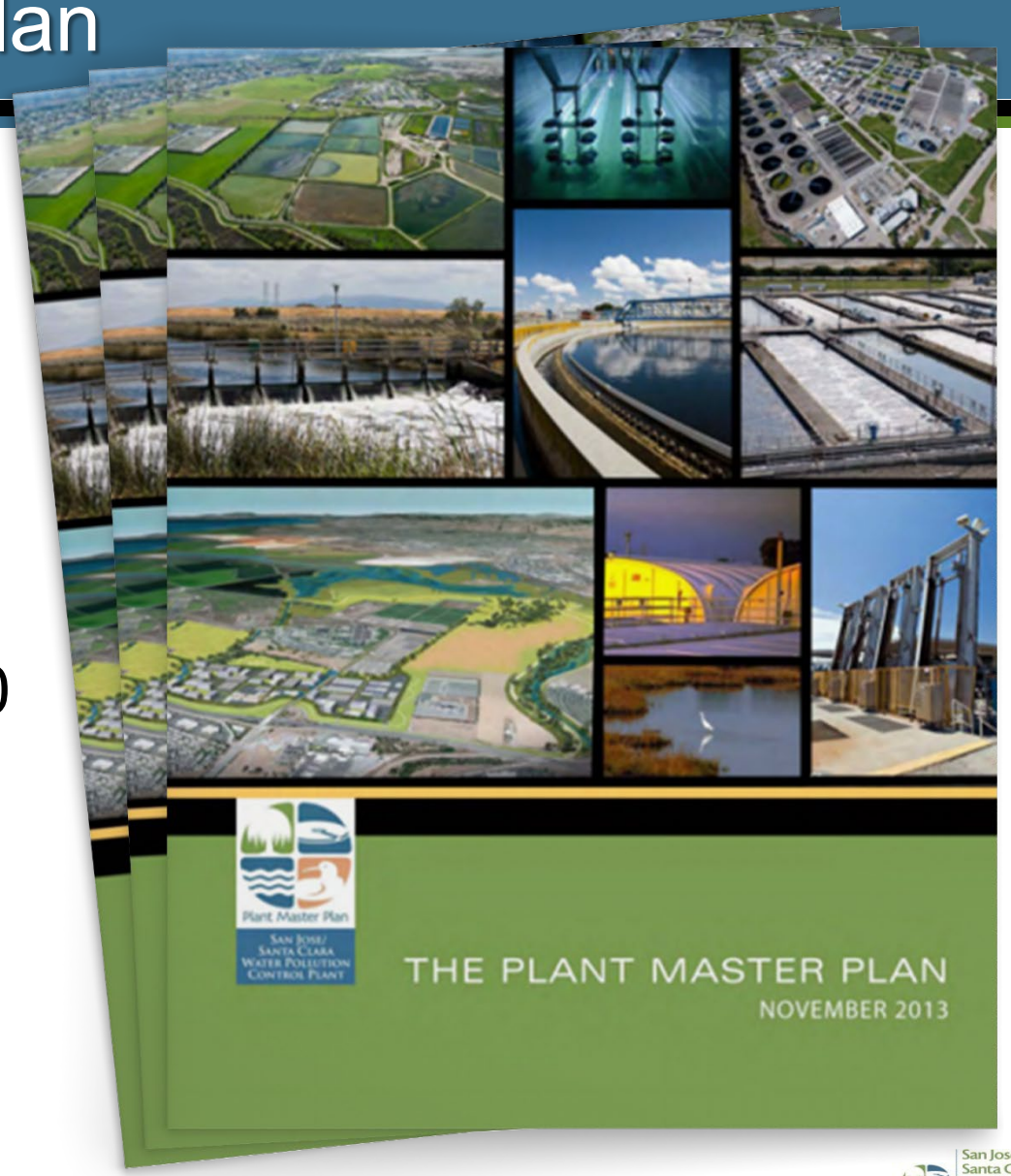
Thriving Ecosystem – Bird Species



CIP – From Plant Master Plan to Today

CIP's Foundation – Plant Master Plan

- 5-year Process including public consultation and environmental review
- Adopted by San José and Santa Clara City councils in 2013
- Identified treatment improvements and capital upgrades at the RWF through 2040
- Two major components:
  1. Technical: Plant Process Improvements
  2. Land Use: Proposed mix of land uses on the buffer lands



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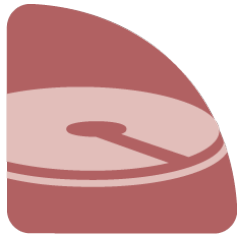
Plant Master Plan Goals and Drivers

Plant Master Plan Goals

operational
Result in a reliable, flexible Plant that can respond to changing conditions.



economical
Maximize economic benefits for customers through cost-effective options.

environmental
Improve habitat and minimize impacts to the local and global environment.

social
Maximize community benefits through improved aesthetics and recreational uses.

Project Drivers

- Critical Condition
- Regulatory Requirements
- Economic Benefit
- Improved Performance Benefit
- Policy Decision

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Purpose of the Plant Master Plan

As adopted in 2013 - the Plant Master Plan:

01 Incorporated a Planning Horizon – 2010 thru 2040

02 Identified future projects, estimated costs and construction scoping strategies

03 Designated future land uses on Plant lands

04 Illustrated how to connect the community to the Bay

05 Outlined a strategy to protect the Plant from sea-level rise

2013-2024 Experience Shows:

Extended completion schedules

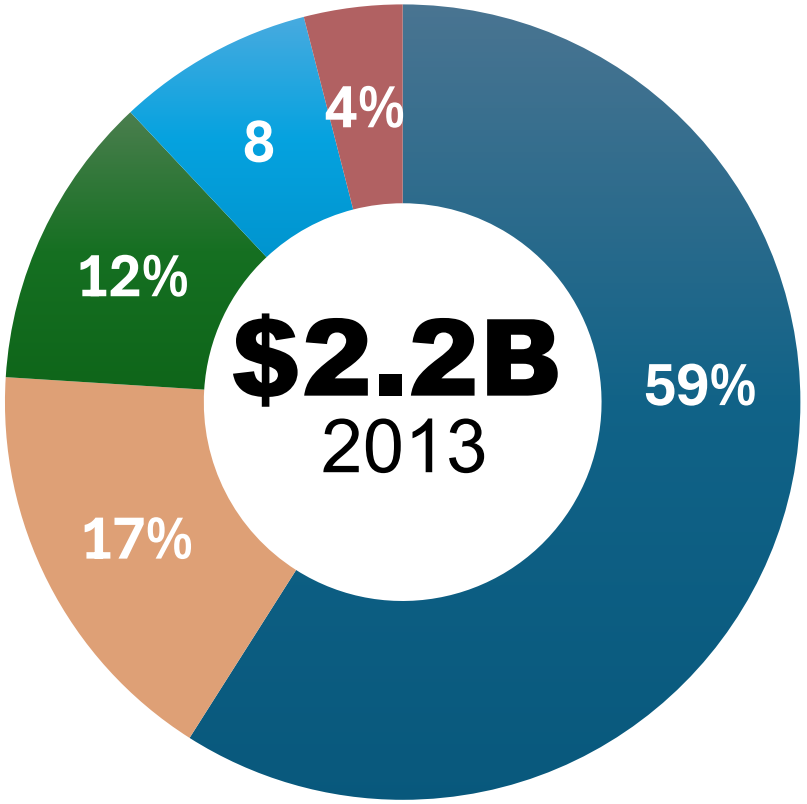
Increased cost

Remains consistent with Plan

No Change

Delayed Implementation

Capital Program Investment - 2013



- Critical Repair & Rehabilitation (R&R)
- Regulatory
- Odor
- Biosolids Transition
- Biosolids R&R

Most of the capital program investment is focused on Rehabilitation and Repair (R&R) projects

CIP funds NOT used for:

- Land Development
- Indirect or Direct Potable Reuse
- Habitat Management
- Recreational Uses

- ✓ Over a 100 CIP Projects Identified
- ✓ $2.2 billion investment (2009 Dollars)
- ✓ 30-year implementation period (2010-2040)
- ✓ Conventional design-bid-build project delivery

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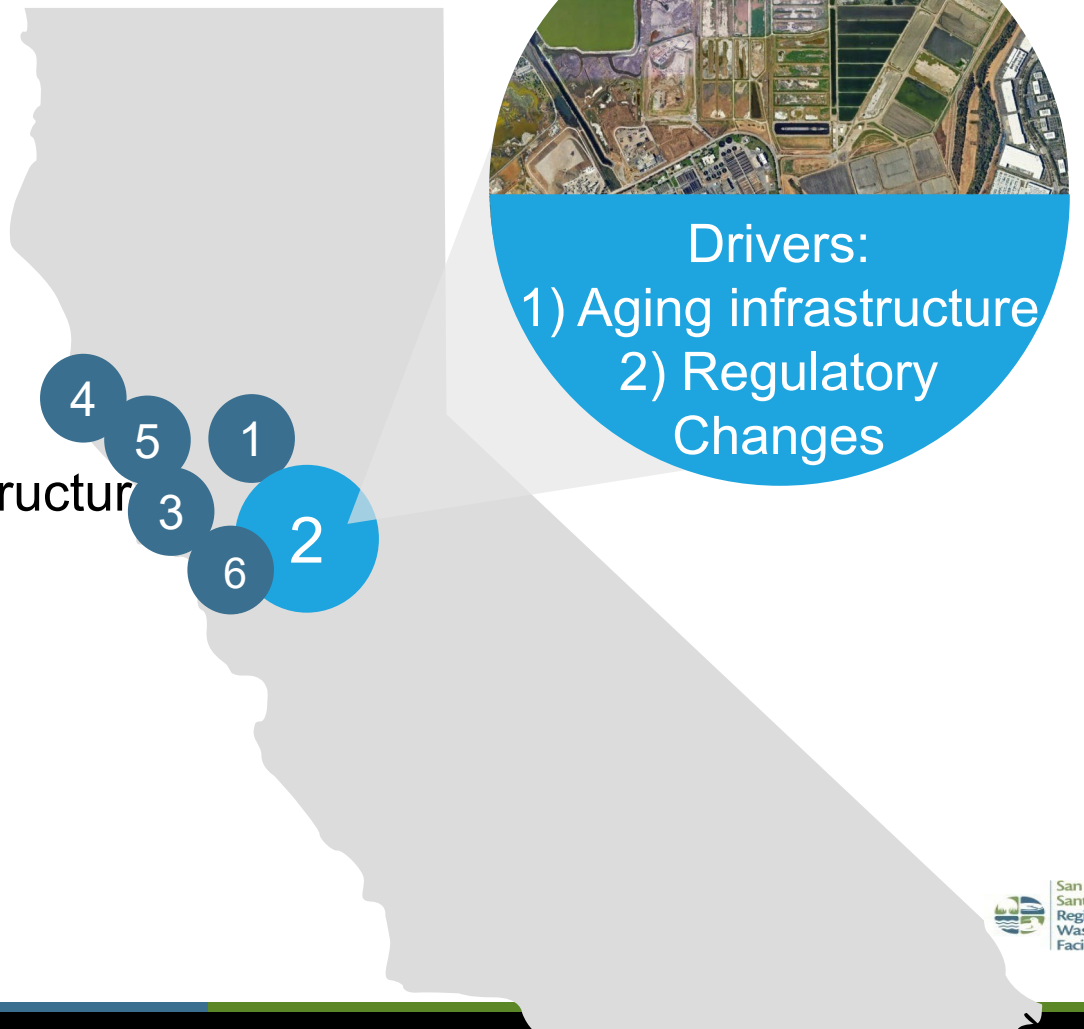
Capital Investments across California Wastewater Agencies

All northern CA wastewater facilities have large CIPs

1. EBMUD: **$2.8B** | 5yrs | Infrastructure
2. San José/Santa Clara: **$1.4/$2.2B** | 10/30yrs
3. San Mateo: **$900M** | 20yrs | Infrastructure
4. SFPUC: **$5.4B** | 10yrs | Infrastructure
5. Silicon Valley Clean Water: **$792M** | 15yrs | Infrastructur
6. Sunnyvale: **$450-$500M** | 15yrs | Infrastructure



Drivers:
1) Aging infrastructure
2) Regulatory Changes

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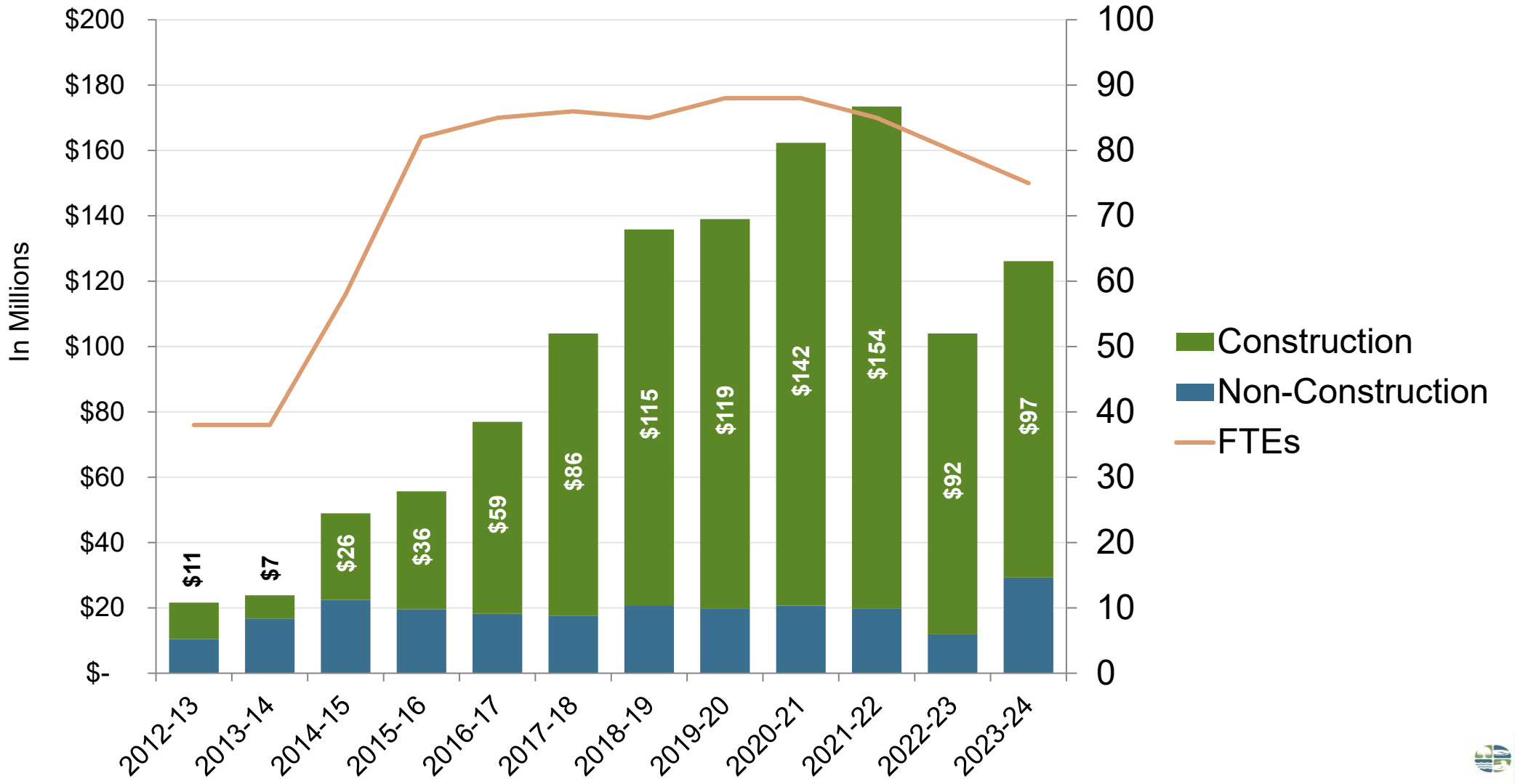
2013–2024 CIP Implementation

CIP Expenditures by Fiscal Year



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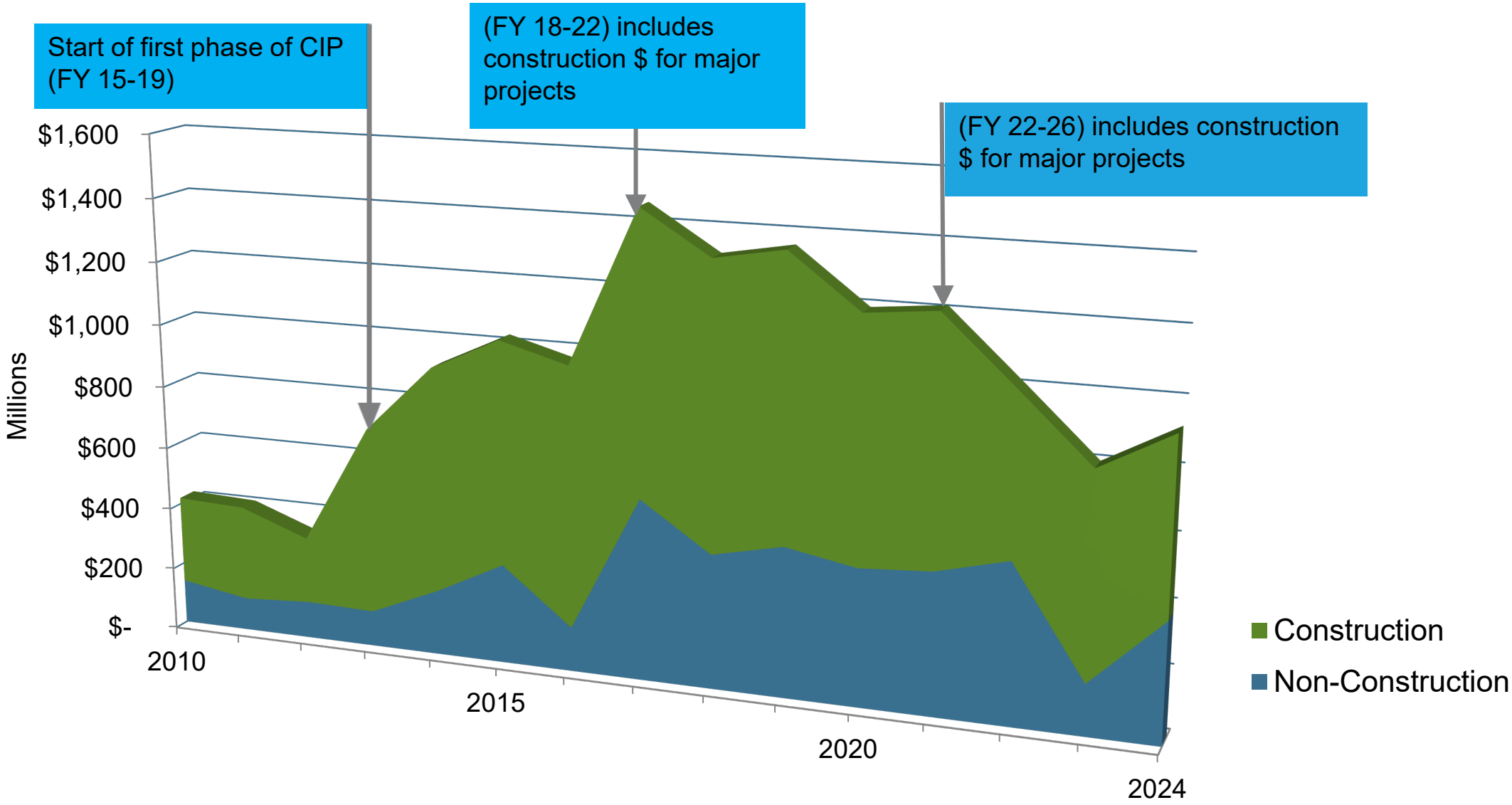
Historical View of the RWF's Five-Year CIP



Program Management Office (PMO) – Establishment and Program Validation

MWH (Stantec) awarded the Program Management Office contract in 2013. An initial 8-month startup phase included:

- **Program Validation**
  - Reviewed and packaged the 100+ projects identified in the PMP into 33 larger projects
- **Establishment Program Controls**
  - Project Delivery Model (PDM)
  - Set-up the Program Portal (SharePoint)
  - Prepared the Program Execution Plan (PEP)
  - Reporting and Metrics
- Developed the 5-year resource plan – CIP staff in 2014

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Core Team: Roles & Responsibilities

Public Works

Procurement

Construction Management

ESD

Overall Program Lead

Package Management

Project Management

Resource Management

Reporting and Controls

O&M Coordination

Budget and Financing

Communications

Programmatic Consultants

Program Management

PMP Validation

Program Startup

Program Tools

Staff Augmentation

Technical Experts

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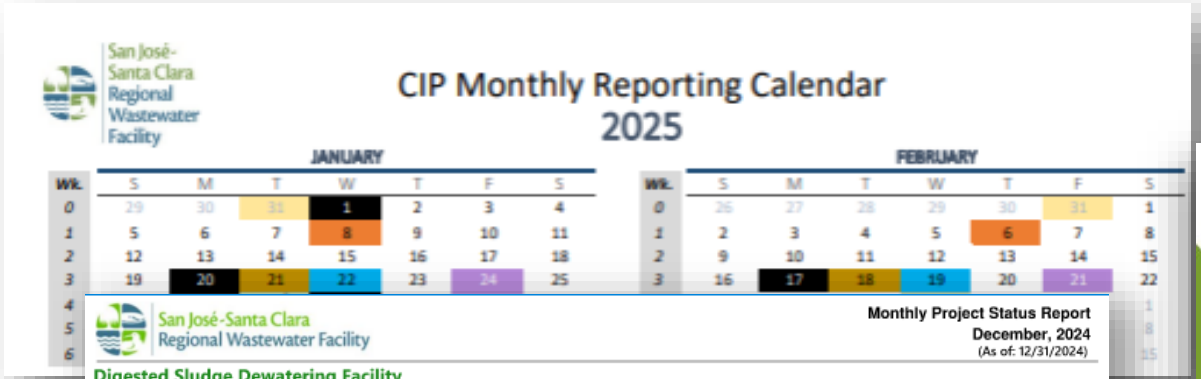
Transparency: Reporting, Metrics, Website



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CIP Monthly Reporting Calendar 2025

JANUARY

Wk.	S	M	T	W	T	F	S
0	29	30	31	1	2	3	4
1	5	6	7	8	9	10	11
2	12	13	14	15	16	17	18
3	19	20	21	22	23	24	25

FEBRUARY

Wk.	S	M	T	W	T	F	S
0	26	27	28	29	30	31	1
1	2	3	4	5	6	7	8
2	9	10	11	12	13	14	15
3	16	17	18	19	20	21	22

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Monthly Project Status Report
December, 2024
(As of: 12/31/2024)

Digested Sludge Dewatering Facility

Scope

New dewatering facility, including a building, centrifuges, conveyors, truck bays, and polymer storage & dosing equipment. Ancillary facilities include DS pump stations & pipelines from digesters to a DS storage tank, DS pump station & pipeline from the DS storage tank to the dewatering building, and a centrate return pump station & pipeline. LAST UPDATED ON: 03/08/2024

Progress Summary

Ongoing installation of ductbanks, FO lines, storm drain, and sludge pipes in Area 84. Ongoing Piping/HVAC/electrical installation at Dewatering and Truck Loadout building. Ongoing installation of perimeter siding/channel glass around the Dewatering and Truck Loadout building. Ongoing installation of cake conveyors. Ongoing development of Pre-commissioning and Commissioning plans. LAST UPDATED ON: 01/17/2025

30 Days Look Ahead

Ongoing installation of ductbanks, FO lines, storm drain, and sludge pipes in Area 84. Ongoing piping/HVAC/electrical installation at the Dewatering and truck loadout building. Ongoing installation of perimeter siding/channel glass around the Dewatering and Truck Loadout building. Ongoing installation of cake conveyors. Ongoing development of Pre-commissioning and Commissioning plans. LAST UPDATED ON: 12/13/2024

Project Information

Project Manager	Marc Nakamoto	**Stage**	Final Design & Construction
Package Manager	Alicia Alba	**% Cost Complete**	74%
Delivery Method	DB	**FMS ID**	83573
Consultant	Brown & Caldwell	**CPMS ID**	7758
Construction Mgr	Humberto Acuna	**PLA**	No
Contractor	Walsh Construction Company II, LLC	**OCIP**	Yes

Explanation for Performance Variance

No variance from last month. LAST UPDATED ON: 03/08/2024

Fiscal Year Cost Performance Summary ($K)

FY Budget w/carryover (1)	Expenses YTD (2)	Incurred YTD (3)	Encumbrance Balance (4)	FY Budget Remaining (1)-(2)-(4)	YE Forecast (5)	FY Estimate To Complete (5)-(3)
$58,452	$13,484	$13,484	$40,436	$4,532	$56,360	$42,875

Inception To Date Cost Performance Summary ($K)

Adopted Project Budget (1)	Proposed Project Budget* (2)	Total Budget To Date (3)	Expenses To Date (3)	Encumbrance Balance (4)	Budget Remaining (2)-(3)-(4)	Estimate At Completion (5)	EAC/Project Budget (%) (5)/(2)	Project Variance (2)-(5)
$177,054	$177,054	$175,906	$130,939	$40,436	$6,733	$173,265	97.3%	$4,843

* Updated each year in Nov/Dec as part of next five year budget cycle

Opinion of Probable Construction Cost ($K)

Value	Class	Date
$131,161	Award	3/1/2022

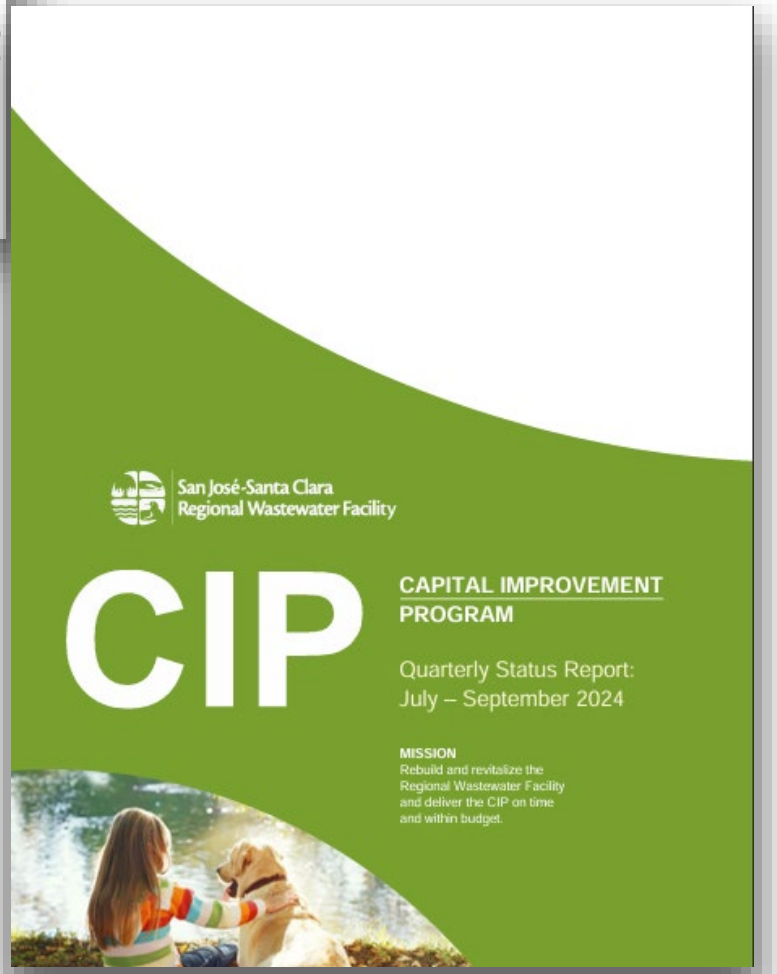
Milestone Performance Summary Baseline Date: 07/31/2023

Milestone	Baseline	Actual	Forecast	Variance	Slip/Gain
Start Date	7/14/2014	7/14/2014		0	0
Scope Completion	9/20/2018	9/20/2018		0	0
Award Date	10/7/2019	10/7/2019		0	0
Design NTP	10/14/2019	10/14/2019		0	0
SG 5 Guaranteed Maximum Price	12/2/2021	12/2/2021		0	0
Design Completion	5/3/2022	5/3/2022		0	0
Construction Start	9/14/2022	9/14/2022		0	0
Construction NTP	8/17/2022	8/17/2022		0	0
Contract Substantial Completion	10/1/2025		10/1/2025	0	0
Contract Beneficial Use	10/1/2025		10/1/2025	0	0
Reporting Beneficial Use	10/24/2025		10/24/2025	0	0
Project Acceptance (NOCA)	12/2/2025		12/2/2025	0	0
SG 7 Final Acceptance	5/13/2027		5/13/2027	0	0

Project Life Cumulative Expenditure

Budget Summary

Printed on: 01/17/2025



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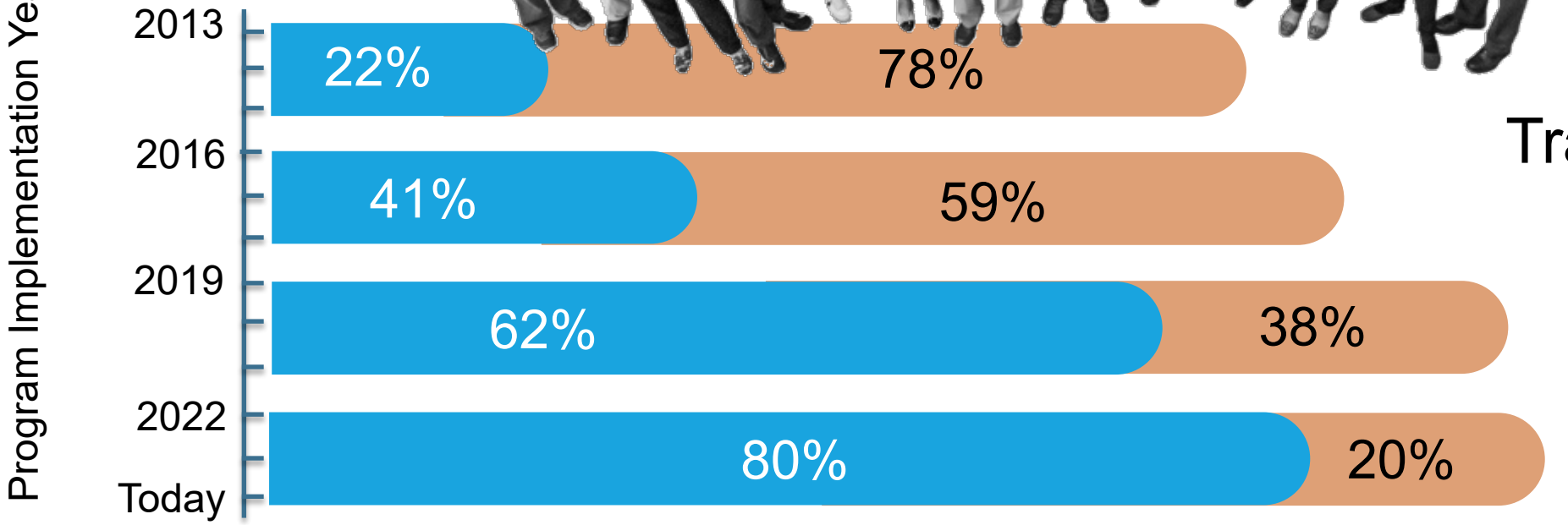
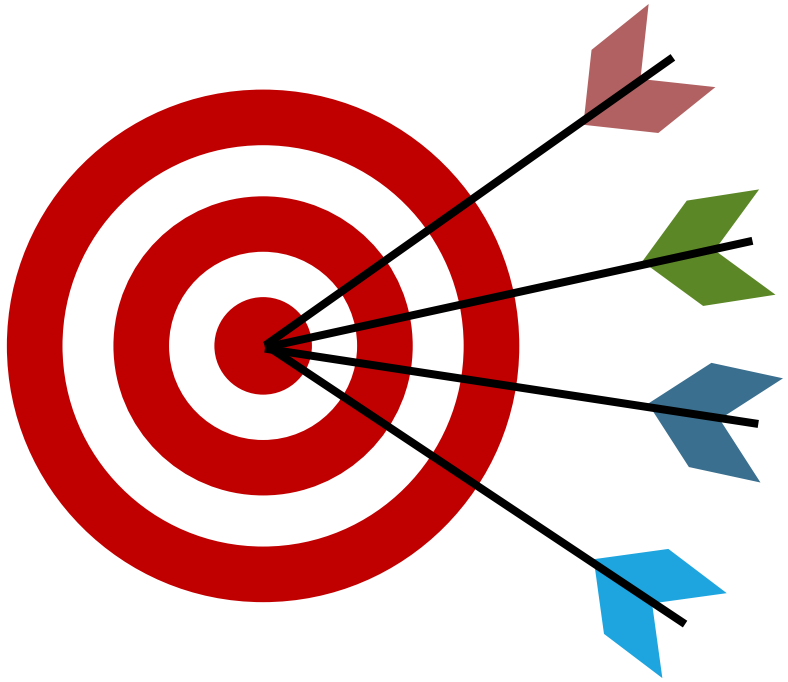
2013-2024 CIP Accomplishments - People



Transition from PMO

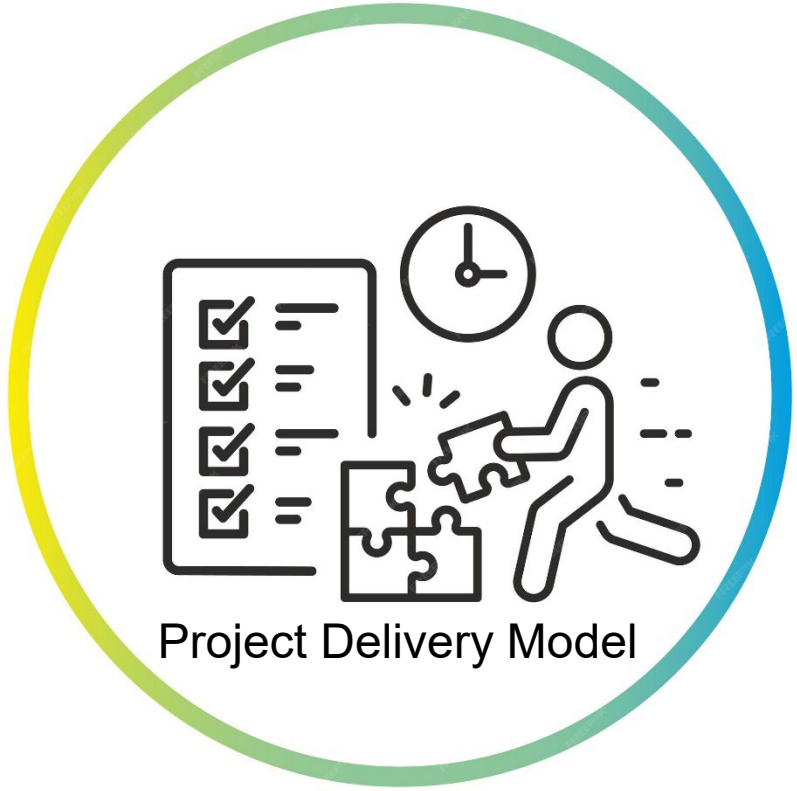


- Deliberate Program Processes
- Project Delivery Methodologies
- Approved Strategies
- Budgeting and Financing

2013-2024 CIP Programmatic Approach

CIP – Deliberate Program Processes

- ✓ Stage Gates
- ✓ Decision Logs
- ✓ Risk Management Matrix
- ✓ Performance Meetings
- ✓ Reporting Transparency



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CIP – Project Delivery Models

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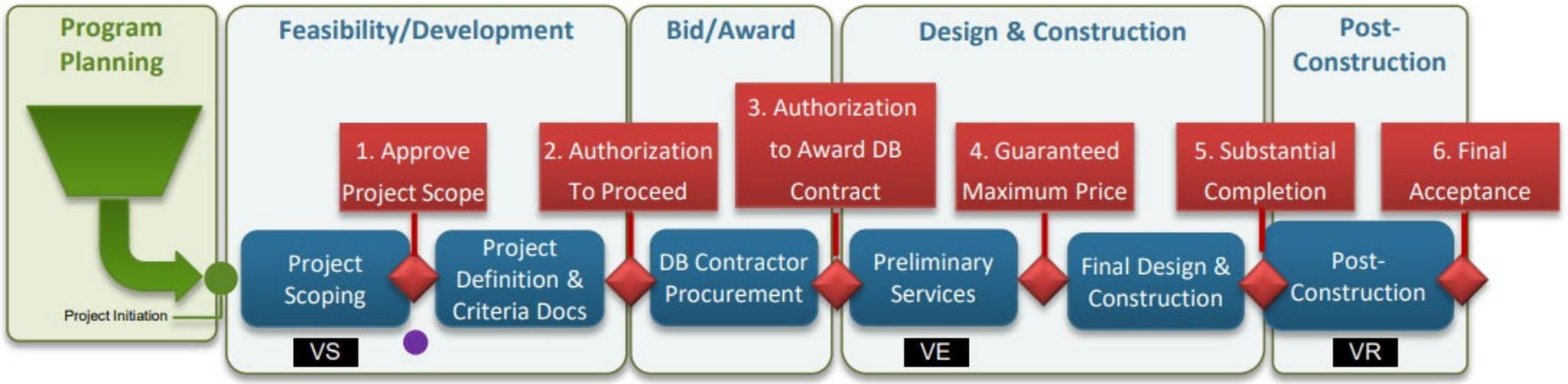
Design-Build



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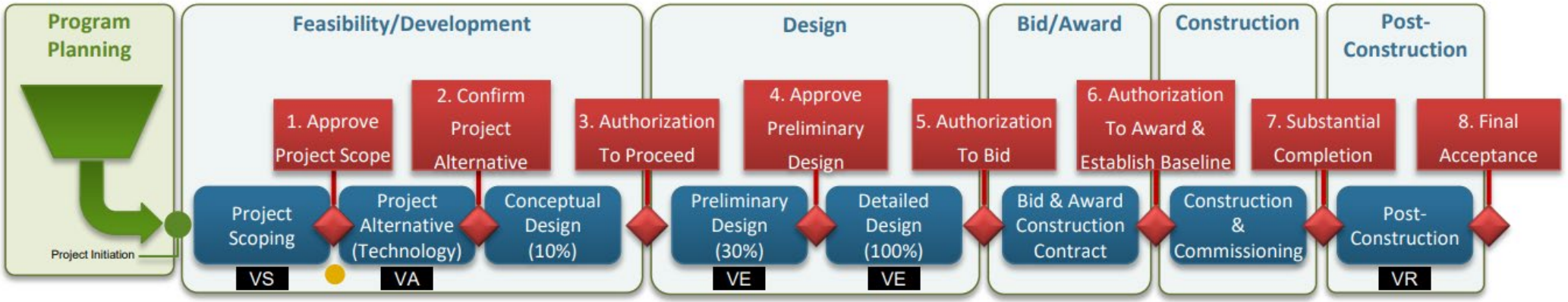
Design-Bid-Build



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CIP – Alternative Project Delivery

- Historically, RWF primarily used design-bid-build
- State law changes have facilitated use of design-build
- Desire to use the “right tool for the job:”
  - Delivery method selection occurs during project scoping
  - Consider time/cost savings, size, complexity, and risk

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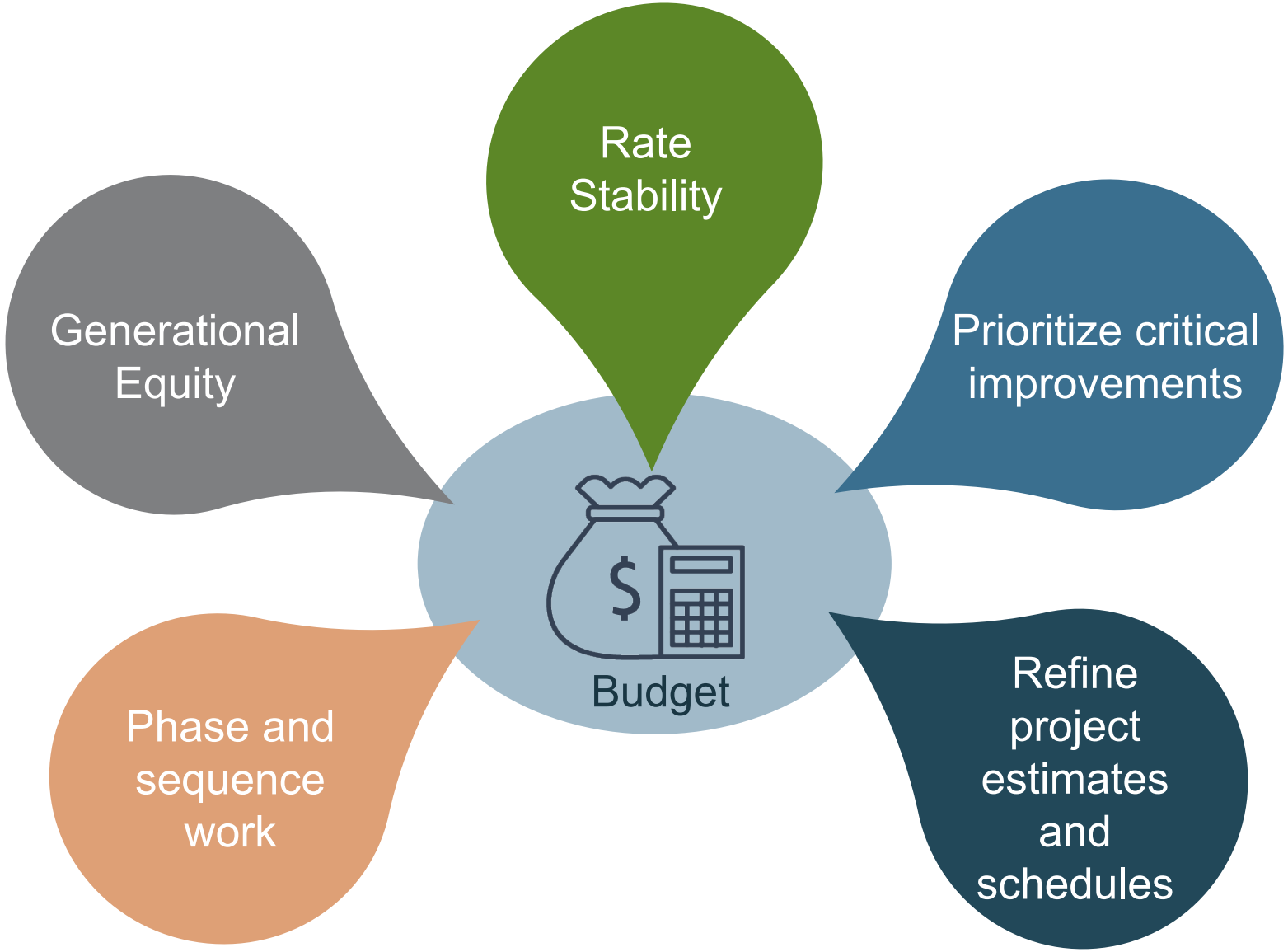
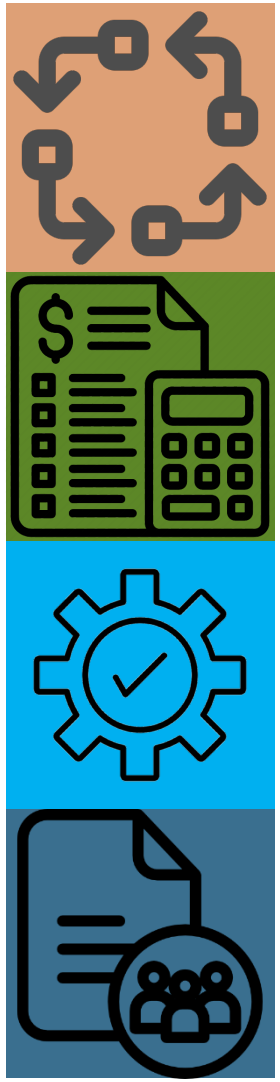
CIP – Guiding Principles for Annual Budget Development



CIP – Cost Control Strategies



Project Stage Gates

Third-Party Cost Estimate Reviews

Value Engineering

Monthly Budget Meetings

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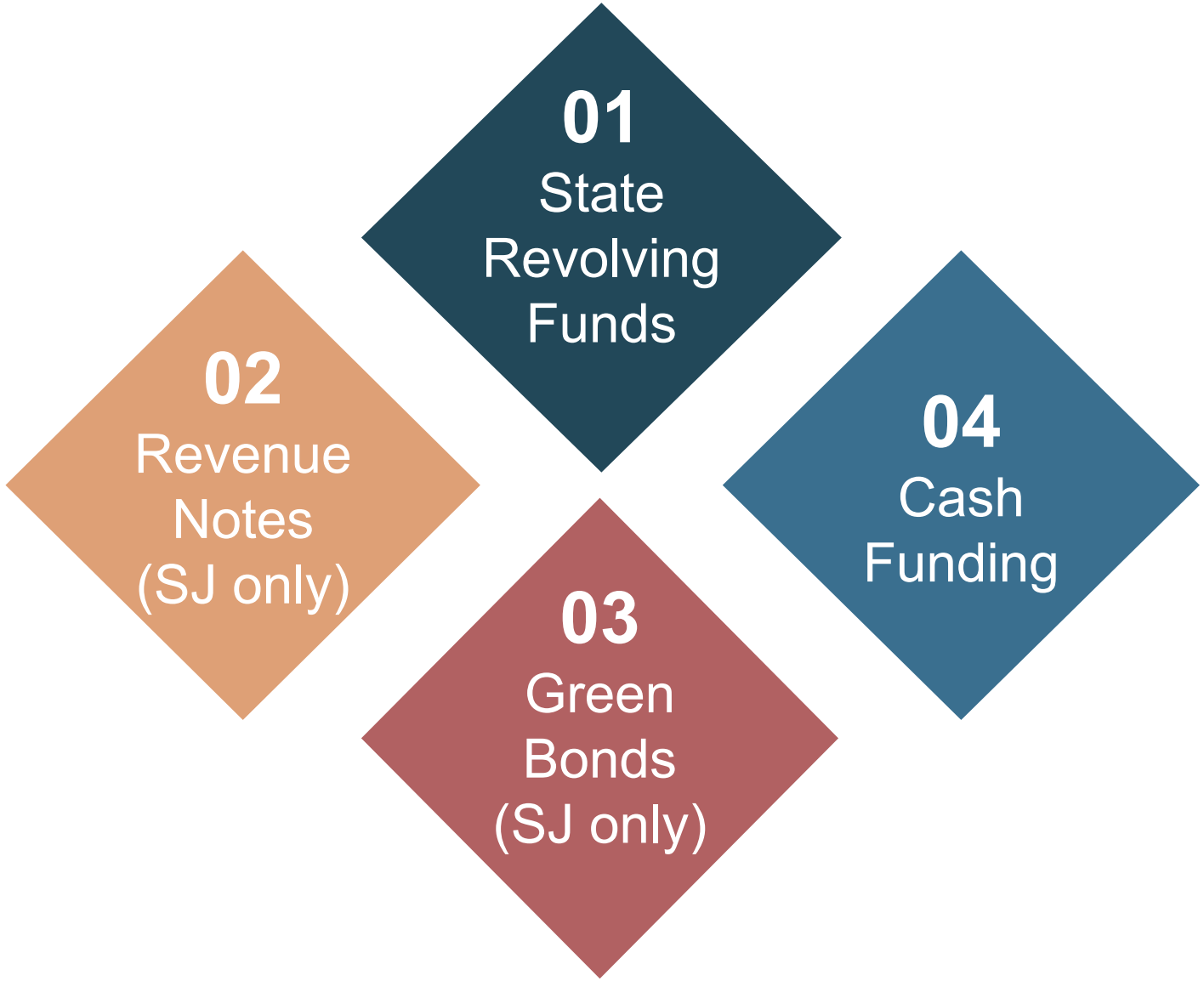
CIP – Funding Strategy: First Ten Years



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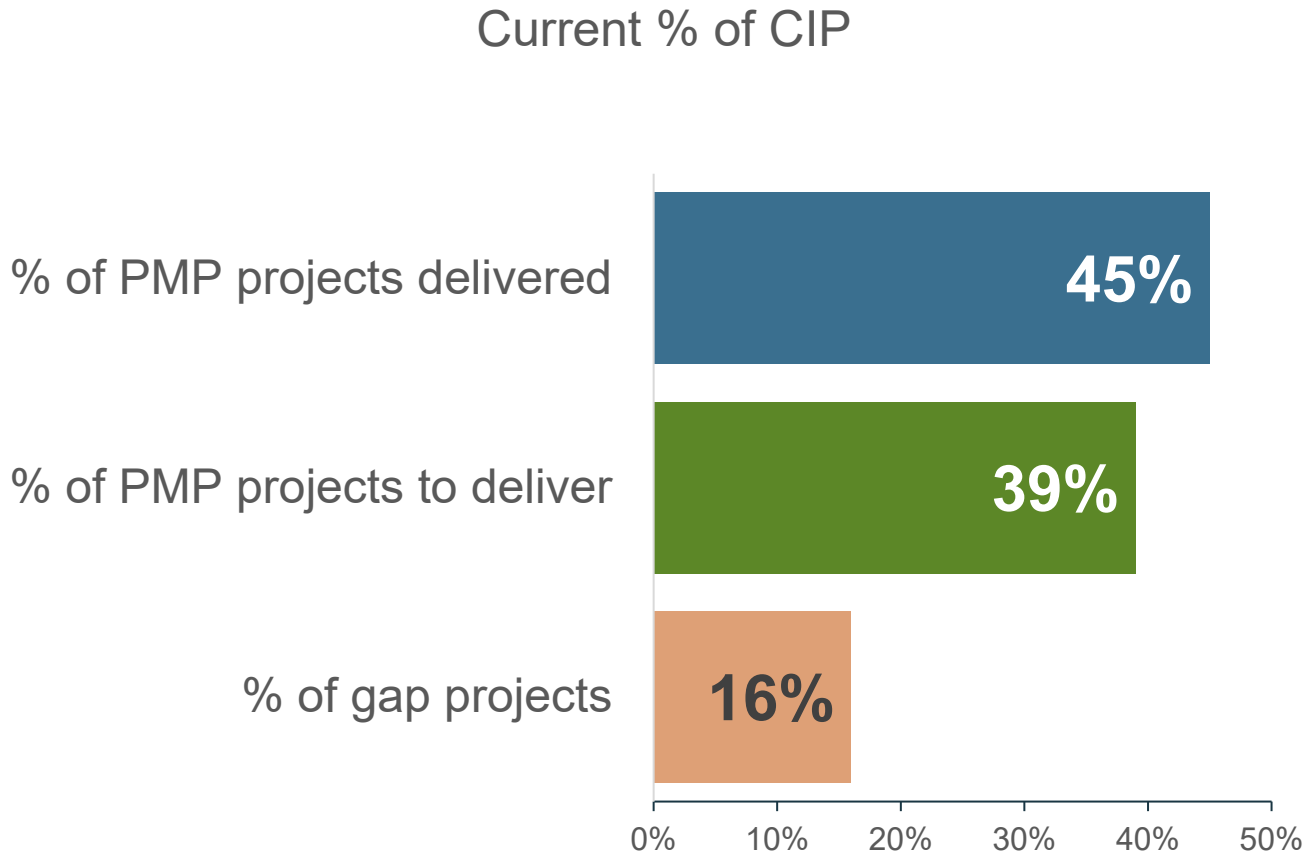
CIP Snapshot

Capital Improvement Program To Date

- ✓ 36 completed projects
- ✓ 17 ongoing projects
  - ➢ (current, active)
- ✓ $1.13B expended since 2014-15



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CIP Project Successes – New Headworks

- Headworks (HW) Purpose:
  - ➢ To protect every downstream process
- Wins:
  - ✓ Construction: $140M, 2 years
  - ✓ Replaced an aging and failing HW1
  - ✓ A safer and more efficient work environment
  - ✓ Delivered on time and on budget – even through the pandemic!
  - ✓ Applauded by RWF staff as the most successful CIP Project to date

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CIP Project Successes – New Headworks

- More wins!
  - ➢ Industry-wide recognition

- Award Winners:
  - ✓ Design Build Institute of America (DBIA)
    - ✓ 2 National Awards
  - ✓ Construction Management Association of America (CMAA)
    - ✓ Local and National Awards
  - ✓ California Water Environment Association (CWEA)
    - ✓ Local Award, nominated for State

CIP – Learning Opportunities

Challenges while Implementing CIP

- Difficulties not envisioned in the Plant Master Plan
  - Minimizing impact to RWF continuous operation
  - Rehabilitating aging infrastructure and continued deterioration of assets
  - Covid-19 pandemic and consequential supply chain issues
  - Regional, state, and national level competition for qualified contractors and skilled labor shortages
  - Evolvingly stringent and complex environmental regulations
  - Unprecedented Cost Escalation

Mitigation of Contaminated Material Discoveries


Remediation Crew


Lead Paint Remediation

Soils Remediation Testing


PCB's Remediation

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Finding Solutions to Complex Rehabilitation Work

- Top: A rerouting of the Primary Effluent was installed in conjunction with the phasing required to accomplish tank repair for the Digester and Thickener Facilities Upgrades Project and maintain Plant functionality.
- Right: Temporary rerouting for Yard Piping Phase II Project to facilitate pipe rehabilitation.

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Installation of 96” Raw Sewage Pipe – Over 250 utility crossings

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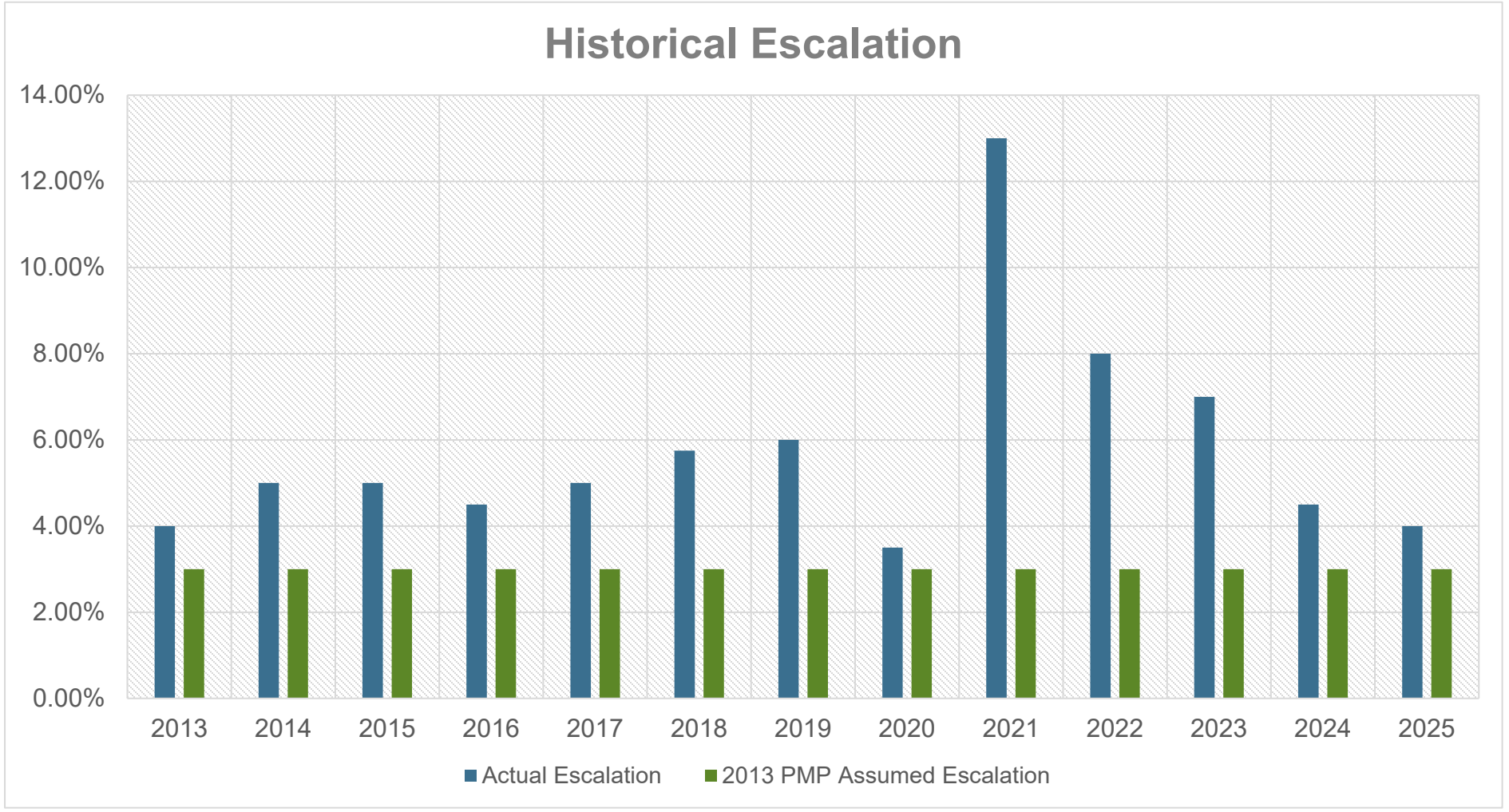
Unprecedented Cost Escalation



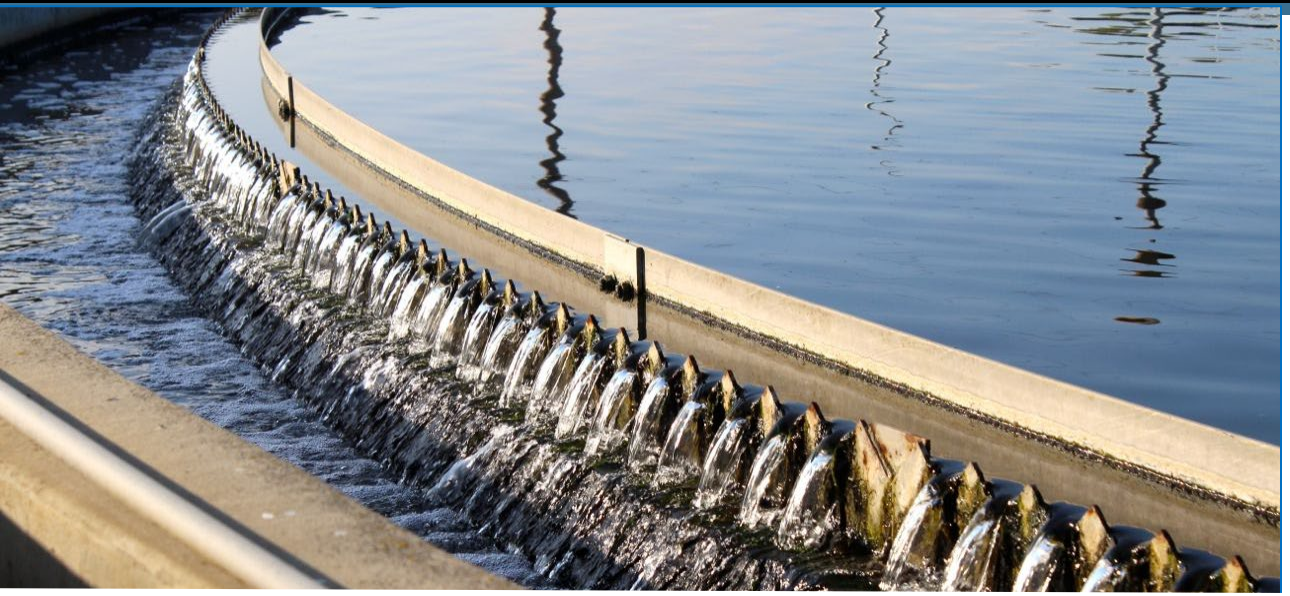
Challenges while Implementing CIP

- Although we've encountered difficulties, we have set ourselves up for success

  - ✓ We've built a strong team of qualified professionals
  - ✓ We've built systems for deliberate decision making, to ensure a rational planning process and stakeholder buy-in
  - ✓ We've evolved innovation in procurement and delivery

Regulatory Requirements - 2024 NPDES Nutrient Limit

RWF Clean Water Act Permits



- RWF is subject to multiple federal (NPDES) Clean Water Act permits
- Regional issue-specific Permits (nutrients, mercury, PCBs)
- Individual NPDES Permit governs water quality requirements for the RWF
- Each Permit is reissued and updated on separate 5 year cycles

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Regional Nutrient Permit – Since 2014

- SF Bay has much higher nitrogen levels than other large urban Bays
- 2/3 of Bay's nutrients from wastewater treatment plant discharges
- Group Nutrient Permit since 2014
- Similar cases in the past - Chesapeake Bay and Long Island Sound
- Nitrogen Permit reissued in 2019 and 2024

Why Nutrients Matter – Nitrogen and Phosphorus

Impacts of Harmful Algal Blooms

Human Health
Exposure can cause irritation & illness

Animal Impacts
Exposed pets, livestock & wildlife can die

Environment
Habitat, water quality & recreation are impacted

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The August 2022 Red Tide – Game changing episode

- Algae Bloom - *Heterosigma akashiwo*
  - Toxic effects – widespread fish mortality
  - Brown or red water
  - Fueled by high nitrogen levels in the Bay

San Francisco Chronicle

Poop and pee fueled the huge algae bloom in San Francisco Bay. Fixing the problem could cost $14 billion

Photo Credit: James Ervin

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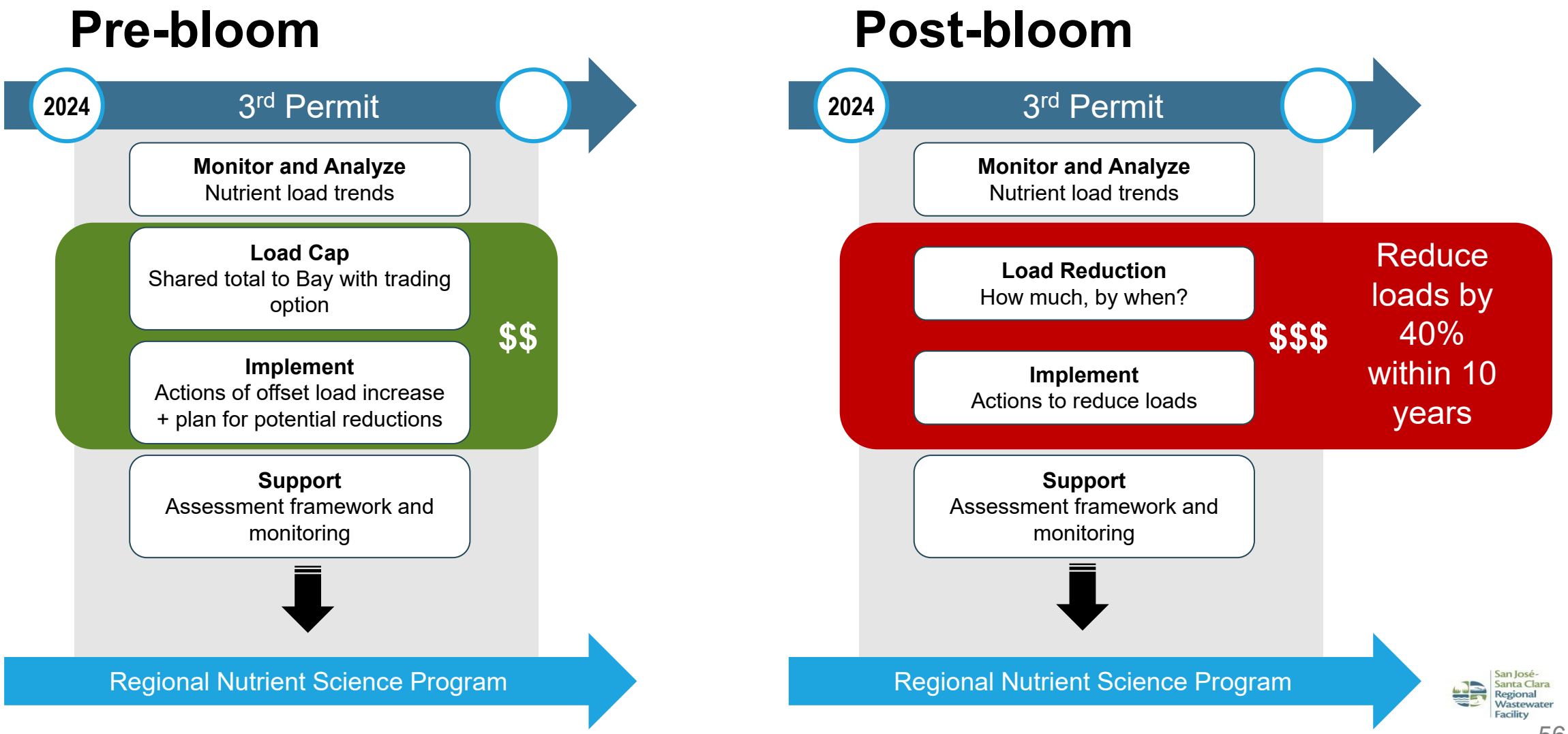
Regulatory Consequences of Bloom



Negotiations with the Water Board

- Two dry-season nitrogen limits imposed by regulators:
  1. Interim Limit from 2024 – 2034 (current performance).
  2. Final Limit from 2035 onward (40% reduction regionally).

- **Active Permit negotiations Jan 2024 – May 2024.** Permit adopted July 2024.

RWF limits in first draft

Interim Limit 5,400 kg/day

Final Limit 3,700 kg/day

RWF negotiated limits

Interim Limit **6,400 kg/day**

Final Limit **5,000 kg/day**

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How to Comply with New Permit?

Treatment Process Upgrades

Increased Water Recycling

Nature-based Solutions

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Immediate Steps For Implementation

- **Evaluate** process upgrades required and identify associated cost and required schedule – Technical Update to PMP
- **Continue engagement** in development of nutrient regulations with Water Board – No moving target
- **How to afford this new requirement?**
  - **RWF is in a better position than other agencies to achieve goals**
- **Explore additional strategies –** Nature-based Solutions, etc.

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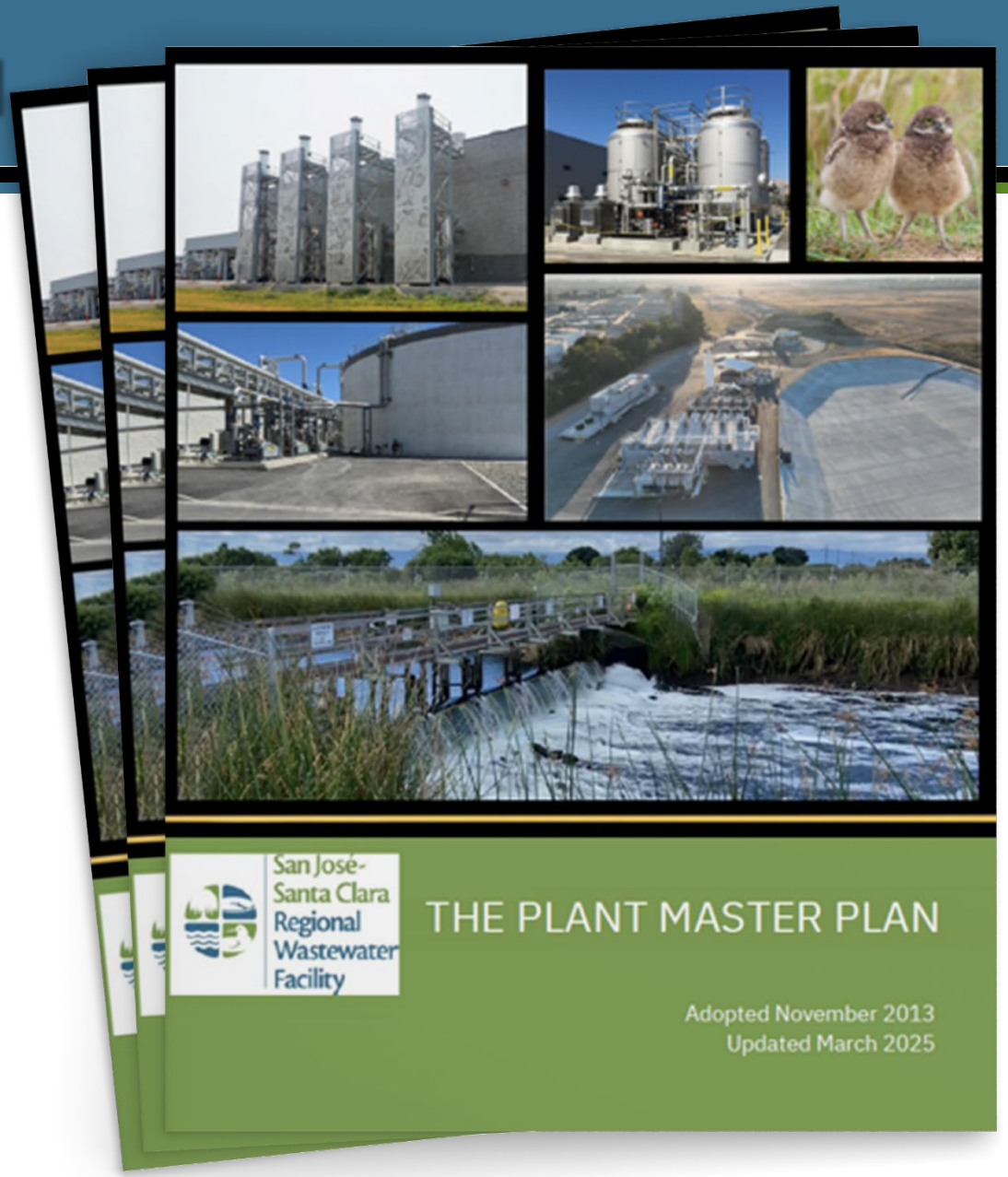
2025 Technical Update
To The Plant Master Plan (PMP)

PMP Technical Update – Need

- Updates were envisioned in the original PMP
- Significant changes since 2013
  - asset conditions
  - project drivers
  - regulations
- Large programs require recalibration



PMP Technical Update – Goal

Document

Improvements completed in the past 10 years

October 2024

Evaluate

Make recommendations for remaining improvements at the RWF for the next 25 years

January 2025

Recommend

Complete technical update by spring 2025

April 2025

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PMP Technical Update – Expected Outcomes

1. Revise Guidance for Future Capital Projects
2. Support Development of CIP Funding Strategies

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Next Steps for CIP

CIP – Building A Roadmap For Success

- Complete Master Plan Technical Update
- Implement New Regulatory Requirements:
  - Manage increased Cost
  - Manage extended Program Implementation Schedule
- Develop and Adopt New Financing Strategies
- Plan both 5 &10 Year CIP

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Advocacy – How can Council Engage?

- **Importance of Preserving the Bay while keeping Utility Affordability**
- **Cannot Be Just on Ratepayers** – Participation of State and Federal Government
- **Engage** – Help to engage stakeholders to advocate for us
  - Professional Associations
  - Environmental Groups
  - Local Community
  - Local Governments

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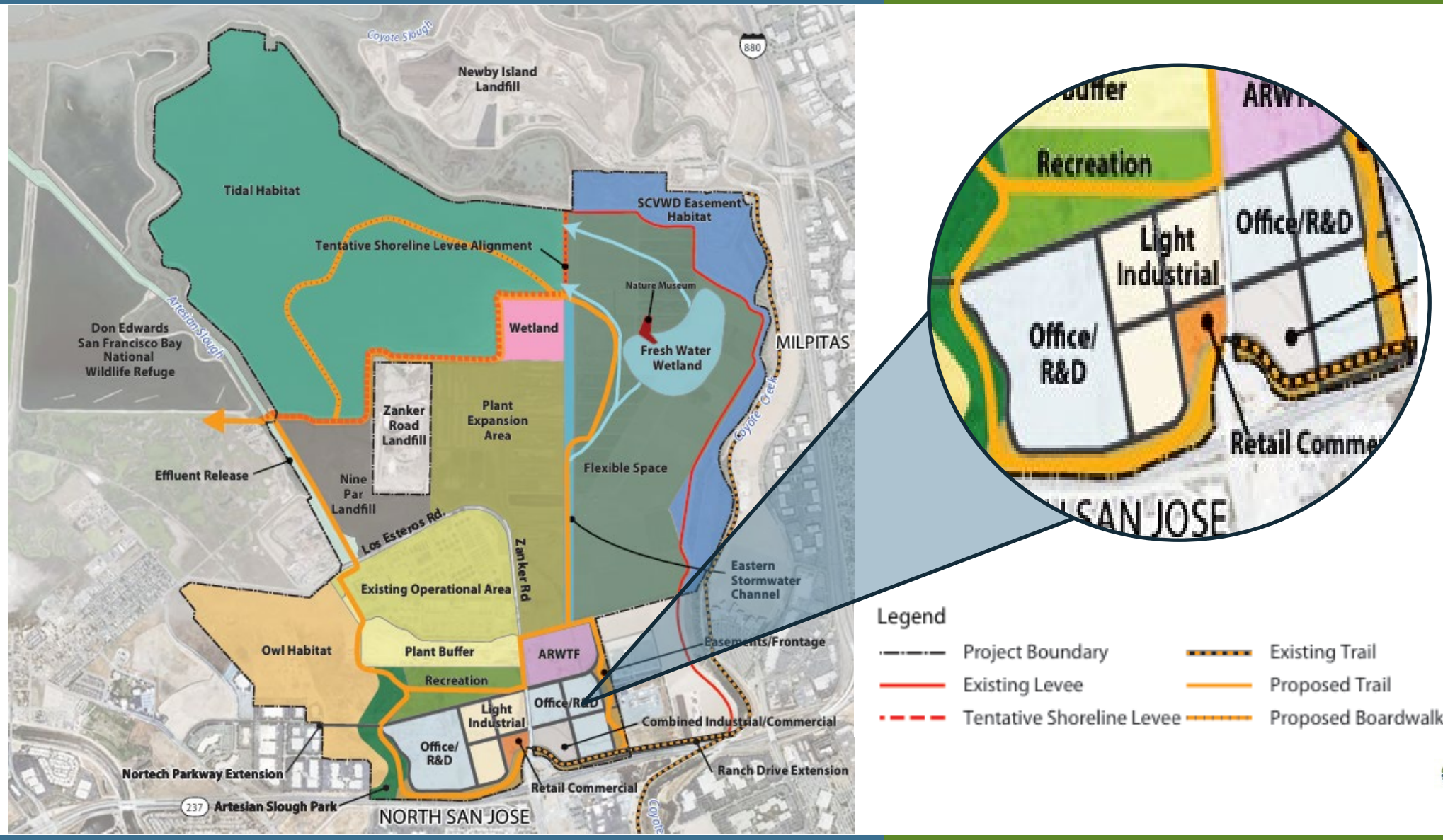
Land Use Component

2013 Land Use Plan



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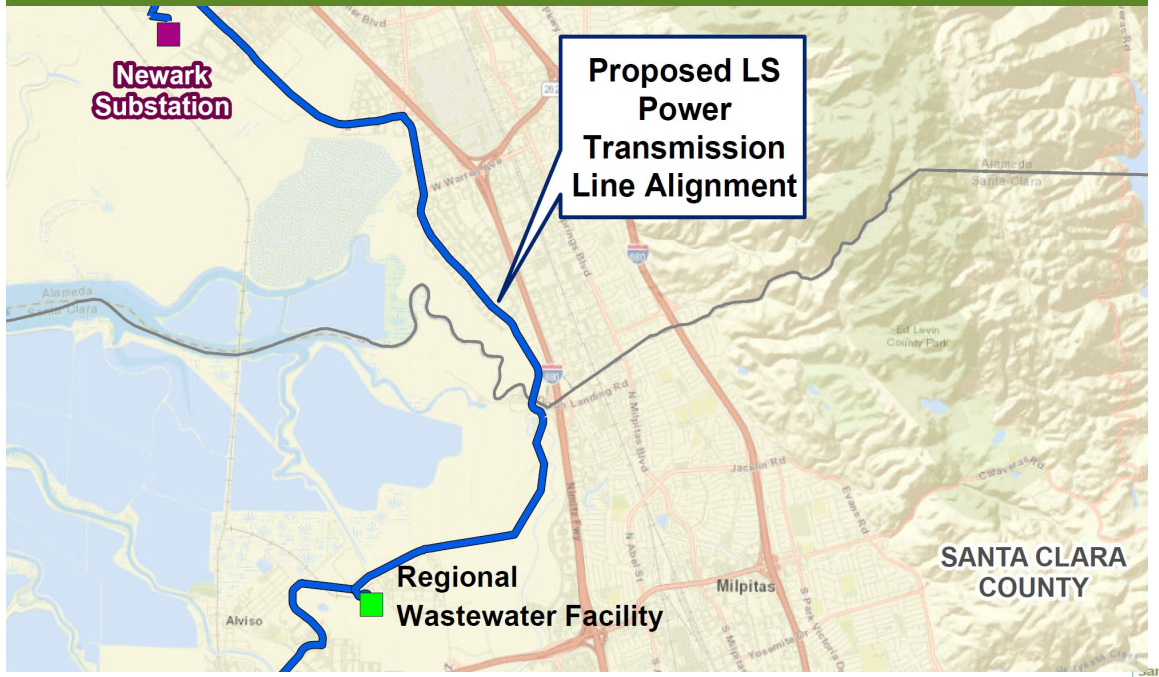
New Tenancies: Power the South Bay Transmission Project

- Critical project infrastructure resiliency project
- High-voltage transmission line between PG&E's Newark substation and Silicon Valley Power's Northern Receiving Station (NRS) substation (230 kV)
- Overhead lines through RWF land and transitions to underground at Zanker
- Potential new Baylands terminal adjacent to RWF Operational Area
- LS Power will construct, own and operate (on behalf of CAISO)
- Tentative construction schedule: June 2026 - October 2028

Next Steps:

- Opportunity to comment on EIR in Spring 2025



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Adjacent Uses: Microsoft Data Center

- Location: Zanker and CA-237
- Scope: Construct two data center buildings (397,205 square feet) and associated electrical substation
- Public Improvements:
  - Zanker Road widening to Purification Center entrance
  - McCarthy Access Road Extension
  - Signalize intersection at McCarthy/Zanker
  - New utility infrastructure w/easements
- Focus for RWF:
  - Offsite utilities and Valley Water Purification Project coordination are the focus for the RWF
  - Real estate negotiating fair market value
- Target construction start date - June 2025 (estimated to take one year)

Next Steps:

- City staff to approve easement package
- Appraise easements

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Shoreline Levee Project


USACE, Valley Water and California State Coastal Conservancy

- Reaches 1 to 3 under construction and to be finalized in 2025
- Insufficient funding for the project put design of Reaches 4 and 5 on hold
- San José, Santa Clara, and Valley Water have signed an LOI
- LOI will be used to negotiate binding MOU Real Estate Services leading negotiations
- To be presented to TPAC in 2025

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New Tenancies: Advanced Water Purification Expansion

- Status of Institutional Arrangements
- Current focus is on Phase 1 demonstration facility, which can be accommodated under existing agreements for SVAWPC
- Full-scale Facility (Phase 2) will require new agreements and will not impose additional cost, risk, or liability to the RWF

Agreement	Status
Staff Funding Agreement	Complete
<u>Amend Existing Agreements:</u>	
• Land Lease	• In Progress
• O&M • Integration	• Complete within 6 months

RWF – Closing Thoughts

- ✓ The CIP is an efficient, cost-effective, industry-recognized program that is delivering critical projects.
- ✓ The RWF has sufficient treatment capacity to support San José's development.
- ✓ The RWF continues to consistently deliver high quality effluent to promote the health of the Lower South Bay.
- ✓ Presenting:
  - Mariana Chavez-Vazquez – General Manager
  - Kapil Verma – Deputy Director, ESD
  - Eric Dunlavey – Deputy Director, ESD
  - Kevin Ice – Assistant to the City Manager
  - Lori Mitchell – Acting Director, ESD
  - Jeff Provenzano – Assistant Director, ESD

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