



San José-Santa Clara  
Regional Wastewater Facility

# CIP

## CAPITAL IMPROVEMENT PROGRAM

Quarterly Status Report:  
October – December 2023

### **MISSION**

Rebuild and revitalize the  
Regional Wastewater Facility  
and deliver the CIP on time  
and within budget.





# CAPITAL IMPROVEMENT PROGRAM

## HOW ARE WE DOING?

Key Performance Indicators (KPIs) Year-to-Date:

### SAFETY

0 Incidents



### EXPENDITURES

On Target



### ENVIRONMENTAL

0 Permit Violations



The San José-Santa Clara Regional Wastewater Facility (RWF) is the largest advanced wastewater treatment facility in the western United States. The RWF has been treating the South Bay's wastewater and protecting public health and the environment without interruption since 1956. The discharge of clean wastewater into the South San Francisco Bay contributes to diverse and thriving fish and wildlife ecosystems.

Much of the RWF's infrastructure is functioning well beyond its intended use. As a result of a long and thoughtful Master Plan process, a \$2.1 billion, 30-year Capital Improvement Program (CIP) is underway to modernize and refurbish the RWF so its critical work can continue. Homes and businesses in Silicon Valley need a modern, reliable, state-of-the-art treatment plant to ensure a high quality of life and a thriving economy. The CIP is rebuilding RWF infrastructure and updating treatment processes with innovative, efficient new technologies. The first phase of the CIP started in 2014 and is nearing completion. The second phase will soon be underway.

This report summarizes the CIP's progress and highlights accomplishments from October to December 2023.

## LEGEND



On Target



Alert



At Risk







## ESD Lab: Critical Collaborator Ensuring Safety & Compliance

By Kerrie Romanow, ESD Director

The City's Environmental Services Department (ESD) Laboratory (Lab) at the RWF plays a critical role in protecting public and environmental health, testing tens of thousands of samples every year to meet federal and state regulations. Additionally, our Lab provides analytical support for RWF operations and maintenance, pretreatment compliance, recycled water (South Bay Water Recycling), and the RWF CIP. Thirty staff members, including highly qualified chemists and microbiologists, analyze wastewater and industrial waste samples before, during and after treatment, to ensure the safety of discharged treated wastewater into the San Francisco Bay, 365 days a year.

For over 10 years, our Lab has been instrumental in supporting the RWF's capital projects. In 2023 alone, the Lab successfully completed over 5,000 CIP-related analyses. This collaborative effort included sampling and analyses in support of startup, commissioning and operation verification for the Digester and Thickener Facilities Upgrade and New Headworks projects, as well as the water quality analysis for the Process Water System Evaluation project. Another example is analysis of the formation and mitigation of struvite, a detrimental chemical deposit in the RWF. Looking ahead, the Lab and CIP teams will be working together on the system performance

verification during the future startup and commissioning of the Digested Sludge Dewatering Facility project. They will also assess wastewater characteristics to update the RWF treatment model, helping to identify process modifications needed to meet future discharge permit requirements.

Our Lab's remarkable track record of meeting 100 percent regulatory compliance on an annual basis underscores its success, contributing to the thriving ecosystem of the South Bay. This ecosystem supports a diverse range of wildlife, including several dozen fish species and iconic birds such as bald and golden eagles.

Kudos to the ESD Lab team on their stellar work and ongoing support of RWF programs.

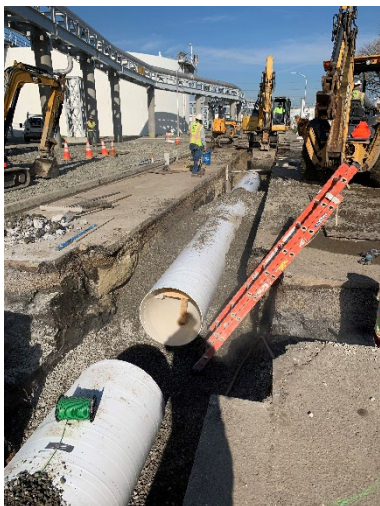


ESD Lab Team

## Storm Drain System Improvements Project Protects Critical Infrastructure

The RWF's Storm Drain System Improvements project will enhance the existing storm drain system by removing and replacing damaged pipes, cleaning clogged pipes, and rehabilitating stormwater pump stations to protect critical infrastructure, buildings, and tunnels. Project Engineer **Austin Pao** said, "The existing storm drain system needs improvement, particularly evident during heavy rainfall events. Our focus is on overhauling the system to handle 10-year to 100-year storm events."

Key project scope elements include inspecting, cleaning, and flushing of over 5,500 linear feet of storm drain and 1,700 linear feet of sanitary sewer pipes. Additionally, the project involves replacing 3,800 linear feet of deficient pipes. The upgrades extend to seven stormwater pump stations, enhancing electrical systems, access, signage, and weather-proofed tunnel entrances. Furthermore, aging pumps at three pump stations have been replaced, boosting the system's effectiveness.



Contractor removes storm drainpipe

Environmental considerations have been a key focus of the project, with the Environmental and Permitting Support team engaged in project meetings to address concerns such as wetland preservation. The project progresses with minimal environmental impact, reflecting the City's commitment to sustainable development.

Currently, the project team is addressing a pump performance issue at one of the stations, a critical step towards achieving the project's beneficial use scheduled for spring 2024. The project's success stems from the collaborative efforts of CIP, Operations and Maintenance, and contractor staff. Teams meet weekly to maintain effective communication, stay on course and proactively resolve issues.

As the project nears completion, it showcases the City's dedication to building resilient infrastructure while balancing environmental stewardship.



# How the CIP Delivers Projects

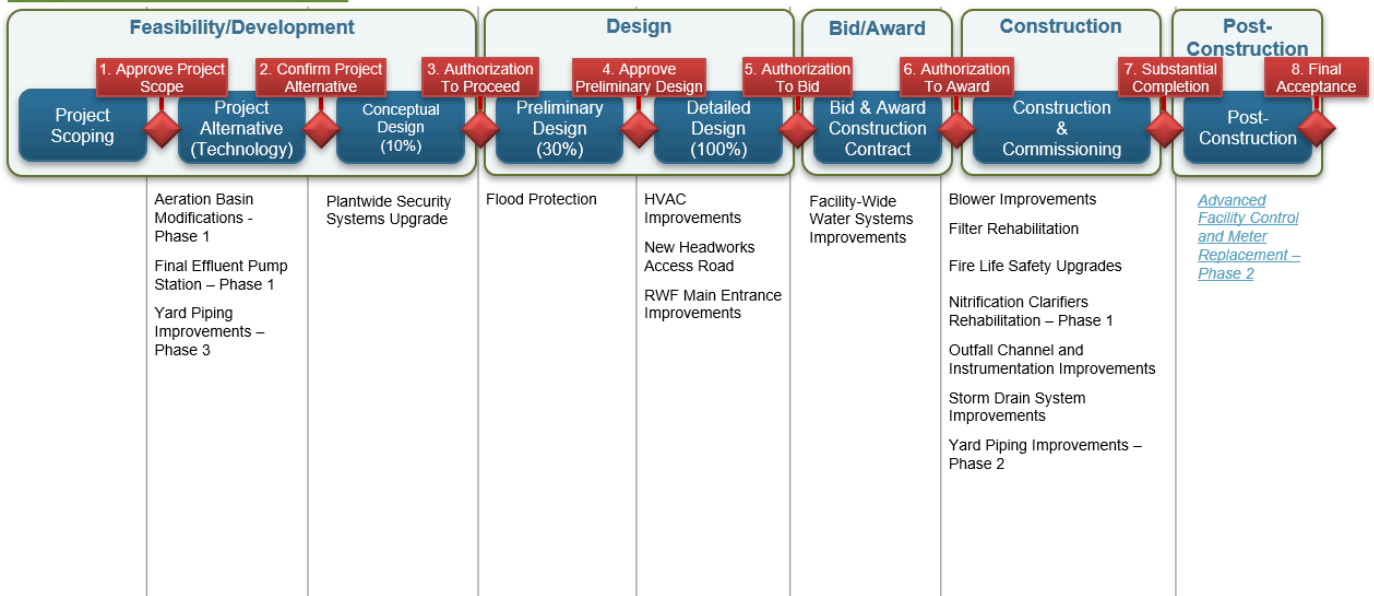
The CIP uses two project delivery methods:

- **Design-bid-build** is a commonly used delivery method in which an owner first procures a professional engineering firm to prepare detailed design plans and specifications for a project. The owner then solicits bids for the project and procures a general contractor to construct the project based on the design completed by the engineer.
- **Progressive design-build** is a two-phase delivery method contracted with a single design-build firm in which the project's design, cost estimating, construction schedule and final guaranteed maximum price (GMP) are developed during the first phase. If the owner and design-builder agree on the schedule and the GMP during the first phase, the final design, construction and commissioning are completed during the second phase.

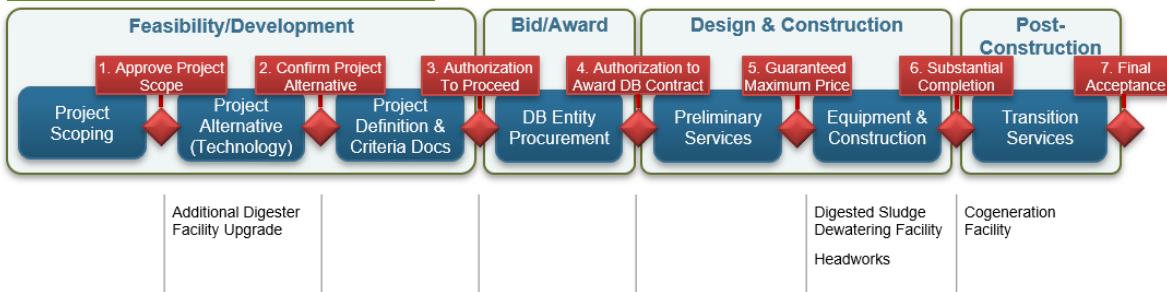
All CIP projects, regardless of project delivery method, follow a consistent process of consecutive delivery stages, each culminating in a stage gate, as presented in the project delivery models below. Stage gates are go/no-go points at which the project team must demonstrate that the project has met predefined evaluation criteria before advancing to the next delivery stage. The benefits of the stage gate process include consistency, quality assurance, ensuring that the scope continues to address existing needs, budget/schedule control, and Operations & Maintenance team engagement.

## Active Projects by Delivery Model

### Design-Bid-Build Active Projects



### Progressive Design-Build Active Projects



\*Projects shown [underlined and in blue and italics](#) have either been initiated or advanced this reporting period.



# CIP PROJECTS

The CIP includes projects in both design and construction phases. This update outlines accomplishments for the past quarter in two sections: Projects in Design and Projects in Construction. For projects in construction and post-construction phases, the CIP uses cost and schedule baselines monitored through the City's Capital Project Management System. Access project performance information at the following link:

[Project Performance Information](#)

COVID-19 update: From October to December, CIP projects continued progressing despite COVID-19 pandemic impacts. Projects in construction continued with all contractors and construction management staff following the latest guidance from the Santa Clara County Health Officer and Public Health Director. During this period, CIP staff continued to work both in the office and remotely. Environmental Services Department and Public Works staff continue to work with the City Attorney's office to address pandemic-related impacts to construction schedules and costs to ensure a consistent approach to resolving COVID-19-related claims across the City.

## Projects in Design

- **Additional Digester Facility Upgrade**

In December, the Treatment Plant Advisory Committee (TPAC) approved the recommendation for Council to award the owner's advisor master consultant agreement.

- **Facility-wide Water Systems Improvements**

In December, TPAC approved the recommendations for Council to award and execute the construction contract and master consultant agreement amendment, respectively.

- **RWF Main Entrance Improvements**

In November, consultant Jacobs completed the draft 100% design package and held a workshop to gather feedback. The project team began preparation to advertise the construction contract in January 2024.

- **New Headworks Access Road**

In December, the project team received and began internal review of the final 100% design and cost estimate submittal. Advertisement of the construction contract is expected in February 2024.

- **Yard Piping Improvements – Phase 3**

In November, consultant Black & Veatch completed visual inspection and ultrasonic testing for a section of waste activated sludge pipes. In December, Black & Veatch conducted alternatives analysis for several pipe segments inspected earlier in the year.





# Projects in Construction

This aerial map of the RWF shows the CIP's active construction projects.



1

### Blower Improvements: Oxygenating wastewater with greater energy efficiency



Newly completed terrazzo flooring in Blower Building

RWF’s aeration blower systems, which supply oxygen for breaking down organic material in wastewater, are more than 30 years old. This project will replace blower engines, gearboxes and associated control equipment, extending the system’s life and enhancing its

energy efficiency.

**Project Budget:** \$48.7 million

**Expected Beneficial Use:** January 2024

**Update:**

- During this period, contractor Monterey Mechanical continued punch list and warranty work and other project close-out activities.

2

### Digested Sludge Dewatering Facility: Drying biosolids more efficiently and effectively



Dewatering Building steel erection

The RWF currently uses an open-air lagoon and drying bed process to stabilize biosolids before landfill disposal. The 2013 Plant Master Plan recommended moving to an enclosed mechanical dewatering process. This project will build a mechanical dewatering facility and

support facilities.

**Project Budget:** \$170.3 million

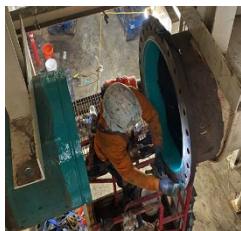
**Expected Beneficial Use:** October 2025

**Update:**

- In October, design-builder Walsh completed the concrete walls and slabs for the dewatering building, slabs for the loadout building, and all concrete walls for the sludge storage tanks.
- In November, Walsh completed installing the deck slab in the Dewatering facility, and the first pilot for the horizontal drilling began.
- In December, Walsh continued installation work at the project sites. Drilling work and pulling of the centrate return pipes under Zanker Road continued.

3

### Filter Rehabilitation: Protecting health and the environment, increasing reliability and capacity



Filter coating on BW supply line

The filtration process is one of the final steps in wastewater treatment. The RWF’s tertiary filtration process consists of 16 granular media filters and ancillary equipment. Built in the 1970s and 1980s, these components are near the end of their useful lives. The project will rehabilitate structural, mechanical, electrical and instrumentation elements

of the system.

**Project Budget:** \$58.8 million

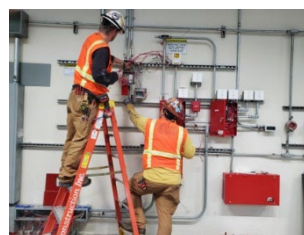
**Expected Beneficial Use:** July 2024

**Update:**

- In October, contractor Walsh completed installation of all Filter Gallery B valves, which allowed an additional eight filters to be brought online prior to the onset of the wet-weather season. Replacement of old electrical equipment continued, and close coordination was required to migrate power to the new devices as they became available.
- In November, operational testing of Filter Gallery B valves was successfully completed. Walsh continued the replacement of old electrical equipment.
- In December, Walsh commenced coating inside Filter Galleries A and B and installed outdoor lighting on the filter deck areas and continued to replace equipment.

4

### Fire Life Safety Upgrades: Improving worker health and safety and the environment



Sludge Screening installation

Several RWF buildings currently lack automated fire alarm systems to monitor and send out a notification in the event of a fire. Fire life safety upgrades are needed to bring the RWF into compliance with current building safety and fire codes.

**Project Budget:** \$7.1 million

**Expected Beneficial Use:** March 2024

**Update:**

- During this period, contractor Blocka Construction continued to coordinate with the San José Fire Department to obtain permit approvals for fire alarm work in several buildings.
- The contractor also continued fire alarm installation work in several buildings.





5

### Headworks: Offering better performance and reliability with new wastewater pre-treatment system



Relabeling wires

Headworks pre-treatment of raw wastewater enhances and protects downstream treatment processes. This project will replace Headworks 1, the oldest RWF facility, with a new Headworks 3, and will also modify Headworks 2. The new system will be more reliable and will be able to treat

projected wet-weather wastewater flows.

**Project Budget:** \$168.4 million

**Achieved Beneficial Use:** December 2023

**Update:**

- In October, a ribbon cutting ceremony was held with project stakeholders and dignitaries to officially commemorate the opening of the new Headworks 3. Phase 2 work, including replacing the meter at the South Meter Vault, and capping off the Headworks 1 inlet and outlet pipes was completed.
- In November, design-builder CH2M HILL installed the pump and pipes in the PG&E Building and completed minor paving, sample relocation and coating work. Phase 2 work continued. Site cleanup and demobilization continued.
- In December, substantial completion was achieved. CH2M HILL continued addressing various minor work and punch list items.

6

### Nitrification Clarifiers Rehabilitation – Phase 1: Improving secondary treatment infrastructure and efficiency



McGrath labeling conduits in handholes

Central to the RWF's biological nutrient removal process, clarifiers separate sludge from effluent. The 16 existing clarifiers were constructed in the 1970s and 1980s and are near the end of their useful lives. This project will make cost-effective improvements to enhance the clarifiers' efficiency and

minimize unscheduled maintenance on them for the next 30 years.

**Project Budget:** \$52.3 million

**Achieved Beneficial Use:** October 2023

**Update:**

- In October, Contractor Overaa completed testing of the new electrical and control systems for the Battery B Nitrification Clarifiers. Overaa achieved substantial completion
- In November and December Overaa continued work on punch list items for the Nitrification A-Battery, B-Battery, and returned activated sludge Gallery.

7

### Outfall Channel and Instrumentation Improvements: Reliable water quality reporting at the edge of the Bay



Articulating light poles

The end product of the wastewater treatment process travels through the outfall channel to the Artesian Slough and South San Francisco Bay. This project will replace older technology with a fiber optic system, install new instruments,

improve the integrity of the weir structure, and construct a large vault structure to install new flow meter technology, making the meters accessible to staff.

**Project Budget:** \$10 million

**Expected Beneficial Use:** February 2024

**Update:**

- In October and November, contractor Anvil Builders delivered a medium-voltage cable to the SO2 Building and finished installing the rip-rap.
- In December, Anvil finished pulling medium voltage cables from Manhole 25 to the pull box located outside the SO2 Building and completed functional testing of the new flow meters in both effluent pipelines.

8

### Storm Drain System Improvements: Protecting critical infrastructure during 10-year through 100-year storm events



Rebar installation for V-ditch

The RWF experiences localized flooding during heavy rainfall events due to runoff, requiring improvements to the existing storm drain system to protect the operational area. This project will improve the existing storm drain system by rehabilitating storm

water pump stations, pipes, manholes, catch basins, and other components. The upgrades made by this project will protect RWF's critical structures and equipment during 10-year through 100-year storm events.

**Project Budget:** \$12.6 million

**Expected Beneficial Use:** April 2024

**Update:**

- In October and November, contractor Ranger Pipelines installed a new pump at the Paint Shop Pump Station and installed a new pump, the control panel, the mini power center, conduits, and two disconnects at the Los Esteros Pump Station.
- In December, Ranger installed the four-float system at the Stores Pump Station and repaired the float at the Zanker Pump Station.





## Yard Piping Improvements – Phase 2: Repairing and replacing critical pipelines at the RWF



Rebar installation for Fish Screening concrete pad

The RWF has 67,000 linear feet of process pipes that carry gas, liquids, sludge, air, steam and other process streams to and from the various treatment areas. These networks of pipeline are critical to RWF operations. Seventy percent of the pipes are more than 25 years old, and 10% are more than 50 years of

age. This is the second of a multi-phase project to repair or replace pipe systems that have been identified as high priority or at high risk of failure.

**Project Budget:** \$24.1 million

**Expected Beneficial Use:** January 2025

### Update:

- In October, contractor Michels Trenchless started potholing, trenching and installation work for several recycled water pipe tie-ins.
- In November, Michels completed installing above-ground and underground 12" recycled water piping and continued installing formwork and rebar for the containment wall at Effluent Junction Structure 1.
- In December, Michels completed installation work on the 12-inch recycled water piping tie-in and No. 3 Process Water Inter-tie.































Preferred alternative for new entrance of the Main Guard Shack

## What's Ahead?

In January – March 2024:

- Obtain Council approval to award the construction contract for Facility-wide Water Systems Improvements project.
- Obtain Council approval to award the master agreement for Owner's Advisor services for Additional Digester Facility Upgrade project.
- Amend the master services agreement with Kennedy Jenks for Facility-wide Water Systems Improvements project.
- Advertise the construction contracts for RWF Main Entrance Improvements and New Headworks Access Road projects.

# Fiscal Year 2023-2024 Program Performance Summary

KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
<b>Stage Gates</b>	90%	100%			100%		
		8/8 <sup>1</sup>			18/18 <sup>2</sup>		
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
<b>Schedule</b>	90%	0%			43%		
		0/2 <sup>3</sup>			3/7 <sup>4</sup>		
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone <sup>5</sup> . Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
<b>Budget</b>	90%	50%			50%		
		1/2 <sup>6</sup>			4/8 <sup>7</sup>		
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget. <sup>5</sup> Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
<b>Expenditures</b>	\$241M	\$186M			\$287M <sup>8</sup>		
Measurement: CIP FY23-24 committed costs. Target: Committed costs meet or exceed 70% of planned budget. 70% of \$344M = \$241M. Therefore Fiscal Year End Green: >=\$241M; Red: < \$241M							
<b>Safety</b>	0	0			0		
Measurement: OSHA reportable incidents associated with CIP Delivery for the fiscal year. Criteria: Green: 0 injuries requiring hospitalization, 0 fatality; Amber: 1 to 2 injuries requiring hospitalization, 0 fatality; Red: >2 injuries requiring hospitalization, any fatality							
<b>Environmental</b>	0	0			0		
Measurement: Number of permit violations caused by CIP delivery for the fiscal year. Target: Green: 0 incidents; Amber: 1 to 2; Red: > 2							
<b>Vacancy Rate<sup>9</sup></b>	10%	16%			16%		
		13/81			13/81		
Measurement: Ratio of the number of vacant approved positions to approved positions. Target: Green: <= 10%; Amber: 10% to 20%; Red: > 20%							

## Program KPI – Fiscal Year 2023-2024 Information

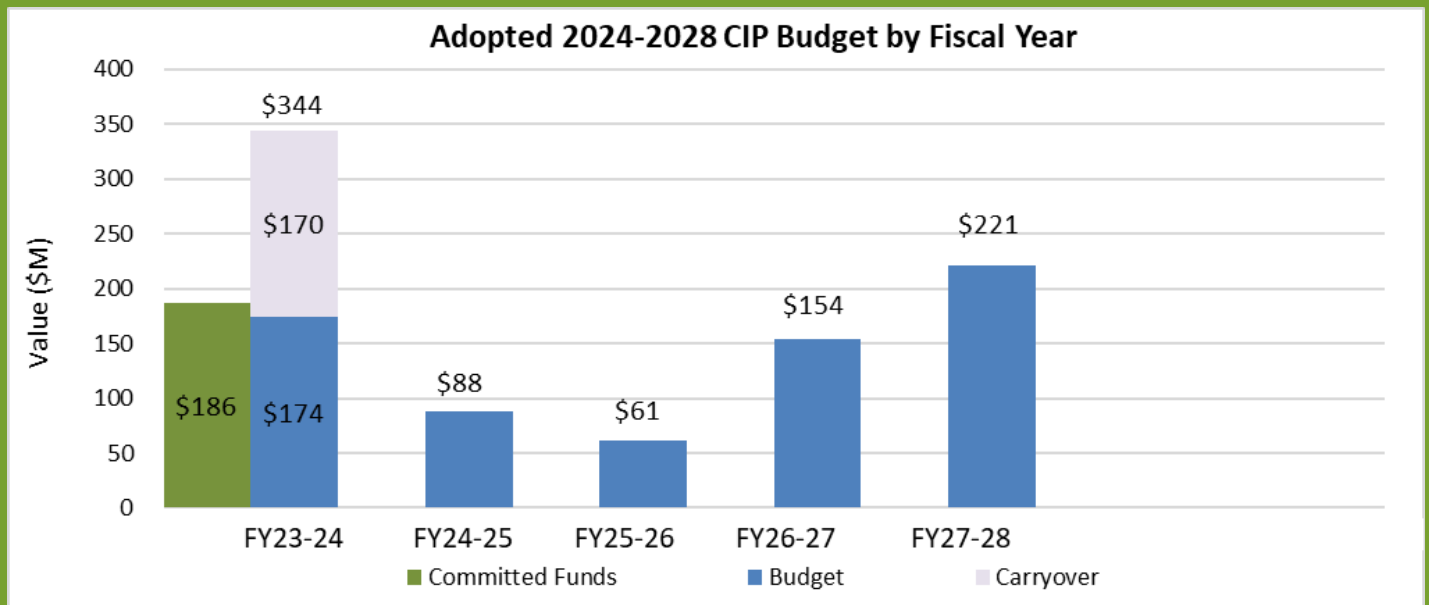




## Program Budget Performance

This section summarizes the cumulative monthly budget performance for FY 2023-24 based on the Adopted 2024-2028 CIP Budget.

### Adopted 2024-2028 CIP Expenditures and Encumbrances



[Budget Performance Information](#)

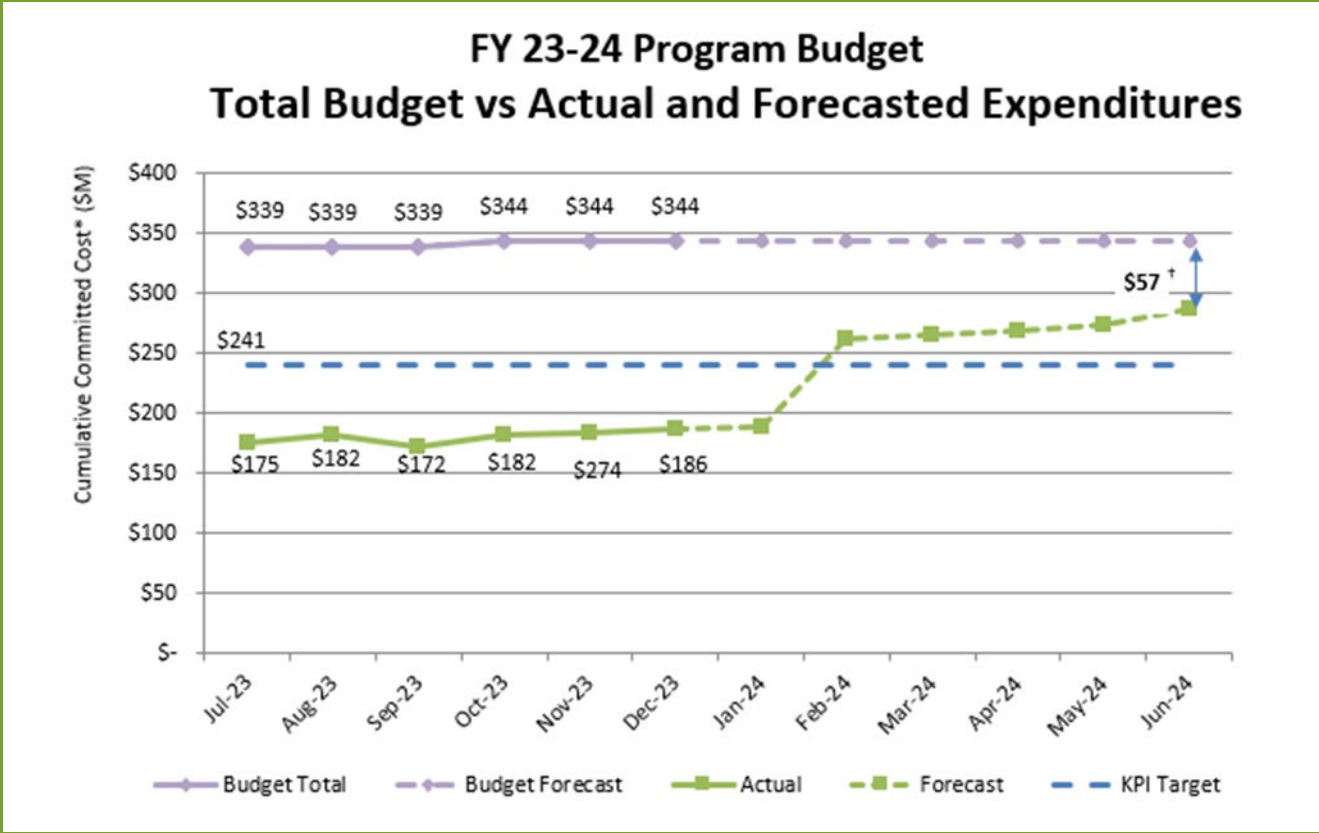




# Fiscal Year 2023-2024 Program Budget Performance

The FY 2023-24 CIP budget is composed of approximately \$174 million in new and re-budgeted funds, plus encumbered carryover of \$170 million, for a total of \$344 million.

## FY 2023-24 Program Budget



[CIP Program Budget Information](#)



# Enhancing the RWF: Yard Piping Upgrades

6



The Yard Piping Improvements project, featured in [this video](#), rehabilitates and replaces critical pipes that carry gas, liquids, sludge, air, steam and other process streams to and from the various treatment areas of the RWF.

Want to learn more?



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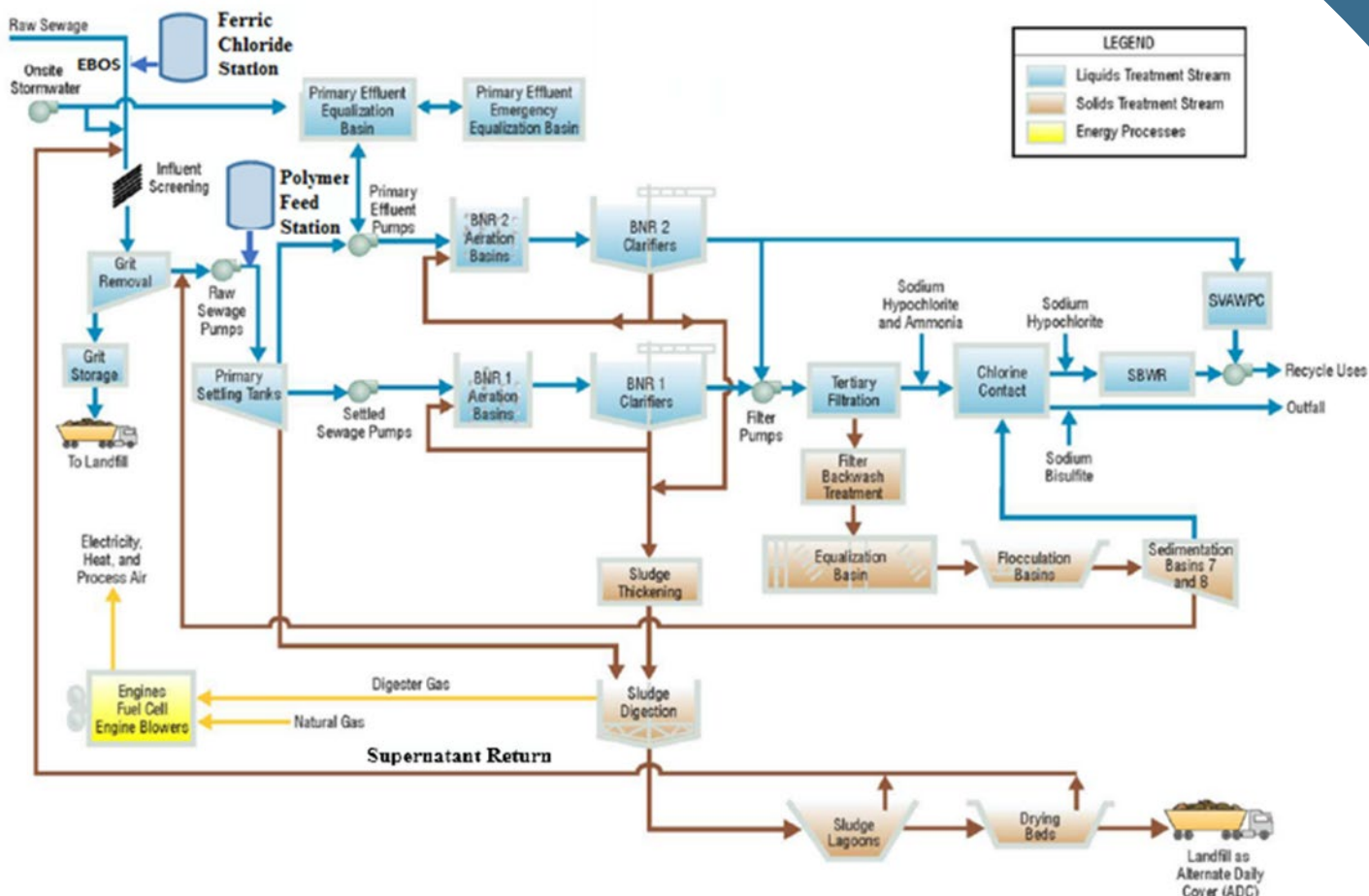


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# Regional Wastewater Facility Treatment

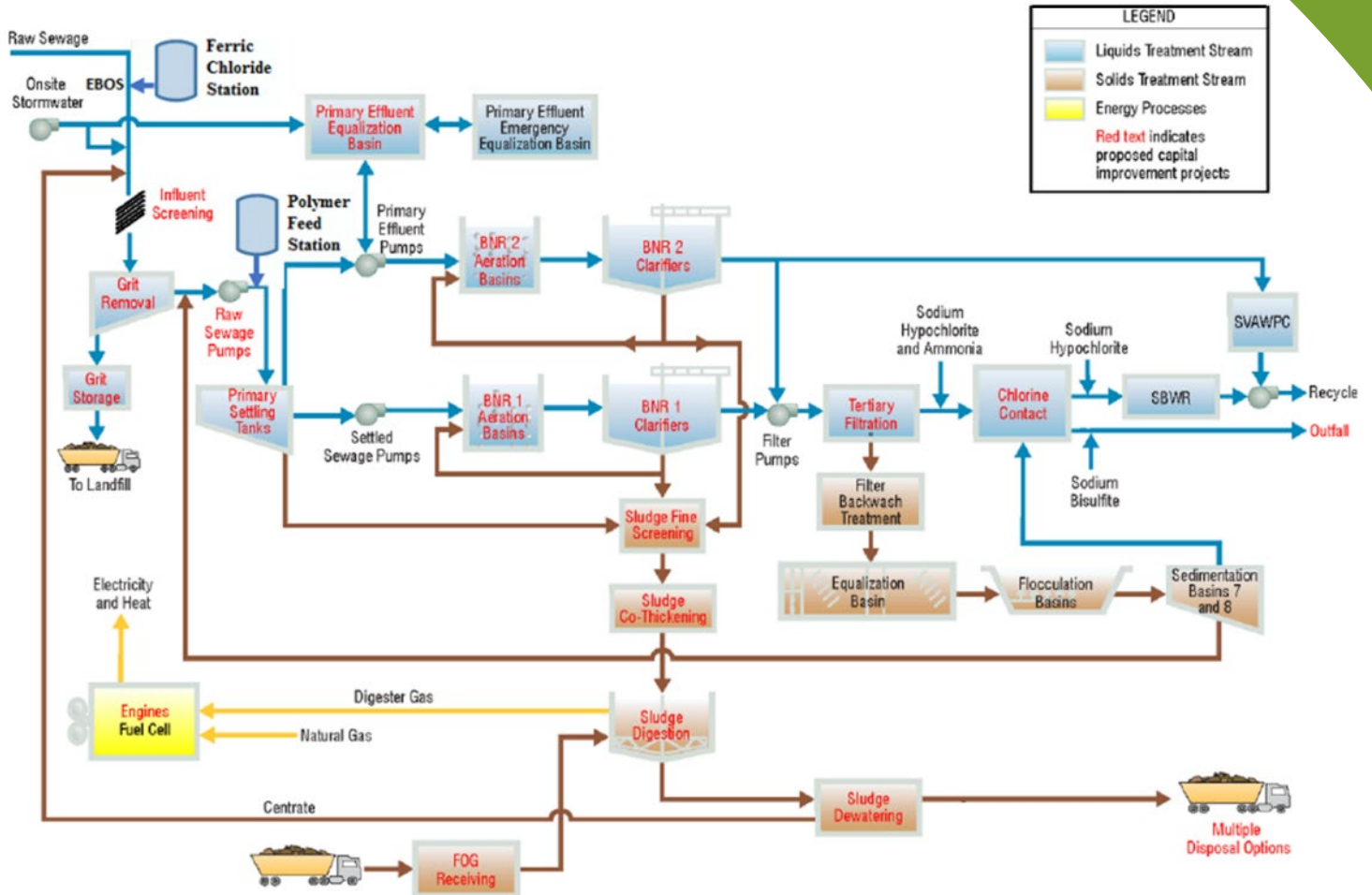
## Current Treatment Process Flow Diagram





# Regional Wastewater Facility Treatment

## Proposed Treatment Process Flow Diagram



# Glossary

<b>Beneficial Use</b>	When a CIP project is complete in accordance with contract documents and can be used or occupied by the City, it has achieved beneficial use.
<b>Biogas</b>	A renewable energy source produced by the breakdown of sewage waste in the absence of oxygen. Biogas is composed of methane, carbon dioxide and small amounts of hydrogen sulfide.
<b>Biosolids</b>	Treated sewage sludge.
<b>Bufferlands</b>	Open acreage used by wastewater treatment plants as a buffer between plant operations and nearby communities. Bufferlands minimize odor and operational impacts on plant neighbors and often serve as wildlife habitat.
<b>Commissioning</b>	The process of assuring that all systems and components of a facility, building or plant are designed, installed, tested, operated and maintained according to the owner's requirements.
<b>DAFT</b>	Dissolved air flotation thickener tanks. Dissolved air flotation, or DAF, is a treatment process that clarifies wastewater by removing suspended matter.
<b>DCS</b>	Distributed control system. A computerized system that allows treatment plant staff to remotely monitor and control treatment processes.
<b>EIR</b>	Environmental Impact Report. A public document required under the California Environmental Quality Act to describe potential environmental impacts associated with a project. An EIR also describes measures to mitigate the impacts.
<b>Effluent</b>	Treated wastewater that is discharged from a treatment plant.
<b>Influent</b>	Raw or untreated wastewater that flows into a treatment plant.
<b>FOG</b>	The Fats, Oils and Grease program administered by the City of San José's Environmental Services Department.
<b>Headworks</b>	Facilities that first receive influent at a wastewater treatment plant. The headworks screen and remove sticks, grit and other solid material from influent to protect downstream equipment in the treatment process.
<b>NPDES permit</b>	Under the federal Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program regulates point sources such as pipes and other conveyances that discharge pollutants into water. In California, NPDES permits for the discharge of treated wastewater are issued by the Regional Water Quality Control Boards.
<b>Polymer</b>	Primarily used to help manage the process of drying and consolidating sludge.
<b>Preliminary treatment</b>	The preparatory wastewater treatment stage, in which influent passes through headworks, which screen and remove sticks, rocks and debris; and grit chambers, which remove sand and gravel.
<b>Primary treatment</b>	The initial treatment for incoming wastewater, in which gravity settles solid material and rotating bars skim floating fats, oil and grease from influent.
<b>Secondary treatment</b>	The second stage of wastewater treatment, in which aeration tanks pump air into wastewater to promote the growth of naturally occurring bacteria that remove organic pollutants.
<b>Stormwater</b>	Water from rain that does not seep into the ground but instead flows into storm drains as runoff.
<b>Tertiary treatment</b>	The final stage in advanced wastewater treatment, in which wastewater flows through filter beds, then through chlorinated tanks to become 99% clean.
<b>Wastewater</b>	Water that enters the sanitary sewer system for treatment at a pollution control plant.
<b>Wastewater Cake</b>	Sludge that is compressed after dewatering.
<b>WAS</b>	Waste-activated sludge, or the excess quantity of bacteria and microbes removed from the secondary wastewater treatment process.

