San José-Santa Clara
Regional Wastewater Facility

CIP

CAPITAL IMPROVEMENT PROGRAM

Quarterly Status Report:
January – March 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

LEGEND

●	On Target
▲	Alert
◆	At Risk

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 modernizing and refurbishing the RWF so that 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 thriving economy. The CIP is rebuilding RWF infrastructure and updating treatment processes with innovative, efficient new technologies. The first phase of the CIP is a 10-year plan that began in 2014, with a budget of $1.4 billion.

This report summarizes the CIP's progress and highlights accomplishments from January to March 2023.

Communication and Collaboration Are Key to Smooth Upgrades

By Kerrie Romanow, ESD Director

Delivering several major construction projects, concurrently and in a continuously operating wastewater facility, is a massive undertaking.

Ensuring construction projects don't impact RWF operations requires teamwork, communication, and collaboration – involving CIP, Operations and Maintenance (O&M), and contractor staff. Effective management of construction issues is so critical that the CIP has established dedicated roles that focus on project interfaces, construction coordination, and risk management.

Interfaces: One of the most complicated situations project teams face is when one project needs something that another project must provide. This could include design information, a physical connection point, or process fluid.

These dependencies can happen in the design or construction phases of a project. For example, during design, one project may require technical information from another project. Without this data, they can't proceed with their design work and the project could be delayed. The constraints can also be physical: If one project is building a pipeline that another project needs to connect to, the second project's team needs to know when the pipe connection will be available.

Careful interface management makes project delivery more efficient and avoids unexpected delays and extra costs.

Construction coordination: Before construction begins, staff identifies potential overlaps between construction and/or O&M activities and finds a resolution to any conflicts. For example, when the Storm Drain System Improvements project needed to shut down a street within the RWF to replace a pipeline, the team realized that the street needed to remain open for critical deliveries to both O&M and another CIP project. O&M and the project teams worked together to find an alternate route for these deliveries.

Risk management: Staff is always trying to get ahead of conflicts and risks. For example, the COVID-19 pandemic and the war in Ukraine have each created significant supply chain problems. If project components that are critical for construction are unavailable for months, they could delay the project, leading to increased costs. With effective risk planning, project teams can consider alternatives, such as prioritizing those submittals or locating an alternative source of supply. At any given time, CIP staff may be monitoring over 150 risks – some specific to certain projects and some at the program level.

The rehabilitation of the RWF doesn't stop because of dependencies or conflicts between projects – our team collaborates to keep the work going, so the RWF can continue to treat water for 1.4 million residents and more than 17,000 businesses. I'm proud of the work these employees are doing!

Rendering of new main guard shack showing improved entry/exit and canopy

Main Guard Shack to be Replaced with Modern, More Secure Entrance

The small, aging guard shack at the entrance to the RWF will be replaced as part of a project to modernize the facility entrance. "The new main entrance will offer improved safety, security and traffic circulation," said Ajmal Aochqon, project manager.

The entrance will feature improvements that are critical to facility operations:

* **Improved access and circulation**. Because the facility currently has two entry lanes and one exit lane, large trucks have to back up and use the entry lanes when leaving. If another vehicle is trying to enter, it has to stop and wait until the entrance lane is clear. The new main entrance will have three entry lanes and two exit lanes, so trucks will be able to enter and exit smoothly, reducing delays on Los Esteros Road. It will also offer improved pedestrian safety.
* **Larger, modern guard shack**. The current guard shack does not offer enough office space for staff members or for IT equipment expansion. In addition to having more space, the new entrance will have an ADA-compliant restroom, a walkway to the guard shack, and a nearby wheelchair-accessible parking space.
* **Improved security and lighting**. The new entrance will improve security by placing the guard house within the secured perimeter of the RWF and adding security cameras and card readers. Lighting will also be upgraded.
* **Better signage**. New wayfinding and building signage will guide visitors, vendors and emergency vehicles around the facility.

The project is currently in design. Construction is scheduled to start in summer 2024.

How the CIP Delivers Projects

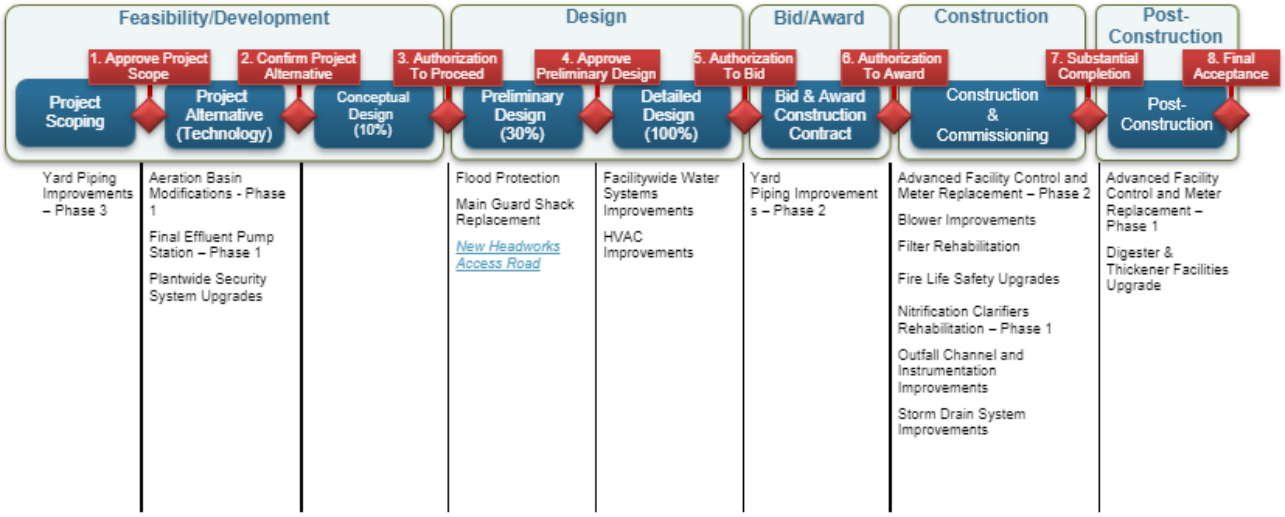
The CIP uses two project delivery methods:

- **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 gets 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.

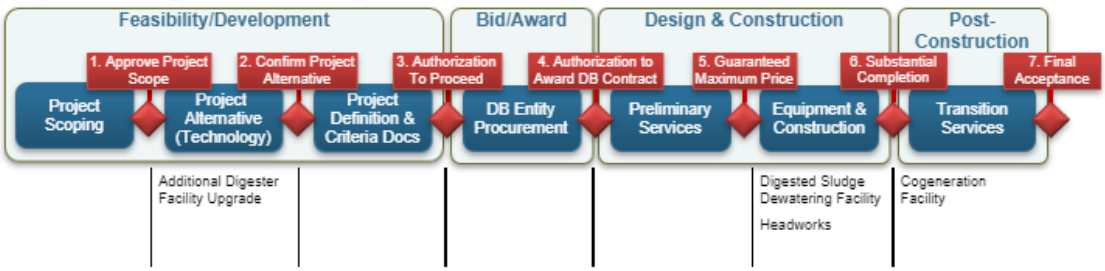
All CIP projects, regardless of project delivery method, follow a consistent process of consecutive delivery stages, each culminating in a stage gate, as presented in the project delivery models below. Stage gates are go/no-go points at which the project team must demonstrate that the project has met set evaluation criteria before advancing to the next delivery stage. The benefits of the stage gate process include consistency, quality, 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. CIP accomplishments for this quarter are outlined in two sections: Projects in Design and Projects in Construction. The CIP's projects in the construction and post-construction phases have cost and schedule baselines that are monitored using the City's Capital Project Management System. Project performance information can be found in the link below:

Project Performance Information

COVID-19 update: From January through March, CIP projects continued to progress 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. Through February 13, City continued to screen all City, consultant and contractor staff using an online form. During this period, CIP staff continued to work both in 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
  During this period, the project team continued to prepare a request for qualifications (RFQ), to procure an owner's advisor, which is expected to be advertised in May.

- Facilitywide Water Systems Improvements
  During this period, consultant Kennedy Jenks submitted the draft 100% design for City review. Final 100% design is expected to be completed in April.

- Flood Protection
  In February, consultant HDR continued to develop the Preliminary Design Report. The project team continued to explore opportunities for grant funding for the project.

- New Headworks Access Road
  In February, consultant Brown and Caldwell finalized the Conceptual Design Report. The project team was approved to advance to the Preliminary Design stage.

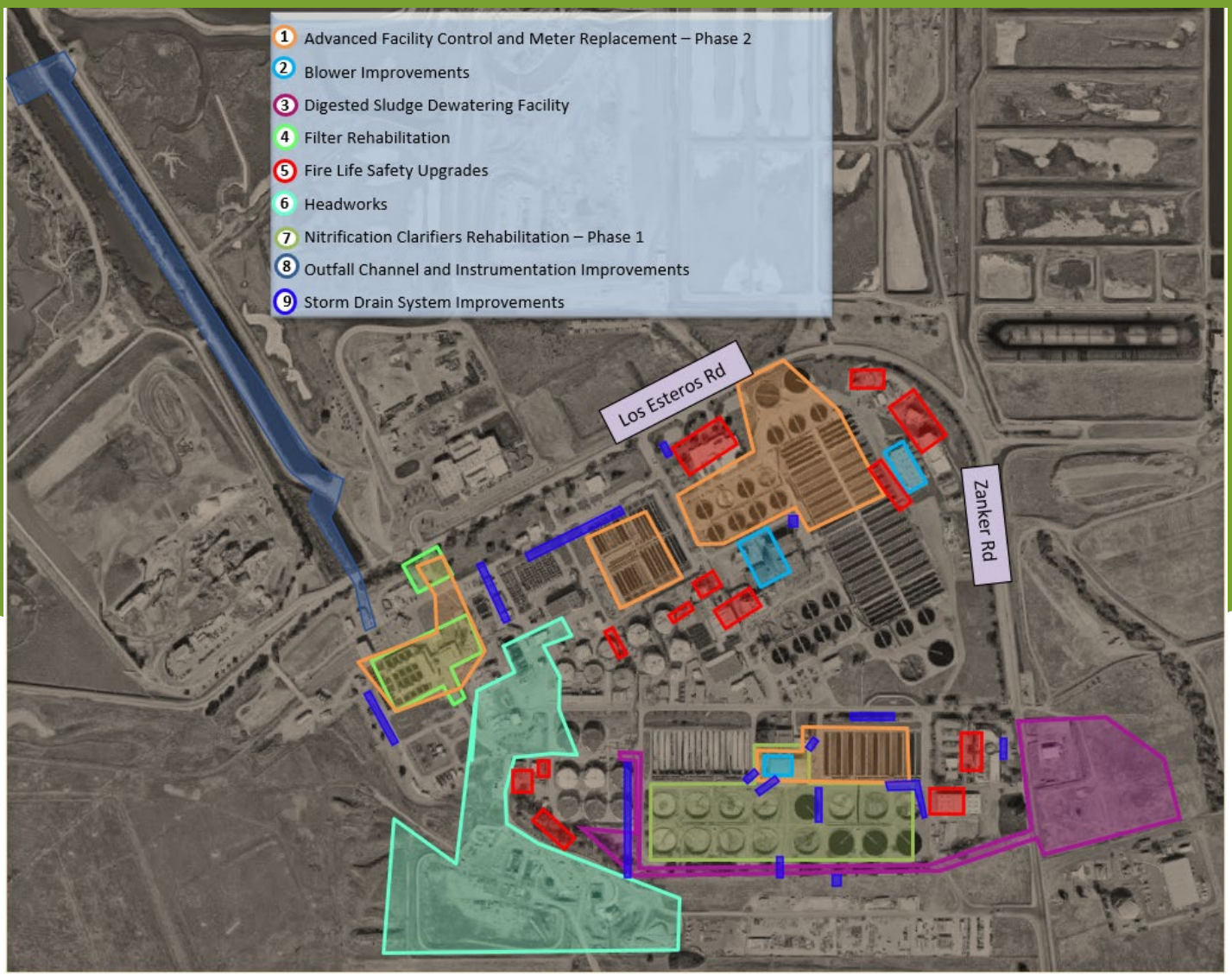
- Plantwide Security System Upgrades
  In February, consultant Jacobs submitted the final Project Definition Memorandum and started the Alternative Analysis stage.

- Yard Piping Improvements – Phase 2
  In January, staff received one responsive bid for the construction contract. Staff anticipate Council award of the construction contract in April.

- Yard Piping Improvements – Phase 3
  In March, consultant Black & Veatch performed inspection on the 36"/66" and 72" Secondary Effluent-Secondary Influent pipes. The project team continued to plan condition assessments for two 84" Raw Sewage (RS) pipes, a 66" RS pipe and a 102" RS pipe, expected to occur this summer.

Projects in Construction

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



1 Advanced Facility Control and Meter Replacement - Phase 2: Reliably controlling processes

Secondary Battery A.

This second part of a two-phase project will replace aging and outdated RWF control equipment such as flow meters, valves, actuators and sensors. Original manufacturers no longer provide support for the existing equipment.

Project Budget: $15.1 million
Expected Beneficial Use: April 2023
Update:

- In January, contractor Kiewit completed functional testing of sludge density meters installed in the East Primaries area.
- In February and March, Kiewit completed the 28-day operational test on various equipment installed in the East Primaries area and Secondary Battery A area.
- Closeout activities continued in all work areas.

2 Blower Improvements: Oxygenating wastewater with greater energy efficiency

New motor installed on Secondary Blower #2.

RWF's aeration blower systems supply oxygen for breaking down organic material in wastewater. The blower systems 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: $50.9 million
Expected Beneficial Use: May 2023

Update:

- In January, contractor Monterey Mechanical completed the 28-day operational testing on Secondary Blower Building (SBB) Blowers #2 and #3.
- Monterey Mechanical continued to paint blower skids and pipe supports in the Tertiary Blower Building, and asbestos and lead remediation and demolition work continued in the SBB basement.

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

Rebar installation at Dewatering building

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: $167 million
Expected Beneficial Use: October 2025

Update:

- In January, following the rainstorms, design-builder Walsh completed dewatering of the site, and completed concrete work for the elevator pit. Walsh also installed vapor barrier, rebar, bulkhead, embeds, in various areas in preparation for concrete slab placement.
- In February and March, Walsh continued concrete work in the main dewatering building and truck-loadout wall rebar installation, and excavations for electrical duct banks.

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

Transformer pads and installation.

The filtration process is one of the final steps in wastewater treatment. The RWF's tertiary filtration unit 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 instrumentational elements of the system.

Project Budget: $59.5 million
Expected Beneficial Use: July 2024

Update:

- In January, contractor Walsh installed new media and air scour piping and completed testing for filter B2. In filter B3 old media was removed and underdrain tiles were replaced and cleaned.
- In February and March, Walsh installed new media and air scour piping and completed testing for filters B3 and B4.
- Walsh continued work on switchgear S12 and conduit installation around the filter building.

5 Fire Life Safety Upgrade: Improving worker health and safety and the environment

Typical Fire Alarm Control Panel

Some RWF buildings do not currently have 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: February 2024

Update:

- In February, contractor Blocka Construction completed fire alarm pretesting in five buildings.
- In March, Blocka Construction completed fire alarm pretesting in six other buildings.

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

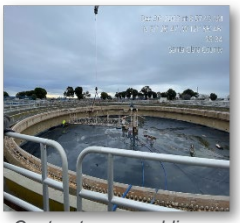
Aerial view of the new Raw Sewage Pump Station and Grit Facility.

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 also modify Headworks 2. The new system will be more reliable and will be able to treat projected wet-weather wastewater flows.
Project Budget: $200.2 million
Expected Beneficial Use: June 2023

Update:

- In January, design-builder CH2M completed functional testing of various equipment, and training of O&M staff.
- In February, CH2M introduced wastewater into the new headworks (Headworks 3) and began equipment tuning. CH2M continued other work around the project site, including installation of CCTV, pumps and piping, and concrete pour.

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



Contractor assembling the clarifier mechanism at nitrification clarifier B6.

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: $51.1 million
Expected Beneficial Use: July 2023

Update:

- In January, contractor Overaa completed the 28-day operational testing on Clarifiers A2, A5 and A8.
- In February, Overaa installed clarifier mechanisms in clarifiers A4, B3 and B5.
- In March, Overaa installed nine dewatering wells in support of ongoing clarifier mechanism, weirs, baffles and deflector plate installation work. Factory acceptance test for the new Battery B motor control center was also completed.

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

The weir structure and Sulfur Dioxide building at the outfall channel.

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; construct a large vault structure to install new flow meter technology, making the meters accessible to staff; and improve the integrity of the weir structure.
Project Budget: $9.9 million
Expected Beneficial Use: November 2023

Update:

- During this period, the project team continued to develop shop drawings for instrument and control panel layout, and other submittals in preparation for contractor Anvil Builders remobilization in late spring for transformer installation.

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

Storm Drain Pipe Replacement

The RWF experiences localized flooding caused by runoff during heavy rainfall events. The existing storm drain system Is deficient and needs to be improved to protect the operational area from floods. 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: $13.8 million

Expected Beneficial Use: December 2023

Update:

- During this period, contractor Ranger Pipelines removed and replaced several pipes on 5th St., near main gate exit area, and along Los Esteros and Zanker Roads.
- Ranger also cleaned several pipe segments across the facility.

Aerial view of the Emergency Overflow Basin of Headworks Project.

What's Ahead?

In April - June 2023:

- Award the construction contract for Yard Piping Improvements – Phase 2 and issue the notice-to-proceed to contractor.
- Advertise the construction contract for Facilitywide Water Systems improvements.
- Advertise the RFQ to procure an owner's advisor for Additional Digester Facility Upgrade.
- Achieve Beneficial Use on Advanced Facility Control and Meter Replacement – Phase 2, Blower Improvements, and Headworks projects.
- Amend the owner's advisor Master Consultant Agreement with Brown and Caldwell for the Digested Sludge Dewatering Facility project.

Fiscal Year 2022-2023 Program Performance Summary

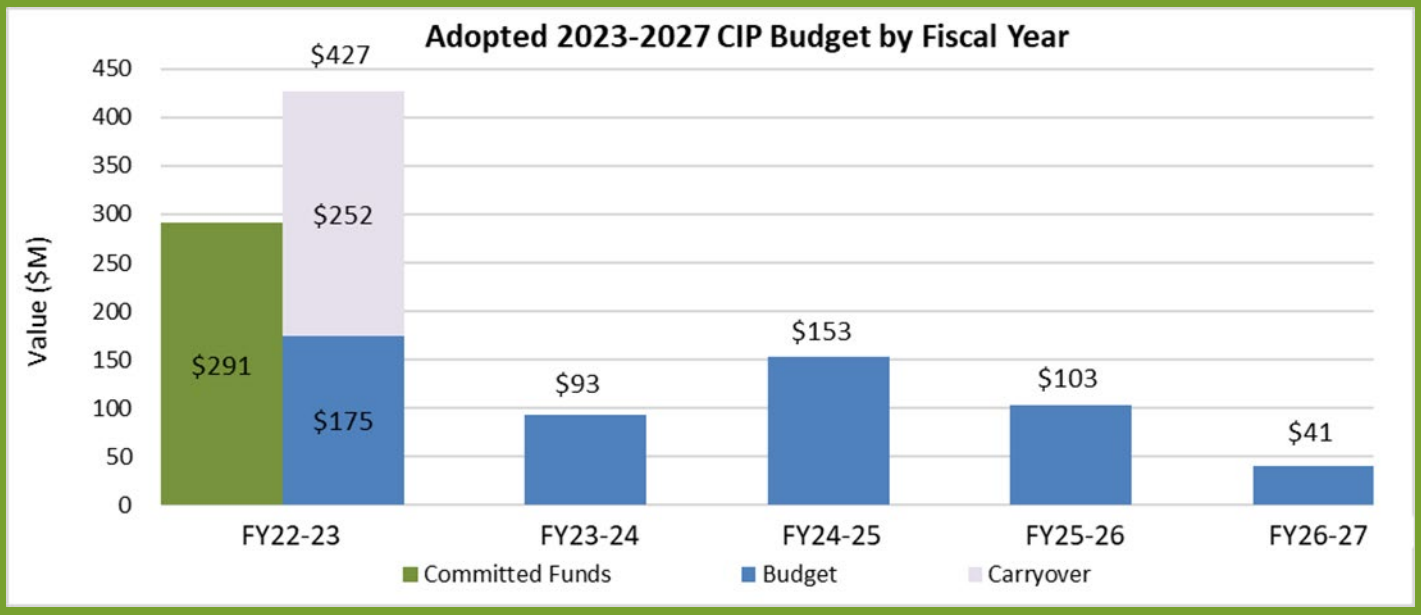
KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	90%	100% 15/15 [1]			100% 21/21		
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Schedule	90%	0% 0/1 [2]			50% 2/4 [3]		
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone.[4] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Budget	90%	100% 1/1 [5]			33% 1/3 [6]		
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget.[4] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Expenditures	$299M	$291M			$318M [7]		
Measurement: CIP FY22-23 committed costs. Target: Committed costs meet or exceed 70% of planned budget. 70% of $427M = $299M. Therefore Fiscal Year End Green: >=$299M; Red: < $299M							
Safety	0	0			0		
Measurement: OSHA reportable incidents associated with CIP Delivery for the fiscal year. Criteria: Green: 0 injuries requiring hospitalization, 0 fatalities; Amber: 1 to 2 injuries requiring hospitalization, 0 fatalities; Red: >2 injuries requiring hospitalization, any fatality							
Environmental	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							
Vacancy Rate[8]	10%	15% 12/78			13% 10/78		
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 2022-2023 information]

Program Budget Performance

This section summarizes the cumulative monthly budget performance for FY22-23 based on the Adopted 2023-2027 CIP Budget.

Adopted 2023-2027 CIP Expenditures and Encumbrances

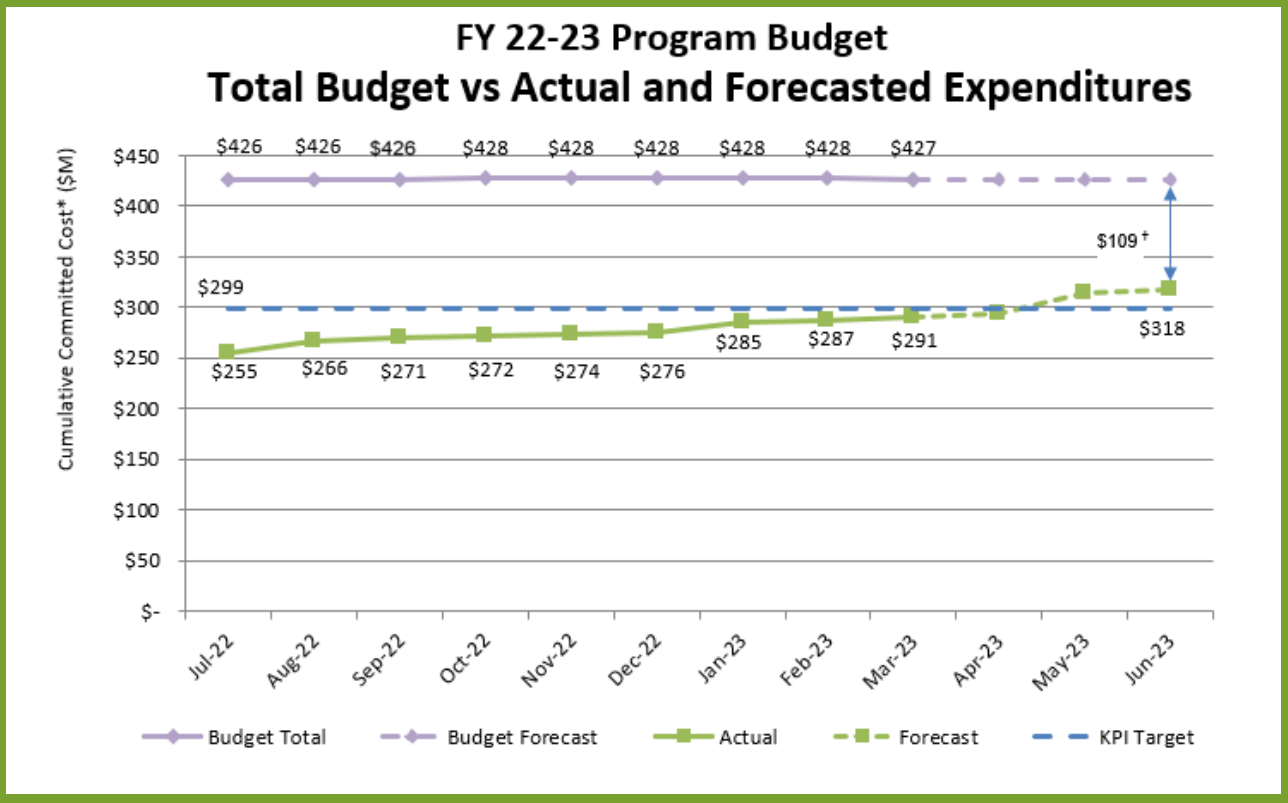


[Budget performance information]

Fiscal Year 2022-2023 Program Budget Performance

The FY22-23 CIP budget is composed of approximately $175 million in new and re-budgeted funds, plus encumbered carryover of $253 million, for a total of $428 million.

FY22-23 Program Budget



[CIP Program Budget Information]

Improving Performance and Reliability at the Wastewater Facility

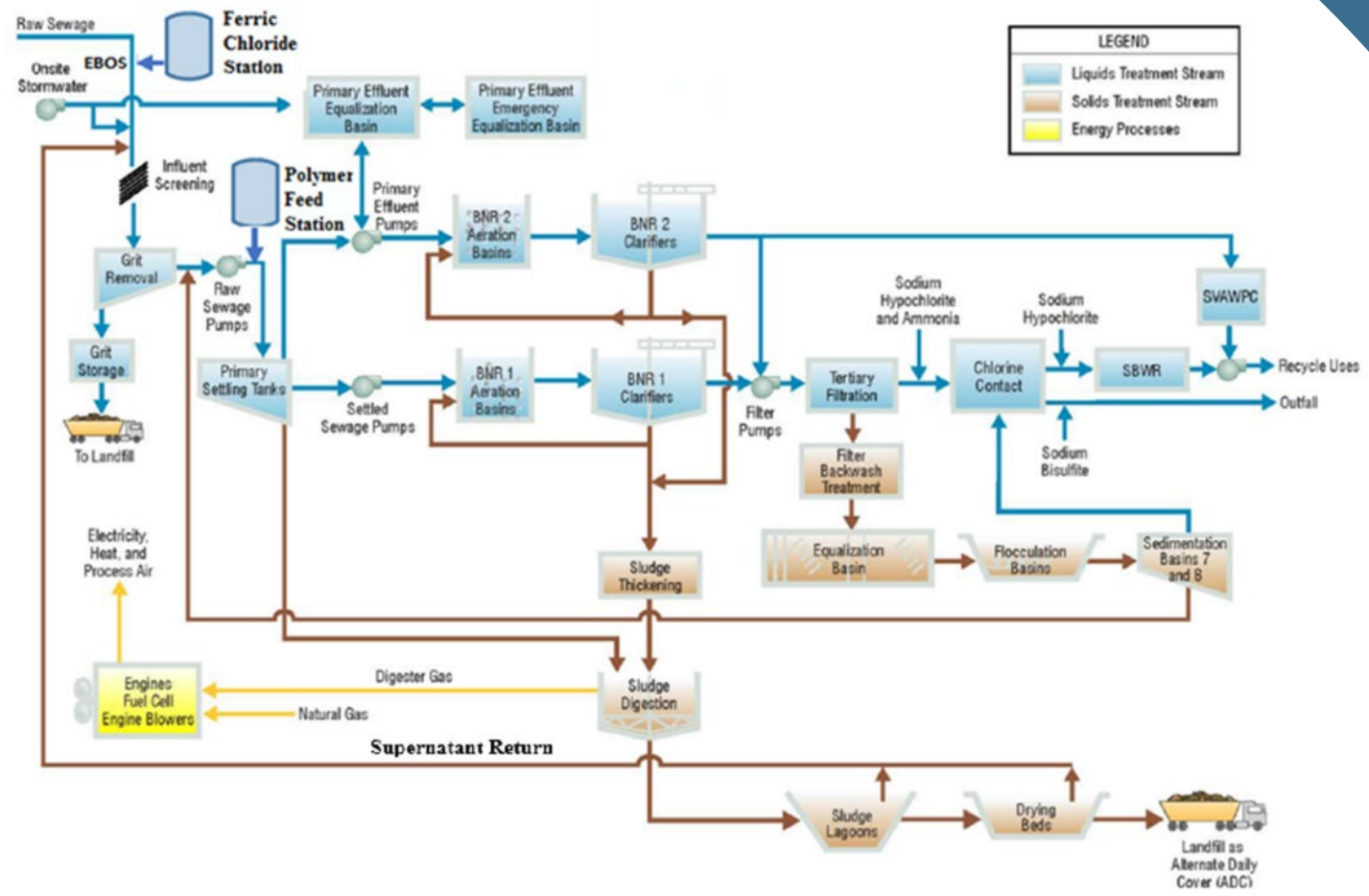
The Headworks project, featured in this video is making improvements to the wastewater facility's performance and reliability.

Want to learn more?

@sjenvironment @sjenvironment @sjenvironment

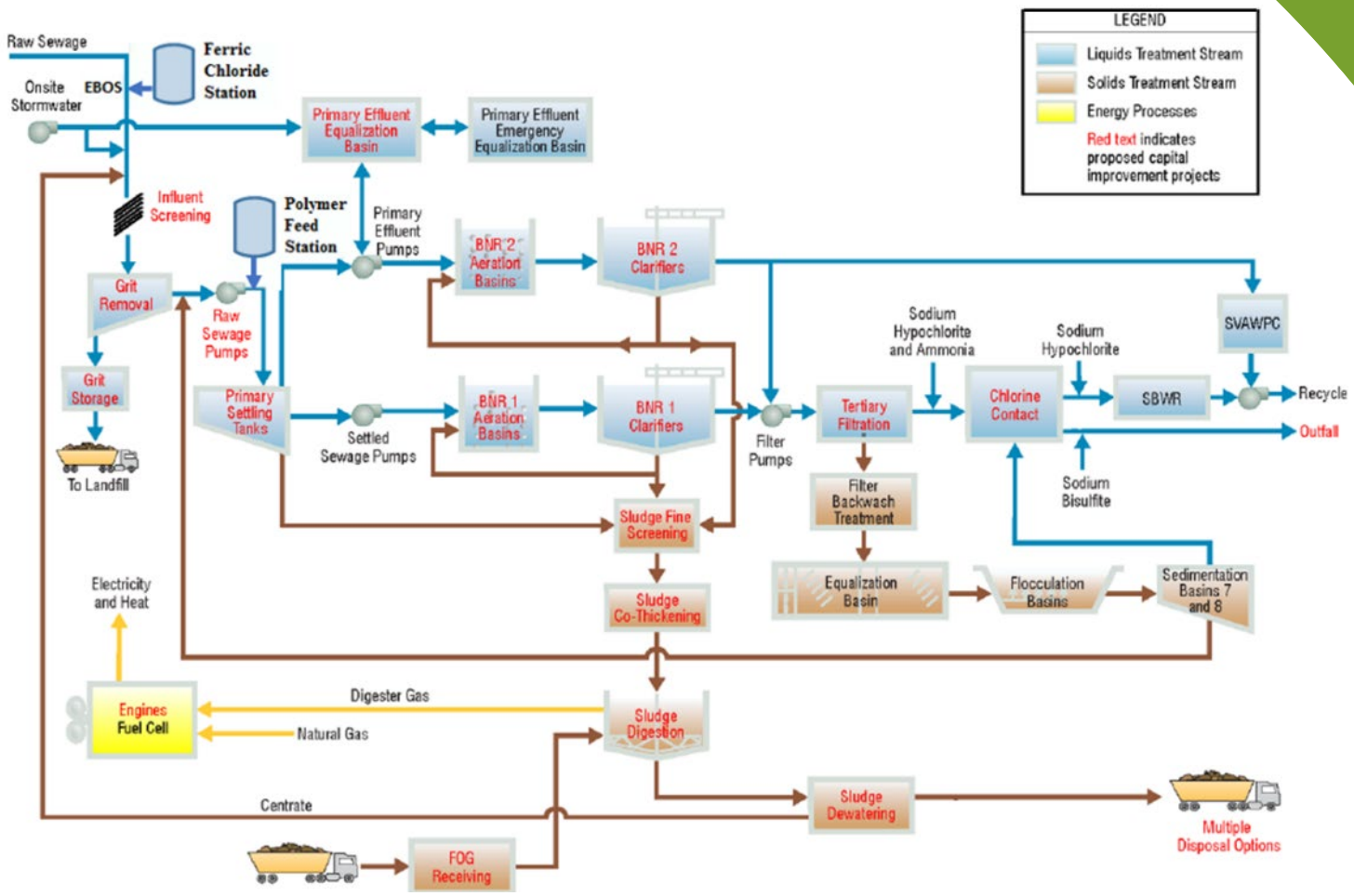
Regional Wastewater Facility Treatment

Current Treatment Process Flow Diagram



Regional Wastewater Facility Treatment

Proposed Treatment Process Flow Diagram



Glossary

Beneficial Use	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.
Biogas	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.
Biosolids	Treated sewage sludge.
Bufferlands	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.
Commissioning	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.
DAFT	Dissolved air flotation thickener tanks. Dissolved air flotation, or DAF, is a treatment process that clarifies wastewater by removing suspended matter.
DCS	Distributed control system. A computerized system that allows treatment plant staff to remotely monitor and control treatment processes.
EIR	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.
Effluent	Treated wastewater that is discharged from a treatment plant.
Influent	Raw or untreated wastewater that flows into a treatment plant.
FOG	The Fats, Oils and Grease program administered by the City of San José's Environmental Services Department.
Headworks	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.
NPDES permit	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.
Polymer	Primarily used to help manage the process of drying and consolidating sludge.
Preliminary treatment	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.
Primary treatment	The initial treatment for incoming wastewater, in which gravity settles solid material and rotating bars skim floating fats, oil and grease from influent.
Secondary treatment	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.
Stormwater	Water from rain that does not seep into the ground but instead flows into storm drains as runoff.
Tertiary treatment	The final stage in advanced wastewater treatment, in which wastewater flows through filter beds, then through chlorinated tanks to become 99 percent clean.
Wastewater	Water that enters the sanitary sewer system for treatment at a pollution control plant.
Wastewater Cake	Sludge that is compressed after dewatering.
WAS	Waste-activated sludge, or the excess quantity of bacteria and microbes removed from the secondary wastewater treatment process.