



City Council Staff Report

From: City Manager

Report Type: INFORMATION REPORTS

Lead Department: Public Works

Meeting Date: June 19, 2023

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TITLE

Update on the Capital Improvement Program and Long Range Facility Planning Update for the Regional Water Quality Control Plant

RECOMMENDATION

This is an informational report and no Council action is required.

EXECUTIVE SUMMARY

The RWQCP is currently implementing projects listed in the 2012 Long Range Facility Plan; there are currently over eight projects that are in various design or construction phases with an estimated budget of over \$400 million. The Long Range Facility Plan needs to be updated to help direct the future upgrades at the RWQCP and to assist with answering questions that have been raised by City Council. The updated Long Range Facilities Plan will include an update to the Biosolids Facility Plan in response to Council's Measure E discussion, as well as an evaluation of cost allocation methodologies for debt service projects. In addition, staff is actively pursuing the opportunity to acquire property adjacent to the RWQCP to assist with future site planning and to future proof the site for new regulations.

BACKGROUND

The RWQCP, originally constructed in 1934, has undergone several expansions and upgrades. The RWQCP is now an advanced tertiary treatment facility that treats, recycles, and discharges wastewater for Palo Alto, Mountain View, Los Altos, Los Altos Hills, East Palo Alto Sanitary District, and Stanford University. The RWQCP has a capital improvement program (CIP) to re-invest in or replace aging infrastructure. The Wastewater Treatment Fund infrastructure is owned by Palo Alto and supported by its partner agencies. The Plant's core infrastructure was built in 1972 with tanks, pumps, large pipes, industrial buildings, acquisition of additional land, and complex mechanical and electrical systems. The Plant has had ongoing capital improvements from major works to minor projects to protect the environment and public health. Capital improvements are driven by new regulations and guided by Long Range Facilities Plans in 1965 and in 2012. On minor capital work, staff has managed an ongoing \$1.9 to \$3.7 million annual CIP reinvestment in aging infrastructure funded on a recurring basis through the partner agreements; the recurring capital budget has been increased by an annual inflation index first

approved by partner agencies in 1998. Key projects are listed in Table 1 with major debt financed/grant funded projects in 1972, 1980, 1984, 1988, 1999, 2009, 2010, 2019, and 2023. Debt service for larger projects financed through loans or bonds is provided through amendments to the partner agreements. Typical useful life of Plant infrastructure is 30 years for mechanical and electrical gear, with portions of the Plant still at or beyond its useful life. The capital program is a critical commitment to replace and improve aging systems for reliable wastewater treatment.

Table 1: Completed Capital Work 1972 – 2023		
Project	Funding	Expense (million \$)
1972 Regional Water Quality Control Plant	Federal Grants/Bonds	\$11.2
1980 Advanced Wastewater Treatment Facility	Federal Grants/Operating	\$10.3
1984 Dewatering and Cogeneration Project	Utility Revenue Bond	\$1.1
1988 Capacity Expansion Project	Utility Revenue Bond	\$9.7
1984 – 1998 Miscellaneous Projects (Notes 1, 2)	Recurring Capital Budget	\$7.8
1999 – 2023 Miscellaneous Projects (Notes 1, 3)	Recurring Capital Budget	\$53.4
1999 Sludge Incinerator Rehabilitation	Utility Revenue Bond	\$7.5
2009 Recycled Water Pipeline	California SRF Loan, Note 4	\$19.4
2010 Ultraviolet Disinfection Facility	California SRF Loan	\$8.6
2019 Sludge Dewatering/Truck Loadout Facility	California SRF Loan	\$29.2
2023 Primary Tank Rehabilitation (Note 5)	California SRF Loan	\$19.4
	Subtotal	\$178
<p>Note 1: Per audited financial statements</p> <p>Note 2: CIP could not exceed 2% of total capital investment of Plant 10/10/68 to 6/30/99</p> <p>Note 3: Recurring CIP allowance of \$1.9 million established in base year FY99; annual consumer price index (CPI) increase of recurring amount increased to \$3.7 million in FY24</p> <p>Note 4: State Water Resources Control Board Clean Water State Revolving Fund (SRF) Program</p> <p>Note 5: Completion scheduled for December 2023</p>		

DISCUSSION

Capital Improvement Updates

The RWQCP's 2012 Long Range Facilities Plan¹ (LRFP) identifies projects that are needed to rebuild and revitalize the facility, with recommended projects expected to cost between \$315 to \$392 million (2015 dollars). The LRFP was accepted by the City Council on July 2, 2012 (SR# 2914²), and staff have been working on implementing the CIP program. Implementation of the LRFP is

¹ Carollo Engineers. Long Range Facilities Plan for the Regional Water Quality Control Plant. 2012.

<https://www.cityofpaloalto.org/files/assets/public/public-works/water-quality-control-plant/lrfp-final-report-08-2012.pdf>. Web. 5/1/2023

² Palo Alto City Council, July 2, 2012; Agenda Item #7; SR# 2914,

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2012/id-2914.pdf>

managed by a CIP team of staff engineers, support staff, and a program manager consultant (Woodard & Curran) (see SR# 11612³). Table 2 provides a summary of projects currently in the planning, design, or construction phases.

Table 2: Current Capital Work In-Progress			
Project	Status	Expected Funding	Expense (million \$)
Primary Sedimentation Tanks Rehabilitation and Equipment Room Electrical Upgrade (WQ-14003)	Construction	SRF Loan	\$19.4
Secondary Treatment Upgrades (WQ-19001)	Construction	SRF Loan	\$193.0
Outfall Line Construction (WQ-19000)	100% Redesign/ Re-evaluation for Future Levee Height	Debt financing	\$17.8
Advanced Water Purification System (WQ-19003)	90% Design	Valley Water \$16M USBR \$12.9M Grant SRF Loan - Mountain View / Palo Alto	\$55.9
72-Inch Joint Interceptor Sewer Rehabilitation – Phase 1 (WQ-24000) (Note 1)	90% Design	Pay-as-you-go 100%	\$6.0
Horizontal Levee Pilot (WQ-22001)	60% Design	Grants with limited local matching funds from WWT Fund	\$2.1
Headworks Facility (WQ-16002)	Consultant Proposal Evaluation	SRF Loan	\$51.7
New Laboratory and Environmental Services Building (WQ-14002)	Planning in LRFP Update	Debt financing	\$47.4
Projects in Progress (WQ-19002)	Varies	Operating Capital Budget	\$12.5
		Total	\$406

Long Range Facilities Plan (LRFP) Update

An LRFP provides guidance on capital facility upgrades and includes load and flow projections, analysis of key issues related to capital improvements, project recommendations, priorities, schedules, preliminary cost estimates, and other long range advanced planning such as a

³ Palo Alto City Council, December 19, 2022; Agenda Item #9 (SR# 14887) & Agenda Item #15 (SR# 14685), <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20221219/20221219pccsm-amendedtime.pdf>

preliminary facilities plan for key unit processes that consider spatial needs and opportunities to meet treatment, operations, staff, and maintenance near- and long-term needs. Staff will issue a Request for Proposal and return to Council for approval of a professional services contract to perform the LRFP Update. The work is estimated to start in late 2023 and require 30 months for completion. The scope of work includes (a) work space planning advanced to a 10% design level, (b) an update to the 2014 Biosolids Facilities Plan⁴ and 2019 Biosolids Facilities Plan Update⁵ with expected completion in 2024, (c) an evaluation of regulatory and emerging contaminant issues as they relate to capital infrastructure, (d) development of a recommended capital program and update of capital costs and scopes from the 2012 LRFP, (e) a cost-of-service analysis, and (f) a capital cost sharing methodology evaluation and recommendation for debt-serviced projects.

The 2012 LRFP's key unfinished projects are listed below. These projects will be re-evaluated and re-prioritized based on the asset age and condition assessment, updated regulatory and emerging contaminant issues, and other appropriate factors. Their associated cost will be re-estimated.

- (a) Dual Media Filter Facility overhaul;
- (b) implement Phase 2 of the Joint Intercepting Sewer Rehabilitation project by relining the remaining 74% (i.e., 6,636 of the 8,964 linear feet) of the upstream sections of the 60-inch and 72-inch diameter joint intercepting sewer;
- (c) evaluation of large diameter plant piping and potential rehabilitation or replacement;
- (d) recycled water filters, storage, and distribution pump station overhaul; and
- (e) potential ozonation or other advanced facilities for advanced treatment of emerging pollutants of concerns.

The site planning, the Biosolids Facilities Plan Update, and the development of the recommended capital improvement program tasks will all include site and workspace planning components to ensure that when future uses and needs are considered, the Plant has the available land to meet near- and long-term treatment, operations, staff, and maintenance requirements. The expense and impacts needed for future construction staging, laydown, and facility sequencing on a constrained site will be considered in a site planning analysis. In addition to considering the demolition, rehabilitation, and otherwise repurposing and optimization of existing facilities and spaces, the site planning components will also evaluate the need for real estate beyond the existing fence line. Staff is actively evaluating acquisition of adjacent real estate as a strategy to address the space needed to accommodate improvement sequencing and take advantage of current real estate market conditions. The timing of acquisition could involve some risk regarding

⁴ CH2MHill. Palo Alto Regional Water Quality Control Plant Biosolids Facility Plan. 2014. <https://www.cityofpaloalto.org/files/assets/public/public-works/environmental-compliance/water-quality/2010-rwqcp-master-planning/parwqcp-biosolids-facility-plan-final.pdf>. Web. 5/1/2023.

⁵ Woodard & Curran. Palo Alto Regional Water Quality Control Plant Biosolids Facility Plan Update. 2019. https://www.cityofpaloalto.org/files/assets/public/public-works/water-quality-control-plant/sludge-dewatering-building/finaldraft_palo_alto_bfp_update.pdf?t=47012.05. Web. 5/1/23.

potentially acquiring land in advance of completing the LRFP update; however, the timing of opportunities to acquire land from a willing seller adjacent to the RWQCP may justify immediate consideration.

Opportunities beyond the Plant’s existing property boundaries include acquisition of property contiguous to the RWQCP as well as regional partnerships. Additionally, the Biosolids Facilities Plan update will evaluate the potential for environmental technology uses on part or all of the 10-acre site (“Measure E site”) adjacent to the Plant, consistent with Measure E, and per Council direction. At the April 3, 2023 Council meeting, staff was directed to report back to Council about scope and timeline on environmental technology and facilities on a portion of the Measure E site and/or other lands. The LRFP Update will include a biosolids facilities plan update to answer these questions (e.g., an alternative evaluation of pyrolysis, anaerobic digestion, offsite treatment, etc.), including locating the biosolids technology and facilities on the plant site, the Measure E site, and/or offsite. Staff in the Community Services and Public Works Departments are coordinating on a proposal to evaluate a minimum buffer size to support a wildlife corridor connecting Renzel Marsh to the Baylands Harbor marsh through the Measure E site.

The LRFP Update will include a cost-of-service analysis, reviewing actual cost data and its relation to flow and wastewater pollutant load data (specifically, water quality; strength; or loading characteristics). As required by the USEPA, partners like Palo Alto, Mountain View, and Los Altos began using strength components in the cost of service by agreement on January 14, 1980 with an effective start date of July 1, 1980. This approach was formalized with EPASD in 1989 and Stanford and Los Altos Hills in 1986. The cost components are set at 34% flow, 22% ammonia (NH₃), 22% total suspended solids (TSS), and 22% chemical oxygen demand (COD). The allocations may be altered “based upon actual cost data derived in accordance with generally accepted accounting principles and upon agreement of all parties hereto.” The City will use the results of this task to establish the cost data per generally accepted accounting principles to potentially change the allocation of total costs to be billed on an annual basis for each of the six agencies. Staff will work with partner agencies on proposed changes and return to Council for approval of any recommended changes.

The partners agreed to fixed capacity share allocations for debt financed capital infrastructure in about April 1985 as shown below. The flow allocations (in million gallons per day) and potential new load allocations (e.g., pounds per day) will be assessed in the LRFP Update. Staff will return to Council for approval of any recommended changes.

Table 3: Maximum Flow Capacity Rights Expressed in Annual Average Flow Million Gallons Per Day						
Los Altos	Mountain View	East Palo Alto Sanitary District	Stanford University	Los Altos Hills	Palo Alto	Total
3.80	15.10	3.06	2.11	0.63	15.30	40.00

Table 4: Fixed Capacity Share of Capital Assets for Debt Service Share						
Los Altos	Mountain View	East Palo Alto Sanitary District	Stanford University	Los Altos Hills	Palo Alto	Total
9.47%	37.89%	7.64%	5.26%	1.58%	38.16%	100%

Total Wastewater Treatment Fund Forecast

The RWQCP capital program requires both the recurring CIP funding as well as debt-financed instruments for larger projects. The 10-year financial forecast is shown in Figure 1 below. Significant new annual debt service (for the above listed projects) will commence at various times over the next ten years as new capital improvements are realized, resulting in debt service to operations ratios ranging from 5% in FY 2025 to 29% in FY 2031.

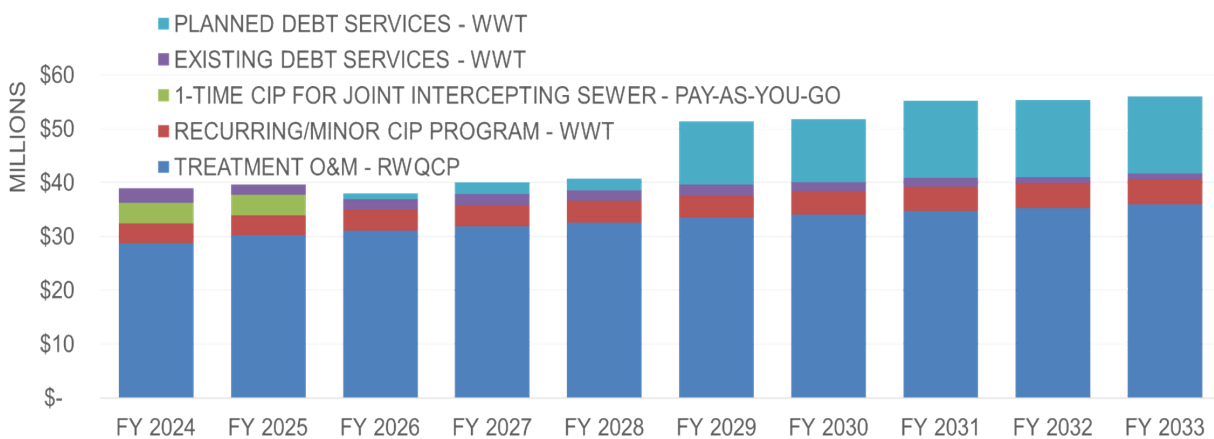


Figure 1. RWQCP Total Estimated Expenses based on Projection and Planned CIP (Forecast Date 3/14/23)

The City Council, on June 20, 2022, adopted the City's Capital Budget (SR# 14352⁶), which included the Wastewater Treatment Fund's multi-year capital expenditure plan. Included in this plan were capital improvement projects consistent with the RWQCP's LRFP. The projects include:

- 1) WQ-14002 New Laboratory and Environmental Services Building;
- 2) WQ-14003 Primary Sedimentation Tank Rehabilitation and Equipment Room Electrical Upgrades;
- 3) WQ-16002 Headworks Facility;
- 4) WQ-19000 New Outfall Line Construction;
- 5) WQ-19001 Secondary Treatment Upgrades;
- 6) WQ-19002 Plant Repair, Retrofit, and Equipment Replacement;

⁶ Palo Alto City Council, June 20, 2022; Agenda Item #28; SR# 14352.

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20220620/20220620pccsm-amended-final-final.pdf>

- 7) WQ-19003 Advanced Water Purification System;
- 8) WQ-22001 Horizontal Levee Pilot; and
- 9) WQ-24000 72-Inch Joint Intercepting Sewer Rehabilitation (Phase 1)

Attachment A provides a brief summary of the status of each project.

Capital Program Delivery Risks

Programmatic risks impacting delivery of capital projects include technical, schedule and sequence, financial, staffing, and logistical issues. Technical risks include, for example, difficulties assessing and rehabilitating infrastructure that is in operation 24/7. Furthermore, project priorities sometimes change when systems are evaluated to be at a greater risk of failure.

Cumulatively, the risks represent a significant undertaking requiring the management and support of a variety of City staff functions beyond the project team to ensure that human and financial resources are directed effectively with appropriate controls and contingencies addressed. This is an ongoing effort involving primarily Public Works, Administrative Services, Human Resources, the City Attorney's Office, and City Manager's Office who have monthly coordination meetings.

Some projects require a greater level of coordination with internal and external stakeholders. Key capital delivery stakeholders include (a) regulators (e.g., Federal Aviation Administration, Bay Area Air Quality Management District, Regional Water Quality Control Board, US Army Corps of Engineers, etc.), (b) internal City departments (e.g. financial, legal, procurement, and planning, etc.), (c) partner agencies, and (d) RWQCP neighbors (e.g., Palo Alto Airport, landfill, Baylands Nature Preserve stewards and advocates, etc.).

Financial risks and considerations to plan for include changing loan interest rates, cash flow needs and limitations to pay contractors prior to reimbursement from lenders, and the need to forecast expenses to help Palo Alto and partner agencies establish rate planning efforts. Planning for differences in costs between estimates, project budget, and bid results continue to impact the timing and financial consideration. Staff has worked to develop debt service and cashflow options for the Secondary Treatment Upgrades project (WQ-19001) and other high demands on the Wastewater Treatment Enterprise Fund cash balance which is expected to go negative at peak investment periods.

Logistical issues include coordinating multiple onsite contractors. Staging and laydown areas at the RWQCP are very limited. Temporary bypass pumping operations and detailed construction sequencing at a 24/7 operation are significant challenges for designers and onsite staff that must plan a rebuild of an aging plant while continuing to safely treat and maintain existing wastewater treatment infrastructure during construction (e.g., during the five-year long construction of the Secondary Treatment Upgrades project).

Comparison to Neighboring Agencies

The \$406 million (2023 dollars) RWQCP capital program highlighted herein is similar to neighboring wastewater treatment capital programs. These programs are also using USEPA WIFIA, State SRF programs, and revenue bonds for financing. Some neighboring agencies are shown below with the size of their capital programs.

Table 6: Comparison Agency CIP Programs		
Project	CIP Program (million, \$)	Residential Population Served
San Jose (10-year CIP for Regional Wastewater Treatment Facility)	\$1,400	1,400,000
Sunnyvale Clean Water Program	\$450	152,770
Silicon Valley Clean Water RESCU Program (Redwood City)	\$495	220,000
San Mateo Clean Water Program	\$991	140,000
Union Sanitary District Enhanced Treatment and Site Upgrade Program	\$482	356,000
Palo Alto Regional Water Quality Control Plant CIP	\$406	236,000

Resource Impact

The Public Works Department is currently seeking funding for the projects planned in the Wastewater Treatment Fund Capital Improvement Program through four primary sources:

1. State SRF loans
2. USEPA WIFIA
3. Commercial market utility revenue bonds
4. Pay-as-you-go special financing

Annual debt service payments associated with each project depend upon prevailing interest rates at the time of the loan approval and/or bond issuance, as well as the length of the repayment term. The annual debt service payments will be paid by all the Partners to the Palo Alto RWQCP and will be specified in amendments to their Agreements with Palo Alto; Palo Alto is responsible for its fixed capacity payment of 38.16% of debt financed instruments. These costs and the Palo Alto share have a direct impact on the City's Wastewater Collection Fund forecasted rates

Environmental Review

This item is not a project as defined by the California Environmental Quality Act (CEQA) because the report is provided for informational purposes only with no action required by the Council.

Individual capital improvement projects are reviewed under CEQA prior to any project approval. All capital projects are designed to comply with the City's Sea Level Rise Policy⁷. Projects, and current CEQA status, include the following:

Table 7: RWQCP CEQA Status	
Project	CEQA Status
Primary Sedimentation Tanks Rehabilitation and Equipment Room Electrical Upgrade Project	Categorically Exempt
Outfall Line Construction	Mitigated Negative Declaration
Secondary Treatment Upgrades	Categorically Exempt
Advanced Water Purification System	Environmental Impact Report
Horizontal Levee Pilot	Categorically Exempt
Joint Intercepting Sewer Rehabilitation - Phase 1	TBD
New Laboratory & Environmental Services Building	TBD
Headworks Facility Replacement	TBD
WQ-19002 Minor CIP Projects in Progress	Varies, Typically Categorically Exempt

ATTACHMENTS:

Attachment A: Wastewater Treatment Fund CIP Update – Project Status

APPROVED BY:

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⁷ City of Palo Alto. Sea Level Rise Adaptation Policy. 2019.
https://www.cityofpaloalto.org/files/assets/public/sustainability/sea-level-rise/slr-adaptation-policy_web.pdf?t=71340.78. Web. 5/1/23.