San José-Santa Clara Regional Wastewater Facility

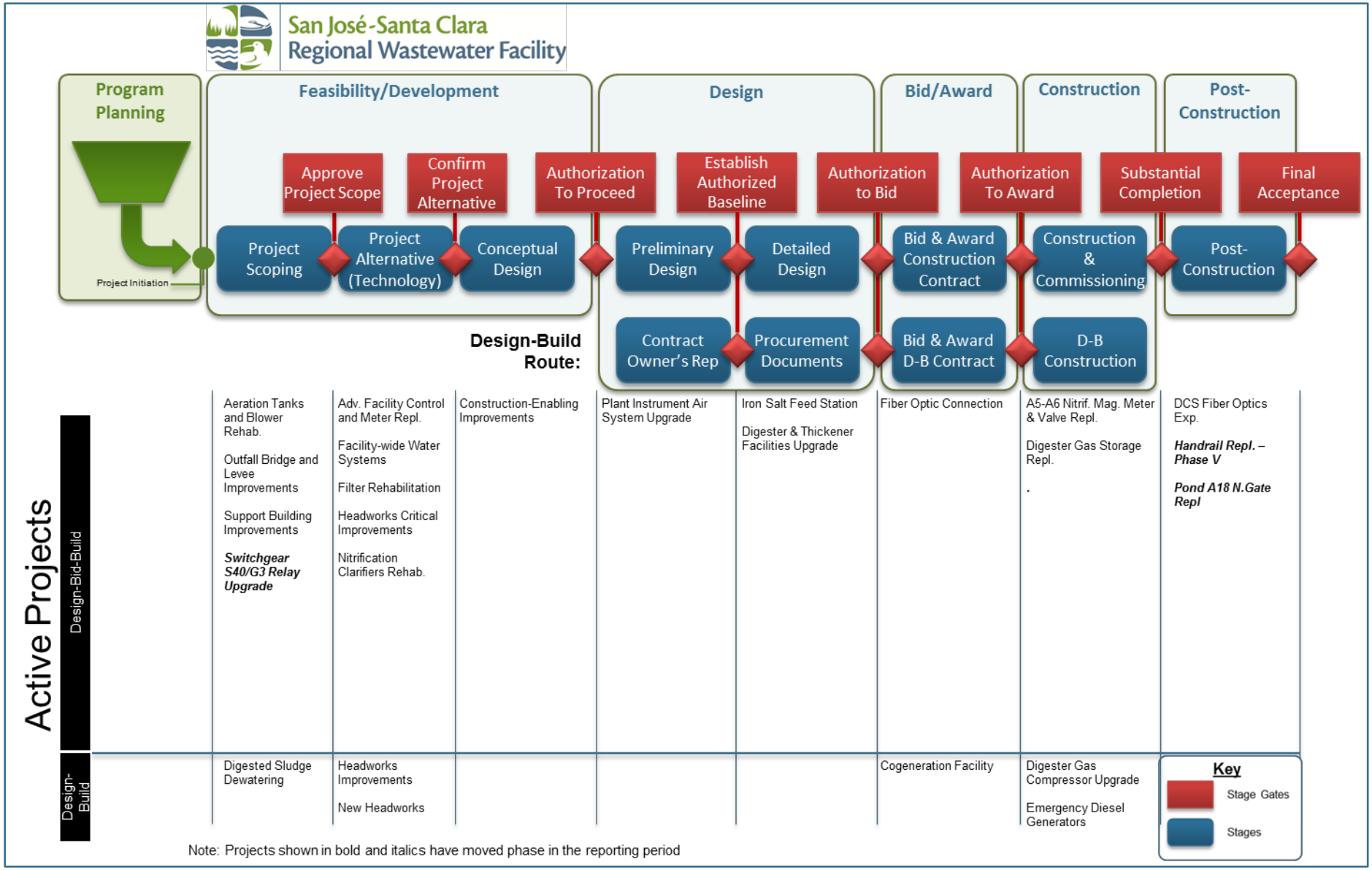
Capital Improvement Program
Monthly Status Report for August 2015

October 1, 2015

This report provides a summary of the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (Wastewater Facility or RWF) for the period of August 2015.

Report Contents

Project Delivery Model



Program Summary

August 2015

The CIP received the 2015 organizational excellence award this month from the California Association of Sanitation Agencies (CASA) for its work on the startup and validation stage of the program.

The CIP progressed on multiple fronts and met a number of key procurement milestones. Staff advertised a Request for Qualifications (RFQ) for General Engineering Services. The City anticipates awarding up to three as-needed engineering services master agreements for programmatic studies and small, urgent and unscheduled capital projects not identified in the current CIP. City Council awarded a Technical Support Services consultant agreement, for the Cogeneration Facility Project, to Black and Veatch. Two construction bids were received for the Fiber Optic Connection Project. The contract award is scheduled for Treatment Plant Advisory Committee (TPAC) and City Council consideration in November. CIP staff received Statements of Qualifications (SOQs) from two firms for the Facility-wide Water Systems Improvements Project and began technical evaluation of the documents. Negotiations with the selected consultants for the Headworks and Filter Rehabilitation projects also commenced this month and CIP staff expects to recommend approval of the agreements to TPAC and City Council in November.

The Odor and Corrosion Control Study (Odor Study) for the RWF was completed this month. In December 2014, Council approved the Odor Control Strategy for the RWF and adopted an odor goal and odor fence line. The final component of the Odor Study – an Odor Control Implementation Plan – will be presented to Transportation & Environment Committee (T&E) and TPAC in October and City Council in November.

The Iron Salt Feed Station Project reached the 100 percent design milestone this month and the project also received final CEQA clearance. The project is scheduled to advertise for bid in September 2015. Work also continued on the Digester and Thickener Facilities Upgrade Project to resolve outstanding design issues and complete both the prequalification documents and the Clean Water State Revolving Fund (SRF) application.

Emergency replacement of the Pond A-18 northern gate structure was completed this month. The entire project was successfully initiated, designed and constructed within six months. The Handrail Replacement - Phase V Project achieved Beneficial Use and the Training Trailer Replacement Project was accepted this month. Construction continued at the RWF for a number of CIP projects including the Emergency Diesel Generators, Digester Gas Compressor Upgrade, and Digester Gas Storage Replacement.

Look Ahead

In September, staff will continue to move forward on numerous efforts related to consultant and design-build procurements for CIP projects including the Cogeneration Facility, Headworks Improvements, New Headworks, Facility-wide Water Systems Improvements, Filter Rehabilitation and the Nitrification Clarifiers Rehabilitation. Procurements for a number of programmatic services will also be developed including Value Engineering and Peer Review Services, System Integration Services, Construction Management Services, and Audit Services.

In particular, an RFQ for engineering services for the Nitrification Clarifiers Rehabilitation Project will be advertised and the contractor prequalification document for the Digester and Thickener Facilities Upgrade Project will be issued.

Four projects will seek to advance through stage gates including the Iron Salt Feed Station Project (Authorization To Bid), Construction-Enabling Improvements Project (Authorization To Proceed), Digested Sludge Dewatering Facility Project and Aeration Tanks and Blower Rehabilitation Project (both Approve Project Scope).

The Digester and Thickener Facilities Upgrade Project will reach the 90 percent design milestone and the Plant Instrument Air System Upgrade Project will reach the 50 percent design milestone.

Formal project management training for all CIP project managers and project engineers will continue in September with sessions on project budgeting, estimating, monitoring, and control, as well as biological permitting.

Program Highlight – Operations & Maintenance (O&M) Staff Engagement Plan

Wastewater Facility O&M staff, responsible for operating and maintaining the Facility on a daily basis, are an integral component of the CIP as participants, contributors and primary customers. The CIP O&M project team is made up of subject matter experts (SMEs) who provide professional guidance for project-related areas, such as power production or wastewater disinfection. In order to coordinate between SMEs, a Lead SME (LSME) role has been designated on each project. The LSMEs and SMEs serve on the CIP O&M project team to streamline information sharing and project coordination between O&M personnel and project staff. From a project's initiation, O&M staff work closely with the project manager (PM) to ensure that timely O&M input is obtained at appropriate times as the project follows the Project Delivery Model (PDM) through to completion.

The O&M Staff Engagement Plan establishes guidelines for SME involvement within each CIP project and serves as an important tool used to obtain O&M input to program delivery. It also helps the O&M project team coordination with other key CIP project participants (See Figure 1). The O&M project team may include one or more O&M SMEs, depending on the size and complexity of the project, with an O&M project team for a large, complex project consisting of an LSME and a number of SMEs, with each representing an O&M-related function. This team will work with a particular PM whereby the SME represents O&M's interests and responds to requests from the PM, which could include attending project meetings, reviewing drawings and specifications, and communicating concerns, problems, and issues within each phase of a project. SMEs also work closely with CIP engineering and consultants. To provide additional guidance, an Oversight Division Manager (ODM) is assigned to each project to monitor the performance of the O&M project teams.

The O&M Staff Engagement Plan manages and guides O&M's actions and activities through a series of directives, procedures, and other documentation. The plan consists of five distinct activity sets:

- Roles and Responsibilities – the different roles, responsibilities and reporting for O&M staff involved with the CIP's implementation
- Participant Directives – covers the procedural elements and documentation relative to O&M staff engagement
- O&M Input Model – provides a summary of the different sources for review and input generated during project delivery
- Project Input – the methodology for obtaining O&M input during the project, and specifically for the review and comment on submittals
- Continuity and Oversight – summarizes the means for providing continuity across projects and across the plant relative to input

O&M staff receive specific training about the CIP and Staff Engagement Plan to ensure that all O&M contributions to CIP studies and projects are successful. Over the past 18 months, approximately 40 O&M project team members have provided valuable and varied contributions to CIP studies and projects.

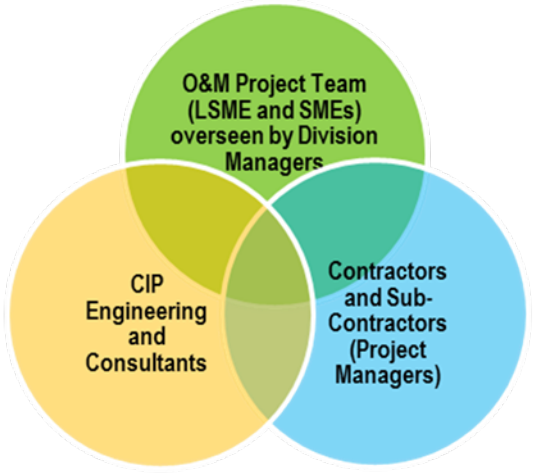


Figure 1 – The Staff Engagement Plan outlines O&M engagement with other CIP participants

Program Performance Summary

Eight key performance indicators (KPIs) have been established to measure the overall success of the CIP. Each KPI represents a metric which will be monitored on a regular frequency. Through the life of the CIP, KPIs will be selected and measured which best reflect the current maturity of the program. An additional KPI has been added for FY15-16 to measure project stage gate compliance.

Program Key Performance Indicators – Fiscal Year 2015-2016

KPI	Target	Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	80%	100% (2/2)			100% (28/28)		
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate. Criteria: Red: < 70%; Amber: 70% to 80%; Green: >=80%							
Schedule	85%	67% (2/3)[1]			40% (2/5)[2]		
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone. Criteria: Red: < 75%; Amber: 75% to 85%; Green: >=85%							
Budget	90%	100% (2/2)[3]			86% (6/7)[4]		
Measurement: Percentage of CIP projects that are completed within the approved baseline budget. Criteria: Red: < 80%; Amber: 80% to 89%; Green: >=90%							
Expenditure[5]	$154M	68M			$190M[6]		
Measurement: CIP Fiscal Year 15/16 committed costs. Committed cost meets or exceeds 70% of planned Budget (70% of $220M = $154M							
Procurement	80%	100% (3/3)[7]			100% (17/17)		
Measurement: Number of consultant and contractor procurements for initiated projects and program-wide services advertised compared to planned for the fiscal year. Criteria: Red: < 70%; Amber: 70% to 79%; Green: >=80%							
Safety	0	0			0		
Measurement: Number of OSHA reportable incidents associated with CIP construction for the fiscal year. Criteria: Red: > 2; Amber: 1 to 2; Green: zero incidents							
Environmental	0	0			0		
Measurement: Number of permit violations caused by CIP construction for the fiscal year. Criteria: Red: > 2; Amber: 1 to 2; Green: zero incidents							
Staffing[8]	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Measurement: Number of planned positions filled for the fiscal year. Criteria: Red: < 70%; Amber: 70% to 79%; Green: >=80%							

Notes

1. For the Schedule KPI Year to Date, the number of completed projects increased from one to three. Pond A18 Northern Gate Replacement project and Handrail Replacement – Phase V project achieved Beneficial Use in August 2015. However, since the Handrail Replacement project was delayed by 275 days, it did not meet the schedule KPI pass criteria resulting in a red indicator.
2. For the Schedule KPI Fiscal Year End (FYE), the total forecasted number of FYE completed projects being measured decreased from six to five and the number of forecast completed projects decreased from six to two compared to last month.
3. For the Budget KPI Year to Date, two out of two projects were completed within the approved baseline budget. These two projects are Fire Main replacement – Phase III project, which was accepted in July 2015 and Training Trailer Replacement project, which was accepted in August 2015.
4. For the Budget KPI FYE, the forecasted number of completed projects within the approved baseline budget decreased from seven to six.
5. FY15-16 budget excludes reserves, ending fund balance, South Bay Water Recycling, Public Art and Urgent and Unscheduled Rehabilitation items.
6. The FYE Forecast Expenditure value has been updated following finalization of anticipated expenses and encumbrances.
7. For the Procurement KPI Year to Date, the number of procurements increased from two to three. Program-wide General Engineering Services was advertised in August 2015.
8. Staffing level KPI measured quarterly; all other KPIs measured monthly.

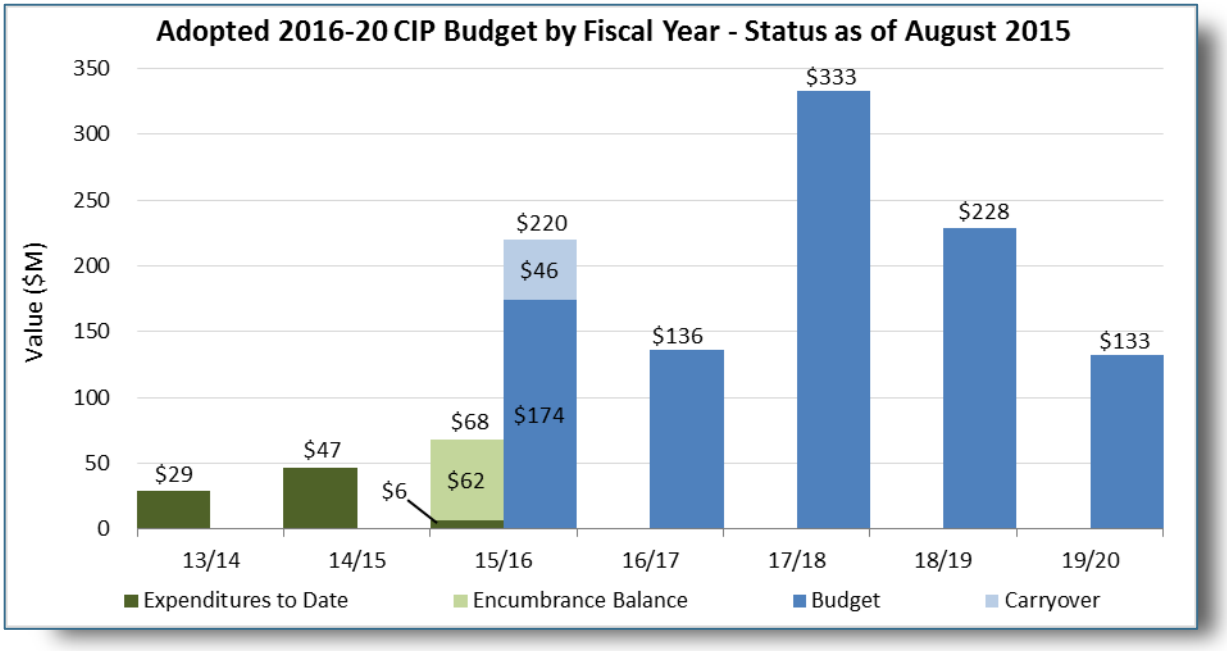
.

Program Cost Performance

This section provides a summary of CIP cost performance for all construction projects and non-construction activities for FY15-16 and the 2016-2020 CIP.

Adopted 2016-2020 CIP Expenditure and Encumbrances

To accommodate the proposed increase in expenditures and encumbrances over the next five years, the City is implementing a long-term financial strategy to fund the needed, major capital improvements while minimizing the impact to ratepayers. FY 13-14 and FY14-5 expenditures have been adjusted to reflect the CIP portion of the 512 funding, excluding South Bay Water and Urgent and Unscheduled Cost ($2.6M and $1.5M respectively).



Notes

Expenditure: Actual cost expended, either by check to a vendor or through the City's Financial System for expense such as Payroll or non-personal expenses that do not require a contract.

Encumbrance: Financial commitments, such as purchase orders or contracts, which are committed to a vendor, consultant, or contractor. The encumbrance reserves the funding within the appropriation and project.

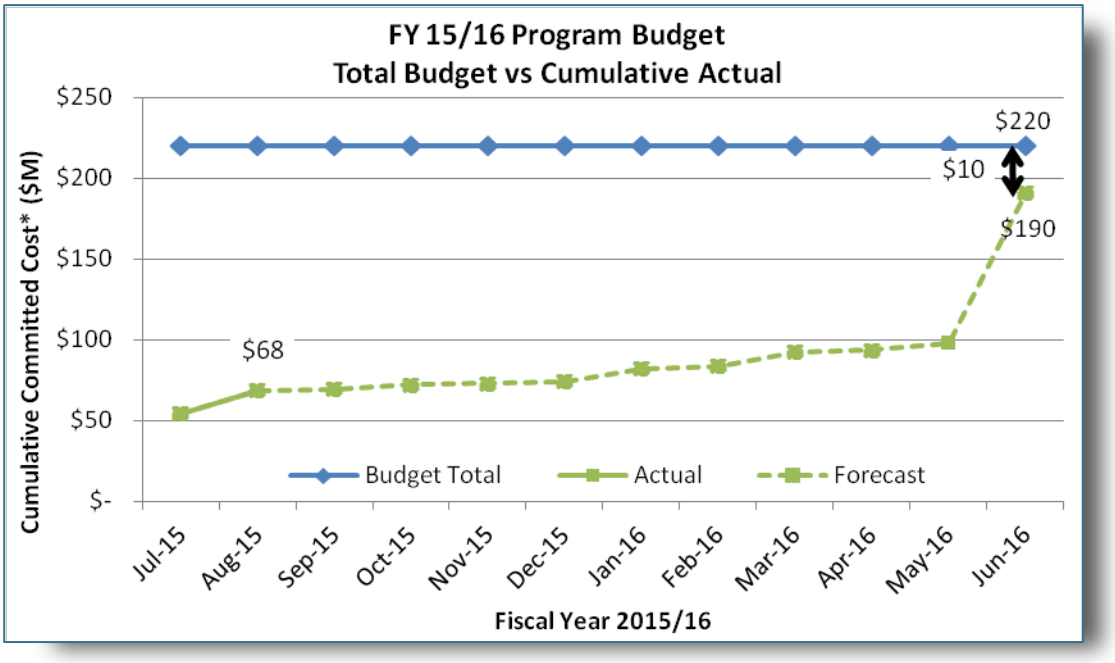
Encumbrance Balance: The amount of the remaining encumbrance committed after payments.

Budget: Adopted FY 2016-2020 Budget. This is new funding plus rebudgeted funds.

Carryover: Encumbrance Balances at the end of a FY become Carryover Funding. This is different from rebudgets, in that this is done automatically in order to utilize the funding previously committed, but not yet paid.

Fiscal Year 2015-2016 Program Budget Performance

The fiscal year program budget is $220 million. The budget amount of $220 million represents the 2015-2016 budget of $174 million plus carryover of $46 million. The budget amount excludes Reserves, Ending Fund Balance, South Bay Water Recycling, Public Art, and Urgent and Unscheduled Rehabilitation items.



*Committed costs are expenditures and encumbrance balances, including carryover (encumbrance balances from the previous fiscal year).

Project Performance

There are currently seven active projects in the construction or post-construction phase with a further 18 projects in feasibility/development, design or bid and award phases (see PDM graphic at the front of this report). All active projects are listed in the tables below. Projects in the construction phase have cost and schedule baselines established and are monitored using the City's Capital Project Management System (CPMS). These projects have green/red icons included in the table below to indicate whether they are on budget and schedule using the CPMS data as a source.

Project Performance – Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]	Cost Performance[2]	Schedule Performance[2]
Distributed Control System (DCS) Fiber Optics Network Expansion	Post-Construction	May 2014[3]	●	●
Handrail Replacement - Phase V	Post-Construction	Aug 2015[3]	●	◆
Pond A18 Northern Gate Structure	Post-Construction	Aug 2015[3]	●	●
Digester Gas Storage Replacement	Construction	Oct 2015	●	◆
A5-A6 Nitrification Mag. Meter & Valve Replacement	Construction	Mar 2016	◆	◆
Emergency Diesel Generators	Construction	Aug 2016	●	●
Digester Gas Compressor Upgrade	Construction	Sep 2016	●	◆

KEY:

Cost:	● **On Budget**	◆ **>1% Over Budget**
Schedule:	● **On Schedule**	◆ **>2 months delay**

Notes

1. Beneficial Use is defined as when the work is sufficiently complete, in accordance with the contract documents, so that the City can occupy or use the work. Beneficial use dates are being reviewed as part of project schedule reviews.
2. An explanation of cost and schedule variances on specific projects identified in this table is provided on page 12.
3. Actual Beneficial Use Date

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
Fiber Optic Connection	Bid & Award	Jul 2016
Cogeneration Facility	Procurement	Feb 2019
Iron Salt Feed Station	Design	Mar 2017
Plant Instrument Air System Upgrade	Design	Jan 2018
Digester & Thickener Facilities Upgrade	Design	Oct 2018
Construction-Enabling Improvements	Feasibility/Development	Oct 2016
Headworks Critical Improvements	Feasibility/Development	Apr 2017
Switchgear S40/G3 Relay Upgrade	Feasibility/Development	Oct 2019
Adv. Facility Control & Meter Replacement	Feasibility/Development	May 2020
Headworks Improvements	Feasibility/Development	Mar 2021
Outfall Bridge and Levee Improvements	Feasibility/Development	May 2021
Facility-wide Water Systems Improvements	Feasibility/Development	Sep 2021
Digested Sludge Dewatering Facility	Feasibility/Development	Dec 2021
Filter Rehabilitation	Feasibility/Development	Jan 2022
New Headworks	Feasibility/Development	Jun 2022
Nitrification Clarifiers Rehabilitation	Feasibility/Development	Aug 2022
Aeration Tanks and Blower Rehabilitation	Feasibility/Development	Nov 2023
Support Building Improvements	Feasibility/Development	Jan 2027

Notes

1. Beneficial Use is defined as when the work is sufficiently complete, in accordance with the contract documents, so that the City can occupy or use the work. Beneficial use dates are being reviewed as part of project schedule reviews.

Significant Accomplishments

Biosolids Package

Digester and Thickener Facilities Upgrade

The detailed design of the digesters and dissolved air flotation tanks (DAFT) continued this month. Brown and Caldwell are currently working on the 90 percent completion level design documents. Design highlights include:

- The SRF technical package was finalized this month and submitted to the State for review.
- The project team continued to prepare the prequalification document for pre-selection of qualified construction contractors. It is anticipated this document will be issued in mid-September.
- The project team attended two meetings with City and consultant staff to review the digester gas piping routing through the Secondary Blower Building. This design change will save construction costs and eliminate access restrictions to existing pipes and valves.

Facilities Package

Cogeneration Facility

In August, the City awarded the Technical Support Services consultant agreement to Black and Veatch. Design-build proposals are due in early September.

Facility-wide Water System Improvements

The City received SOQs from two firms. Evaluations are underway and interviews are planned for September.

Pond A18 Northern Gate Structure

Significant work occurred on this project and the gate valves were returned to full operation on August 21st. The project achieved Beneficial Use on August 31.

Fiber Optic Connection Project

This project will provide the final fiber optic link between the RWF and the rest of the City's communications network. The project was advertised and bids were opened in early August. Two bids were received and Staff is preparing the Council memorandum to recommend award of the contract in November.

Liquids Package

Filter Rehabilitation

Negotiations are underway with the consultant selected to provide engineering services for the project. Staff anticipates that the agreement will be recommended to TPAC and City Council for approval in November.

Headworks Improvements and New Headworks

Negotiations are underway with the consultant selected to provide owner's representative and construction management services for the project. Staff anticipates that the agreement will be recommended to TPAC and City Council for approval in November.

Iron Salt Feed Station

CH2M Hill submitted the 100 percent design and cost estimate on August 19th. Staff received final approval on CEQA documents on August 20th. Pending the stage gate approval on September 3rd, the bid documents are expected to be finalized in September.

Programmatic Studies

Automation Master Plan and Process Control Approach

The Future Requirements Final Technical Memorandum (TM) was completed on August 30th. The Control Systems Standards Draft TM was delivered August 12th and a review workshop was held August 31st. A review workshop will be held for the Implementation Plan on September 21st.

Flood Protection study

The Stormwater Model Workshop was held on August 17th. Staff received a draft Stormwater Drainage Model for review. The initial flood protection system concepts were received on August 18th.

Odor and Corrosion Control study

The final report was received and staff is currently preparing to present the Odor Control Implementation Plan to T&E and TPAC in October and City Council in November.

Traffic Circulation and Impacts

The Final Traffic Control Plan Guidelines were received on August 17th. The preliminary draft of the Traffic Management Plan was received on August 21st. Results from the study revealed the need to coordinate with adjacent planned developments and Department of Transportation (DOT) bicycle user designations. The bicycle user designations will require future installation of signage for external bicyclist traffic and internal construction truck traffic.

Power and Energy

Digester Gas Compressor Upgrade

The new Gas Compressor Building floors have been completed and the design-builder continues to install underground conduits and piping in the cooling tower and chiller area. All equipment and material for the project have been approved and ordered.

Emergency Diesel Generators

The project received its Authority to Construct from the Bay Area Air Quality Management District (BAAQMD). Designers anticipated certain types of emissions filters that are not required under the ATCs. This could result in significant project cost savings. Staff and the design-builder are evaluating the potential impacts.

Explanation of Project Performance Issues

A5-A6 Nitrification Magnetic Meter & Valve Replacement

In September 2014, during startup, the project team discovered that the actuators that had been specified and installed were incompatible with the available power supply. Engineering staff determined it would be cost more to modify the electrical system than to order and install compatible actuators. In addition, O&M staff requested that the actuators match the custom actuators used in the other 14 clarifiers. The City pursued various options to resolve the issue and has recently requested a proposal from the contractor to install new actuators based on a revised specification. The existing funding will not likely be sufficient and the project will need Council approval for additional funds. If TPAC and Council approve the Construction Change Order (CCO), there will be a 14-16 weeks lead time for ordering custom-built actuators. Contractor mobilization, actuator installation, wiring, troubleshooting and punch list-sign off will take a minimal of three weeks. Beneficial use is expected by March 2016.

Handrail Replacement - Phase V

The Aeration Basin 1 handrail replacement material submittal and review process extended into the wet weather season, when several of the secondary aeration tanks are required for process capacity. Typically, aeration basin repairs cannot occur prior to April 15th because the rainy season requires that basins remain available in the event of heavy rains. Work had originally been planned to commence in May after the rainy season ended and the basin could be drained for safety reasons, but was further delayed until June due to additional work occurring in the basin at that time. With the handrail replacement, which requires a side-mounted installation from inside of the tanks, the contractor had to not only wait for the tank to be drained but was further delayed because of maintenance repairs to diffusers that also needed to take place in May and which subsequently made the project site unavailable to the contractor. Furthermore, RWF Maintenance has made much-needed mechanical repairs to three of the aeration tanks (B1, B2, and B3). Handrail replacement work resumed in early August and Beneficial Use was reached on August 31.

Digester Gas Compressor Upgrade

During the course of the design portion of this design build project, it was determined that some of the equipment for this project would need to meet the explosion-proof classification of Class 1, Division 1 of the National Electric Code. This classification was more stringent than what was originally called for in the bid documents. Cost and schedule impacts were received from contractor, Anderson Pacific. Council approved additional project funding and a three month time extension due to motor upgrade during its June 16, 2015 session. Beneficial Use is expected by September 2016.

Digester Gas Storage Replacement

During a comprehensive review of the gas storage tank design submittal by the design consultant, Brown and Caldwell, it was identified that the removable piston legs used in the proposed design by the sub-contractor did not meet the design standards and would have caused problems in the intended use of the tank. As a result, the sub-contractor re-designed the tank with permanent piston legs with a subsequent delay in mobilization until the re-design of the tank was reviewed and approved. The re-design was subsequently completed and has been approved. There were several leak tests performed on the gas holder to ensure gas tightness of the tank. Leakage test results have been submitted and the gas storage tank has passed the required leakage test. O&M submitted a list of desired modifications that is under evaluation. Some of these items on this list will require welding and/or drilling. All welding or spark producing work must be completed prior to filling the tank with gas for safety reason. The contractor is in a process of submitting a revised schedule along with costs associated with these modifications. Despite the project schedule delay, the construction cost has minimally impacted. Beneficial Use is expected by October 2015.

Project Profile

Filter Rehabilitation

The RWF currently has a Tertiary Filtration Unit Process (Process) which consists of 16 granular media filters and associated ancillary equipment. The filtration process is one of the final treatment steps and responsible for producing effluent in compliance with the RWF's discharge permit, as well as recycled water in compliance with Title 22 requirements. The process has a design capacity of 167 million gallons per day ("MGD") and a peak capacity in wet weather of 271 MGD. The filtration process has recently been operating at an annual average flow rate of 110 MGD, and produces approximately 10 MGD of Title 22 compliant effluent (after disinfection) which flows to the South Bay Water Recycling Program ("SBWR") for distribution. The remaining flow is discharged to the San Francisco Bay by way of the Artesian Slough.

The filters, built in the 1970s and 1980s, are nearing the end of their useful life and require significant refurbishment. These improvements are needed to ensure continued regulatory compliance and operational reliability. In March 2015, a "Tertiary Filtration Technology Evaluation" was completed by Carollo Engineers. This study included a fatal flaw analysis to screen preliminary options. The fatal flaw analysis recommended pilot testing of alternative technologies. However, in order to refine the cost of retrofitting the existing granular medium filters and the process components, a more detailed condition assessment of the RWF's existing granular medium filters is required This assessment will also provide better information on an approach to resolving the current deficiencies associated with the filtration process. In particular, the filter media (consisting of anthracite and sand), needs to be replaced and some of the mechanical and electrical components need to be upgraded.

The objective of the project is to perform a detailed evaluation of the process, in order to make recommendations for both short-term and long-term improvements. Specifically, this project will evaluate improvement options to mitigate identified deficiencies and provide reliable filtration for the short-term while the long-term filter facility is undergoing planning and construction.

The following filter components will be inspected as part of the scope of the project to determine the extent of repair/replacement:

- Filter media, and potentially under drain systems
- Valves
- Electrical control
- Air scouring equipment and piping additions
- Concrete repairs

Contract negotiations are underway for a design consultant and an agreement is anticipated to be approved by the end of 2015. The engineering design will commence once a consultant is in place. The project budget is $34 million.

Figure 2 – Aerial View of Filter Unit Process, SJ-SCRWF

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

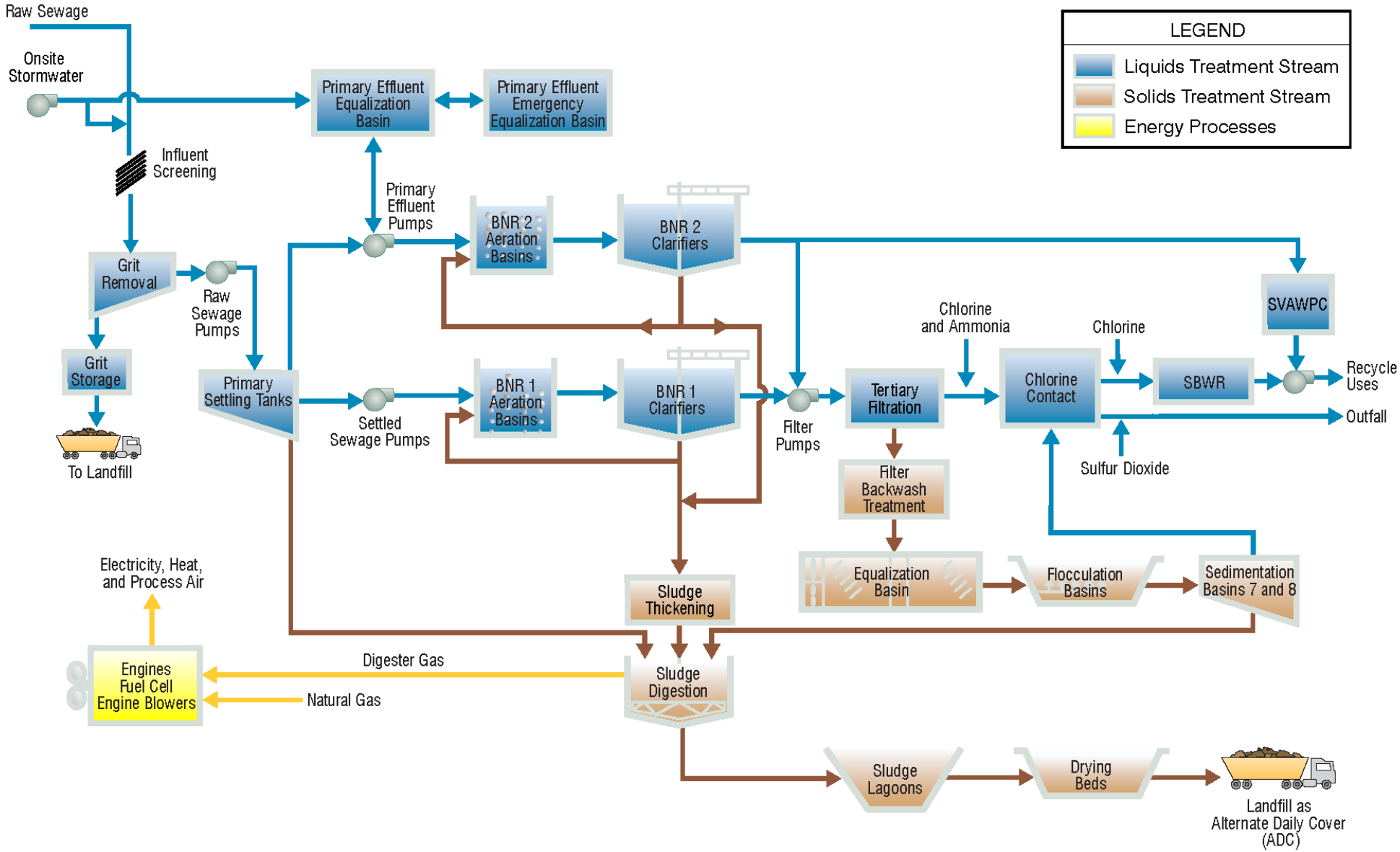


Figure 3 — Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

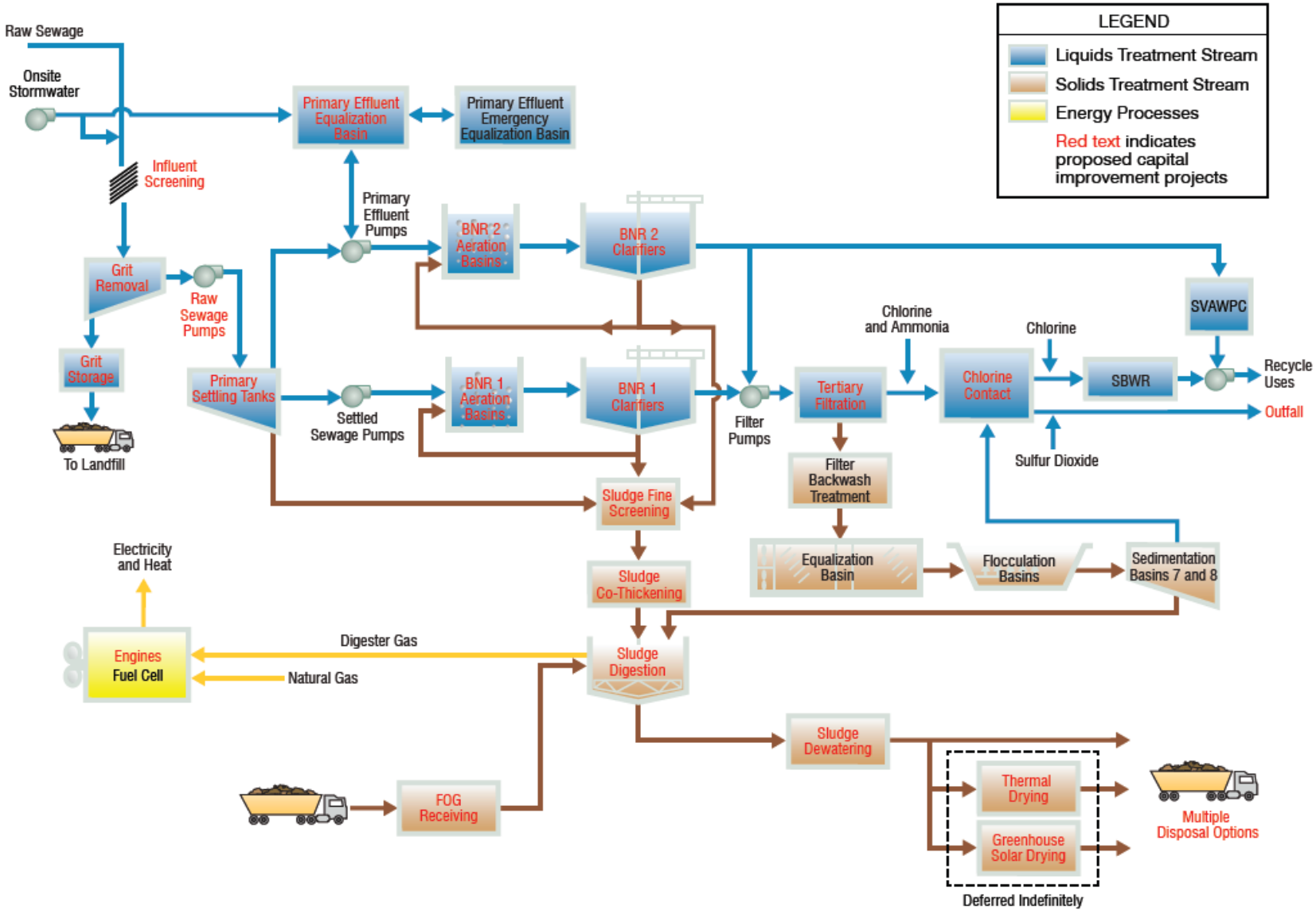


Figure 4 — Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

Figure 5—Active Construction Projects