San José-Santa Clara Regional Wastewater Facility

Capital Improvement Program
Monthly Status Report: October 2016

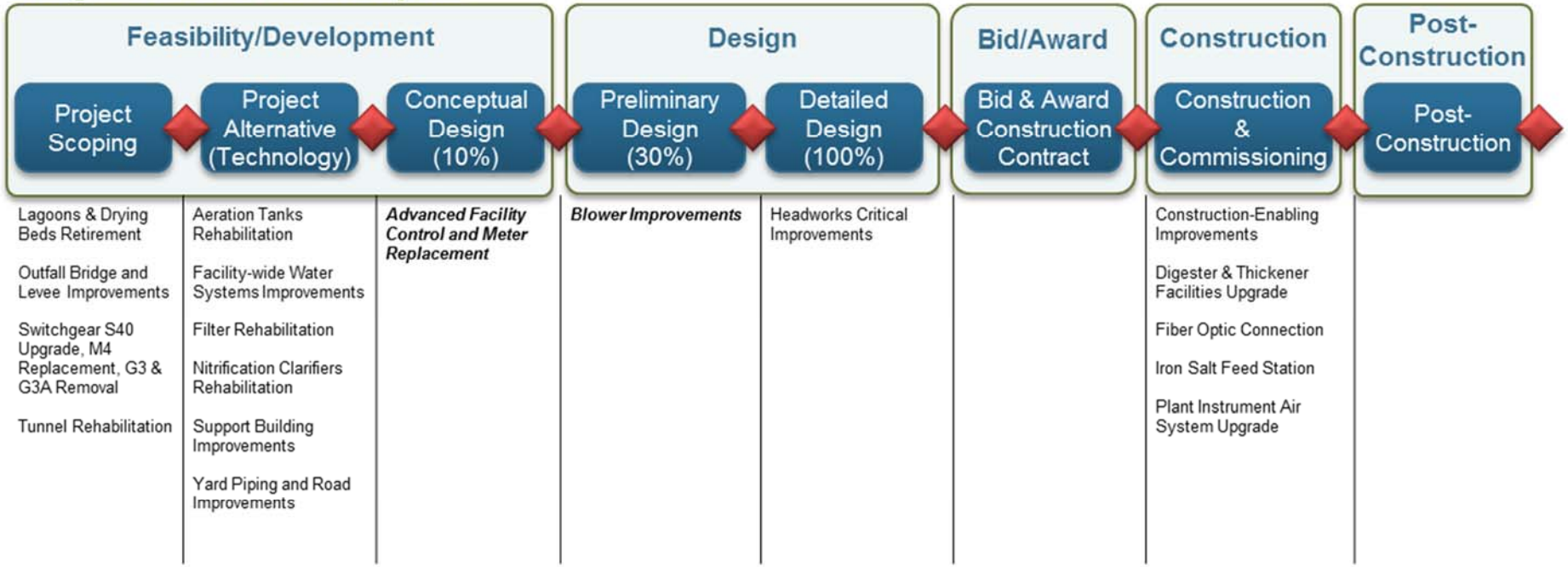
December 1, 2016

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for October 2016.

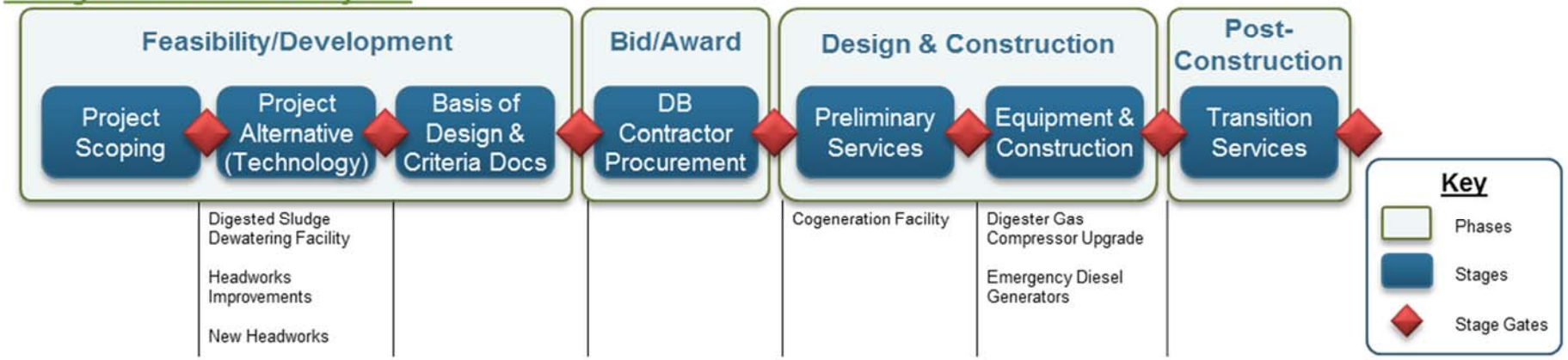
Report Contents

Project Delivery Model

Design-Bid-Build Active Projects



Design-Build Active Projects



*Projects shown in ***bold and italics*** have advanced this reporting period

Program Summary

October 2016

In October, the CIP progressed on multiple fronts, including advancing two projects through the Project Delivery Model (PDM) stage gate process: the Blower Improvements Project (Authorization to Proceed), and the Headworks Critical Improvements Project (Authorization to Bid).

In additional developments, CIP staff:

- Presented recommendations to the Treatment Plant Advisory Committee (TPAC) and City Council (Council) to award Brown and Caldwell a master consultant agreement (MCA) to provide Owner's Advisor engineering services for the Digested Sludge Dewatering Project; and accept the January-June 2016 CIP Semi-annual Status Report. Both recommendations were approved.
- Advertised a Request for Qualifications (RFQ) for firms interested in providing programwide industrial hygienist services for the RWF. The scope of these services includes assessing existing conditions and testing for hazardous materials; providing field testing services; preparing construction specifications, remediation, and compliance plans that will satisfy the state's Division of Occupational Safety and Health requirements and all other applicable codes and standards; and monitoring as necessary during CIP Project construction.

Design work was completed on the Headworks Critical Improvements Project this month. The Cogeneration Facility Design-Build Project continued to progress through preliminary design work stages. Staff will recommend a preferred engine and gas purification early works package in November. Conceptual design and alternatives analysis work continued on the Headworks Improvements, New Headworks, Filter Rehabilitation, and Nitrification Clarifier Rehabilitation projects. The Conceptual Design Report was completed for the Blower Improvements Project; detailed design work will commence on the project next month. Condition assessment work progressed on the Filter Rehabilitation and Nitrification Clarifier Rehabilitation projects. Both projects will complete condition assessment activities next month, and then will begin alternative analysis and conceptual design tasks. Service orders negotiations for the Advanced Facility Control and Meter Replacement Project were completed this month. Condition assessment work will commence in November.

Construction work continued at the RWF on the Emergency Diesel Generators, Digester Gas Compressor Upgrade, Iron Salt Feed Station, Fiber Optic Connection, Construction-Enabling Improvements, and Digester and Thickener Facilities Upgrade projects. Staff carried out a number of major process shutdowns to isolate sections of the RWF and allow construction to progress for the Digester and Thickener Facilities Upgrade Project. These shutdowns revealed major damage to a critical, 78-inch effluent pipeline. Further investigations are ongoing to evaluate necessary repairs and design modifications. Pre-construction activities also commenced on the Plant Instrument Air System Upgrade Project this month.

Look Ahead

In November, CIP project teams and associated design consultants will move forward with design, condition assessment, and alternatives analysis work for the Headworks Improvements, New Headworks, Cogeneration Facility, Filter Rehabilitation, Blower Improvements, Nitrification Clarifiers Rehabilitation, and Advanced Facility Control and Meter Replacement projects. The Headworks Critical Improvements Project will be advertised for construction in November. Applications and discussions with the State Water Resources Control Board relating to Clean Water State Revolving Fund (SRF) funding for the Digester and Thickener Facilities Upgrade and Cogeneration Facility projects will also continue.

Staff will continue with efforts related to consultant procurements and service orders, including for the Aeration Tanks Rehabilitation, Facility-wide Water Systems Improvement, Switchgear S40 Upgrade, M4 Replacement, G3 and G3A Removal, Digested Sludge Dewatering Facility, Support Building Improvements, and Yard Piping and Road Improvements projects. An RFQ for Owner's Advisor services for the Yard Piping and Road Improvements Project will also be advertised in December. In January 2017, staff will recommend that TPAC and Council award an engineering services MCA for the Support Buildings Improvement Project.

Construction activities will continue on the Emergency Diesel Generators, Digester Gas Compressor Upgrade, Iron Salt Feed Station, Fiber Optic Connection, Digester and Thickener Facilities Upgrade, Construction-Enabling Improvement, and Plant Instrument Air System Upgrade projects.

Program Highlight – Condition Assessment Procedure

An essential element in the ongoing effort to rebuild the aging RWF is condition assessment. RWF treatment processes and support facilities date from the early 1960s and are in varying states of operability due to intensity of use, maintenance, and environmental conditions. The CIP is comprised of projects to rebuild the RWF. Most CIP projects include condition assessments to examine the current state of facilities' structural, mechanical, electrical, and instrumentation/controls systems conditions, determine their remaining useful life, and identify needed repairs or replacements to extend service. Techniques and methods to inspect, observe, and measure RWF facilities' conditions include visual observation, the use of remotely operated cameras, concrete coring, electronic sensing devices, laser scanners, and the use of underwater divers. During inspections, teams strictly adhere to confined space procedures; however, as a precaution, rescue teams are also on site to safely recover inspection teams should unexpected difficulties arise.

Figure 1: Technological devices such as the Pipeline Inspection and Condition Analysis' Seesnake allow visual and electronic inspection of flooded piping.

When design engineering consultants are appointed, one of their first tasks is to conduct condition assessments of the facilities within their scope of services. This assessment analyzes all aspects of treatment and support systems, and evaluates whether facilities can be effectively operated and maintained in their current condition. The condition assessment also identifies and prioritizes specific areas that need repairs or replacement. The consultant then develops alternatives for implementing the necessary improvements, taking into account products and materials, construction sequencing strategies, and probable cost of construction. At the conclusion of the condition assessment, the consultant presents an analysis of improvement alternatives together with a recommended preferred alternative that will support continued regulatory compliance and operational flexibility, and that falls within the allocated construction budget.

RWF facilities to be inspected as part of an assessment are usually operational with the consequent hazards that presents. To complete an assessment, staff must often plan and carry out one or more process shutdowns, described in detail in the September 2016 Monthly Status Report. When a process shutdown is required, planned, approved, and implemented, the condition assessment team must be ready to do its work at the low-flow period of the day – usually from 2:00 a.m. to 6:00 a.m. During this time, Operations and Maintenance (O&M) staff must operate the facility to limit flow to selected structures while maintaining compliance with the RWF's discharge permit, and maintaining the supply of treated wastewater to the South Bay Water Recycling system.

Figure 2: Concrete scanning and coring to evaluate structural conditions in the Filter Block.

CIP project condition assessments have been carried out, or are planned, this fiscal year for Blowers Improvement, Filter Rehabilitation, Nitrification Clarifiers Rehabilitation, Advanced Facility Control and Meter Replacement, Facility-wide Water Systems Improvement, Support Building Improvements, and Aeration Tanks Rehabilitation projects.

Program Performance Summary

Eight key performance indicators (KPIs) have been established to measure overall CIP success. Each KPI represents a metric that will be monitored on a regular frequency. Through the life of the CIP, KPIs will be selected and measured that best reflect the current program.

Program Key Performance Indicators – Fiscal Year 2016-2017

KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	80%	100% 3/3[1]			100% 23/23		
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >=80%; Amber: 70% to 80%; Red: < 70%							
Schedule	90%	NA 0/0			50% 2/4		
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone. Target: Green: >=90%; Amber: 75% to 89%; Red: < 75%							
Budget	90%	NA 0/0			75% 3/4		
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget. Target: Green: >=90%; Amber: 75% to 89%; Red: < 75%							
Expenditure	$186M[2]	$174M			$242M[3]		
Measurement: CIP FY16-17 committed costs. Committed cost meets or exceeds 70% of planned Budget Target: 70% of $266M = $186M. Therefore Green: >=$186M; Amber: $146M to $186M; Red: < $146M							
Procurement	80%	50% 1/2[4]			100% 5/5		
Measurement: Number of consultant and contractor procurements advertised compared to planned for the fiscal year. Target: Green: >=80%; Amber: 70% to 79%; Red: < 70%							
Safety	0	0			0		
Measurement: Number of OSHA reportable incidents associated with CIP delivery for the fiscal year. Criteria: Green: zero incidents; Amber: 1 to 2; Red: > 2							
Environmental	0	0			0		
Measurement: Number of permit violations caused by CIP delivery for the fiscal year. Target: Green: zero incidents; Amber: 1 to 2; Red: > 2							
Staffing[5]	80%	100% 5/5			100% 24/24		
Measurement: Number of planned positions filled for the fiscal year. Target: Green: >=80%; Amber: 70% to 79%; Red: < 70%							

Notes

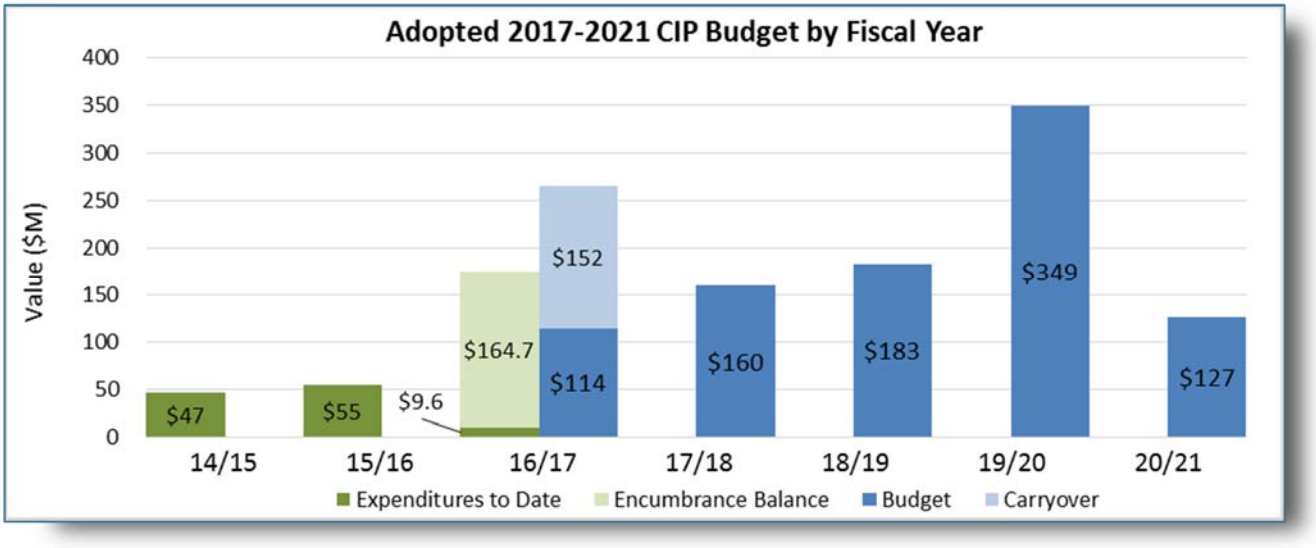
1. The Blower Improvements Project successfully passed Stage Gate 3: Authorization to Proceed and the Headworks Critical Improvement Project successfully passed Stage Gate 5: Authorization to Bid.
2. The CIP baseline budget was reduced by a net $10 million as the $11 million budget for repayment of SRF loan and debt service associated with South Bay Water Recycling (SBWR) was removed from CIP reporting totals. Additionally, $1 million was added to the CIP budget from the fall budget clean up.
3. The fiscal year-end projection has increased due to an increase in anticipated encumbrances, but the reported value is less than last month due to the removal of SBWR expenditures from CIP reporting totals.
4. The CIP advertised the Programwide Industrial Hygienist Services RFQ on October 31. The RFQ for consultant services for the Yard Piping & Road Improvements Project was not advertised as originally anticipated.
5. The City staffing level KPI for planned recruitments for positions that are vacant at the start of the fiscal year is measured quarterly; all other KPIs are measured monthly. KPI measurement does not account for staff turnover throughout the fiscal year.

Program Cost Performance Summary

This section summarizes CIP cost performance for all construction projects and non-construction activities for fiscal year (FY)16-17 and for the 2017-2021 CIP.

Adopted 2017-2021 CIP Expenditure and Encumbrances

FY14-15 and FY15-16 expenditures have been adjusted to reflect the CIP portion of the Treatment Plant Capital Fund (Fund 512), excluding South Bay Water Recycling and Urgent and Unscheduled Cost ($2.6 million and $1.5 million, respectively).



Notes:

Expenditure: Actual cost expended, either by check to a vendor or through the City's financial system, for expenses such as payroll or non-personal expenses that do not require a contract. Expenditures to date decreased this month as the expenses associated with the SBWR loan and debt service payments have been removed.

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

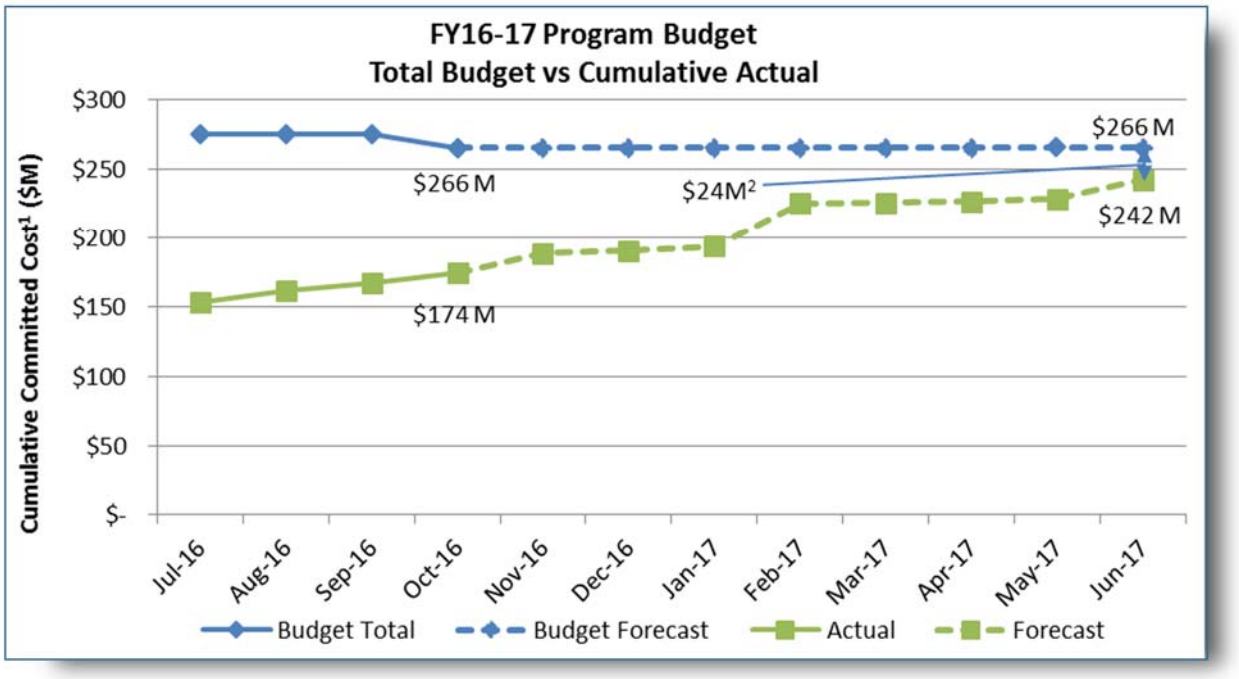
Encumbrance Balance: The amount of the remaining encumbrance committed after payments.

Budget: Adopted 2017-2021 CIP Budget, which is new funding plus rebudgeted funds. Budget decreased this month as the budget associated with the SBWR loan and debt service payments have been removed.

Carryover: Encumbrance balances at the end of a fiscal year become carryover funding. Carryover is different from rebudgeted funds, in that it automatically utilizes funding that was previously committed, but not yet paid.

Fiscal Year 2016-2017 Program Budget Performance

This budget comprises the FY16-17 budget of $114 million, plus carryover of $152 million. The budget excludes Reserves, Ending Fund Balance, South Bay Water Recycling, Public Art, and Urgent and Unscheduled Rehabilitation items.



Notes:

1. Committed costs are expenditures and encumbrance balances, including carryover (encumbrance balances from the previous fiscal year).
2. The forecasted variance between budget and expenditures can be primarily attributed to the following factors:
    a. Expenses anticipated for the pre-purchase of blowers for the Blower Improvements Project are no longer required this fiscal year. Originally, the project had identified a potential need to pre-purchase blowers to meet schedule constraints. As design progressed, this pre-purchase was deemed unnecessary. The equipment will now be purchased in FY17-18 as part of the construction contract.
    b. Several encumbrances for consultant services are either anticipated to be lower than budgeted or are no longer anticipated this fiscal year.
    c. Estimated personal services are anticipated to be under budget. Several authorized positions are currently vacant, resulting in lower than budgeted personal services expenses.
    d. Recurring appropriations such as Equipment Replacement and Plant Infrastructure Improvements are included in the budget, but not anticipated at this time to be expended.

Project Performance Summary

There are currently seven active projects in the construction or post-construction phases, with an additional 17 projects in feasibility/development, design, bid and award, or design and construction (design-build projects) phases (see PDM, page 2). All active projects are listed in the tables below. Projects in the construction phase have established cost and schedule baselines and are monitored using the City's Capital Project Management System (CPMS). Green/red icons are included in the table below to indicate whether these projects are on budget and schedule, using CPMS data as a source.

Project Performance – Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]	Cost Performance [2]	Schedule Performance[2]
1. Digester Gas Compressor Upgrade	Construction	Jan 2017	◆	◆
2. Emergency Diesel Generators	Construction	Mar 2017	●	◆
3. Fiber Optic Connection	Construction	Feb 2017	●	●
4. Construction-Enabling Improvements	Construction	Mar 2017	●	●
5. Iron Salt Feed Station	Construction	Sep 2017	●	●
6. Plant Instrument Air System Upgrade	Construction	Jan 2018[3]	●	●
7. Digester and Thickener Facilities Upgrade	Construction	Apr 2020	●	●

KEY:

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

Notes

1. Beneficial Use is defined as work that is sufficiently complete, in accordance with contract documents, that it can be used or occupied by the City. Beneficial Use dates are 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. The project construction Beneficial Use date will be baselined once the contractor submits their construction schedule.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
1. Headworks Critical Improvements	Design	Oct 2017
2. Cogeneration Facility	Design & Construction	May 2019
3. Blower Improvements	Design	Mar 2020
4. Adv. Facility Control & Meter Replacement	Feasibility/Development	Jan 2021
5. Headworks Improvements	Feasibility/Development	May 2021
6. Switchgear S40 Upgrade, M4 Replacement, G3 & G3A Removal	Feasibility/Development	Jul 2021
7. Digested Sludge Dewatering Facility	Feasibility/Development	Dec 2021
8. Outfall Bridge and Levee Improvements	Feasibility/Development	Jun 2022
9. Filter Rehabilitation	Feasibility/Development	Jul 2022
10. Facility-wide Water Systems Improvements	Feasibility/Development	Jul 2022
11. New Headworks	Feasibility/Development	Oct 2022
12. Nitrification Clarifiers Rehabilitation	Feasibility/Development	Nov 2022
13. Yard Piping and Road Improvements	Feasibility/Development	Mar 2023
14. Aeration Tanks Rehabilitation	Feasibility/Development	Mar 2024
15. Tunnel Rehabilitation	Feasibility/Development	Nov 2025
16. Support Building Improvements	Feasibility/Development	Jan 2027
17. Lagoons & Drying Beds Retirement	Feasibility/Development	Apr 2027

Notes

1. Beneficial Use is defined as work that is sufficiently complete, in accordance with contract documents, that it can be used or occupied by the City. Beneficial Use dates are reviewed as part of project schedule reviews.

Significant Accomplishments

Biosolids Package

Digester and Thickener Facilities Upgrade

- Contractor Walsh Construction made significant construction progress this month including utilities and sitework clearance, excavation for the sludge processing facility, and the start of demolition of the digester roofs including lead paint abatement work.
- Two major process shutdowns were carried out to investigate pipeline conditions and plan process bypass options. These investigations revealed major structural damage to a critical 78" effluent pipeline and associated concrete chambers. Further Investigations are currently ongoing to evaluate the necessary repairs and design modifications.
- Staff continued to review and approve submittals, Process Shutdown Requests (PSR), and Requests for Information (RFI). Over 180 submittals, 30 PSRs and 140 RFIs have been received to date. EADOC document management implementation continues to help streamline the management and processing of all construction documents.

Digested Sludge Dewatering Facility

- Council approved an Owner Advisor Agreement with Brown and Caldwell on October 25, 2016. Staff and Brown and Caldwell have begun negotiations for the first service order to start assessing project alternatives.

Facilities Package

Cogeneration Facility

- The design-builder, CH2M, submitted a cost estimate based on the Basis of Design Report completed in September. Estimated costs were considerably higher than the project budget. Value engineering and scope adjustments were evaluated to bring the project costs back in line with the budget.
- The project team evaluated engine and gas purification packages and will recommend a preferred vendor in November.

Construction-Enabling Improvements

- The project team is evaluating several electrical submittals. Contractor Teichert Construction began repairing poor pavement on Zanker Road in advance of final paving and road-widening later this year.

Fiber Optic Connection

- Contractor Aegis ITS, Inc. began conduit and pull box installation and anticipates pulling fiber optic cable by early November.

Support Building Improvements

- The project team completed negotiations with the top-ranked consulting firm, and anticipates in January recommending Council award the MCA. Next, staff and the consultant will negotiate the first service order to start condition assessment work and assessing project alternatives.

Liquids Package

Advanced Facility Control and Meter Replacement

- The project team issued the Notice to Proceed (NTP) to the design consultant Black & Veatch Corporation on October 19 and commenced conceptual design work.
- Black and Veatch submitted their draft project work plan for review and will begin work on condition assessment in November.

Blower Improvements

- The project team successfully passed the Stage Gate 3: Authorization to Proceed, moving the project into the PDM Preliminary Design stage.
- The project team completed negotiating the scope of work and fees with design consultant Brown & Caldwell, issued the NTP on October 28, and scheduled a kickoff meeting for next month.

Filter Rehabilitation

- The project team held a workshop to discuss the results of the draft Tertiary Process Energy Evaluation Technical Memorandum.
- Design consultant Kennedy/Jenks completed the onsite process, structural, and mechanical condition assessment of the tertiary filters and prepared for the effluent channel condition assessment.

Headworks Critical Improvements

- CDM Smith submitted the final design drawings and specification documents. The project team successfully passed Stage Gate 6: Authorization to Award and Establish Baseline. The project will be advertised for construction in November.

Iron Salt Feed Station

- Contractor Anderson Pacific completed formwork for concrete footings, slabs, and walls for the iron salt station and began formwork for concrete footings, slabs, and walls for the polymer station.

New Headworks

- The project team held workshops with O&M staff to discuss results of the hydraulic analysis and preferred equipment technologies to finalize the alternative selection process.

Nitrification Clarifiers Rehabilitation

- Design consultant HDR, with assistance from O&M staff, completed the condition assessment of the nitrification clarifier settled sludge lines and underground utilities, and began the alternative analysis of the clarifier mechanisms.

Power and Energy Package

Emergency Diesel Generators

- Contractor Anderson Pacific submitted the third-party testing report to PG&E for review and approval.

Digester Gas Compressor Upgrade

- Contractor Anderson Pacific successfully tested the cooling tower system.

Plant Instrument Air System Upgrade

- The City held a kickoff meeting and issued the NTP on October 27. Pre-construction activities and EADOC implementation will commence in November.

Studies and Programwide Services

- The City advertised a Request for Qualifications (RFQ) for firms interested in providing programwide industrial hygienist services across the RWF. Staff anticipate awarding the contract in February or March.

Explanation of Project Performance Issues

Emergency Diesel Generator

The project completion schedule has been delayed approximately nine months due to the following three factors:

- Caterpillar, the supplier of the emergency diesel generator system, encountered delays in developing the controls and network switches that interface with existing RWF controls. Caterpillar and Peterson Control are in the process of completing all outstanding items. A problem was found with the new network switches during the factory acceptance test. The City and the design-build team completed an engineering study and found a solution to the problem. Additional switches have been ordered and installed for the existing network system. Caterpillar will conduct Level 1 and Level 2 startup process testing to test and verify that all issues have been corrected. Level 1 startup testing is ongoing. Level 2 system testing will start after Level 1 testing has been completed.
- Additional time is required for Pacific Gas & Electric (PG&E) to schedule the witness test of the emergency diesel generator equipment installation and commissioning to connect to the RWF grid. The City completed the third-party testing of the switchgear, power, and controls and submitted the report to PG&E for review and approval. The proposed onsite inspection and witness testing dates for the emergency diesel generator equipment commissioning have been submitted to PG&E for approval and is pending per PG&E's available schedule.
- A no-cost time extension change order has been processed and fully executed to split the commissioning sequence into two periods and ensure RWF backup power during engine modification work. The City's phase 1 existing engine modification has been completed and testing is ongoing.

Digester Gas Compressor Upgrade

The project is over budget by approximately two percent due to increased project delivery costs associated with increased construction inspection requirements and an extended project timeline.

The project Beneficial Use has been delayed primarily due to the following reasons:

- The compressor skids needed to be reclassified from Class 1 Division 2 to Class 1 Division 1; and
- The Bay Area Air Quality Management District (BAAQMD) had not approved digester gas flaring during the tie-in of the new gas piping with existing piping.

Staff have resolved the reclassification issue. This month, BAAQMD signed a new agreement that permits the RWF to flare digester gas during equipment upgrades. The contractor will shut down and flare the digester gas system in early November to tie in the new digester inlet and discharge piping to existing piping.

Project Profile – Fiber Optic Connection

The RWF relies on a microwave dish that communicates with City Hall as its primary data connection. Installed in June of 2012, the dish is capable of data transfer speeds of up to one gigabit per second. However, the connection is susceptible to environmental interference–including weather–which results in frequent network access interruptions. To improve the RWF data network's speed and reliability, and to provide a hard-wired connection to the City's network, the Fiber Optic Connection Project was initiated.

The Fiber Optic Connection Project installs fiber optic (FO) cable between the RWF Transmission Pump Station and the City's existing FO network near Highway 237 and Zanker Road. The project uses a combination of existing conduits and new conduits. The contractor first checks the continuity of existing conduits, then installs new conduits to provide a path for FO cable between termination locations. Next, the contractor pulls FO cable through the conduit network and terminates the FO cable at each end. Finally, the contractor performs end-to-end testing of the installed FO cable to ensure there is no damage to the cable, and that the communication link from the RWF to the City network is operational. The completed project will provide a direct, reliable, and more secure data connection between the RWF and the City network, with greater data transfer capabilities.

As of this month, the contractor has installed all conduits and verified the conduit path. The FO cable will be completely installed by the end of the first week of November. Fiber optic technicians are scheduled to splice and terminate the FO cable and perform final acceptance testing in December 2016.

Figure 3: New conduits at Hwy 237 and Zanker Rd

Figure 4: Fiber coiled in new pull box

Staff encountered a significant environmental challenge several months before the start of construction. A family of burrowing owls–a protected species–was found at the southern end of the project. Although the discovery was good news for the region's owl population, it had the potential to delay construction or add environmental cost to the project. While construction within 250 feet of the owl's burrow could have been attempted with an avoidance plan and full-time monitoring by a qualified biologist, in the end neither option was needed, as the young fledged and the parents dispersed. By the time construction was set to begin, protocol-level surveys came back clear and the project was given the green light to proceed.

Staff anticipate that the project will be completed ahead of schedule and under budget. The Beneficial Use date for the project is February 2017. The project budget is $705,446.

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

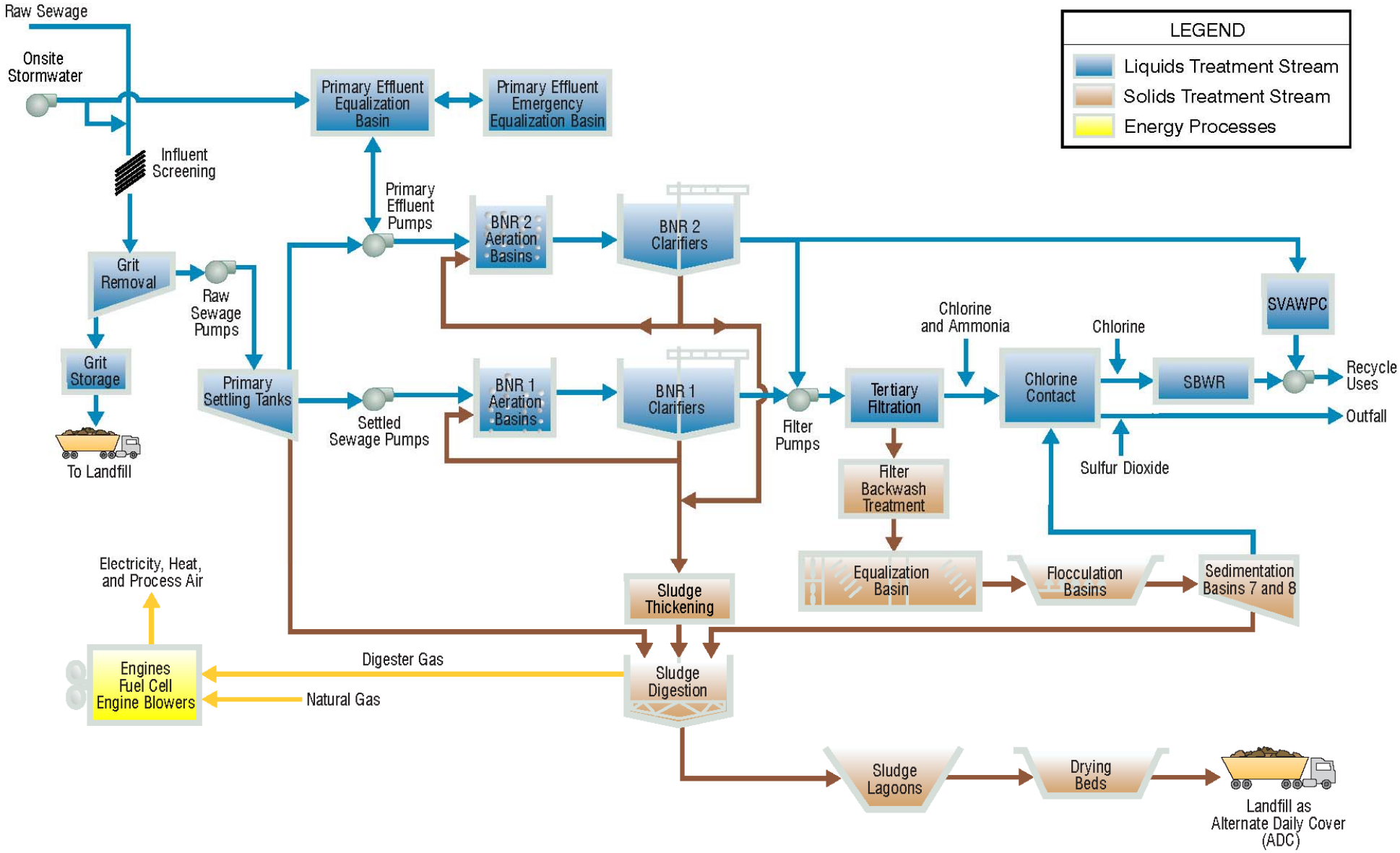


Figure 5 – Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

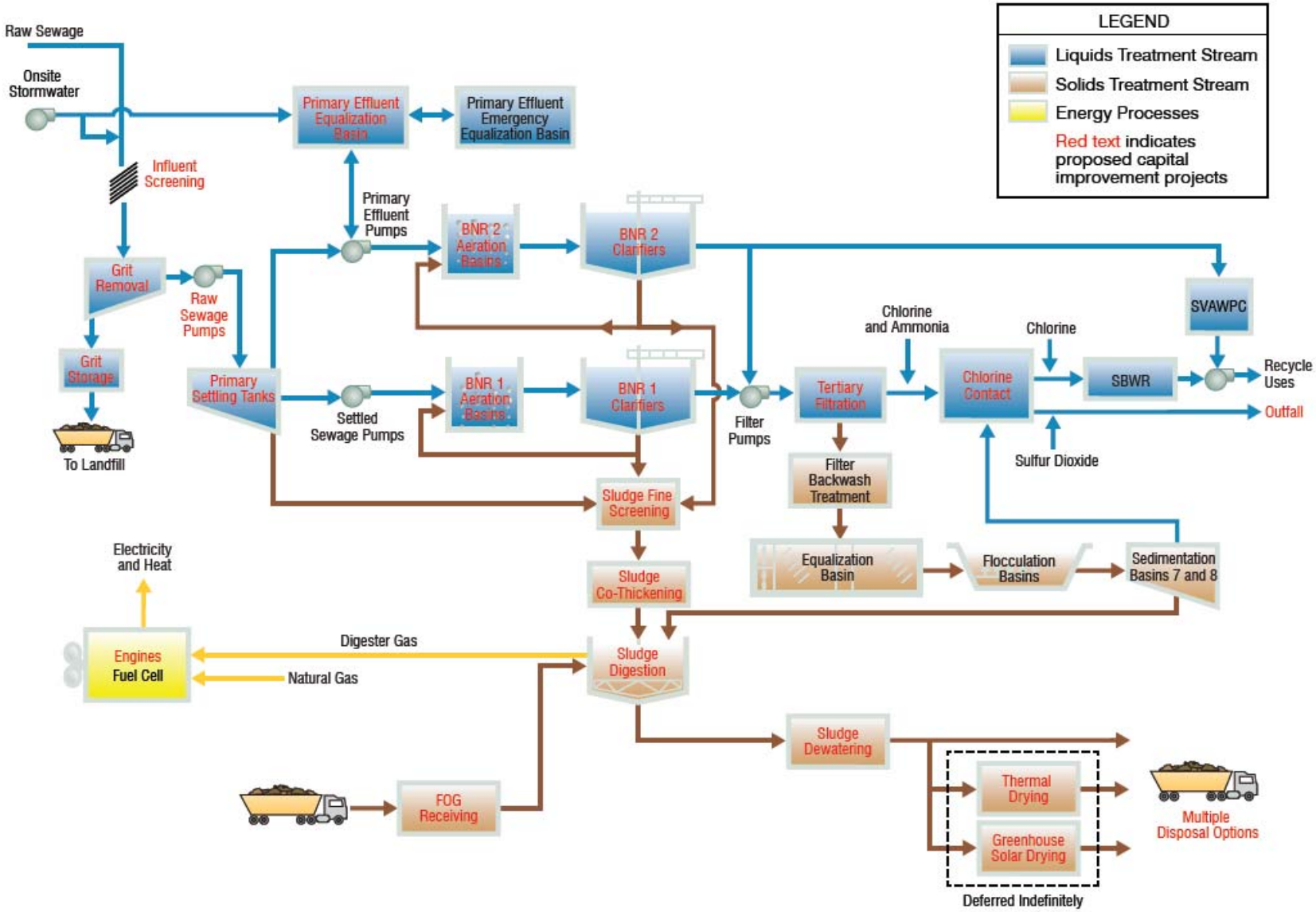


Figure 6 – Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

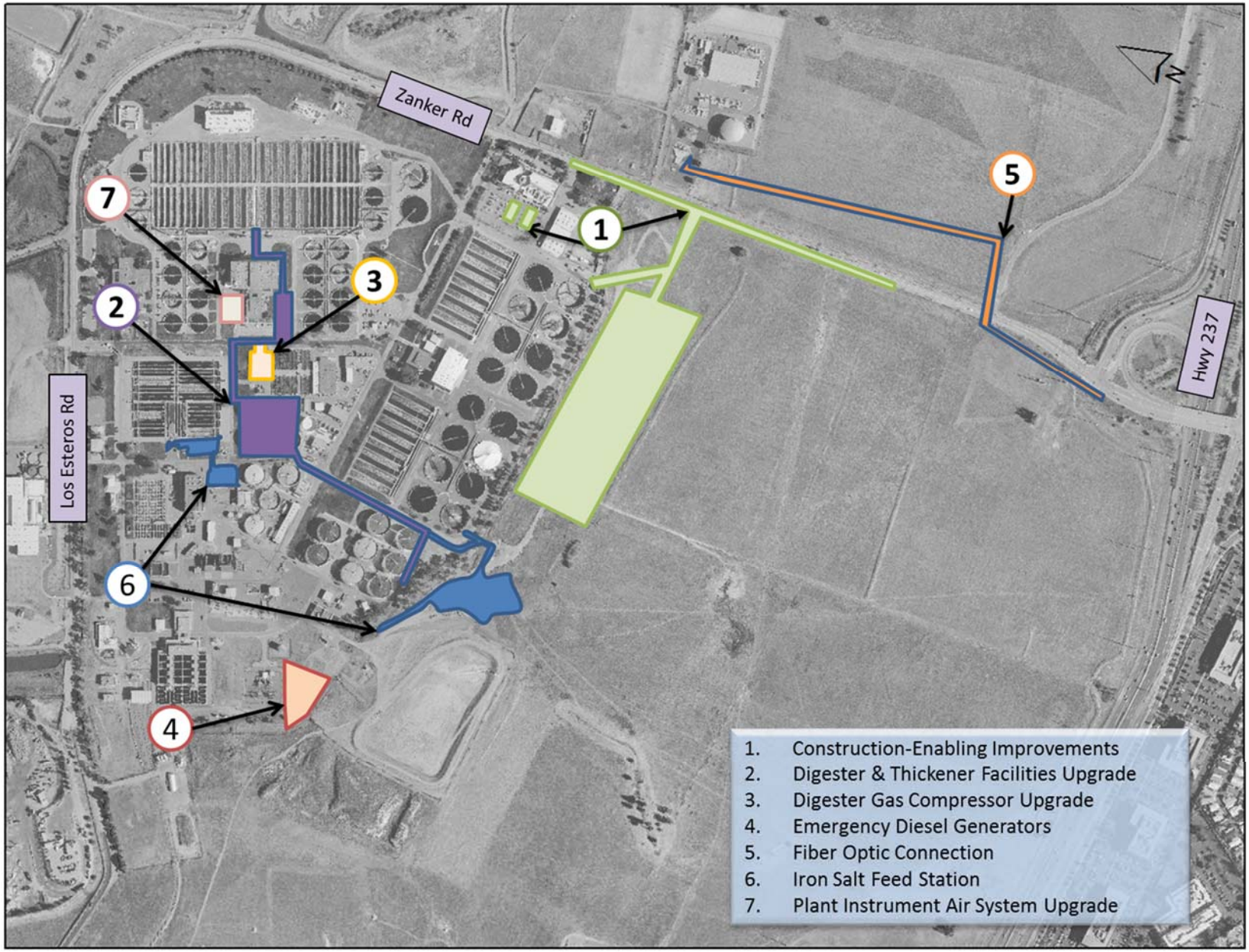


Figure 7 – Active Construction Projects