



**San José-Santa Clara**  
Regional Wastewater Facility

# Capital Improvement Program Monthly Status Report: February 2017

April 6, 2017

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for February 2017.

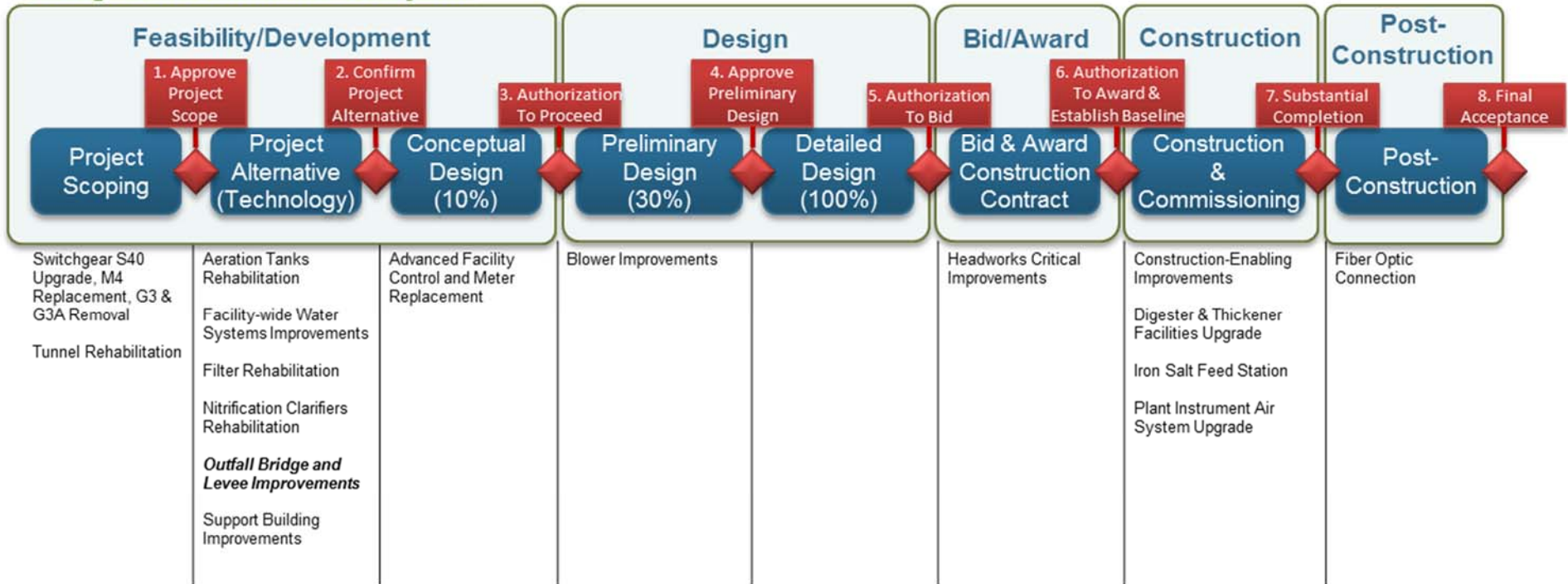
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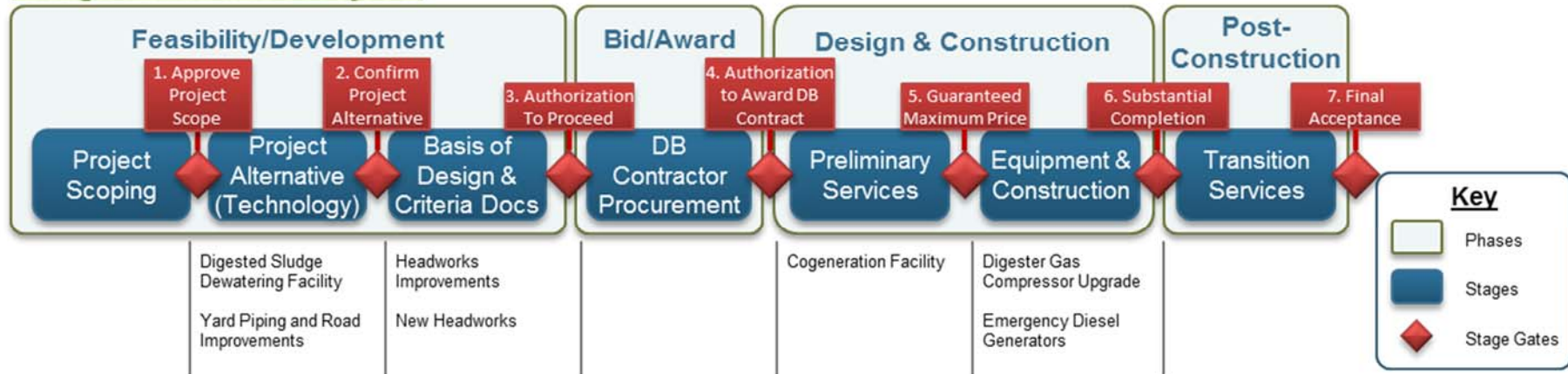


# Project Delivery Model

## Design-Bid-Build Active Projects



## Design-Build Active Projects



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





# Program Summary

## February 2017

In February, two projects advanced through the Project Delivery Model (PDM) stage gate process: The Cogeneration Facility Project (Early Works Package 1 Approval) and the Outfall Bridge and Levee Improvement Project (Approve Project Scope). Staff advertised a Request for Qualifications (RFQ) to prequalify vendors for programwide system integrator services, and held an open house for prospective vendors to share information on upcoming design-build procurements (read more about the event on page 4).

On the Cogeneration Facility Project, the design-builder advanced the design based on the approved basis of design report. The first early work package—which covers the internal combustion engines and gas purification equipment—and 30 percent design submittal are anticipated over the next three months. The Digested Sludge Dewatering Facility Project team began alternatives analysis work. Alternatives analysis efforts continued for the Filter Rehabilitation, Nitrification Clarifier Rehabilitation, and Facility-wide Water Systems Improvements projects. The design consultant for the Advanced Facility Control and Meter Replacement Project submitted the draft conceptual design report. The Headworks Improvements and New Headworks project team advanced the basis of design and procurement documents and aim to start prequalification of design-build entities during May 2017. The Blower Improvements Project preliminary design also continued this month, with the 30 percent design completion anticipated in May 2017.

Six active construction projects made significant progress this month. Of particular note, testing and commissioning continued successfully on the Digester Gas Compressor Upgrade and Emergency Diesel Generators projects. For the Digester and Thickener Facilities Upgrade Project, staff continued to coordinate process shutdowns, isolating sections of the RWF so that construction may proceed. These shutdowns are needed so the contractor can reroute unmapped utilities and repair damaged pipelines. A major inspection was completed to assess the condition of several primary effluent pipelines near a previously identified, heavily corroded 78-inch concrete pipeline. The information collected will help staff evaluate how best to address the corroded pipeline, which is impacting the project's construction progress.

## Look Ahead

In March, the Aeration Tanks Rehabilitation Project will commence alternative analysis work. Alternatives analysis work on the Facility-wide Water Systems Improvements; Filter Rehabilitation; Nitrification Clarifiers Rehabilitation; and Digested Sludge Dewatering Facility projects will continue. The Headworks Improvements and New Headworks projects will advance the basis of design report and the design-build procurement documents. Design work will continue for the Advanced Facility Control and Meter Replacement; the Cogeneration Facility; and the Blower Improvements projects. The Tunnel Rehabilitation Project will seek to advance through the Approve Project Scope Stage Gate.

Staff will continue with project service orders for the Switchgear S40 Upgrade, M4 Replacement and G3 and G3A Removal; Outfall Bridge and Levee Improvements; and Support Building Improvements projects. Discussions with providers for Owner-Controlled Insurance Program (OCIP) products will continue.

Testing and commissioning activities will continue on the Digester Gas Compressor Upgrade and Emergency Diesel Generators projects, with each project forecast to achieve Beneficial Use during the next three months. A key test to verify correct automatic operation of the new emergency diesel generators—to be carried out when the RWF is isolated from PG&E electrical power—is planned for March.

In addition, CIP project delivery staff will continue to participate in monthly project managers' training. This training gives project managers tools and techniques to effectively manage projects based on Project Management Institute (PMI) fundamentals tailored to the CIP. The training also includes introductory topics such as environmental and regulatory requirements. Project management training modules will be repeated to provide consistent project management training for new staff.



## Program Highlight – Vendor Open House

Since 2012 the CIP has been hosting open house events to increase vendor awareness of CIP projects and upcoming procurements. Approximately one month before the open house, prospective vendors are invited to register for the free event, which typically consists of a staff presentation, networking, and a tour of the RWF.

At the most recent open house, on February 8, staff presented attendees with information about upcoming professional consulting and construction contracting opportunities. The event focused on three of the CIP's design-build projects and desirable qualities that the City is looking for in design-builders.

- Headworks Improvements & New Headworks – This project will make modifications to allow the future decommissioning of the existing Headworks 1, improve the existing Headworks 2 to ensure long-term reliability, and construct Headworks 3 to serve as the duty/dry weather headworks. The project team anticipates advertising the RFQ to prequalify design builders in May.
- Digested Sludge Dewatering Facility – This project will construct a new multistory building with mechanical dewatering equipment, polymer treatment systems, sludge cake conveyance facilities, and truck load-out facilities. This project will also create a sludge pump station and sludge storage tanks. The project team anticipates advertising the RFQ to prequalify design builders in August.
- Yard Piping and Road Improvements – This project will rehabilitate and replace aging process piping and roads throughout the RWF. The project team anticipates advertising the RFQ for an owner's advisor in April.

The qualities preferred of the selected design-builder include:

- Collaborative with a history of successful partnerships among team members,
- Experienced with large continuously operating wastewater treatment plants,
- Innovative and efficient to achieve cost and schedule goals,
- Communicative with accurate information as soon as it's available, and
- Familiarity with local labor market and material suppliers

The construction budget for these three projects totals approximately \$250 million, which is roughly 25 percent of the adopted CIP's total construction budget.

Nearly 70 consultants, contractors, and material and equipment suppliers attended the February event. About 40 percent of the attendees represented small or local businesses. Information presented during this event and previous vendor open houses is available through BidSync and in the CIP Document Library at [www.sjenvironment.org/cip](http://www.sjenvironment.org/cip).



## 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 |
| <b>Stage Gates</b>   | 80%    | 89%                 |        |       | 94%                |        |       |
|  |        | 8/9 <sup>1</sup>    |        |       | 17/18 <sup>2</sup> |        |       |
| Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt.<br>Target: Green: >=80%; Amber: 70% to 80%; Red: < 70%                      |        |                     |        |       |                    |        |       |
| <b>Schedule</b>  | 90%    | 100%                |        |       | 50%                |        |       |
|  |        | 1/1                 |        |       | 2/4                |        |       |
| Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone. <sup>3</sup><br>Target: Green: >=90%; Amber: 75% to 89%; Red: < 75%                 |        |                     |        |       |                    |        |       |
| <b>Budget</b>  | 90%    | NA                  |        |       | 100%               |        |       |
|  |        | 0/0                 |        |       | 1/1 <sup>4</sup>   |        |       |
| Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget. <sup>3</sup><br>Target: Green: >=90%; Amber: 75% to 89%; Red: < 75%                       |        |                     |        |       |                    |        |       |
| <b>Expenditure</b>   | \$186M | \$185M              |        |       | \$244M             |        |       |
| Measurement: CIP FY16-17 committed costs. Committed cost meets or exceeds 70% of planned Budget<br>Target: 70% of \$266M = \$186M. Therefore Green: >=\$186M; Amber: \$146M to \$186M; Red: < \$146M |        |                     |        |       |                    |        |       |
| <b>Procurement</b>   | 80%    | 75%                 |        |       | 100%               |        |       |
|  |        | 3/4 <sup>5</sup>    |        |       | 6/6                |        |       |
| Measurement: Number of consultant and contractor procurements advertised compared to planned for the fiscal year.<br>Target: Green: >=80%; Amber: 70% to 79%; Red: < 70%                             |        |                     |        |       |                    |        |       |
| <b>Safety</b>  | 0      | 0                   |        |       | 0                  |        |       |
| Measurement: Number of OSHA reportable incidents associated with CIP delivery for the fiscal year.<br>Criteria: Green: zero incidents; Amber: 1 to 2; Red: > 2                                       |        |                     |        |       |                    |        |       |
| <b>Environmental</b>   | 0      | 0                   |        |       | 0                  |        |       |
| Measurement: Number of permit violations caused by CIP delivery for the fiscal year.<br>Target: Green: zero incidents; Amber: 1 to 2; Red: > 2   |        |                     |        |       |                    |        |       |
| <b>Staffing<sup>6</sup></b>  | 80%    | 91%                 |        |       | 100%               |        |       |
|  |        | 10/11               |        |       | 24/24              |        |       |
| Measurement: Number of planned positions filled for the fiscal year.<br>Target: Green: >=80%; Amber: 70% to 79%; Red: < 70%  |        |                     |        |       |                    |        |       |

#### Notes

1. The Outfall Bridge and Levee Improvements Project successfully passed Stage Gate 1: Approve Project Scope. The Cogeneration Facility Project successfully passed the Early Work Package 1 stage gate, but is not counted due to the definition of the KPI.
2. The fiscal year-end count has been updated to reflect a decrease in planned stage gates due to project schedule revisions.
3. The Baseline Beneficial Use Date and the Baseline Budget for a project are established at the time of construction contract award and execution.
4. The Budget KPI fiscal year end has been reduced due to project schedule revisions.
5. The CIP advertised the Prequalification for System Integrator Services on February 28.
6. The staffing KPI represents CIP recruitments planned for the fiscal year and is measured quarterly. This KPI measurement does not account for staff turnover throughout the fiscal year.

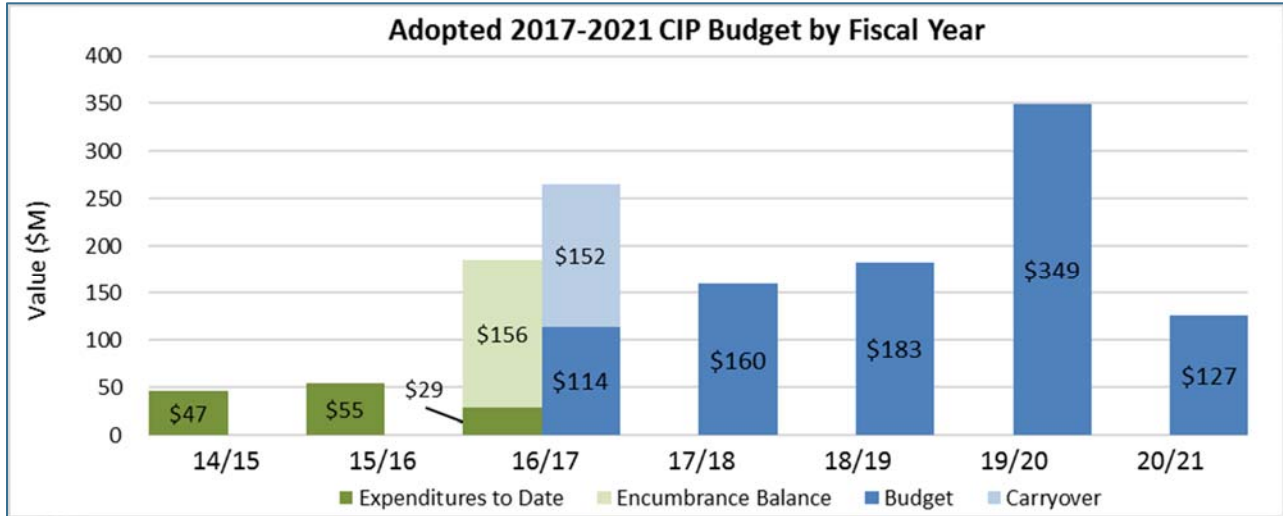


## Program Cost Performance Summary

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.

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

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

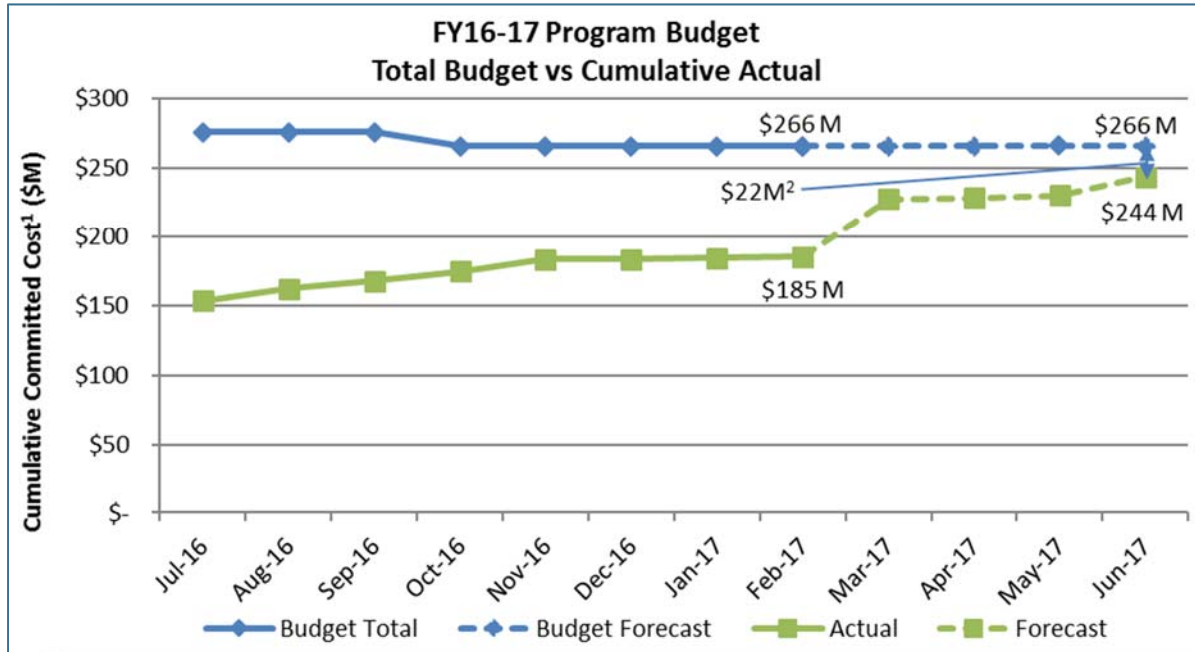
**Budget:** Adopted 2017-2021 CIP Budget, which is new funding plus rebudgeted funds in FY16-17.

**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. The Blower Improvements Project had originally planned to prepurchase blower equipment in FY16-17 due to long lead times. However, the equipment will now be furnished through the construction contract, shifting approximately \$12 million in estimated expenditures to FY17-18.
  - 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. The FY16-17 budget includes three recurring appropriations (Preliminary Engineering, Equipment Replacement, and Plant Infrastructure Improvements) totaling approximately \$3.66 million. These appropriations are included in the budget for implementing minor capital improvement projects that may be needed during the fiscal year. As of February, there are no new major expenditures or encumbrances against these appropriations.























## Project Performance Summary

There are currently seven active projects in the construction or post-construction phases, with an additional 16 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 <sup>1</sup> | Cost Performance <sup>2</sup>   | Schedule Performance <sup>2</sup>   |
|--|-------------------|--|---|---|
| 1. Fiber Optic Connection                    | Post-Construction | Jan 2017 <sup>3</sup>                      |  |  |
| 2. Digester Gas Compressor Upgrade           | Construction      | Mar 2017                                   |  |  |
| 3. Construction-Enabling Improvements        | Construction      | May 2017                                   |  |  |
| 4. Emergency Diesel Generators               | Construction      | Jun 2017                                   |  |  |
| 5. Iron Salt Feed Station                    | Construction      | Sep 2017                                   |  |  |
| 6. Plant Instrument Air System Upgrade       | Construction      | Apr 2018                                   |  |  |
| 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. Actual Beneficial Use date.





## Project Performance – Pre-Baselined Projects

| Project Name  | Phase                   | Estimated Beneficial Use Date <sup>1</sup> |
|---|-------------------------|--|
| 1. Headworks Critical Improvements                          | Bid and Award           | Feb 2018                                   |
| 2. Cogeneration Facility                                    | Design & Construction   | Apr 2019                                   |
| 3. Blower Improvements                                      | Design                  | Mar 2020                                   |
| 4. Outfall Bridge and Levee Improvements                    | Feasibility/Development | Oct 2020                                   |
| 5. Adv. Facility Control & Meter Replacement                | Feasibility/Development | Jan 2021                                   |
| 6. Headworks Improvements                                   | Feasibility/Development | May 2021                                   |
| 7. Switchgear S40 Upgrade, M4 Replacement, G3 & G3A Removal | Feasibility/Development | Sep2021                                    |
| 8. Digested Sludge Dewatering Facility                      | Feasibility/Development | Jul 2022                                   |
| 9. Filter Rehabilitation                                    | Feasibility/Development | Aug 2022                                   |
| 10. Facility-wide Water Systems Improvements                | Feasibility/Development | Aug 2022                                   |
| 11. New Headworks   | Feasibility/Development | Oct 2022                                   |
| 12. Nitrification Clarifiers Rehabilitation                 | Feasibility/Development | Nov 2022                                   |
| 13. Support Building Improvements                           | Feasibility/Development | Apr 2025                                   |
| 14. Aeration Tanks Rehabilitation                           | Feasibility/Development | Jul 2025                                   |
| 15. Tunnel Rehabilitation                                   | Feasibility/Development | Dec 2025                                   |
| 16. Yard Piping and Road Improvements                       | Feasibility/Development | Jun 2026                                   |

### 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 Thickener and Facilities Upgrade

- The project team continues to coordinate ongoing and future process shutdowns. Contractor Walsh Construction prepared to pour the digester floors and continued with utility relocations and contaminated material abatement.
- A major inspection was completed to assess the condition of several primary effluent pipelines near a previously identified heavily corroded 78-inch concrete pipeline. The information collected will help evaluate how best to address the corroded pipeline, which is impacting construction progress.

### Digested Sludge Dewatering Facility

- The City issued a Notice to Proceed (NTP) to Owner's Advisor (OA) Brown and Caldwell to complete the alternatives analysis, Basis of Design Report, and design-builder procurement.
- Brown and Caldwell held the project kickoff meeting and began developing design criteria for the project.

## Facilities Package

### Cogeneration Facility

- The project team held a follow-up stage gate to discuss options for adding administration, storage, and workshop space into the project while remaining within budget. Design-builder CH2M is revising and pricing various options to be included in the 30 percent design submittal. Staff is currently developing a contract amendment for Early Work Package 1 (engines and gas purification purchase) with a target approval date in mid-April.

### Facility-wide Water Systems

- The project team commenced data collection and interviews with O&M Staff for the hydraulic modeling stage of the project.

### Outfall Bridge and Levee Improvements

- The project team passed Stage Gate 1: Approve Project Scope and began developing the consultant's scope of services.

### Tunnel Rehabilitation

- The project team finalized the project scope, project delivery method recommendation, and planning-level cost forecasts in advance of the Approve Project Scope Stage Gate scheduled for March 2017.

### Yard Piping and Road Improvements

- The project team issued an information memorandum to Council informing them of the decision to use progressive design-build as the main delivery method for this project. The project team will advertise an RFQ for OA services in spring 2017.

## Liquids Package

### Advanced Meter and Facility Control Replacement

- Design consultant Black & Veatch submitted the draft conceptual design report and held a conceptual design workshop. The third stage gate, Authorization to Proceed, is scheduled for April.

### Aeration Tanks Rehabilitation

- The project team finalized negotiations with the design consultant, Brown and Caldwell, to complete Project Alternative (Technology) Stage. The consultant is scheduled to begin the condition assessment next month as part of the alternatives analysis.

### Blower Improvements

- Design consultant Brown and Caldwell submitted design concepts for HVAC, mechanical, electrical, and structural disciplines. The project team has approved the proposed concepts and is anticipating the 30 percent design next month.

### New Headworks

- The project team completed negotiations with OA CDM Smith to develop the Basis of Design Report, prepare necessary CEQA documentation, and support the design-builder procurement efforts.



## **Power and Energy Package**

### Digester Gas Compressor Upgrade

- The contractor began the functional testing of the automation controls. The project team expects completion of the functional test by mid-March.

### Emergency Diesel Generators

- Contractor Anderson Pacific completed the eight-hour load test for all four new generators followed by an “island mode” test, in which emergency generators supply the plant load without PG&E power.
- The City HAZMAT fire inspector approved the leak detection system.

### Plant Instrument Air System Upgrade

- Contractor Anderson Pacific began subsurface investigations of the construction site to determine the relocation of the underground utilities.



## Explanation of Project Performance Issues

### Emergency Diesel Generator

The project completion schedule has been delayed approximately one year 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 installed for the existing network system. Caterpillar continued Level 2 process load tuning testing for four new emergency diesel generators. The parallel test and synchronization for the new generators and existing generator have been completed, and were accepted by PG&E.
- Additional time is required for PG&E to schedule the witness test of the emergency diesel generator equipment installation and commissioning to connect to the RWF grid. The parallel inspection and witness testing with PG&E for new and existing generators was completed this month.
- 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 was completed this month. Next, the eight-hour load test for the four new generators, the fueling system, and the diesel exhaust fluid system will be completed so the simulated power outage test (black start) can take place.

### Digester Gas Compressor Upgrade

This project is over budget by approximately 2 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:

- The compressor skids needed to be reclassified from Class 1 Division 2 to Class 1 Division 1. This issue was resolved in May 2015.
- The Bay Area Air Quality Management District (BAAQMD) delayed approval of the digester gas flaring during the tie-in of the new gas piping. This issue was resolved in November 2016.
- Functional testing of the automation system has taken longer than anticipated.
- The schedule has been delayed due to conflicting process shutdowns with other projects.





## Project Profile – Yard Piping and Road Improvements

The Yard Piping and Road Improvements Project will rehabilitate and replace aging process piping and roads throughout the RWF. Approximately 300,000 linear feet of piping run through the Facility. The pipes vary in age, material, condition, reliability, redundancy, and diameter (up to 144 inches). They carry gas, liquids, sludge, air, steam, and other process streams to and from the various treatment areas. Seventy percent of the pipes at the RWF are more than 25 years old, and 10 percent are more than 50 years of age. This project will focus on the roughly 67,000 linear feet of process piping. The RWF's existing roads are between 30 and 50 years old and require frequent maintenance.

Due to the complexity of the condition assessment, rehabilitation, and repair work, the primary project delivery method for this project will be design-build, though the City may use other delivery methods to complete portions of the work. The project is expected to involve multiple complicated shutdowns and will require regular collaboration between the project team and O&M staff. To begin to address the numerous shutdowns, during the scoping stage, the project team developed preliminary pipeline shutdown plans based on results from a 2015 risk assessment study and discussions with O&M staff.

The project will be implemented in phases over an eight-year period. Each phase will consist of condition assessments, prioritization, design, and construction. The project has a construction budget of \$85 million and is estimated to be completed by winter of 2026.

Procurement of an owner's advisor is anticipated to be advertised in spring 2017. The owner's advisor will assist the City with planning, development of basis of design reports, preparation of documents for procuring a design-build entity, design reviews, and construction management. The first set of condition assessments is scheduled to begin in the summer of 2019.



Figure 1: RWF process piping highlighted by risk rating



Figure 2: RWF process piping located adjacent to other utilities

# Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

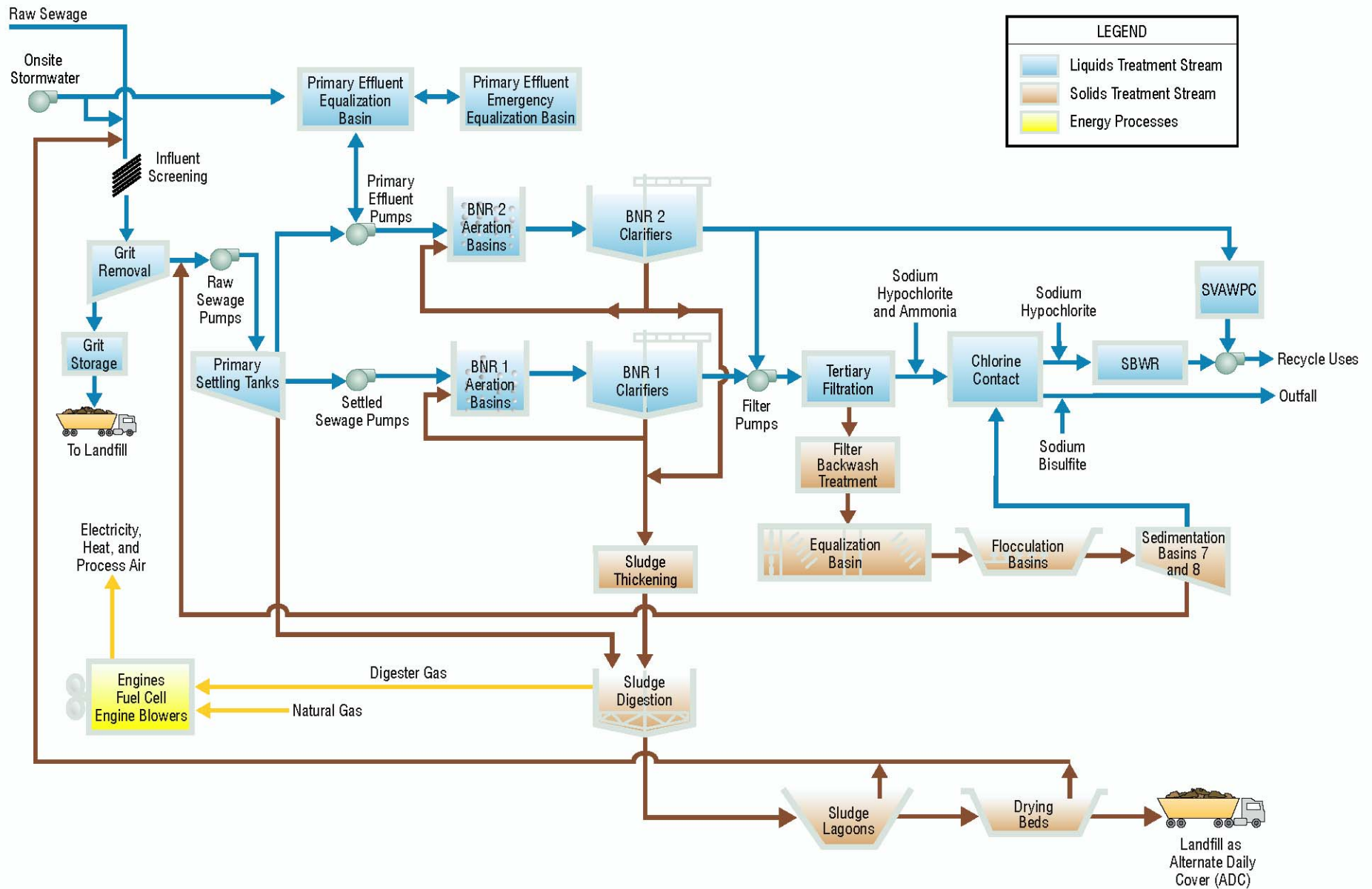


Figure 3 – Current Treatment Process Flow Diagram



# Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

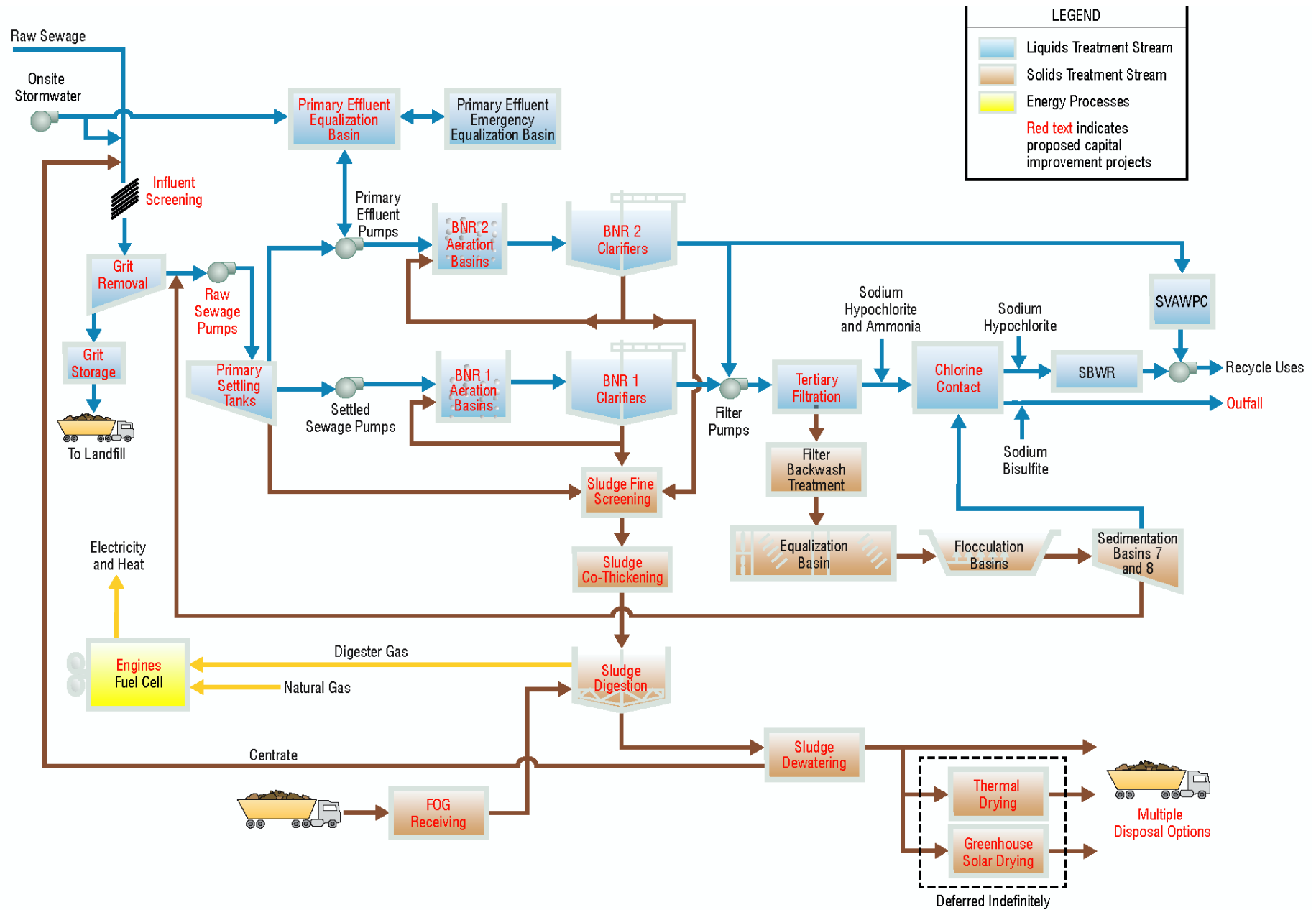


Figure 4 – Proposed Treatment Process Flow Diagram





## Active Construction Projects – Aerial Plan

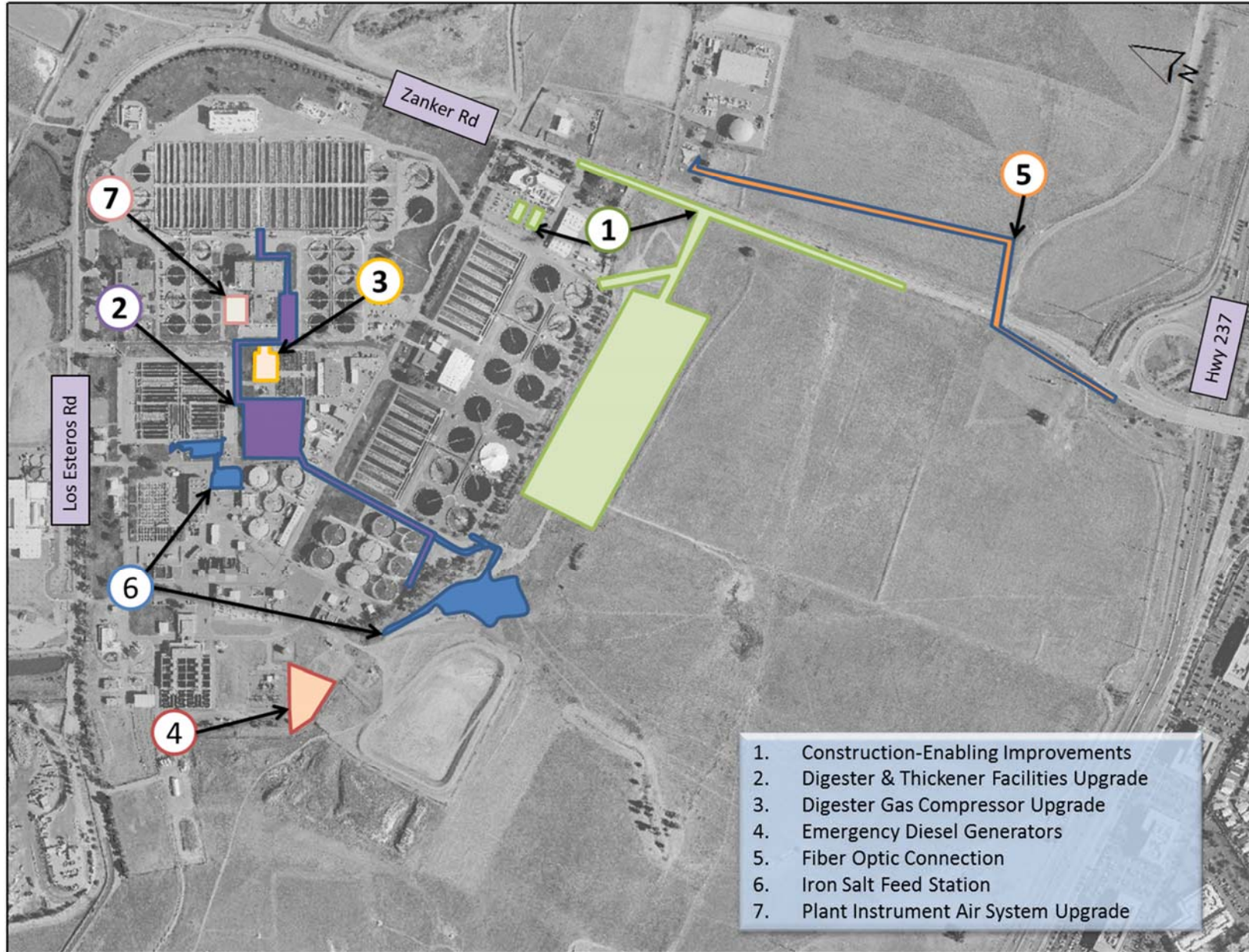


Figure 5 – Active Construction Projects

