San José-Santa Clara Regional Wastewater Facility

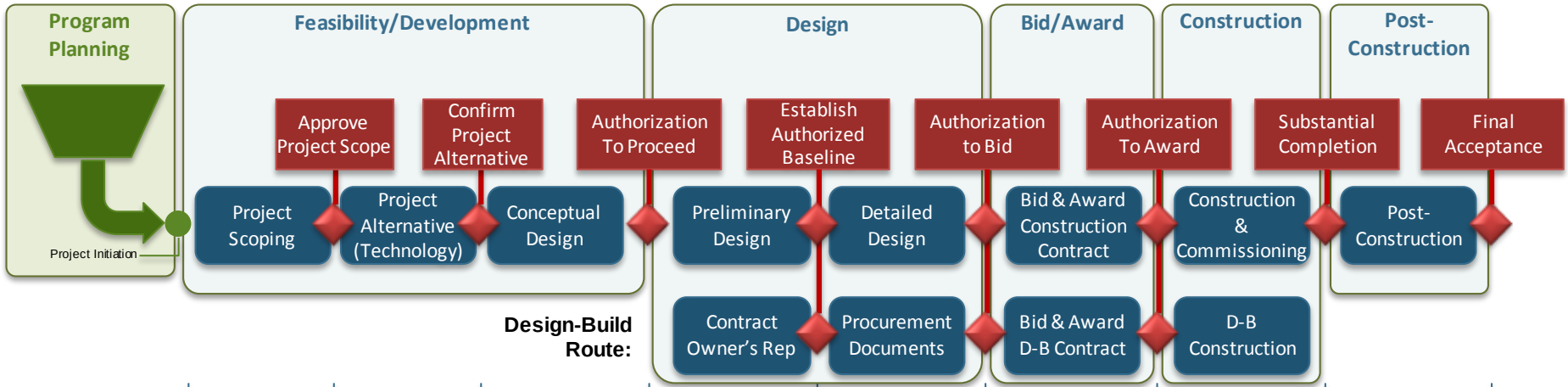
Capital Improvement Program
Monthly Status Report for February 2015

April 2, 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 February 2015.

Report Contents

Project Delivery Model



Active Projects

Design-Bid-Build

Feasibility/Development		Design		Bid/Award	Construction	Post-Construction
Adv. Facility Control and Meter Repl. Construction-Enabling Improvements Outfall Bridge and Levee Improvements	Facility Wide Water Systems Filter Rehabilitation Headworks Critical Improvements Headworks Improvement New Headworks Nitrification Clarifiers Rehab.	Fiber Optic Connection to RWF Digester & Thickener Facilities Upgrade ***Plant Instrument Air System Upgrade***	Iron Salt Feed Station		A5-A6 Nitrif. Mag. Meter & Valve Repl. BNR2 Clarifiers Guardrail Repl. DCS Upgrade/Repl. Digester Gas Storage Repl. Filtration Bldg.B2 & B3 Pipe & Valve Repl. Fire Main Repl. – Ph. III Handrail Repl. – Phase V Training Trailer Repl.	DCS Fiber Optics Exp. RWF Street Treatment – Phase III

Design-Build

Feasibility/Development	Bid/Award	Construction
Digested Sludge Dewatering	Cogeneration Facility	Digester Gas Compressor Upgrade Emergency Diesel Generators

Key

Stage Gates

Stages

Note: Projects shown in bold and italics have moved phase in the reporting period

Program Summary

February 2015

In the month of February the Program Team moved forward on multiple fronts.

We continued to advance studies and projects through stage gates of the Project Delivery Model (PDM) process. In particular, the Biosolids feasibility study and the Plant Instrument Air System Upgrade Project advanced through the "Final Acceptance" and "Authorization to Proceed" stage gates respectively.

Our Biosolids and Odor Control teams continued work on a revised Biosolids Transition Strategy, based on the input received from the Treatment Plant Advisory Committee (TPAC) and City Council in December 2014. The team is currently focusing on alternative analyses of options to meet the Plant Master Plan goal to transition out of the open air lagoons and drying beds and to reduce odors.

Staff developed the proposed FY 15-16 Capital Budget and FY 16-20 CIP and provided an update on the 10-year funding strategy to the Transportation & Environment (T&E) Committee.

In line with our funding strategy, we started the submittal process for our first Clean Water State Revolving Fund (SRF) application for the Digester and Thickener Facilities Upgrade Project. An amendment to the design consultant agreement for this project was also approved by City Council this month.

The Cogeneration Facility team began to review prequalification submittals from potential design-builders and continued to work on procurement documents for the subsequent Request for Proposals. The Cogeneration Facility team and the Headworks Improvements Team continued work on Requests for Qualifications for technical support / owner's representative services for these projects.

Our resourcing work for FY 15-16 continued, as we looked at staffing needs across the whole CIP, including Program, Engineering, O&M and Environmental staff. This will form part of the wider annual update to our Program Execution Plan (PEP) which also commenced this month.

Work continued on the assessment of the water control gate structures along the western levee of Pond A-18. Initial analysis indicates that the northern gate structure is at a critical risk of failure. In March, staff will ask City Council to declare that an emergency replacement of the north gate structure is necessary and delegate authority to the directors of Public Works (DPW) and Environmental Services (ESD) to award the needed engineering and construction contracts, so repairs can start as soon as possible. Previously this work had been planned to occur later as part of the larger Outfall Bridge and Levee improvement Project.

Look Ahead

In March, we will continue to move forward on numerous efforts related to consultant procurements, including the Headworks Improvements, New Headworks, Facility Wide Water Systems Improvement, Filter Rehabilitation and Nitrification Clarifiers Rehabilitation. Staff will solicit bids for the emergency construction work required at the Pond A-18 north gate structure and award the project before the end of the month.

Stage Gate meetings will be held for the Construction-Enabling Project, and the Flood Protection Study. We will also present our project delivery and procurement strategy and request the delegation of authority to the directors of DPW and ESD to determine the appropriate delivery method for each project.

Our Biosolids team will continue to undertake further analysis on the revised Biosolids Transition Strategy based on the input previously in December with the intent to bring it back to TPAC and City Council for consideration in May and June, respectively.

The Program team will continue with the first annual update to the Program Execution Plan (PEP), which provides the overall roadmap for our program execution and project delivery.

Program Highlight – Choosing a Project's Delivery Method

The wastewater industry uses various project contract vehicles to deliver capital projects, with the traditional method being design-bid-build (DBB). Over the years, the use of delivery methods other than DBB has become increasingly popular, in particular design-build (DB). Based on a detailed analysis of all delivery methods, the Program team has identified the following methods as most applicable for the projects in the CIP:

- **Design Bid Build (DBB)** - The owner selects an engineer to design and develop construction documents, from which the owner solicits lump sum bids. Selection is based on the lowest responsible bid and the contractor is responsible for construction but not the design. Historically, projects at the RWF have been delivered through DBB contracts.
- **Low Bid Design Build (LB/DB)** - Prospective design-builders submit lump sum proposals based on the owner's specifications and project concept (usually a preliminary design). The design-builder is primarily selected based upon cost. The selected design-builder has singular responsibility to deliver a project that meets the owner's specifications (including performance requirements) at the proposed lump sum price.
- **Progressive Design Build (P/DB)** – The design-builder is selected based primarily upon qualifications (and other criteria per State regulations, such as technical approach, price and life-cycle costs). The design-builder works collaboratively with the owner to "progress" the design and provides a construction cost estimate, in an open-book format, until the design and a Guaranteed Maximum Price (GMP) can be agreed upon between the design-builder and owner.

The Program has developed a rigorous method to determine the preferred delivery method for a given project. This method uses seven decision criteria:

- Project size
- CEQA or other permitting requirements
- Project complexity
- Design performance risk
- Design control
- Optimizing quality and cost
- Schedule

Program Performance Summary

Seven 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. The target for the seventh KPI "Staffing Level" KPI will be established as part of the analysis of future staffing needs.

Program Key Performance Indicators – Fiscal Year 2014-2015

KPI Description	Target	Actual	Status	Trend	Measurement
Schedule	85%	100% (2/2)[1]			Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone. ***Target: 85% of projects delivered within 2 months of approved baseline schedule or better.***
Budget	90%	50% (1/2)			Percentage of CIP projects that are completed within the approved baseline budget. ***Target: 90% of projects delivered are within 101% of the baseline budget.***
Expenditure[2]	≥$95.8M	$93.3M			Total CIP actual + forecast committed cost for the fiscal year compared to CIP fiscal year budget. ***Target: Forecast committed cost meets or exceeds 60% of budget for Fiscal Year 14/15 (60% of $159.6M= $95.8M)***
Procurement[3]	100%	43% (3/7)			Number of actual + forecast consultant and contractor procurements compared to planned for the fiscal year. ***Target: Forecast /actual procurements for fiscal year meet or exceed planned.***
Safety	0	0			Number of OSHA reportable incidents associated with CIP construction for the fiscal year. ***Target: zero incidents.***
Environment/Permits	0	0			Number of permit violations caused by CIP construction for the fiscal year. ***Target: zero violations.***
Staffing Level[4]	TBD	TBD	TBD	TBD	Percentage of authorized staffing level ***Target: to be determined***

KEY:

Cost:	 Meets or exceeds KPI target	 Does not meet KPI target

Notes

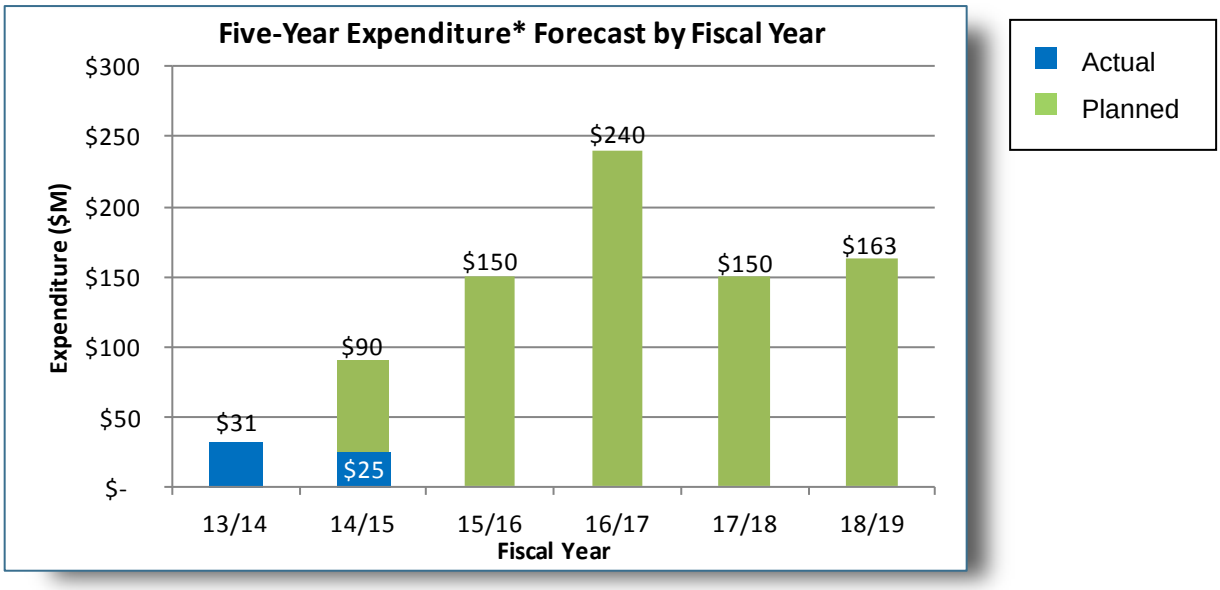
1. FY14-15 budget excludes reserves, ending fund balance, South Bay Water Recycling, Public Art and Urgent and Unscheduled Rehabilitation items
2. The Expenditure KPI Target Forecast percentage has been adjusted to reflect the decision to report against the total program budget including contingency (previously the total budget did not include contingency allowance).
3. Delays have occurred to the following procurements resulting in award slipping to FY 15/16: Value Engineering and Peer Review Services, Audit Services, Cogeneration Facility Technical Services and Cogeneration Facility Design-Build.
4. Staffing level KPI measured quarterly; all other KPIs measured monthly.

Program Cost Performance

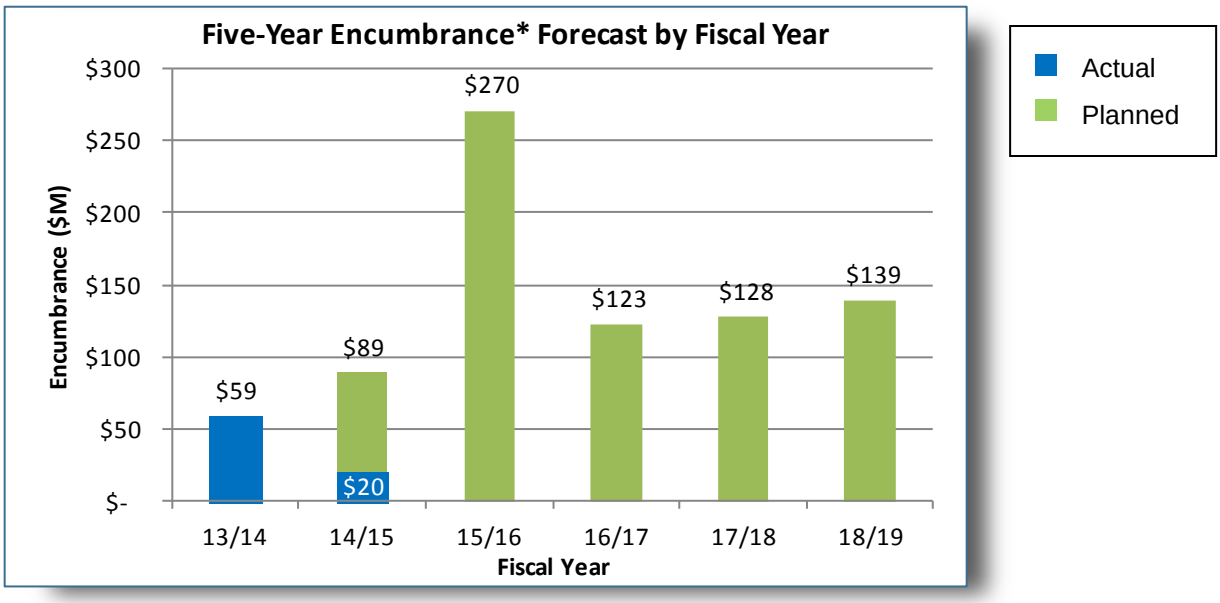
This section provides a summary of CIP cost performance for all construction projects and non-construction activities for FY13-14 and the 2015-2019 CIP.

Adopted 2015-2019 CIP Expenditure and Encumbrances

To accommodate the proposed increase in expenditures and encumbrances over the next five years, the City is developing a long-term financial strategy to fund the needed, major capital improvements while minimizing the impact to ratepayers.



*Expenditure defined as: Actual cost expended associated with services and construction of physical asset which may include encumbered amounts from previous years



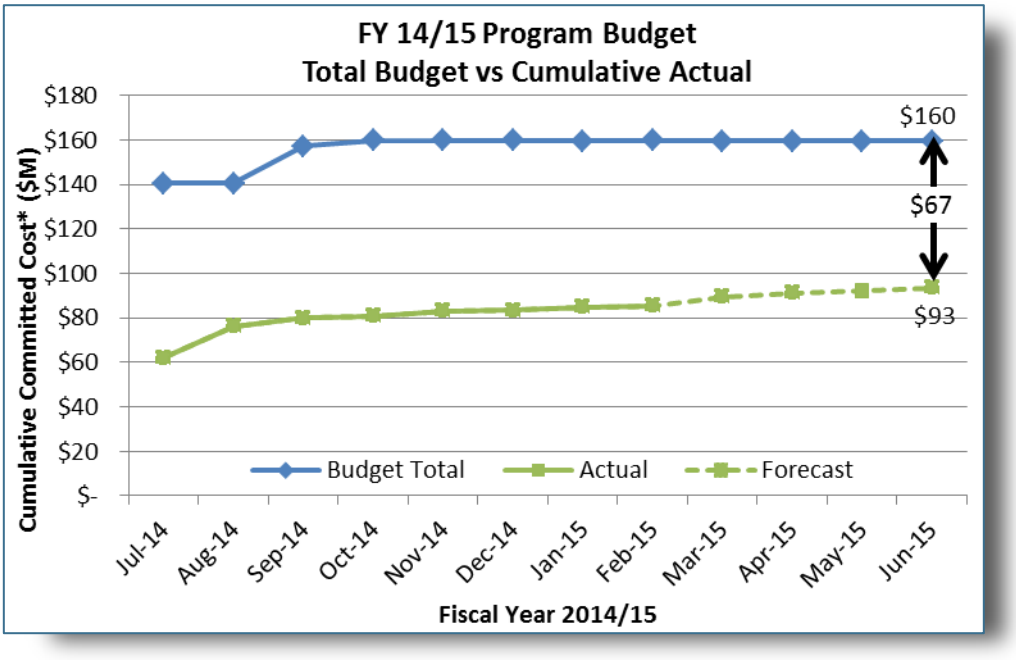
*Encumbrance defined as: Financial commitments, such as purchase orders or contracts, which are chargeable to an appropriation and for which a portion of the appropriation is reserved

Fiscal Year 2014-2015 Program Budget Performance

The fiscal year program budget is $160 million. The budget amount of $160 million represents the 2014-2015 budget of $107 million plus carryover of $53 million. The budget amount excludes reserves, ending fund balance, South Bay Water Recycling, Public Art and Urgent and Unscheduled Rehabilitation items.

The projected year-end variance of approximately $67 million is primarily due to the following reasons:

- Award of the Cogeneration Facility design-build contract and technical support services agreement are now expected in FY15-16 ($24 million).
- Award of construction contracts for the Iron Salt Feed Station, Plant Instrument Air System Upgrade, and Switchgear S40/G3 Relay Upgrade projects are anticipated in FY15-16 ($18 million).
- Award of a design contract for critical rehabilitation work in the Headworks Improvements is expected in FY15-16 ($4 million).
- Award of a design contract for the Advanced Facility Control and Meter Replacement project has been removed from the forecast while the project team reevaluates the scope to determine the best way to implement the project ($2 million).
- Lowered forecasts for consultant services for the Emergency Diesel Generators, Fiber Optic Connection to RWF, and Plant Instrument Air System Upgrade projects ($2 million).
- Lower than expected expenditures and encumbrances in Equipment Replacement ($1 million).



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

Project Performance

There are currently 12 active projects in the construction or post-construction phase with a further 15 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	●	●
RWF Street Rehabilitation - Phase III	Post-Construction	Nov 2014	●	●
A5-A6 Nitrification Mag. Meter & Valve Replacement	Construction	May 2015	◆	◆
Filtration Building B2 & B3 Pipe & Valve Replacement	Construction	Mar 2015	●	●
BNR-2 Clarifier Guardrail Replacement	Construction	May 2015	●	●
Fire Main Replacement - Phase III	Construction	Apr 2015	●	●
Handrail Replacement - Phase V	Construction	Aug 2015	●	◆
Training Trailer Replacement	Construction	Jun 2015	●	●
Digester Gas Storage Replacement	Construction	Aug 2015	●	●
DCS Upgrade/Replacement	Construction	Jun 2016	●	●
Digester Gas Compressor Upgrade	Construction	Jul 2016	●	●
Emergency Diesel Generators	Construction	Aug 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 10.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
Cogeneration Facility	Procurement	Sep 2018
Fiber Optic Connection to RWF	Design	Dec 2015
Iron Salt Feed Station	Design	Sep 2017
Digester & Thickener Facilities Upgrade	Design	Sep 2018
Construction-Enabling Improvements	Feasibility/Development	Oct 2016
Headworks Critical Improvements	Feasibility/Development	Apr 2017
Plant Instrument Air System Upgrade	Feasibility/Development	Oct 2017
Adv. Facility Control & Meter Repl. Ph. 2	Feasibility/Development	Jun 2019
Digested Sludge Dewatering Facility	Feasibility/Development	Apr 2020
Headworks Improvements	Feasibility/Development	Aug 2020
Outfall Bridge and Levee Improvements	Feasibility/Development	Nov 2020
Facility-wide Water Systems Improvements	Feasibility/Development	Sep 2021
Filter Rehabilitation	Feasibility/Development	Dec 2021
Nitrification Clarifiers Rehabilitation	Feasibility/Development	Mar 2022
New Headworks	Feasibility/Development	Apr 2022

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

Liquids Package

Iron Salt Feed Station

Completed the review of the design submittal (60% design) and returned comments to the consultant. Met with the environmental team to resolve site issues including mapping and surveying potential areas for construction site avoidance. The next step is to complete the detailed design.

Biosolids Package

Biosolids Transition Strategy

Staff continued to evaluate site alternatives for locating the new proposed dewatering facility. In addition, an odor modeling study commenced this month that investigates the odor impacts of the existing sludge lagoons and drying beds as compared with the new dewatering facility. The Staff will be returning to Council with odor and cost information for the biosolids transition in June 2015.

Digester and Thickener Facilities Upgrade

The detailed design of the digesters and dissolved air flotation tanks (DAFT) has continued this month. The design consultant, Brown and Caldwell, conducted three workshops in February to further define supporting facilities (e.g. biogas piping, screening facility layout, and waste gas burner upgrades) and to discuss the seismic design criteria for the digesters and DAFT tanks. Construction costs estimates are currently being updated.

Power & Energy Package

Cogeneration Facility

Prequalification submittals for design-builders were received on February 3. Staff is performing a detailed evaluation to determine which teams are qualified to proceed to the RFP stage.

Digester Gas Compressor Upgrade

Construction on the new Gas Compressor Building continues. The forms for the Compressor Building south wall were being installed. The City has selected the manufacturer for the Gas Compressor motor.

Facilities Package

Outfall Bridge and Levee Improvements

A Condition Assessment, completed in January 2015, revealed that the Northern Gate Structure is in critical condition and needs immediate replacement. Staff confirmed the findings in late February and will be requesting that City Council declare an emergency to allow repairs to begin as soon as possible.

Explanation of Project Performance Issues

A5-A6 Nitrification Mag. Meter & Valve Replacement

In September 2014, during startup, the project discovered that the actuators that had been specified and installed were incompatible with the available power supply. Engineering staff determined it would be more costly to modify the system than to order and install compatible actuators. In addition, O&M staff requested that the actuators match those used in the other clarifiers. The contractor has submitted a proposal for the requested equipment. Beneficial use is expected by the end of May 2015.

Handrail Replacement - Phase V

For safety reasons, the contractor has only been replacing handrails on empty aeration basins. November through April is designated as the rainy season during which O&M staff need to have aeration basins available in the event of heavy rains. As a result, the contractor has suspended work until the end of April 2015. Work is expected to resume when the remaining basins become available. Beneficial Use is expected by late August 2015.

Project Profile

Digester Gas Compressor Upgrade

The Wastewater Facility currently operates three digester gas compressors located in the Sludge Control Building: two smaller Ingersoll-Rand single-action gas compressors (GC1 and GC3) installed in 1964, and one Norwalk gas compressor (GC4) installed in 1984. GC1 and GC3 are nearly 50 years old and are increasingly unreliable and difficult to maintain. GC4 is also nearing the end of its useful life due to continuous use.

The gas compressors are a critical element of the Wastewater Facility's power system. The engine generators rely on blended gas to produce power and air for operating the various treatment processes. The compressors receive low-pressure digester gas and boost the pressure to the required operating pressures for use by the engines. Without reliable compressors, the engines would revert to operating on only natural gas with valuable digester gas being flared.

This project will design and construct a new 4,000 square foot building to house two new gas compressors. The new facility will be located immediately north of the existing Sludge Control Building. The project also includes two digester gas pre-coolers, two cooling towers, associated gas piping, and associated building and equipment utility tie-ins.

On May 20, 2014, the City awarded a design-build contract to Anderson Pacific Engineering and Construction, Inc. entered for a total amount of $11,316,000. Contract work began in June 2014 and is anticipated to be completed in June 2016.

Buried process and potable waterlines were relocated in August-September 2014 to clear the way for the new building foundation. A deep foundation was chosen over a shallow foundation to suit design requirements and site conditions. A total of 42 drilled piers were completed in December 2014. The top of 30 out of 42 piers were then tied together with grade beams to complete the building foundation system. Design coordination for the compressor system and associated components is in progress.

Project Budget: $15,000,000.

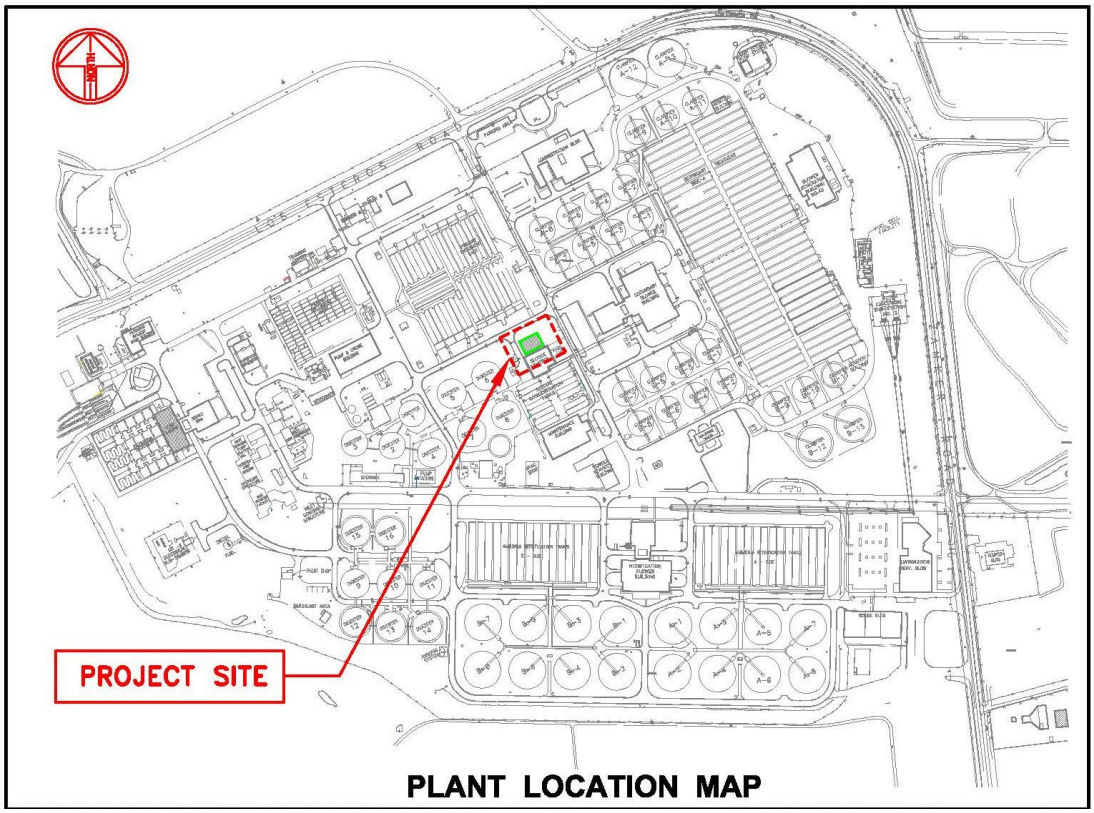


Figure 1: Digester Gas Compressor Location Plan

Figure 2: Pier Construction in Progress

Figure 3: Grade Beams/Footings Concrete Pouring in Progress

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

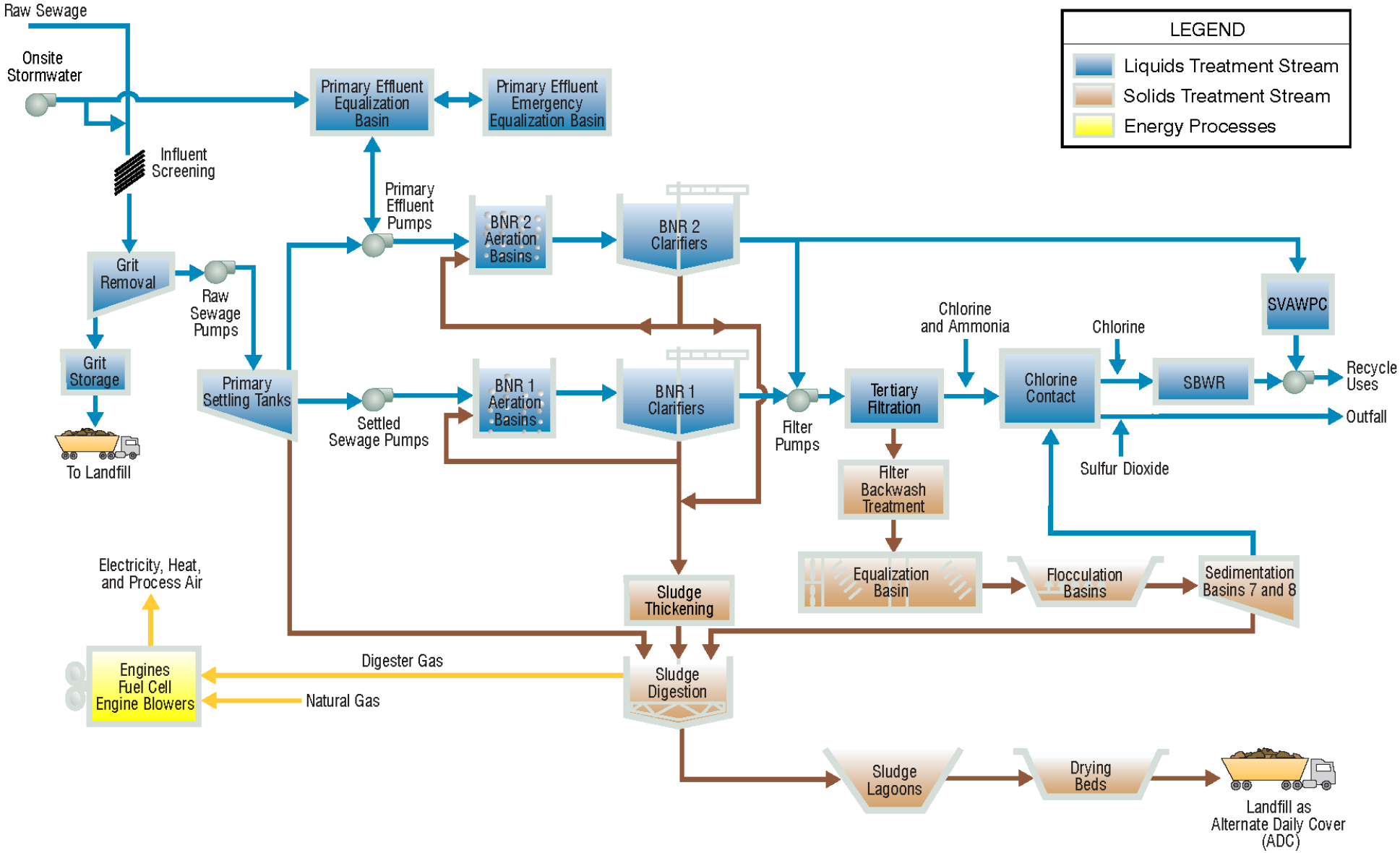


Figure 4—Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

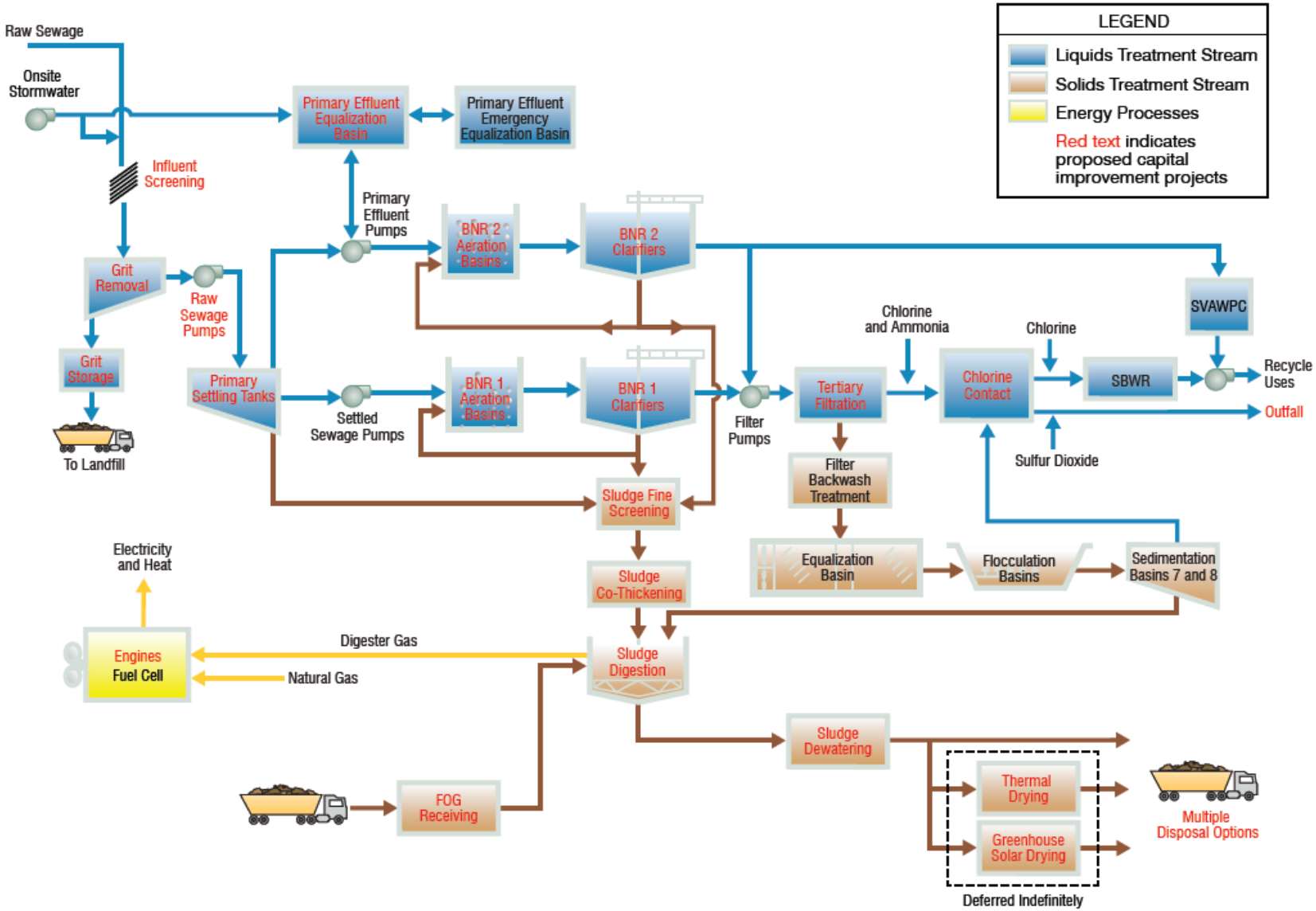


Figure 5—Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

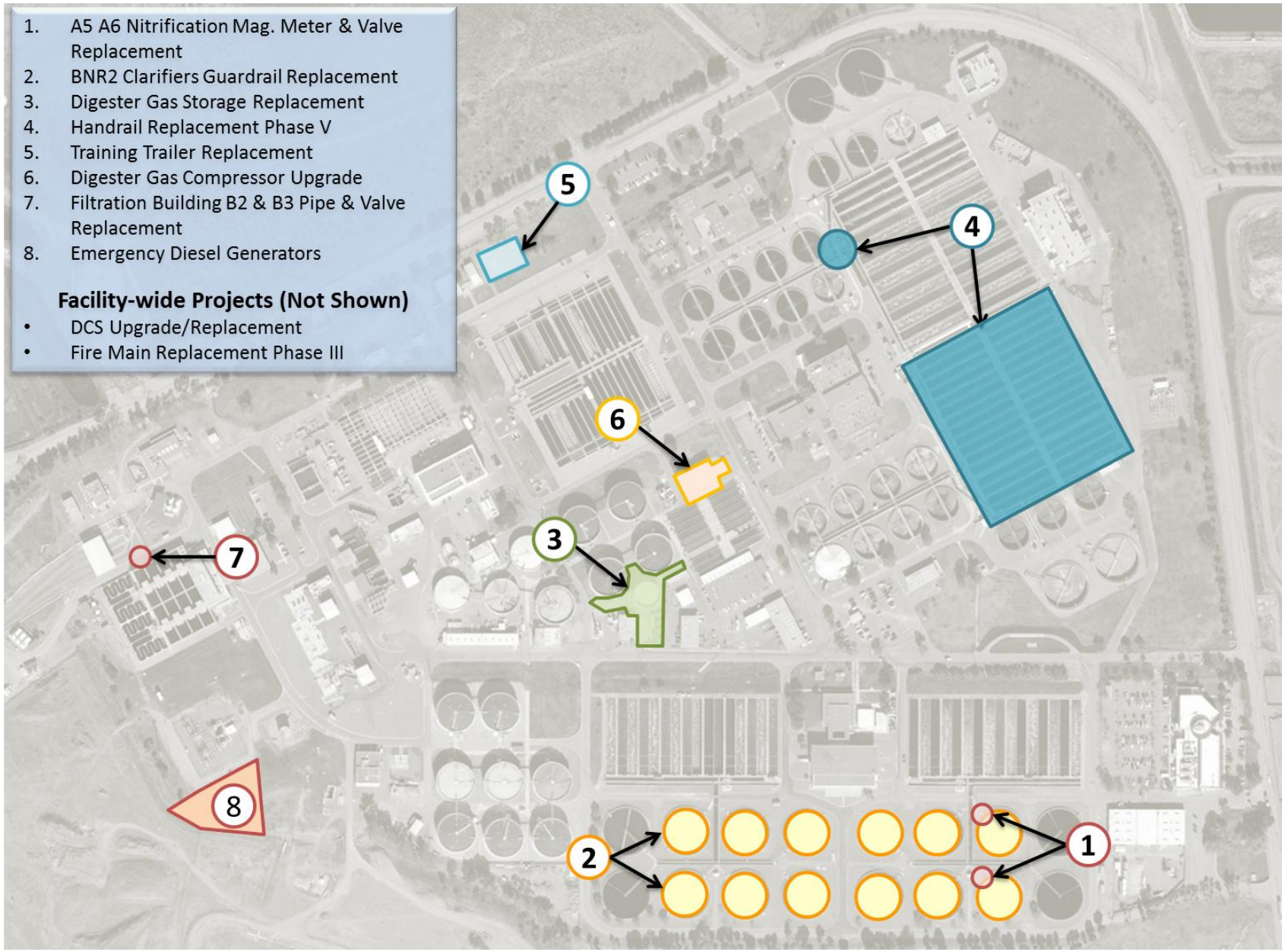


Figure 6—Active Construction Projects