San José-Santa Clara Regional Wastewater Facility

# Capital Improvement Program

# Monthly Status Report: June 2020

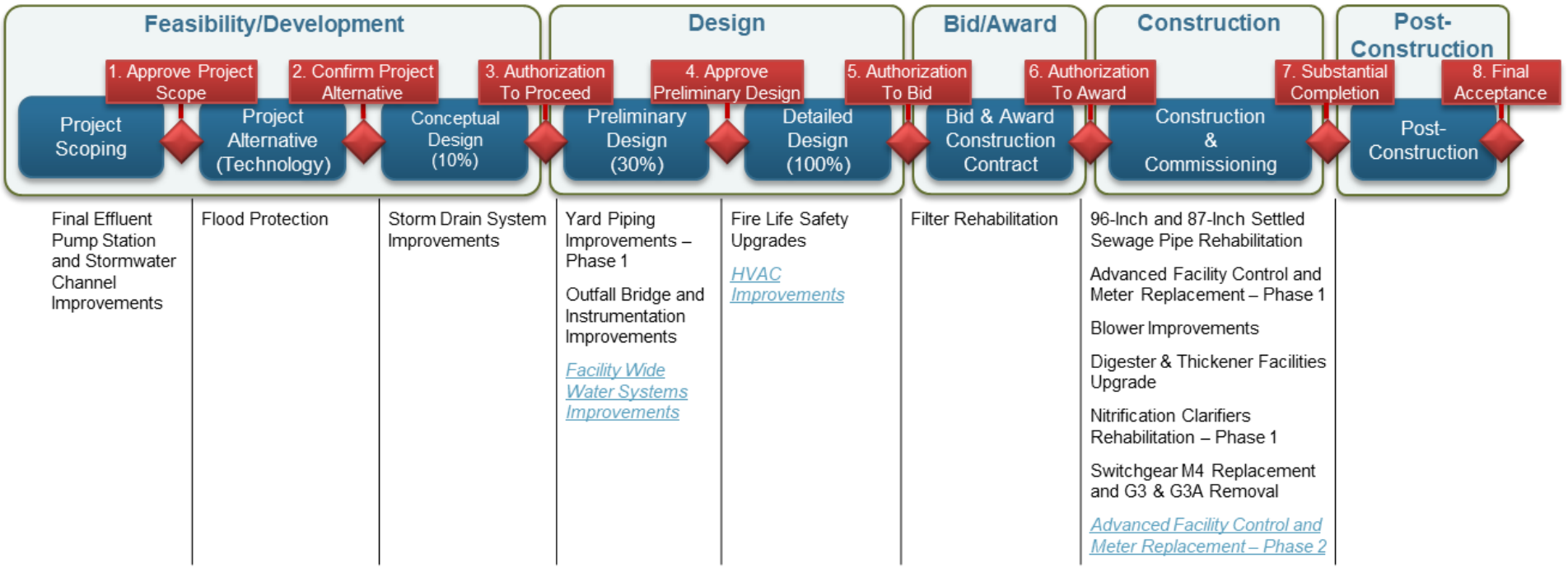
August 13, 2020

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for June 2020.

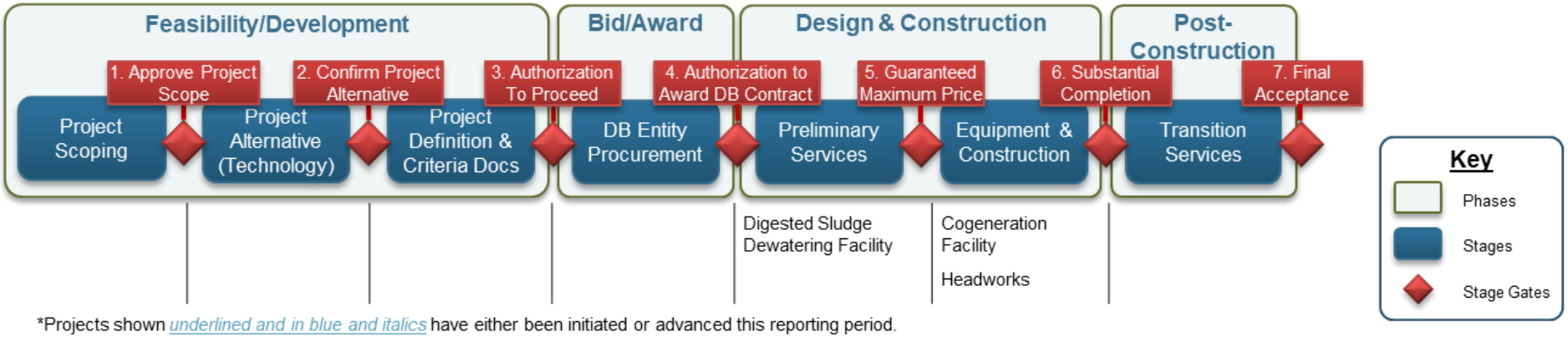
## Report Contents

# Project Delivery Models

## Design-Bid-Build Active Projects




## Progressive Design-Build Active Projects




*Projects shown *underlined and in blue and italics* have either been initiated or advanced this reporting period.

# Program Summary

## June 2020

In June, CIP projects continued to progress despite COVID-19 pandemic impacts. Projects in construction continued with all contractors and construction management (CM) staff following the latest guidance from the Santa Clara County Public Health Officer. The City began temperature screening at each RWF entrance for all City, consultant, and contractor staff, followed by screening questions at individual work sites. All other CIP staff continued to work remotely.

Two projects successfully passed stage gates of the Project Delivery Model (PDM). The Facility Wide Water Systems Improvements Project was approved to proceed with preliminary design. The associated exploratory trenching contract, which will help inform the design, was approved to bid. The HVAC Improvements Project was approved to proceed with detailed design.

The San José City Council (Council) approved the construction contract award for the Advanced Facility Control and Meter Replacement – Phase 2 Project.

On June 18, the City received three bids for the Filter Rehabilitation Project, with the lowest bid only four percent above the engineer's estimate. Staff will seek approval to award the construction contract in September.

The Digester and Thickener Facilities Upgrade Project contractor performed pre-commissioning on the dissolved air flotation thickener (DAFT) tanks, including testing equipment and cleaning and water-testing the tanks.

The Cogeneration Facility Project design-builder completed functional testing on the first train of the digester gas treatment system. The design-builder also continued pre-operational and functional testing for the cooling towers, cogeneration engines, and boilers.

The Blower Improvements Project contractor completed installation of conduits in the Building 40 basement and installed a new electric motor in the new electrical room.

The Advanced Facility Control and Meter Replacement – Phase 1 Project contractor began removing existing flow meters, transmitters, and associated piping in the Nitrification Battery B area.

The Headworks Project design-builder commenced construction on June 1. Early construction activities included relocation of existing utilities; installation of temporary electrical power and fiber optic systems; and clearing and excavating the site.

The 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project contractor completed all preconstruction activities, including startup and functional testing of the DAFT liquid effluent (DLE) reroute system.

The Nitrification Clarifier Rehabilitation – Phase 1 Project contractor began construction with the installation of temporary access stairways and ladders for Clarifiers B6 and B8 and trenching for electrical duct banks.

**Figure 1 – Trenching between nitrification clarifiers in preparation for an electrical duct bank**

Staff completed review of the draft Basis of Design Report (BODR) for the Digested Sludge Dewatering Facility Project.

## Look Ahead

The following key activities are forecast for July and August 2020:

- Work will begin on the repair of the 96-Inch and 87-Inch settled sewage pipelines.
- The City will open bids for the Facility Wide Water Systems Exploratory Trenching contract.
- The Notice to Proceed (NTP) will be issued for the Advanced Facility Control and Meter Replacement – Phase 2 Project.
- Two projects will seek to advance through the following stage gates:
    - Outfall Bridge and Instrumentation Improvements Project – Stage Gate 4: Approve Preliminary Design; and
    - Yard Piping Improvements – Phase 1 Project – Stage Gate 4: Approve Preliminary Design.

## Program Highlight – Headworks Project

When raw wastewater enters the RWF, it first goes to the headworks for preliminary treatment. The headworks facility removes inorganic material such as sticks, stones, grit, and sand from the influent wastewater stream to reduce wear on the downstream process equipment and enhance process performance.

The City's Plant Master Plan recommended replacing the aging Headworks 1 facility with a new Headworks 3, while maintaining the existing Headworks 2 facility to provide backup and wet-weather capacity. In June 2018, Council approved a design-build contract with CH2M Hill Construction (CH2M) for the Headworks Project. The contract consists of two phases: preliminary services and design-build.

**Preliminary Services**

During this first phase, CH2M advanced the project to the 60-percent design level. A key objective was to fully define the project scope so that a Guaranteed Maximum Price (GMP) could be negotiated between the City and CH2M to complete the remainder of the design and construct, startup, and test the new facilities. This phase was completed in February 2020.

The new headworks will be located in the southwest corner of the RWF as shown in Figure 2. The basis of design was predicated on the following criteria:

- Headworks 2 and Headworks 3 need to be able to treat the projected year 2040 extreme peak hour wet-weather flow of 400 million gallons per day (MGD) when both facilities are in service; and
- Headworks 3 will be the lead headworks facility, normally operating in dry flow conditions and capable of treating the projected year 2040 peak hour dry-weather flow of 209 MGD with one train out of service.

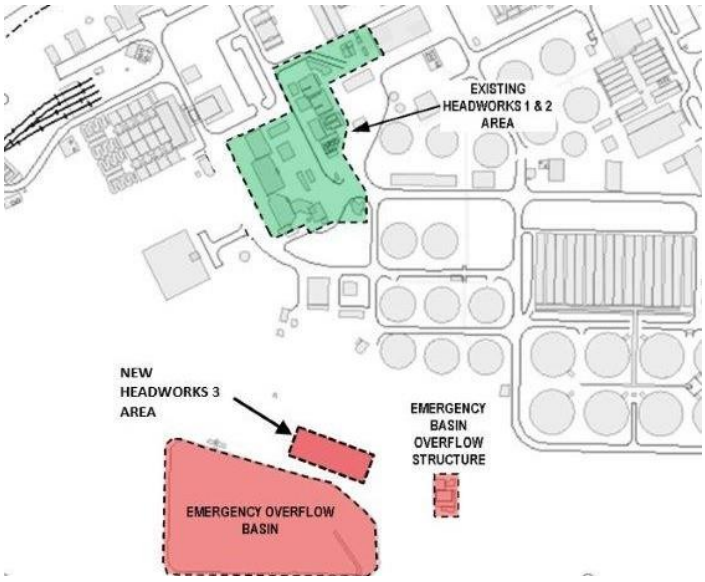



**Figure 2 – Project Site Map**

Cost reduction and validation activities preceded the GMP development. As part of this work, a value engineering session was conducted; the owner's advisor developed a 30-percent cost estimate; and CH2M completed a preliminary procurement of process equipment and major subcontractors. As part of the 60-percent submittal, CH2M presented the initial GMP along with terms and conditions to be incorporated into the amended and restated design-build contract. Following evaluation of the initial GMP, the project team negotiated a final value of $126.9 million for the design-build phase. The Treatment Plant Advisory Committee (TPAC) and Council approved the amended and restated contract in February 2020.


**Figure 3 – Rendering of New Headworks 3**

**Design-Build**

This phase began after Council approval. Initial activities included dividing the design into several packages to allow construction to begin while the design was being completed. CH2M identified three early design packages (EDPs):

- EDP1 – Utility relocations; installation of temporary power and fiber; site establishment; and excavation of Headworks 3 site;
- EDP2 – Procurement of materials needed for early construction work such as gates, imbedded piping, and coatings; and
- EDP3 – Design of lower level concrete slabs for Headworks 3.

The design of EDP1 was completed and approved in April 2020 and construction of this package started on June 1. EDP2 was completed this month and material procurement is underway. EDP3 and the rest of the design is currently under review.

**Figure 4 – Start of Headworks 3 excavation and tower crane installation**

Concurrent with the above work and spanning both project phases, the project team has engaged in numerous permitting activities so that project construction may proceed. Staff obtained permits from the City's Planning Department, the Bay Area Air Quality Management District; Santa Clara Valley Habitat Conservation Agency, and the US Army Corps of Engineers. Negotiations with the Regional Water Quality Board are ongoing for one final permit. Environmental pre-construction surveys discovered baby burrowing owls and a baby golden eagle nesting in the nearby RWF bufferlands. Mitigation and monitoring activities are underway to ensure the well-being of these protected species.

**Figure 5 – Burrowing owls monitored during Environmental pre-construction surveys.**


**Figure 6 – Adult Golden Eagle and nest**

## 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 basis. Through the life of the CIP, KPIs that best reflect the current program will be selected and measured. KPIs are reset each fiscal year.

### Program Key Performance Indicators – Fiscal Year 2019-2020

| KPI | Target | Fiscal Year to Date | | | Fiscal Year End | | |
|---|---|---|---|---|---|---|---|
| | | Actual | Status | Trend | Forecast | Status | Trend |
| **Stage Gates** | 90% | 96%<br>22/23[1] | ● | ↑ | 96%<br>22/23 | ● | → |
| Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >= 90%; Amber: 75% to 90%; Red: < 75% | | | | | | | |
| **Schedule[2]** | 90% | N/A<br>0/0 | N/A | N/A | N/A<br>0/0 | N/A | N/A |
| Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone.[3] Target: Green: >= 90%; Amber: 75% to 90%; Red: < 75% | | | | | | | |
| **Budget[4]** | 90% | N/A<br>0/0 | N/A | N/A | N/A<br>0/0 | N/A | N/A |
| Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget.[3] Target: Green: >= 90%; Amber: 75% to 90%; Red: < 75% | | | | | | | |
| **Expenditure** | $369M | $403M | ● | ↑ | $403M[5] | ● | ↓ |
| Measurement: CIP FY19-20 committed costs. Target: Committed costs meets or exceeds 70% of planned budget. 70% of $528M = $369M. Therefore Fiscal Year End Green: >=$369M; Red: < $369M | | | | | | | |
| **Procurement** | 80% | 83%<br>5/6 | ● | → | 83%<br>5/6[6] | ● | → |
| Measurement: Number of consultant and contractor procurements advertised compared to planned for the fiscal year. Target: Green: >= 80%; Amber: 70% to 80%; 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 | 1 | ▲ | → | 1[7] | ▲ | ↑ |
| Measurement: Number of permit violations caused by CIP delivery for the fiscal year. Target: Green: zero incidents; Amber: 1 to 2; Red: > 2 | | | | | | | |
| **Vacancy Rate[8]** | 10% | 15%<br>13/86 | ▲ | → | 15%<br>13/86[9] | ▲ | ↑ |
| Measurement: Ratio of the number of vacant approved positions to approved positions. Target: Green: <= 10%; Amber: 10% to 20%; Red: > 20% | | | | | | | |

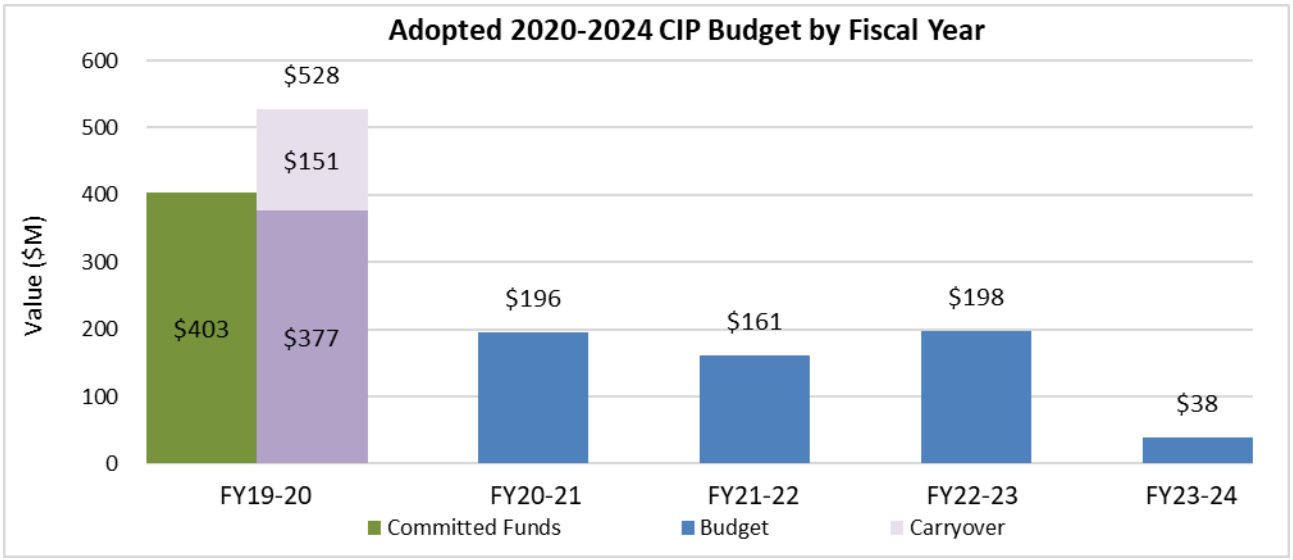
**Notes**

1. The Facility Wide Water System Improvements Project passed Stage Gate 3: Authorization to Proceed, with an additional approval to bid the exploratory trenching contract, and the HVAC Improvements Project passed Stage Gate 4: Approve Preliminary Design.
2. The CIP did not have any projects reach Beneficial Use this fiscal year.
3. The baseline Beneficial Use date and the baseline budget for each project are established at construction contract award and execution.
4. The CIP did not accept any projects this fiscal year.
5. The fiscal year-end expenditure has decreased due to lower than anticipated expenses and liquidated carryover.
6. The CIP did not advertise the subsurface investigation construction contract for the Facility Wide Water Systems Improvements Project this fiscal year.
7. The City has appealed a BAAQMD notice of violation related to permitting procedures and did not receive a response this fiscal year.
8. The vacancy rate KPI measures CIP-approved positions, including ESD, Public Works, and program management consultant full-time staff
9. The fiscal year-end Vacancy KPI increased as less positions were filled than originally anticipated.

# Program Budget Performance Summary

This section summarizes the cumulative monthly budget performance for fiscal year (FY)19-20 based on the Adopted 2020-2024 CIP.

## Adopted 2020-2024 CIP Expenditure and Encumbrances




**Notes:**

Committed Funds: Total of expenditures and encumbrances.

Expenditure: Actual cost expended, either by check to a vendor or through the City's financial system, for expenses such as payroll or for 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.

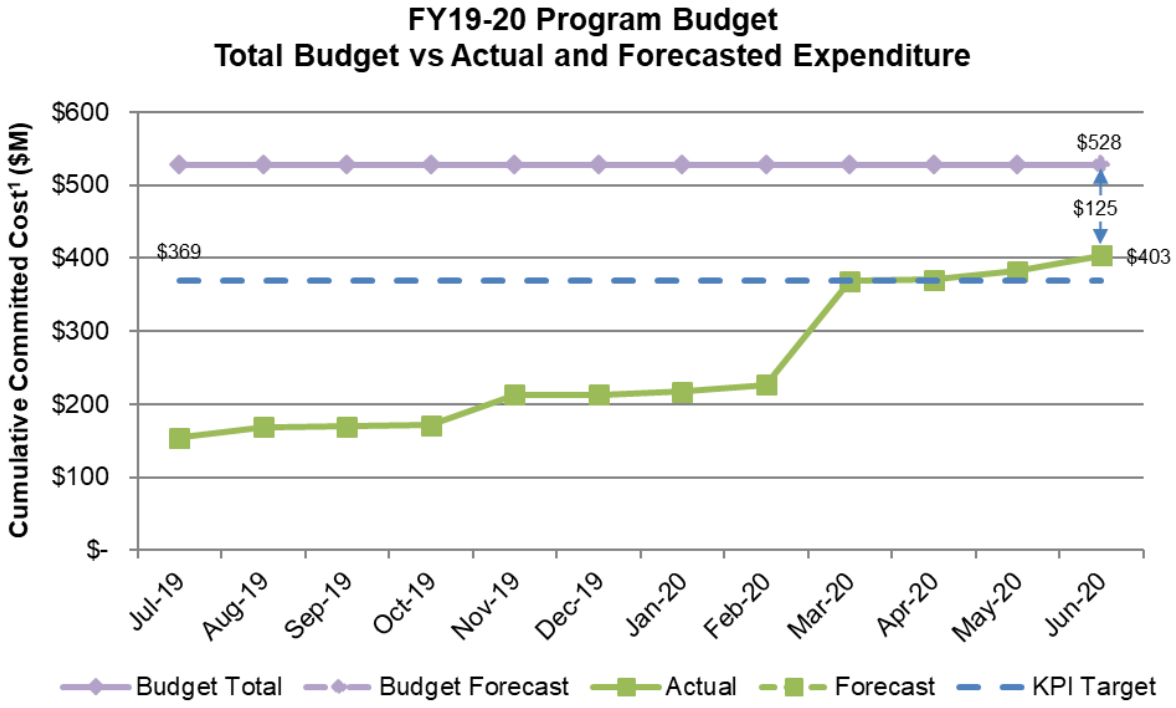
The FY19-20 budget is $401.5 million, which consists of $339.6 million in new funds and $61.9 million in rebudgets. For purposes of this monthly report, the adopted FY19-20 budget is adjusted from $401.5 million to $377.2 million due to the exclusion of certain appropriations that are not measured as part of the expenditure KPI. Excluded appropriations include City Hall Debt Service Fund; Clean Water Financing Authority Debt Service Payment Fund; Debt Service Repayment for Plant Capital Improvement Projects (San José only debt service); Equipment Replacement Reserve; Ending Fund Balance; Public Art; City Facilities Emergency Power; and Urgent and Unscheduled Treatment Plant Rehabilitation. Similar adjustments have been made to the budgets for FY20-21 through FY23-24.

Carryover: Encumbrance balances at the end of the previous fiscal year are automatically carried forward to the current fiscal year as carryover funding to pay invoices for approved construction contracts and consultant agreements. FY19-20 carryover is $151.0 million.

Budget of $377.2 million and carryover of $151.0 million totals $528.2 million for FY19-20.

## Fiscal Year 2019-2020 Program Budget Performance

The FY19-20 CIP budget is comprised of approximately $377.2 million in new and rebudgeted funds, plus encumbered carryover of $151.0 million, for a total of $528.2 million. This excludes City Hall Debt Service Fund; Clean Water Financing Authority Debt Service Payment Fund; Debt Service Repayment for Plant Capital Improvement Projects (San José only debt service); Equipment Replacement Reserve; Ending Fund Balance; Public Art; City Facilities Emergency Power; and Urgent and Unscheduled Treatment Plant Rehabilitation items. Overall, the fiscal year-end committed funds exceed the fiscal year-end target by $34 million.




**Notes:**

1. Committed costs are expenditures and encumbrance balances, including carryover (encumbrance balances from the previous fiscal year).
2. The variance between budget and commitments can be primarily attributed to the following factors:
    a. Three construction contracts were not awarded in FY19-20.
        i. Filter Rehabilitation Project
        ii. HVAC Improvements
        iii. Outfall Bridge and Instrumentation Improvements Project
    b. Several consultant service orders were not awarded in FY19-20:
        i. Aeration Tank Rehabilitation Project conceptual through final design
        ii. Facility Wide Water Systems Improvements Project preliminary engineering and value engineering
        iii. Flood Protection Project alternatives analysis and conceptual design
    c. The Yard Piping and Road Improvements Project was divided into multiple design-bid-build phases, resulting in different encumbrance timings and values.
    d. Construction bids for the Nitrification Clarifiers Rehabilitation – Phase 1 and Advanced Facility Control and Meter Replacement - Phase 2 projects came in under budget.
    e. Several other minor encumbrances for consultant services are either lower than budgeted or were not awarded in FY19-20.
    f. Several authorized positions remain vacant, resulting in lower personal services expenses than budgeted.

## Project Performance Summary

There are currently nine projects in the construction and post-construction phases and an additional nine projects in feasibility/development, design, bid and award, or design and construction phases (see PDM, page 2). 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.

### Project Performance – Baselined Projects

| Project Name | Phase | Estimated Beneficial Use Date[1] | Cost Performance[2] | Schedule Performance[2] |
|---|---|---|---|---|
| 1. Cogeneration Facility | Design & Construction | Oct 2020 | ● | ● |
| 2. 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation | Construction | Jan 2021 | ● | ● |
| 3. Digester and Thickener Facilities Upgrade | Construction | May 2021 | ◆ | ◆ |
| 4. Advanced Facility Control & Meter Replacement - Phase 1 | Construction | June 2021 | ◆ | ● |
| 5. Blower Improvements | Construction | Sep 2022 | ● | ● |
| 6. Advanced Facility Control & Meter Replacement - Phase 2 | Construction | Jan 2023[3] | ● | ● |
| 7. Switchgear M4 Replacement and G3 & G3A Removal | Construction | Jan 2023 | ● | ● |
| 8. Nitrification Clarifiers Rehabilitation – Phase 1 | Construction | Jan 2023 | ● | ● |
| 9. Headworks | Design & Construction | Jun 2023 | ● | ● |

**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 City issues the construction contract NTP letter.

## Project Performance – Pre-Baselined[2] Projects

| Project Name | Phase | Estimated Beneficial Use Date[1] |
|---|---|---|
| 1. Digested Sludge Dewatering Facility | Design and Construction | Nov 2023 |
| 2. Fire Life Safety Upgrades | Design | Nov 2022 |
| 3. Outfall Bridge and Instrumentation Improvements | Design | Dec 2022 |
| 4. Filter Rehabilitation | Design | Jan 2024 |
| 5. HVAC Improvements | Design | Apr 2024 |
| 6. Yard Piping Improvements – Phase 1 | Feasibility/Development | Oct 2021 |
| 7. Storm Drain System Improvements | Feasibility/Development | Sep 2023 |
| 8. Facility Wide Water Systems Improvements | Feasibility/Development | Mar 2025 |
| 9. Final Effluent Pump Station and Stormwater Channel Improvements | Feasibility/Development | Feb 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.
2. Pre-baselined projects are CIP projects not yet in construction that do not yet have schedules and budgets baselined.

# Project Significant Accomplishments

## Biosolids Package

Digested Sludge Dewatering Facility Project

- The City completed review of the Draft Basis of Design Report which documented alternatives that had been evaluated, project recommendations, and estimated project cost.
- Design-builder Walsh and the City selected with the new dewatering facility's configuration and conveyance equipment.

Digester and Thickener Facilities Upgrade Project

- Contractor Walsh checked all connections and tested about 900 items including control links, mechanical equipment, pumps, and valves required to run the new DAFT tanks. DAFT startup will occur next month.

## Facilities Package

96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project

- Contractor Michels Pipeline Construction completed all preconstruction activities, including start-up and functional testing of the DLE reroute system.

Facility Wide Water Systems Improvements Project

- The project passed Stage Gate 3: Conceptual Design. The project team began negotiations with the design consultant, Kennedy Jenks, for preliminary design.
- The associated exploratory trenching contract was also approved to advertise for bid in July.

Yard Piping Improvements – Phase 1 Project

- Design consultant, Black & Veatch, completed piping condition assessments for Digesters 11, 12 and 15.

## Liquids Package

Advanced Facility Control and Meter Replacement – Phase 1 Project

- Contractor Overaa began mechanical and electrical demolition work in the Nitrification Battery B area to remove existing flow meters, transmitters, and associated piping. The demolition work will be completed in July.

Advanced Facility Control and Meter Replacement – Phase 2 Project

- Council awarded the construction contract to Kiewit Infrastructure West Co. (Kiewit). The City will issue the Notice to Proceed (NTP) in July.

Blowers Improvements Project

- Contractor Monterey Mechanical completed installation of conduits in the Building 40 basement and installed a new electric motor in the new electrical room.

Filter Rehabilitation Project

- The City opened bids and issued a Notice of Intent to Award. Staff will recommend Council award the construction contract in October to the lowest bidder, Walsh Construction Company.

Headworks Project

- Design-builder CH2M began construction on June 1. Early construction activities included relocation of existing utilities, installation of temporary electrical power and fiber optic systems, and clearing and excavating the site.

Nitrification Clarifier Rehabilitation - Phase 1 Project

- Contractor Overaa drained groundwater from Clarifier B8 and built temporary access stairways and ladders for Clarifiers B6 and B8.

## Power and Energy Package

Cogeneration Facility Project

- Design-Builder CH2M completed functional testing on the first train of the digester gas treatment system.

# Explanation of Project Performance Issues

## Digester and Thickener Facilities Upgrade Project

This project encountered numerous unforeseen conditions at the beginning of construction in 2016, including corroded underground pipe and other obstructions for new building foundations. A temporary reroute system was installed to enable replacement of a 78-inch settled sewage pipeline and junction structure during the 2018 dry season.

In 2017, design modifications were required to address seismic risks, control system changes, additional underground obstructions, pipe anchorage, and new fire department requirements. Discovery of hazardous materials required the City to submit an extensive cleanup proposal to the federal Environmental Protection Agency (EPA) for approval. Once mitigation was completed in 2019, the City submitted another report to the EPA that detailed how it met each EPA cleanup permit requirement.

In late 2019 and early 2020, further design modifications were required to remove underground interferences to make room to install new pipe and conduit duct banks. As a result, twice as much paving had to be removed and excavation done than originally planned. COVID-related power plant shutdowns reduced availability of fly ash, which increased paving materials costs. After an anchor in the tunnel ceiling failed, structural engineers determined that new pipes should be supported from the tunnel floors instead of being hung from the ceiling. The contractor had to redesign supports and procure different support materials than originally planned. These changes, along with additional pipe supports required in the elevated pipe rack and the digester area, also increased costs. In addition, more concrete was used for equipment pads than originally planned, which required redesign of site drainage.

To pay for the additional work to address unforeseen conditions, Council approved a construction contingency increase of $15 million in November 2017 and another contingency increase of $25 million in June 2018. Staff will approach Council for a third contingency increase in early 2021.

Delays for these conditions have amounted to 273 working days. The original construction completion and Beneficial Use date of September 2019 was delayed to November 2020. Currently, the City is evaluating Walsh's request for additional delays due to numerous design-related change orders. If granted, these schedule delays may postpone project completion to September 2021.

## Advanced Facility Control and Meter Replacement – Phase 1 Project

In late 2018, the CIP identified the need for additional construction management (CM) team resources to adequately manage the construction, testing, and startup challenges the project was experiencing, as well as unforeseen conditions (see drain plate issue below). The project team subsequently added staff and increased budget hours for both the CM and project management teams to better support the project's construction and post-construction phases.

Additional staff time and consultant engineering services were required in late 2019 to resolve unforeseen corroded drain plates and other obstructions for the new flowmeter equipment. A design modification was required to address the aging pipe flange connected to the drain plate. To resolve these unforeseen conditions, project and construction teams had to perform additional work that has resulted in additional project delivery costs. Completion of this additional work has now been pushed to July 2020 with an additional cost of $530,000. The overall construction completion date of December 2020 has not changed.

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# Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

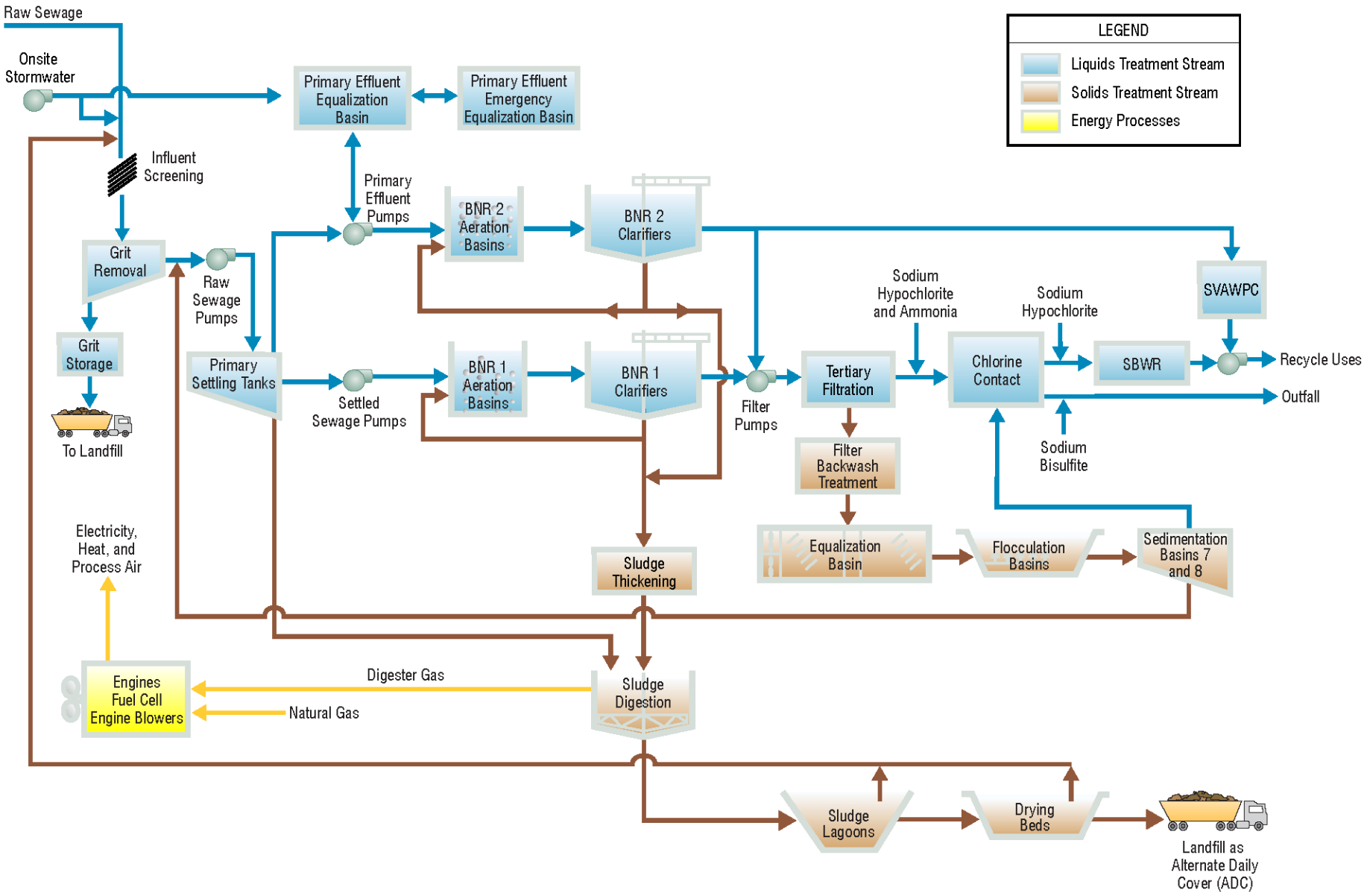


**Figure 7 – Current Treatment Process Flow Diagram**

# Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

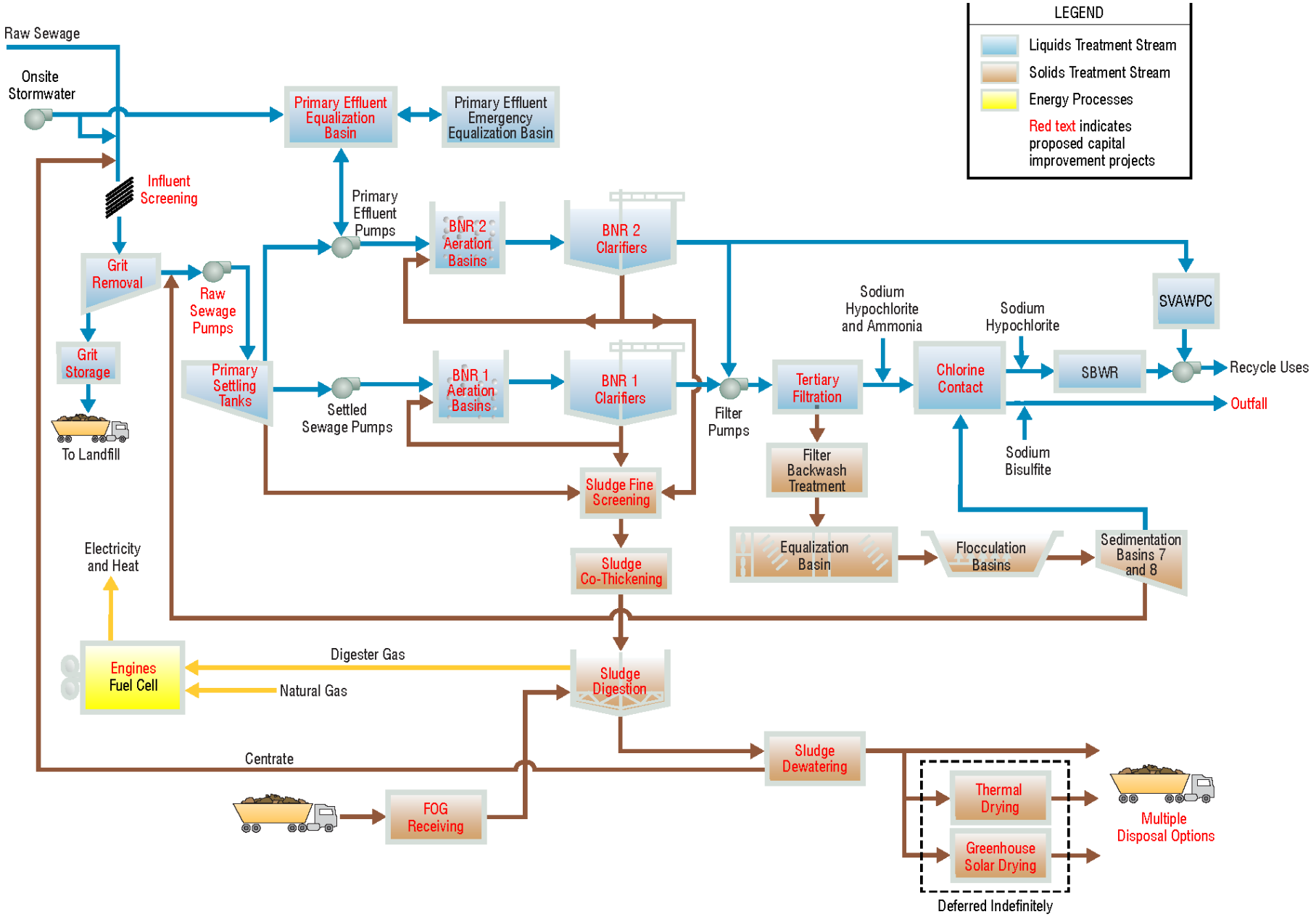


**Figure 8 – Proposed Treatment Process Flow Diagram**

## Active Construction Projects – Aerial Plan

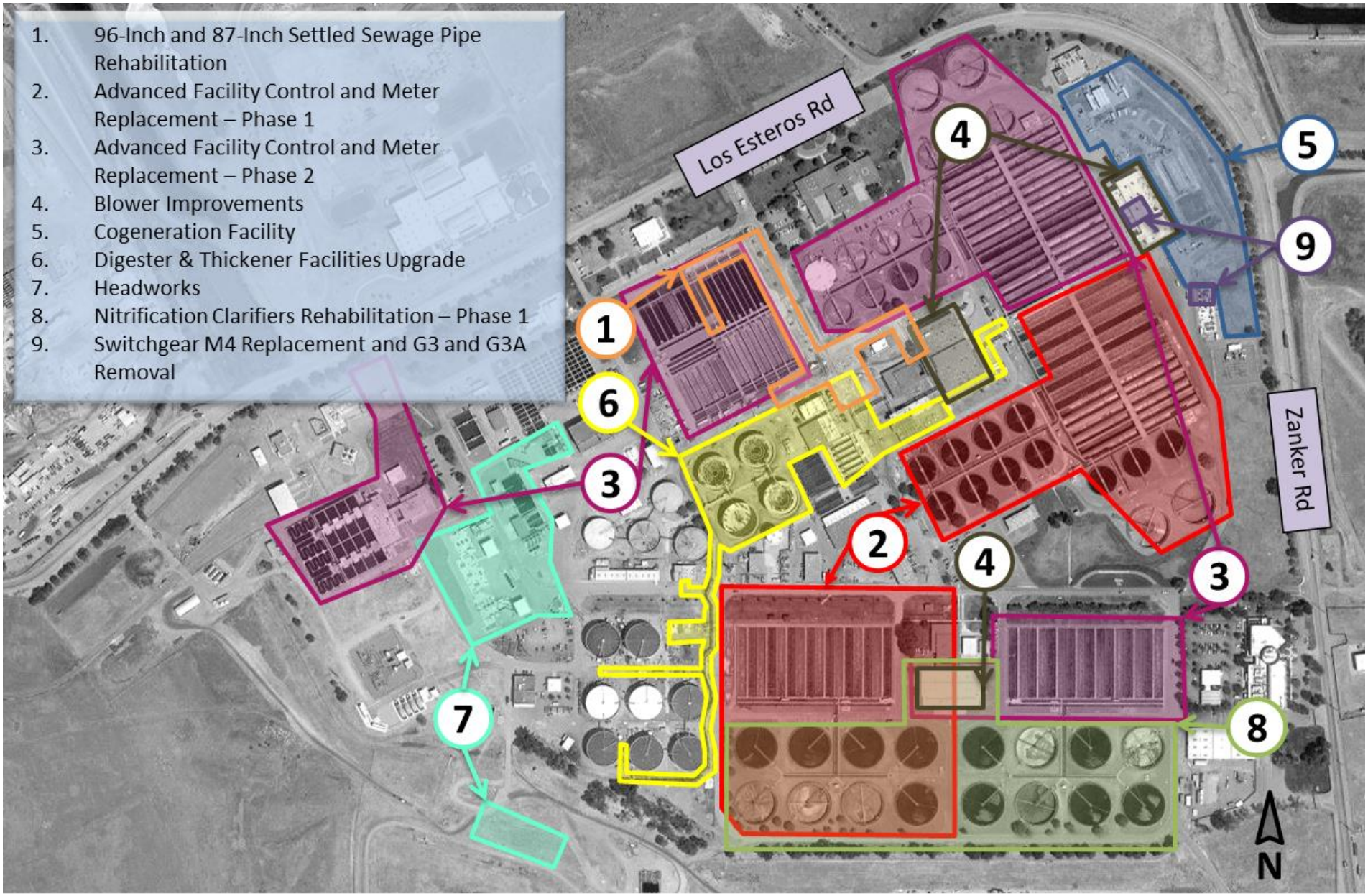


**Figure 9 – Active Construction Projects**