San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

OFFICE OF THE GENERAL MANAGER
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

DATE: May 17, 2021

TO: Commissioner, Sophie Maxwell, President
Commissioner, Anson Moran, Vice President
Commissioner, Tim Paulson
Commissioner, Ed Harrington
Commissioner, Newsha Ajami

FROM: Michael Carlin, Acting General Manager

RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
3rd Quarter / Fiscal Year 2020-2021

Enclosed please find the Hetch Hetchy Capital Improvement Programs Quarterly Report for the 3rd Quarter (Q3) of Fiscal Year (FY) 2020-2021. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the Hetch Hetchy Capital Improvement Programs based on data for the period of January 1, 2021 to March 31, 2021.

This quarterly report incorporates the Hetch Hetchy Capital Improvement Programs 2018 Baseline that was approved by the San Francisco Public Utilities Commission (SFPUC) on December 11, 2018. The scopes, schedules, and budgets are included for individual projects over $5M that are currently active or planned to be active within FY19/20 or FY20/21 and are part of the Hetchy Capital Improvement Projects (HCIP), a sub-set of projects within the adopted SFPUC Ten-Year Capital Plan for FY18/19 through FY27/28 for the Hetch Hetchy Water and Power (HHWP) Division of the Water Enterprise.

This report also includes a status summary of the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets. The progress of these R&R programs is measured and reported upon based on the status of planned milestones at the end of the reporting quarter and forecast milestones for the subsequent quarter.

This will be the last quarter to report the Power Section (see Section II entitled San Francisco Power Enterprise Capital Improvement Programs (Power). More

information about alternate reporting for status updates on the Power Enterprise-led capital projects will be shared in the future.

The highlights for this reporting period are as follows:

For Contract HH-1000R, Mountain Tunnel Improvement project, the Notice to Proceed for construction was issued on January 29, 2021. The contractor is preparing submittals for approval and has completed construction of environmental fencing and staging areas. Safety improvements for access roadways are under construction. The contractor has mobilized to begin site excavations for the new tunnel portal, tunnel access adit, and flow control facility construction at the Priest Reservoir site next quarter. Forecast construction completion is at the end of 2026.

For Moccasin Penstock Rehabilitation project, Notice to proceed (NTP) was issued for a JOC Contractor to provide field support for the internal inspection. The internal inspection was completed in February 2021. Condition Assessment Report is being developed for distribution in April 2021.

For Design-Build Contract DB-121R2, Moccasin Powerhouse Generator Rehabilitation, one bid was received. Through Commission approval, the Project Team was allowed to negotiate with any qualified bidder. The recommendation for award is anticipated in late April.

For Contract HH-1003R, Moccasin Powerhouse Generator Step-up Transformers Installation, the contract went out to bid in January. Two bids were received. The contract will go the Commission for award in April.

For Contract HH-1002R, O'Shaughnessy Dam Access and Drainage Improvements, the scope of work was reduced and rebid in March. Four bids were received. The qualifications for the apparent low bidder are being reviewed. The contract will go to the Commission for award next quarter.

For Contract HH-1001, Moccasin Reservoir Perimeter Security Fence, construction has completed. The contractor achieved substantial completion on January 19, 2021 and final completion notification was issued on March 17, 2021.

Attachment

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs

January 2021 – March 2021

Published: May 17, 2021

This page is intentionally left blank.

Quarterly Report
Hetch Hetchy
Capital Improvement Programs

TABLE OF CONTENTS

This page is intentionally left blank.

I. HETCH HETCHY WATER AND POWER (HHWP)– WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS

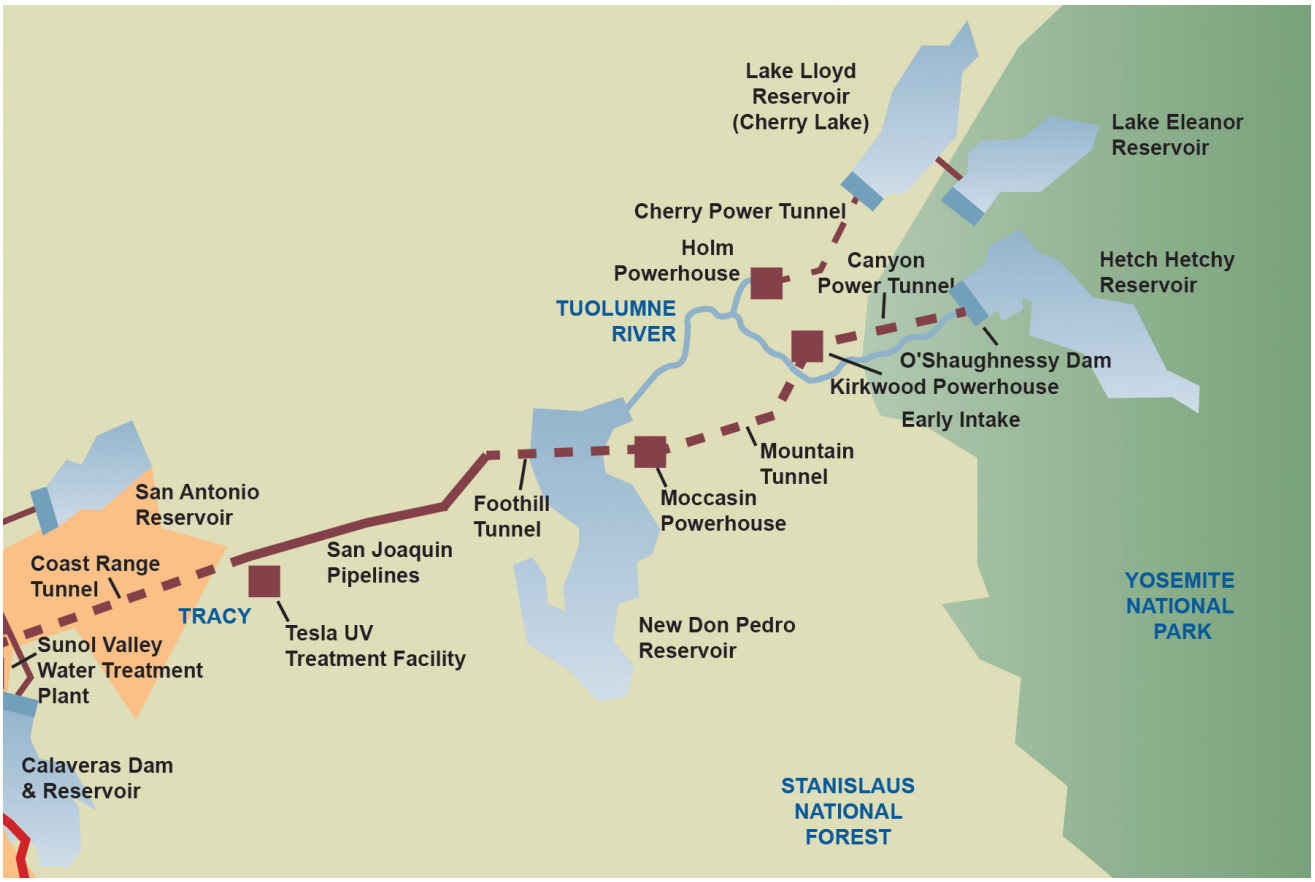
This page is intentionally left blank.

INTRODUCTION

The Hetch Hetchy Water and Power (HHWP) Water Division is the division responsible for operating, managing, and maintaining the HHWP system and facilities. This includes water facilities from Hetch Hetchy Reservoir, located in Yosemite National Park, to Alameda East Portal, located in Sunol Valley and power facilities located from Early Intake to Newark. The HHWP Water Division operates, manages, and maintains three impoundment reservoirs, three regulating reservoirs, four powerhouses, one switchyard, three substations, 170 miles of pipeline and tunnels, almost 50 miles of paved road, over 160 miles of transmission lines, watershed land, and right-of-way property. HHWP Water Division provides 85 percent of the San Francisco Public Utilities Commission (SFPUC) water supply for 2.7 million residential, commercial, and industrial customers in Alameda, Santa Clara, San Mateo, and San Francisco counties. On average, HHWP Water Division generates about 1,650 gigawatt hours (GWH) of clean hydro-generated power annually.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R).

A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco. The map below shows the location of the assets and facilities associated with HHWP.



This page is intentionally left blank.

I.A. HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

This page is intentionally left blank.

1. PROGRAM DESCRIPTION

The Hetchy Capital Improvement Projects (HCIP) are a multi-year group of capital projects to upgrade existing, aging infrastructure so that it will meet the challenges of today and the future. These projects will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality water to its 2.7 million customers in an environmentally sustainable manner. The goals are to provide capital improvements needed to cost-effectively ensure that water quality, seismic reliability, delivery reliability, and water supply objectives that have been established for the regional water system facilities managed by HHWP are met, while optimizing the benefits of HHWP power facilities operations. Ongoing development of the HCIP will sustain the regional water system's status as an unfiltered water source and a gravity-driven system.

The scope of HCIP is divided into three major project types: Water, Power, and Joint. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. In addition, projects in each program have been further organized by asset type to align with the Hetch Hetchy 10-Year Capital Improvement Program (CIP) Plan for Fiscal Years (FY) 2019-2028. These sub-programs include the following:

- Buildings – projects to provide safe and code compliant work spaces for HHWP operations and maintenance crews.
- Dams & Reservoirs – projects to improve assets used for storage and delivery of water to SFPUC customers, as well as water storage for power generation.
- Mountain Tunnel – projects to address deficiencies with the Mountain Tunnel, a critical, non-redundant link in the Hetch Hetchy water system that conveys water from Kirkwood Powerhouse to Priest Reservoir.
- Powerhouses – projects to improve facilities at the Holm, Kirkwood, and Moccasin powerhouses.
- Roads & Bridges – projects intended to replace bridges that are utilized to access HHWP assets.
- Switchyard & Substations – projects to meet operational objectives for power, including reliability, regulatory compliance, and sustainability.
- Tunnels – projects to repair tunnels along the HHWP system (other than Mountain Tunnel).
- Water Conveyance – projects to enhance the reliability of water delivery through pipelines and penstocks, allowing for both delivery of water to SFPUC customers and delivery of water to powerhouses for power generation.

2. PROGRAM STATUS

This third (3rd) quarter report for FY2020-2021 presents the progress made on the HCIP between January 1, 2021 and March 31, 2021. The data reported herein as the "approved" project budget and schedule conforms to the annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018.

On December 11, 2018, SFPUC approved the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline of $682.93M, a subset of the Hetch Hetchy 10-Year CIP for FY2019-2028. The Approved Baseline included projects over $5M that were then active or were intended to be active by FY2020. The status of these projects included in the 2018 Approved Baseline are discussed in this quarterly report and can be found in sections I.A.6 and I.A.10.

The CUH10215 – Canyon Tunnel Rehabilitation project remains in "On-Hold" status.

Project Development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs were created in the 2018 Approved Baseline to capture overall programmatic costs. The accrued PD expenditures are included in Program Delivery Costs in Table 3.1 in order to give an accurate report of the overall HCIP cost performance.

In addition to the nineteen (19) projects presented in the 2018 Approved Baseline, this quarterly report includes the status of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project, which is in the closeout phase and is reported on in Section 8 of the report.

On March 22, 2018, HHWP experienced excessive rainfall and subsequent flash flooding with a large volume of debris, consisting of silt, downed trees, and logs. This affected various assets associated with Priest Reservoir, Moccasin Reservoir, and adjacent areas. The project (with funding budgeted at $17.92M) includes debris removal and emergency repairs at the water-related assets.

The budget baseline for the project is based on initial cost estimates and contract pricing, but has not been formally approved by the Commission. This project has been funded by deferring money from Water projects included in the Hetch Hetchy 10-Year CIP for FY2019-2028. Progress reporting for this project is included in Section I.A.6.

Figure 2.1 shows the total Approved Budget for all twenty (20) projects in each phase of the program as of March 31, 2021 (excluding PD accounts). The number of projects currently in each phase is shown in parentheses.

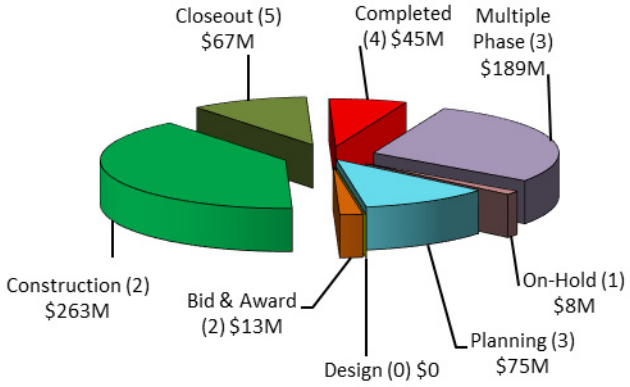


Figure 2.1 Approved Budget for Projects in Each Phase

Figure 2.2 shows the total number of projects in the following stages as of March 31, 2021: Pre-construction, Construction, and Post-construction.

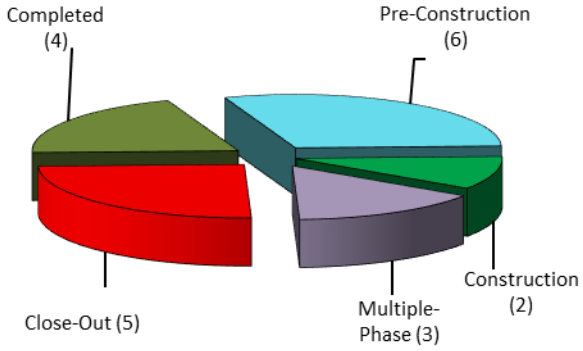


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of March 31, 2021. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

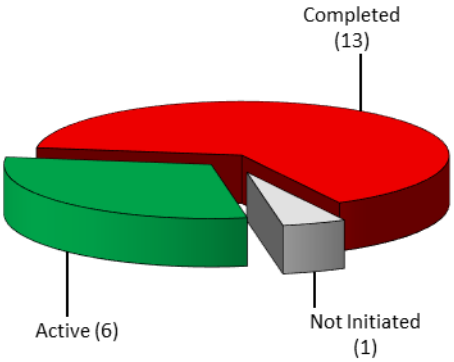


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall cost summary of the 20 approved HCIP projects included in this report, as well as PD costs. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, and the Cost Variance between the Approved and Forecast Costs. The Current Approved Budget has been increased by $17.92M over the 2018 Approved Baseline with the addition of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project.

The overall program negative Cost Variance of $34.12M in Table 3.1 can be attributed to the following factors:

- Water Infrastructure – the overall positive Cost Variance of $5.99M is due to the following project reevaluations:
  - The CUH10001 SJPL Rehabilitation project has been completed at $0.75M under budget.
  - The CUH10003 Lower Cherry Aqueduct Forecasted Costs were reevaluated and reduced by $6.03M.
  - The 10035574 SJPL Tesla Valves Replacement Forecasted Costs were decreased by $3.64M due to a transfer of scope to 10035575.
  - The 10035575 SJPL Valve and Safe Entry Improvements Forecasted Costs were increased by $3.64M due to a transfer of scope from 10035574.
  - The CUH100PD WATER ONLY/PROJ DEV Forecasted Costs increased by $0.79M.
- Power Infrastructure – the overall negative Cost Variance of $36.62M is due to the following project reevaluations:
  - The CUH10102 Holm and Other Powerhouse Projects' Forecasted Costs were reduced by $3.67M.
  - The CUH10113 Kirkwood Penstock achieved Closeout $1.82M under budget.
  - The CUH10115 Warnerville Substation Rehabilitation Forecasted Costs were increased by $9.94M for additional design and construction to complete project work; this work has been funded as part of the approved 10-Year CIP for FY2021-30.
  - The CUH10116 Moccasin Penstock Rehabilitation Forecasted Costs were increased by $34.09M, to match the approved 10-Year CIP for FY2021-30.
  - The CUH10119 Early Intake Switchyard Slope Hazard Mitigation Forecasted Costs were reduced by $2.91M.
  - The CUH101PD POWER ONLY/PROJ DEV Forecasted Costs were increased by $0.99M.
- Joint Infrastructure – the overall positive Cost Variance of $0.72M is due to the following project reevaluations:
  - The CUH10214 Moccasin Facilities New Construction achieved Closeout at $1.33M under budget.

- The CUH10216 Cherry Dam Outlet Works Rehabilitation achieved Closeout $0.65M under budget.
- The CUH10220 Mountain Tunnel Inspection & Repairs project was completed at $2.09M under budget.
- The 10032903 OSD Outlet Works Phase I Forecasted Costs were increased by $4.00M to account for initial design and construction estimates being higher than expected.
- The CUH102PD JOINT/PROJ DEV Forecasted Costs were increased by $1.23M.

- 2018 March Storm Event – the negative Cost Variance of $4.04M is due to increased construction cost for the flood control berm and associated construction management costs.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date ($ Million) (A)	2018 Approved Budget ($ Million) (B)	Current Approved Budget ($ Million) (C)	Q3/FY20-21 Forecasted Costs ($ Million) (D)	Cost Variance ($ Million) (E = C - D)
Water Infrastructure	**$26.14**	**$137.94**	**$137.94**	**$131.94**	**$5.99**
Construction Costs (1)	$10.43	$74.87	$74.87	$68.44	$6.43
Program Delivery Costs (2)	$15.39	$52.40	$47.75	$50.97	($3.22)
Other Costs (3)	$0.32	$10.67	$15.32	$12.54	$2.78
Power Infrastructure	**$55.23**	**$151.19**	**$151.19**	**$187.81**	**($36.62)**
Construction Costs (1)	$26.73	$80.79	$80.79	$112.13	($31.34)
Program Delivery Costs (2)	$26.83	$57.73	$57.76	$69.79	($12.03)
Other Costs (3)	$1.67	$12.68	$12.65	$5.89	$6.76
Joint Infrastructure	**$84.24**	**$393.81**	**$393.81**	**$393.08**	**$0.72**
Construction Costs (1)	$31.54	$215.69	$212.69	$224.13	($11.45)
Program Delivery Costs (2)	$52.60	$156.05	$159.05	$145.71	$13.34
Other Costs (3)	$0.10	$22.07	$22.07	$23.24	($1.17)
2018 March Storm Event Emergency Repair and Interim Improvements (Water-Only Assets)	**$21.67**	**-**	**$17.92**	**$21.97**	**($4.04)**
Overall Program Total	**$187.29**	**$682.93**	**$700.86**	**$734.80**	**($33.94)**

Notes:

1. Construction Costs include the Construction Base Bid and owner-provided equipment/material for all projects. Those costs include any construction contingency.

2. Delivery Costs include program management (i.e. Project Development), project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.

3. Other Costs include environmental mitigation, art enrichment, security improvements, real estate expenses, and director's reserve.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2018 Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4.1, the overall HCIP is currently forecast to be completed in May 2037.

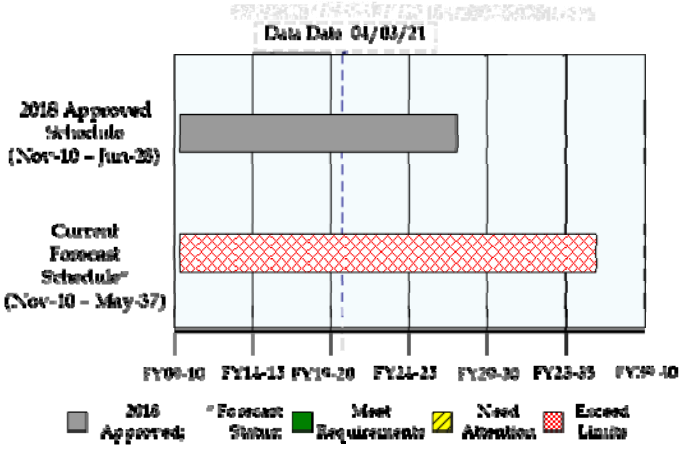


Figure 4.1 Program Schedule Summary

Table 4.1 2018 Approved vs. Current Forecast Schedule Dates

Sub-Program	2018 Approved Project Start	Actual Start	2018 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/28	06/30/31	36
Power Infrastructure	05/29/12	05/29/12✓	06/30/28	06/30/31	36
Joint Infrastructure	10/03/11	10/03/11✓	06/30/28	05/25/37	106.9
Overall HCIP Projects	**11/08/10**	**11/08/10✓**	**06/30/28**	**05/25/37**	**106.9**

This page is intentionally left blank.

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 04/03/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Conveyance (Water)											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	BA	$ 7,380	$ 3,740	$ 875	$ 3,640	★	06/28/24	12/30/22	18.0 mo. Early	★	See Section 10
10035575 - SJPL Valve and Safe Entry Improvement	MP	$ 95,284	$ 98,924	$ 1,466	($3,640)	⚠	07/01/25	03/13/28	32.4 mo. Late	●	See Section 6
Power Infrastructure											
Water Conveyance (Power)											
CUH10116 - Moccasin Penstock	PL	$ 13,158	$ 47,251	$ 4,715	($34,093)	●	12/31/24	02/28/28	37.9 mo. Late	●	See Section 6
Powerhouse											
CUH10102 - Holm and Other Powerhouse Projects	MP	$ 26,733	$ 23,061	$ 19,717	$ 3,672	★	03/30/20	10/07/21	18.3 mo. Late	●	See Section 6
CUH10114 - Moccasin Powerhouse and GSU Rehabilitation	MP	$ 66,714	$ 66,714	$ 2,835	-	★	06/28/24	04/13/27	33.5 mo. Late	●	See Section 6
Switchyard & Substations (Power)											
CUH10115 - Warnerville Substation Rehabilitation	CN	$ 24,305	$ 34,248	$ 21,166	($9,943)	●	03/04/20	11/25/26	80.8 mo. Late	●	See Section 6

* Exclude projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

**** Phase Status Legend**

PL Planning DS Design

BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.

⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.

● Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	$ 17,206	$ 21,206	$ 433	($4,000)	●	08/25/22	09/25/26	49.1 mo. Late	●	See Section 6
CUH10223 - OSH Dam Access and Drainage Improvements	BA	$ 5,830	$ 3,952	$ 887	$ 1,878	★	02/26/21	02/28/23	24.1 mo. Late	●	See Section 6
Mountain Tunnel											
CUH10221 - Mountain Tunnel Improvement Project	CN	$ 238,219	$ 238,219	$ 27,333	-	★	12/31/26	06/03/27	5.1 mo. Late	⚠	See Section 6
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	$ 44,287	$ 44,287	$ 323	-	★	12/30/25	05/25/37	136.9 mo. Late	●	See Section 6

* Exclude projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

**** Phase Status Legend**

PL Planning DS Design

BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.

⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.

● Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

Program: Water Conveyance (Water)	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved		$95.28 M
Forecast		$98.92 M
Actual		$1.47 M

Project Schedule:

Approved	Jul-19		Jul-25
Forecast	Jul-19		Mar-28

Project Percent Complete: 15.0%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion
Current Forecast	10/14/21	(A) 09/16/21 (B) 12/03/21 (C) 12/06/22 (D) 05/20/22	(A) 02/21/22 (B) 05/23/22 (C) 06/19/23 (D) 11/21/22	(A) 06/12/23 (B) 06/07/24 (C) 05/24/27 (D) 06/07/24

** A) Phase 1A – Pipeline 2 Tesla & Oakdale Entry Improvements, B) Phase 1B – Pipelines 3&4 Tesla & Oakdale Entry Improvements, C) Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements, and D) Phase 3 - Tesla Surge Stack*

Progress and Status:

This project is divided into 3 phases: Phase 1 - Tesla and Oakdale Entry Improvements; Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements and Phase 3 - Tesla Surge Stack. Phase 1 is sub-divided into Phase 1A and 1B based on pipeline location as indicated in the footnote above.

The project team presented the draft conceptual engineering report (CER) to the SFPUC Technical Steering Committee on January 7, 2021 and obtained approval to proceed to the design phase. A design team was formed and started the design for Phase 1 work in this quarter.

Issues and Challenges:

The forecasted cost and schedule are greater than the approved budget and schedule due to updated cost estimate during CER and resequencing of construction contracts. Construction must be coordinated with system shutdowns in Fall/Winter to minimize the impact on water delivery. The construction sequences are being considered to minimize the time of returning the asset to service in case of emergency.

CUH10116 - Moccasin Penstock

Project Description: The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. The lower 1,084 foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

Program: Power Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved		$13.16 M
Forecast		$47.25 M
Actual		$4.71 M

Project Schedule:

Approved	Feb-16	Dec-24
Forecast	Feb-16	Feb-28

Project Percent Complete: 93.1%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	10/07/24	10/08/24	04/16/25	08/24/27

Progress and Status:

Notice to proceed (NTP) was issued for a JOC Contractor to provide field support for the internal inspection of the penstock. The internal inspection was completed in February 2021. A Condition Assessment Report is being developed and is anticipated to be distributed for review in April.

Issues and Challenges:

This project will continue, during the planning phase, to use remaining encumbered Power funds. Starting fiscal year 2021-2022, funding will be jointly provided by Water and Power for this project.

Moccasin Penstock – JOC field support for internal inspection

CUH10102 - Holm and Other Powerhouse Projects

Project Description: This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 13.8 kV equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (HHWP) of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation & cleanup.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Completed

Project Cost:

Approved		$26.73 M
Forecast		$23.06 M
Actual		$19.72 M

Project Schedule:

Approved	Sep-13	Mar-20
Forecast	Sep-13	Oct-21

Project Percent Complete: 98.9%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/17/17✓	04/21/17✓	01/29/18✓	11/29/20✓

Progress and Status:

The breakdown below shows the number of subprojects summarized according to current status and/or active phase during this reporting period. The eleven (11) subprojects are distributed as follows:
Construction: 2 subprojects
J101-02.010 Cherry Valve House - Bypass Fill Valve for Cherry Power Tunnel: The bypass valve was delivered in January. The valve installation by HHWP staff was delayed due to recent February system outage staffing requirements; HHWP plans to install the valve and piping in the next quarter.
J101-02.003 Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment Upgrade: The Project Team is working on closeout documents.
Completed: 9 subprojects

Oil Water separator tank removal at Kirkwood Powerhouse

Issues and Challenges:

The variance between the forecasted schedule over the approved schedule is due to the initial delay in issuing NTP, additional delay from COVID-19 work stoppage required rescheduling work that could only be performed during a shutdown, and scope that will be performed by HHWP crews after the construction contract is complete.

CUH10114 - Moccasin Powerhouse and GSU Rehabilitation

Project Description: The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved		$66.71 M
Forecast		$66.71 M
Actual		$2.83 M

Project Schedule:

Approved Jan-16		Jun-24
Forecast Jan-16		Apr-27

Project Percent Complete: 23.3%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion
Current Forecast	09/28/20✓	(A) 11/20/20✓ (B) 10/30/20✓ (C) 09/06/23	(A) 05/27/21 (B) 06/21/21 (C) 03/05/24	(A) 08/28/23 (B) 12/02/24 (C) 10/13/26

** A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers HH-1003R was re-advertised on 1/14/21; B) Moccasin Powerhouse Generators Rewind; and C) Moccasin Powerhouse Systems Upgrade.*

Progress and Status:

This project is divided into 3 sub-projects: A) the purchasing and installation of the Moccasin Powerhouse Generator Step-Up Transformers (GSU's); B) the rewind of the Moccasin generators; and C) the overall plant rehabilitation.

Subproject A: HH-1003R Moccasin Powerhouse GSU Installation was advertised in January, bids were opened in February, and the contract will go to the Commission for award in April. The Purchase Order for the GSU's was issued in January. Delivery of the first GSU is anticipated in October/November 2021.

Sub-project B: Contract DB-121R2 Moccasin Powerhouse Generators Rehabilitation: Only one bid was received on February 4 and it was deemed nonresponsive due to inclusion of exceptions to the SFPUC's contract terms and conditions. On February 23 (Resolution No. 21-0029), the Commission authorized the General Manager to negotiate a Design Build Agreement for this project with any qualified contractor. Negotiations are underway, and it is anticipated that Commission (and Board of Supervisors if needed) approvals will be sought next quarter. The goal is to award the contract by next quarter in order to meet planned shutdown schedules.

Sub-project C: The Project Team conducted condition assessment workshops with HHWP. This information will be used to develop a Needs Assessment Report. A professional services contract for engineering planning and design services is anticipated to be awarded in August 2021.

Issues and Challenges:

Sub-project A: Delays to the procurement process may affect the equipment delivery schedule; the project team will work with the GSU vendor after the PO is issued next quarter to determine if the GSU can still be delivered by October/November 2021; this timing is critical to the HH-1003 GSU installation contract and the fixed Mountain Tunnel outage in December 2021.

Sub-project C: The variance in the forecasted completion date from the approved completion date is due to the extended time to procure a professional services contract for planning and design.

CUH10115 - Warnerville Substation Rehabilitation

Project Description: Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components including grounding, fence, circuit breaker, control room upgrade, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

Program: Power Infrastructure	**Project Status:** Construction	**Environmental Status:** Active

Project Cost:		**Project Schedule:**		
Approved	$24.31 M	Approved Sep-15		Mar-20
Forecast	$34.25 M	Forecast Sep-15		Nov-26
Actual	$21.17 M	Project Percent Complete: 84.9%		

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval**	**Bid* Advertisement**	**Construction NTP***	**Construction* Final Completion**
Current Forecast	03/31/16✓	(A) 01/24/17✓ (B) 06/12/24	(A) 10/05/17✓ (B) 12/02/24	(A) 07/05/21 (B) 05/25/26

** (A) Warnerville Substation Phase 1 – DB-127R; (B) Warnerville Substation Phase 2.*

Progress and Status:

DB-127R Warnerville Substation Rehabilitation - Negotiations for settlement with the contractor (who is no longer working) are continuing. A mediation meeting occurred in March..

Oil Circuit Breaker Replacement Contingency Plan - Notice to Proceed for a professional services task order was issued in January to develop a contingency plan in case a breaker fails. Tthe final design will result in a complete, biddable set of specifications, drawings, and calculations. The 100% design is anticipated in early August.

Phase II - Replace 4 Oil Circuit Breakers and Associated Equipment – A Professional Service Contract for planning, design, and construction support for the Phase 2 work is out for bids. Notice to Proceed for this contract is anticipated by August.

Old Oil Circuit Breakers to be Replaced

Issues and Challenges:

HHWP Operations have requested the installation of the four remaining breakers and associated equipment in 2023/2024. This will be challenging because the design contract will not be available until August 2021. The Project Team is looking for ways to reduce the Planning and Design Phases.

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved		$17.21 M
Forecast		$21.21 M
Actual		$0.43 M

Project Schedule:

Approved	Feb-18	Aug-22
Forecast	Feb-18	Sep-26

Project Percent Complete: 3.5%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	06/30/23	12/30/22	06/30/23	12/31/25

Progress and Status:

In this quarter, the consultant addressed SFPUC's comments on the conceptual bulkhead system relating to hoisting, sealing, diving, and seating/unseating procedures. The bulkhead conceptual design was fine-tuned to address leakage control and self-positioning issues. The draft Conceptual Engineering Report will be revised next quarter to incorporate these changes. The recent project cost estimate forecasts that the current budget is inadequate for the original scope of work in Phase 1. In consultation with HHWP, the priorities of Phase 1 have been identified as completing planning for the original scope and designing and constructing the bulkheads, slide gates, and access/drainage improvements. The remaining scope, including work on the drum gates and isolation valve, would be deferred to Phase 2. These changes will be reflected in the HCIP 2021 Revised Baseline and the Q4 report.

Bulkhead gate slot at top of dam and setup for underwater camera inspection

Issues and Challenges:

The current planning-level design and construction estimates are higher than budgeted due to the addition of diver inspections and the higher level of detail included in the most recent construction cost estimate. The schedule forecast has been extended to allow time for additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. In addition, the project team re-evaluated the overall project schedule and sequencing and considered the best combination of sub-projects and contracts. Based on this analysis, it is forecasted that the construction will be completed under multiple contracts, and the final subproject will be completed in late 2026. This sequencing and the overall project schedule will be updated in the HCIP 2021 Revised Baseline and in the Q4 report.

CUH10223 - OSH Dam Access and Drainage Improvements

Project Description: The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

• Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.

• Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA)"compliant ladders and landings with safety cage and/or install fall restraint systems.

• Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.

• Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.

• Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

Program: Joint Infrastructure	**Project Status:** Bid and Award	**Environmental Status:** Completed (CatEx)

Project Cost:

Approved		$5.83 M
Forecast		$3.95 M
Actual		$0.89 M

Project Schedule:

Approved	Mar-17	Feb-21
Forecast	Mar-17	Feb-23

Project Percent Complete: 26.8%

Approved; Actual Cost; Forecast Status: Meet Requirements; Need Attention; Exceed Limits

Key Milestones:	Environmental Approval*	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	03/18/21✓	10/01/21	08/29/22

** The O'Shaughnessy Dam Fall Protection and Spillway Access construction contract [HH-1002] was re-advertised on 3/18/21*

Progress and Status:

The scope for Contract HH-1002R was reduced in order to prioritize immediate repairs with the remaining available funds. The anticipated contract has also been renamed O'Shaughnessy Dam Fall Protection and Spillway Access to reflect the narrowed scope. The new scope includes fall protection on exiting ladders and stairs, new spillway access, and control room improvements. The scope that was deleted will be added to the scope under Project 10032903 O'Shaughnessy Dam Outlet Works Phase I. The contract with revised scope was re-advertised in March. Notice to Proceed is scheduled for early October.

Inclined Stairway OSH Dam

Issues and Challenges:

The forecasted cost is less than the approved budget due to the reduced scope of work. The forecasted schedule is longer than the approved schedule due to contracting delays, added complexity of the work, and the need to revised the contract documents and rebid with the reduced scope.

CUH10221 - Mountain Tunnel Improvement Project

Project Description: Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides for design and construction of an engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

Up until 2016, the scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including rehabilitation or relining the existing tunnel or construction of a new tunnel.

In 2017, the City adopted the rehabilitation alternative as the preferred project for design and construction. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of tunnel lining repairs, contact grouting, downstream flow control valving, a new tunnel adit at Priest Reservoir, a South Fork Siphon extension tunnel, access road widening and tunnel access improvements, and environmental mitigations, and site restoration.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved	$238.22 M
Forecast	$238.22 M
Actual	$27.33 M

Project Schedule:

Approved	Oct-11	Dec-26
Forecast	Oct-11	Jun-27

Project Percent Complete: 16.2%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/14/20✓	11/13/19✓	01/29/21✓	12/03/26

Progress and Status:

During the quarter, on January 29, the Notice to Proceed for construction was issued to Michels Tunneling for HH-1000R Mountain Tunnel Improvements. The contractor has started providing submittals for approval. The contractor has constructed environmental fencing and staging areas. Safety improvements to access roadways are under construction. The contractor has mobilized to begin site excavations for the new tunnel portal, the tunnel access adit, and the flow control facility at the Priest Reservoir site next quarter. The State Water Resources Control Board is nearing completion of review of the City's application for $238.2M in low interest loan funding for this project from the State Revolving Fund.

South Fork Access Rd. Surveying Prior to Improvements

Issues and Challenges:

The Schedule Variance between the Current Forecast and Approved schedule is due to delays associated with re-bidding the project and COVID-19 challenges. The delays have been reduced through mitigation efforts, including resequencing of the tunnel shutdowns to minimize schedule impact. The team will evaluate the contractor's schedule for potential adjustments to further mitigate the delay.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), O'Shaughnessy Adit Access Bridge, and Lake Eleanor Dam Bridge.

Program: Roads & Bridges (Joint)	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$44.29 M
Forecast	$44.29 M
Actual	$0.32 M

Project Schedule:

Approved Jul-19		Dec-25
Forecast Feb-20		May-37

Project Percent Complete: 10.0%

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	02/27/23	(A) 08/02/23 (B) 07/31/24	(A) 01/31/24 (B) 02/03/25	(A) 03/09/26 (B) 03/09/27

Progress and Status:

This project is in the planning phase. For the O'Shaughnessy Adit Access Bridge, the consultant completed bathometry near the bridge in this quarter. The topographic survey was delayed due to weather conditions and will continue in the next quarter. Also, the Department of Public Works (DPW) revised its work plan for the planning and design of the bridge improvements to better align with the final Memorandum of Understanding (MOU) which was signed on February 3 between SFPUC and DPW. For Lake Eleanor Dam Bridge, the consultants collected and reviewed the background information as part of the planning efforts. The alternatives analysis for this bridge will commence in Q4.

O'Shaughnessy Adit Access Bridge

Issues and Challenges:

The variance between the approved schedule and forecasted schedule dates is due to the reforecasting for this project based on the funding for two of the bridges being deferred to after the 10-Year CIP (with completion in 2037). Funding for only the two bridges discussed above, the O'Shaughnessy Adit Access Bridge and the Lake Eleanor Dam Bridge, is included in this approved project budget.

7. On-Going Construction*

The following table reflects active construction contract(s) with an original contract amount greater than $1M.

Construction Contract	Schedule			Budget		Variance (Original - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion	Current Forecast Construction Final Completion*	Approved Contract Cost	Current Forecast Cost*	Schedule (Cal. Days)	Current Forecast Cost	
Power Infrastructure								
CUH101-15.001 Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	07/05/21	$ 14,591,450	$ 14,591,450	(727)	-	90.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	$ 14,591,450	**$ 14,591,450**	**$-**	**- %**

Note:

* The Current Forecast Cost and Current Forecast Construction Final Completion include all approved, pending, and potential change orders.

** The contract is funded with both CIP and non-CIP funds, but only the CIP funded amount is reflected.

8. PROJECTS IN CLOSE-OUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date*
Water Infrastructure				
Dams & Reservoirs				
10033156 - Moccasin Reservoir Perimeter Security Fence	10/30/20	03/17/21	$ 3,135,031	$ 1,620,466
Water Conveyance (Water)				
CUH10003 - Lower Cherry Aqueduct	01/31/20	11/26/19	$ 11,526,985	$ 6,425,961
Power Infrastructure				
Water Conveyance (Power)				
CUH10113 - Kirkwood Penstock	12/31/18	02/05/19	$ 1,893,834	$ 1,164,263
Joint Infrastructure				
Buildings (Joint)				
CUH10214 - Moccasin Facilities New Construction	06/11/18	06/11/18	$ 4,775,795	$ 10,053,964
2018 Moccasin Storm Event				
2018 Moccasin Storm Event				
10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)	11/27/19	04/20/20	$ 11,454,122	$ 13,712,568
TOTAL			$ 32,785,766	$ 32,977,222

** It should be noted that this report does not include all phase-level expenditures that have been accrued for work completed due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft.*

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
CUH10001-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	$ 5,370,000	$ 4,622,228
Power Infrastructure				
Switchyard & Substations (Power)				
CUH10119 - Early Intake Switchyard Slope Hazard Mitigation	09/30/20	09/30/20	$ 5,533,855	$ 2,174,899
Joint Infrastructure				
Dams & Reservoirs (Joint)				
CUH10216 - Cherry Dam Outlet Works Rehabilitation	06/28/19	06/30/20	$ 10,382,439	$ 9,512,645
Mountain Tunnel				
CUH10220 - Mountain Tunnel Inspection & Repairs (completed)	12/31/19	12/02/19	$ 23,500,000	$ 21,412,754
TOTAL			$ 44,786,294	$ 37,722,526

10. PROJECTS WITHIN BUDGET AND SCHEDULE

10035574 - SJPL Tesla Valves Replacement

Project Description: This project intends to replace all the inline valves that are under-rated for pressure, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all four (4) San Joaquin Pipelines (SJPL). In addition, all cross- over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

Program: Water Conveyance (Water)	**Project Status:** Bid and Award	**Environmental Status:** Completed

Project Cost:		**Project Schedule:**	
Approved	$7.38 M	Approved Jan-20	Jun-24
Forecast	$3.74 M	Forecast Jan-20	Dec-22
Actual	$0.88 M	Project Percent Complete: 19.5%	

Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	08/26/20✓	N/A	04/06/21	05/31/22

Progress and Status:

This project is divided into 2 sub-projects: A) the pre-purchase and installation of Tesla Valve TUV-101; B) the procurement and installation of Tesla Valves TUV-201, TUV-301 & TUV-401.

Subproject A: In this quarter, the purchase order for a 66-inch butterfly valve and actuator was advertised on January 29. Five bids were received on February 24, and the Office of Contract Administration issued the award of the purchase order on March 26. The project team has commenced the process of reviewing the cost proposal for a JOC contract for installation of the valve.

Subproject B: The procurement and installation of the remaining valves TUV 201, 301, and 401 will follow the traditional design-bid-build project delivery method. To optimize the construction and reduce impact on water delivery, the scope and budget for the improvements to TUV201, 301 and 401 will transfer out of this project and become a part of the SJPL Valve and Safe Entry Improvement project. This change will be included in the proposed 2021 HCIP Revised Baseline.

SJPL#1-4 with isolation valves within Tesla Valvehouse

Issues and Challenges:

The variances between the approved schedule and budget and the forecasted schedule and cost are in anticipation of scope and budget to be transferred to the SJPL Valve and Safe Entry Improvement project.

This page is intentionally left blank

I.B. HETCHY RENEWAL AND REPLACEMENT PROGRAM (R&R)

1. PROGRAM DESCRIPTION

The Hetchy Renewal and Replacement (R&R) Program is an ongoing annual program that addresses deficiencies in three areas: Water Infrastructure, Power Infrastructure, and Joint Infrastructure. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. The objective of the R&R Program is to meet level of service goals and objectives, to ensure regulatory permit compliance, to obtain system reliability and functionality, and to continue sustainable operation of the system.

The R&R Program consists of a series of projects specifically developed to address the needs of an aging infrastructure associated with the Hetch Hetchy Water and Power System. The projects are designed to better the system through inspections, assessments, protective and corrective measures, and routine equipment replacement. Due to the nature of these ongoing projects that are funded on an annual basis, progress is measured by achievement of short-term goals. These goals are discussed in further detail in Section I.B.10, and are referred to as Planned Milestones for the Reporting Quarter (goals that are expected to be achieved during the quarter), Status of Planned Milestones for the Reporting Quarter (progress made in achieving these goals), and Planned Milestones for the Subsequent Quarter (goals for the upcoming quarter).

2. PROGRAM STATUS

This Quarterly Report presents the progress made on the R&R projects between January 1, 2021 and March 31, 2021. The data reported herein as the "approved" project budget and schedule conforms to the most recent annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, which was approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018. The 10-Year CIP for FY2019-2028 re-prioritizes the R&R program by defunding several projects that were determined to be lower priority, and re-allocating a portion of the funding to projects determined to be higher priority. Overall, this constituted an increase of $85.75M in the program budget, from $227.05M in FY2017-2026 to $312.08M. The project budget and schedule were developed and approved based on the project team's best assessment HHWP's infrastructure needs at the time. It should be noted that the project team continues the process of re-validating these earlier assessments.

Figures 2.1 to 2.3 show the total number of subprojects remaining in each phase of the R&R Water, Power, and Joint Infrastructure programs as of March 31, 2021. As reported in previous quarters, the following CUH10001 – SJPL Rehabilitation subprojects were removed from the R&R program and included in the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline with a budget of $5.37M (it should be noted that these subprojects have been subsequently completed under the HCIP Program:

CUH10001 – SJPL Rehabilitation
- CUH10001.011 – SJPL No. 1 Replacement at Cashman Creek
- CUH10001.018 – SJPL No. 1 Replacement at SJVH
- CUH10001.022 – Tesla Valves Replacement

The remaining subprojects under project CUH10001 will continue to be reported under the R&R Program. The CUH10001 approved budget, expenditures to date, and current forecast cost have been reduced to reflect the transfer of the three subprojects to the HCIP program.

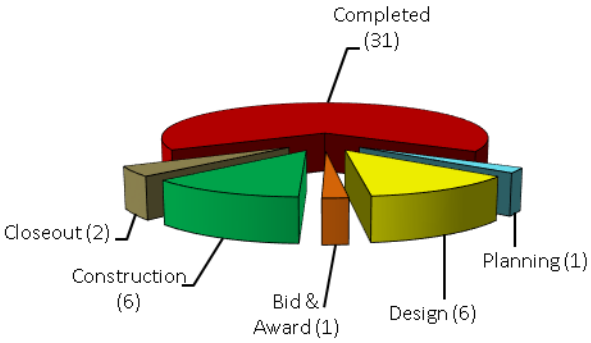


Figure 2.1 Total Number of Water Infrastructure Sub-Projects in R&R Program

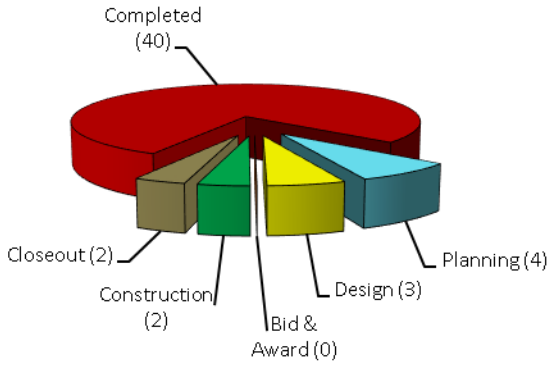


Figure 2.2 Total Number of Power Infrastructure Sub-Projects in R&R Program

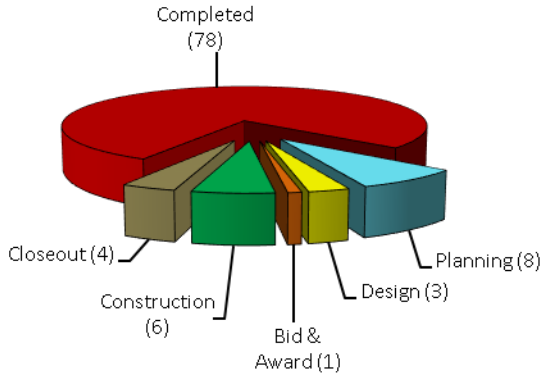


Figure 2.3 Total Number of Joint Infrastructure Sub-Projects in R&R Program

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program level cost summary of the R&R Program included in this report. It shows the Expenditures to Date, Approved Budget, Current Forecast Cost, and Cost Variance between Approved Budget and Current Forecast Cost. There were no adjustments to the Approved Budget or Current Forecast Cost during the quarter.

Table 3.1 Program Cost Summary

	Expenditures to Date ($ Million) (A)	**Approved Budget** ($ Million)** (B)	**Current Forecast Cost ($ Million)** (C)	**Cost Variance ($ Million)** (D = B - C)
Water Infrastructure	$19.38	$115.70	$115.70	-
Power Infrastructure	$39.59	$89.51	$89.51	-
Joint Infrastructure	$45.04	$106.88	$106.88	-
Hetchy R&R Program Total*	**$104.00**	**$312.08**	**$312.08**	**-**

**The program total values include completed, not-initiated, and on-hold projects.*
***The approved budget includes the 10-Year CIP Plan, as well as the previous fiscal year's appropriated budget*

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 compares the 2018 Approved Schedule and Current Forecast Schedule for the R&R program. Refer to the "Cost and Schedule Status" notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits.

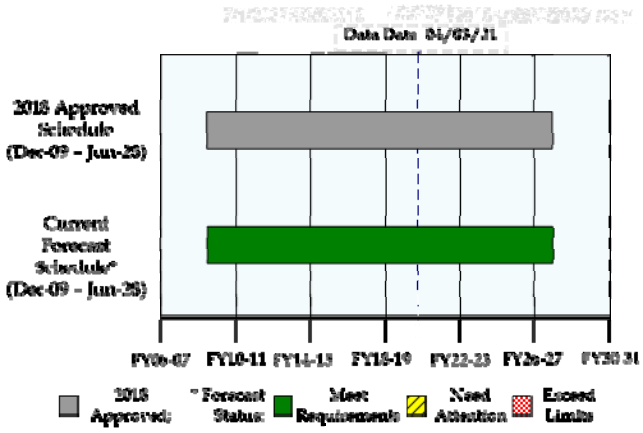


Figure 4.1 R&R Program Schedule Summary

This page is intentionally left blank.

5. PROGRAM PERFORMANCE SUMMARY

All costs are shown in $1,000s as of 04/03/21

Program Name	Active Phase (**)	Approved Budget (A)	Current Forecast Cost (B)	Expenditures To Date (C)	Cost Variance (D= A - B)	Cost Status (+)	Approved Completion (E)	Current Forecast Completion (F)	Schedule Variance (G = E - F)	Schedule Status (+)	Program Data Sheet
Water Infrastructure											
CUH100 - Water Infrastructure	MP	$ 115,698	$ 115,698	$ 19,380	-	★	06/30/28	06/30/28	-	★	See Section 10
Power Infrastructure											
CUH101 - Power Infrastructure	MP	$ 89,509	$ 89,509	$ 39,585	-	★	06/30/28	06/30/28	-	★	See Section 10
Joint Infrastructure											
CUH102 - Joint Infrastructure	MP	$ 106,875	$ 106,875	$ 45,039	-	★	06/30/28	06/30/28	-	★	See Section 10

**** Phase Status Legend**

PL Planning DS Design

BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.

⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.

● Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROGRAMS NOT WITHIN BUDGET AND/OR SCHEDULE

All programs are within the current approved budget and schedule.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than $1 million.

8. PROGRAMS IN CLOSE-OUT

No program is currently in close-out.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
CUH10005 - Priest Pipe Recoating	06/30/18	06/30/18	$ 39,407	$ 38,368
CUH10006 - Moccasin Gate No. 3 Shaft Replacement and Automation	12/31/18	12/31/18	$ 1,049,557	$ 133,278
Power Infrastructure				
CUH10103 - Powerhouse Control Upgrade	07/31/15	07/31/15	$ 1,724,231	$ 1,724,231
CUH10108 - Step-Up Transformers	04/04/17	04/04/17	$ 221,995	$ 182,525
CUH10109 - Moccasin Low Head Rehabilitation Project	05/31/18	05/31/18	$ 619,140	$ 568,367
CUH10111 - Moccasin GSU Transformers & Oil Containment	02/27/15	02/27/15	$ 84,343	$ 82,369
CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV	06/30/17	06/30/17	$ 62,177	$ 47,473
CUH10118 - Kirkwood PH Valve Dissipation	06/30/17	06/30/17	$ 810,613	$ 718,117
Joint Infrastructure				
CUH10205 - Small Water Systems Upgrades	06/30/14	06/30/14	$ 1,922,482	$ 1,922,482
CUH10207 - Existing Hetchy Facilities (Outside Moccasin)	11/02/18	11/02/18	$ 1,588,814	$ 1,231,168
CUH10208 - Remote Terminal Unit Replacement	09/28/18	09/28/18	$ 1,648,985	$ 1,134,513
CUH10210 - Hetchy Fiber Projects	05/29/15	05/29/15	$ 167,531	$ 115,621
TOTAL			$ 9,939,275	$ 7,898,512

10. PROGRAMS WITHIN BUDGET AND SCHEDULE

CUH100 - Water Infrastructure

Program Description: The purpose of the Hetchy R&R Water Infrastructure Program is to extend the useful life of the water conveyance facility assets including tunnels and pipelines. The R&R projects are prioritized based upon regulatory compliance, condition assessment, operation staff recommendations, and level of service goals.

Program: Water Infrastructure	**Program Status:** Multiple Phase	**Environmental Status:** Active (Various)

Program Cost:

Approved		$115.70 M
Forecast		$115.70 M
Actual		$19.38 M

Program Schedule:

Approved	Nov-10	Jun-28
Forecast	Nov-10	Jun-28

Program Percent Complete: 30.2%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	Various	Various	Various	Various

Progress and Status:

The CUH100 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 47 subprojects.

Planning: 1 subproject

•10034364.007 SJPL No 1 Alternatives Analysis Report (December 02, 2019)

Design: 6 subprojects

•J100-01.019 San Joaquin Pipeline System Wide Testing (April 01, 2015)

•J100-01.038 SJPL Improvement at Claratina Crossing (February 01, 2018)

•J100-01.021 SJPL Isolation Assessment and Valve Replacement (April 01, 2015)

•J100-05.001 Priest Outlet 24 (inch) Pipe Recoating (February 03, 2014)

•10034364.002 Foothill Tunnel Lining Repair at Oakdale Portal (October 02, 2019)

•10034364.006 Oakdale Portal Standpipe and Anchors System Repairs (December 02, 2019)

Bid and Award:1 subproject

•10034364.005 SJPL No 4 Oakdale Portal Flowmeter Replacement (September 03, 2019)

Construction: 6 subprojects

•J100-01.031 San Joaquin Pipeline No 1 East of River Road Damage Assessment (December 01, 2016)

•J100-01.033 SJPL No 1 Oakdale Portal to Emery Inspection and Repair (September 01, 2017)

•10034364.001 SJPL No 1 Oakdale Portal and Tesla Roll Out Installation (December 14, 2018)

•10034364.003 SJPL No 1 Pipe Replacement 2020 Outage (September 03, 2019)

•10034364.004 SJPL No 1 Air Guard and Blow-off Valve Replacement (October 01, 2019)

•10034364.008 San Joaquin Pipeline No.1 Pipe Replacement - Mile Post 91 (May 12, 2020)

Closeout: 2 subprojects

•J100-01.010 Rankin Property Acquisition (April 01, 2013)

•10034520.001 Moccasin Dam and Outlet Works (September 02, 2019)

Completed: 31 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: Two subprojects 100-01.035 and 100-01.036 closed this quarter.

Status of Milestones for Reporting Quarter:

One subproject moved from Planning to Design, One subproject moved from Design to Bid and Award, and one subproject moved from Planning to Construction and two subprojects moved from Bid and Award to Construction. One subproject moved from Planning to Closeout.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Start Planning: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

CUH101 - Power Infrastructure

Program Description: The purpose of the Hetchy R&R Power Infrastructure Program is to extend the useful life of the power generation facility assets including powerhouse, switchyards, power distribution towers, and electrical distribution lines. The R&R projects are prioritized based upon regulatory compliance, condition assessments, Operations staff recommendations, and level of service goals.

Program: Power Infrastructure	**Program Status:** Multiple Phase	**Environmental Status:** Active (Various)

Program Cost:		**Program Schedule:**	
Approved	$89.51 M	Approved Dec-09	Jun-28
Forecast	$89.51 M	Forecast Dec-09	Jun-28
Actual	$39.59 M	Program Percent Complete: 48.7%	

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	Various	Various	Various	Various

Progress and Status:

The CUH101 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 51 subprojects.

Planning: 4 subprojects

•101-18.002 Kirkwood PH Bypass Interim Repairs (November 01, 2019)

•10036104.001 Modicon Quantum Programmable Logic Controller Upgrade to M580 (March 02, 2020)

•10036104.002 Moccasin Low Head Powerhouse Exterior and Interior Repairs (March 02, 2020)

•10036265.001 Riverbank Transmission Line Service Extension (February 10, 2020)

Design: 3 subprojects

•101-18.004 Critical Spare Procurement for Kirkwood Powerhouse Energy Dissipation Cone (August 31, 2020)

•10036104.003 Moccasin Powerhouse Gates and Valves Automation (April 02, 2020)

•10036265.002 Warnerville and Early Intake Switchyard Control Room Roof Replacements (April 13, 2020)

Construction: 2 subprojects

•101-01.021 Moccasin Switchyard Isolation Transformer Protection (September 01, 2016)

•101-17.003 Transmission Line Clearance Mitigation Project (July 03, 2017)

Closeout: 2 subprojects

•10034521.001 Moccasin Powerhouse Gantry Crane Upgrade (October 01, 2019)

•101-01.013 HPH/KPH Ridge Line Transformer Protection (October 04, 2012)

Completed : 40 subprojects

Generator Shaft at Moccasin Powerhouse

Planned Milestones for Reporting Quarter:

Complete closeout: No subprojects closed this quarter.

Status of Milestones for Reporting Quarter:

One (1) new subproject started this quarter and is already in design, 101-18.004. One (1) subproject moved from planning to design. One (1) subproject moved from planning to closeout this quarter. One (1) subproject moved from design to construction.

Planned Milestones for Subsequent Quarter:

Complete closeout of one (1) project.

Issues and Challenges:

No new issues or challenges at this time.

CUH102 - Joint Infrastructure

Program Description: The purpose of the Hetchy R&R Joint Infrastructure Program is to extend the useful life of the joint-facilities assets including dams, roads, communication systems, wastewater treatment facilities, cottages, and operational yard facilities. The R&R projects are prioritized based upon regulatory compliance, condition assessments, and Operations staff recommendations.

Program: Joint Infrastructure	**Program Status:** Multiple Phase	**Environmental Status:** Active (Various)

Program Cost:

Approved	$106.88 M
Forecast	$106.88 M
Actual	$45.04 M

Program Schedule:

Approved	Nov-10	Jun-28
Forecast	Nov-10	Jun-28

Program Percent Complete: 36.4%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	Various	Various	Various	Various

Progress and Status:

The CUH102 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 100 subprojects.

Planning: 8 subprojects

•102-03.011 Early Intake Dam Stability and Spillway Repairs (June 20, 2013)

•102-08.001 KPH Unit 3 Remote Terminal Unit (RTU) Replacement and PLC Stop Logic Implementation (June 20, 2013)

•102-09.016 Yosemite Park Hetch Hetchy Road Guard Rail Improvements (January 01, 2015)

•102-09.018 Hetch Hetchy Roads FY 2019-2020 (August 01, 2019)

•102-11.007 Rock River and Microwave Sites Physical Security Upgrade (September 23, 2019)

•10034501.002 Distribution PRC 4292 Equipment Replacement (November 01, 2019)

•10034501.004 Overhead Electrical Distribution Line (March 16, 2020)

•102-13.005 Moccasin Peak Communication Building Air Conditioner Replacement (May 04, 2020)

Design: 3 subprojects

•102-02.006 Moccasin Sewer Pond Upgrade (November 01, 2012)

•102-03.010 O'Shaughnessy Dam Spillway Condition Assessment (September 01, 2017)

•10034501.001 Cherry Ridgeline Transformer Rehabilitation (April 01, 2019)

Bid and Award: 1 subproject

•10034501.003 Cherry Camp Power System Upgrade (December 15, 2019)

Construction: 6 subprojects

•102-01.005 Upcountry Microwave Improvement (March 09, 2017)

•102-02.025 Moccasin Village and Shops Transformers (April 03, 2017)

•102-09.010 Small Bridge Improvement Project (January 15, 2016)

•102-09.012 Kearny Lateral Crossing (August 08, 2016)

•102-11.005 Security Upgrade for Mixed Facilities (March 27, 2017)

•102-02.028 Early Cottage No 1, 2, 3, & 4 Roof Replacement (November 01, 2019)

Closeout: 4 subprojects

•102-02.019 Moccasin Control and Server Building Boiler Work (March 01, 2016)

•102-03.005 Cherry Dam Condition Assessment (February 03, 2014)

•102-09.008 Road and Bridge Improvement (July 06, 2015)

•102-09.014 Cherry Lake Road Guardrail C-3 and 4 (May 01, 2017)

Completed : 78 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout of one (1) subproject.

Status of Milestones for Reporting Quarter:

One (1) subproject closed: 102-13.004 Duckwall Communication Site Power System Repair. One (1) new subproject moved from Planning to Design. One (1) subproject moved from Design to Bid and Award. One (1) subproject moved from Bid and Award to Construction. One (1) subproject moved from Design to Construction. One (1) subproject completed this quarter.

Planned Milestones for Subsequent Quarter:

Complete Closeout of one (1) subproject.

Issues and Challenges:

No new issues or challenges at this time.

II. SAN FRANCISCO POWER ENTERPRISE

CAPITAL IMPROVEMENT PROGRAMS (POWER)

INTRODUCTION

The San Francisco Power Enterprise (Power) is responsible for the marketing and sale of the clean hydro-generated power produced by the Hetch Hetchy system, and balances that supply with purchases or sales to meet customer demand. Power transmits, distributes, meters, and prepares the electric bills for its customers, comprised of all City and County of San Francisco offices, facilities, and their tenants, ranging from neighborhood Police Stations and Fire Houses, the Ferry Building, and City Hall, to the Airport, General Hospital, Wastewater pumping and treatment facilities, the Regional Water Treatment Facilities, and the Municipal Railway (MUNI). Power is also the full-service electricity provider to Treasure and Yerba Buena Islands, and the newly developing Hunters Point Shipyard. Power operates and maintains four substations and switchgear, and many miles of distribution wires, to provide reliable electric service to its customers. Power also owns, operates, manages, and maintains approximately 25,000 street lights and related circuitry throughout San Francisco.

Power provides the full complement of electricity services to its vital City service customers, which includes identifying and implementing energy efficiency improvements and on-site renewable power generation. Power has developed and owns 2 Megawatts (MW) of rooftop solar projects, developed and owns the output of the 5 MW Sunset Solar Generating project, and developed 2 MW of methane gas-fired co-generation facilities at the Southeast Wastewater Treatment Plant.

1. PROGRAM DESCRIPTION

The SFPUC Power Enterprise's capital improvement projects are divided into six groups: Generation, Energy Efficiency, Retail Services, Street Lights, Transmission/ Distribution System, and Redevelopment-Treasure Island Projects.

2. PROGRAM STATUS

This Quarterly Report presents the progress made between January 1, 2021 and March 31, 2021. The data reported herein as the "approved" project budget and schedule conforms to the Power Capital Improvement Program's 10-Year Plan, which was approved by the Water and Power Enterprise Managers and became effective on February 9, 2016.

Figure 2.1 shows the Approved Budget for the projects in each phase of the program as of March 31, 2021. The number of projects currently in each phase is shown in parentheses. Multiple Phase projects are currently active in several phases as indicated by their respective project status sheets (Sections 6 and 10 of this report).

There are three (3) projects whose status is "on-hold", CUHCAP02, CUH98001, and CUH985, and are consequently not being reported in this quarterly report. However, funding status related to these on-hold projects is included in Table 3.1, in order to give an accurate report of the overall program's cost performance. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Figure 2.2 summarizes the environmental review status of the Hetch Hetchy projects as of March 31, 2021.

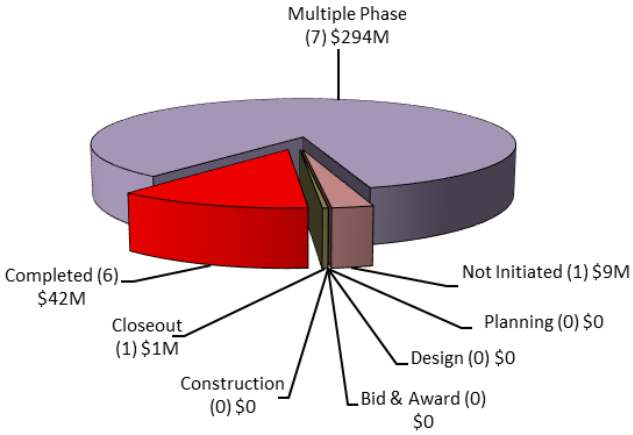
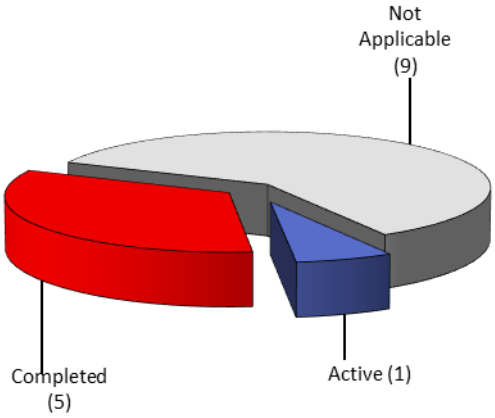


Figure 2.1 Approved Budget for Projects in Each Phase



** Environmental review does not apply to the projects not under CEQA requirements or with no environmental phase.*

Figure 2.2 Program Environmental Status

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program-level funding status of the Power projects included in this report. It shows the Approved Budget as of 2018 Hetch Hetchy 10-Year CIP Plan, Appropriated Budget to Date, Not Appropriated Budget to Date, Total Expenditures to Date, and Remaining Appropriated Budget.

Table 3.2 reflects the total number of projects by their status. Table 3.3 provides an overall current program-level cost summary of the active projects included in this report. It shows the Expenditures to Date, Current Approved Budget and Current Forecast Cost, and the Cost Variance between the Current Approved Budget and the Current Forecast Cost. The total Current Approved Budget for active projects included in this report is $256.01M, and the current Forecast Cost is $153.00M over budget.

The staffing and development of schedules for new and inactive projects are underway. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Table 3.1 - Status of Funding Appropriated to Date

	Approved Budget as of Hetch Hetchy 10-Year CIP Plan ($ Million) (A)	Appropriated Budget to Date ($ Million) (B)	Not Appropriated Budget to Date ($ Million) (C=A-B)	Total Expenditures to Date ($ Million) (D)	Remaining Appropriated Budget ($ Million) (E=B-D)
Generation	$55.57	$45.77	$9.80	$39.47	$6.30
Efficiency	$49.01	$36.31	$12.70	$33.56	$2.75
Street Lights	$109.34	$84.57	$24.76	$64.93	$19.64
Retail Services	$41.70	$166.78	($125.08)	$54.00	$112.77
Transmission/ Distribution System**	$117.47	$34.30	$83.17	$19.72	$14.58
Redevelopment - Treasure Island	$43.75	$41.88	$1.87	$9.84	$32.03
Power Enterprise Total*	**$416.83**	**$409.61**	**$7.23**	**$221.53**	**$188.08**

**The Total Values include Project Development related costs, On-Hold, Completed, and Not Initiated projects.*

***A new project, Intervening Facilities, with budget cost of $99.5M was added in March 2019.*

Table 3.2 - Number of Projects by Status

	# of Active Projects (A)	# of Completed Projects (B)	# of Not Initiated Projects (C)
Generation	1	3	0
Efficiency	2	1	0
Street Lights	1	1	0
Retail Services	2	1	0
Transmission/ Distribution System	2	0	0
Redevelopment - Treasure Island	0	0	1
Power Enterprise Total	**8**	**6**	1

Table 3.3 Active Projects Cost Summary

	Expenditures to Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Current Forecast Cost ($ Million) (C)	Cost Variance ($ Million) (D= B-C)
Generation	$32.98	$34.12	$34.12	-
Efficiency	$5.29	$7.85	$7.85	-
Street Lights	$63.71	$108.10	$108.10	-
Retail Services	$47.87	$1.70	$154.70	($153.00)
Transmission/ Distribution System	$6.38	$104.25	$104.25	-
Redevelopment - Treasure Island	-	-	-	-
Power Enterprise Total*	**$156.23**	**$256.01**	**$409.01**	**($153.00)**

**The Total Values do not include Project Development related costs, On-Hold, Completed, and Not Initiated projects.*

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2016 Approved Schedule and Current Forecast Schedule for the Power program. As shown in Table 4.1 the Overall Power Enterprise Program is currently forecast to be completed in June 2028.

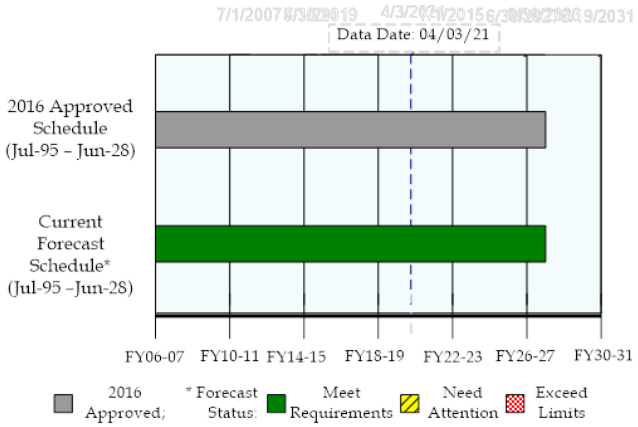


Figure 4.1 Program Schedule Summary

Table 4.1 2016 Approved vs. Current Forecast Schedule Dates

Sub-Program	2016 Approved Project Start	Actual Start	2016 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Generation	07/01/08	07/01/08✓	06/29/18	06/28/24	72.0
Efficiency	01/01/08	01/01/08✓	12/30/21	12/30/21	-
Street Lights	09/08/08	09/08/08✓	05/12/25	06/30/27	25.6
Retail Services	07/01/95	07/01/95✓	03/01/22	06/30/22	4.0
Transmission/ Distribution System	07/01/05	07/01/05✓	06/30/28	06/30/28	-
Redevelopment - Treasure Island	-	-	-	-	-
Overall Power Enterprise*	**07/01/95**	**07/01/95✓**	**06/30/28**	**06/30/28**	**-**

**The Overall Schedule does not include On-Hold and Not Initiated projects.*

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 04/03/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Generation											
CUH94763 - Go Solar SF Program	MP	$ 34,120	$ 34,120	$ 32,981	-	★	06/29/18	06/28/24	72.0 mo. Late	●	See Section 6
Efficiency											
CUH983 - Civic Center Sustainable District Program	MP	$ 6,650	$ 6,650	$ 4,179	-	★	12/30/21	12/30/21	-	★	See Section 10
Street Lights											
CUH896 - Streetlight Replacement	MP	$ 108,096	$ 108,096	$ 63,707	-	★	05/12/25	06/30/27	25.6 mo. Late	●	See Section 6
Retail Services											
CUH870 - Distribution Services Retail Customers	MP	$ 40,000	$ 168,452	$ 52,348	($128,452)	●	07/02/20	06/30/22	23.9 mo. Late	●	See Section 6
CUH891 - Metering and Load Monitoring	MP	$ 699	$ 699	$ 337	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* Exclude projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

**** Phase Status Legend**

PL Planning DS Design

BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.

⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.

● Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Transmission / Distribution											
10033821 - Intervening Facilities	MP	$ 99,500	$ 99,500	$ 3,705	-	★	06/30/28	06/30/28	-	★	See Section 10
CUH972 - Load Meter Program	MP	$ 4,750	$ 4,750	$ 2,679	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* Exclude projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

**** Phase Status Legend**

PL Planning DS Design

BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.

⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.

● Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH94763 - Go Solar SF Program

Project Description: GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between $2 and $5 Million per year in incentives to residents of San Francisco.

Program: Generation	**Project Status:** Multiple Phase	**Environmental Status:** Not Applicable

Project Cost:		**Project Schedule:**		
Approved	$34.12 M	Approved	Jul-08	Jun-18
Forecast	$34.12 M	Forecast	Jul-08	Jun-24
Actual	$32.98 M	Project Percent Complete: 97.0%		

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval+**	**Bid+ Advertisement**	**Construction+ NTP**	**Construction+ Final Completion**
Current Forecast	See Note	N/A	N/A	N/A

+ This is one of the programmatic projects; it does not result in construction projects that the City bids out, manages, or owns.

Progress and Status:

GoSolarSF recently ended the programs first quarter for calendar year 2021, providing incentives to 63 applicants. As of March 31, 2021, $251,004.00 in incentives were paid in the reporting quarter. On Jan 1, 2021 according to the Solar ordnance the incentives rates that were reduced annually over the last 4-years reached $0, concluding most of the programs offerings. Currently only a small amount of funding for Non-Profit and Low-Income incentives remain.

Issues and Challenges:

GoSolarSF is also providing relief to applicants that are not able to meet stipulated deadlines when impacted by Covid-19.

CUH896 - Streetlight Replacement

Project Description: The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting projects, street light engineering and capital support services, electric vehicle charger installations, community benefits capital projects, small and large street lighting capital projects, and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and end dates.

Program: Street Lights	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved		$108.10 M
Forecast		$108.10 M
Actual		$63.71 M

Project Schedule:

Approved	Sep-08	May-25
Forecast	Sep-08	Jun-27

Project Percent Complete: 59.0%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	Various	Various	Various	Various

Progress and Status:

-CUH896.01 is an ongoing capital project for the streetlights of San Francisco. 52 sub-level projects are each composed of several mini-streetlight projects at various milestone stages.

-CUH 896.48 - 3rd Street Rehabilitation. This project is complete and fully operational.

-CUH 896.32 - Van Ness Bus Rapid Transit. This is a cost share project with MTA. SFPUC is only providing funds for the ongoing project. Installation of new street and sidewalk light pole foundations are in progress.

-CUH 896.49 - Holiday and Festival Lighting. This is an ongoing project with annual work during the holiday season. SFPUC crews install holiday lighting on Market St. and Third St.

-CUH896.50 Pedestrian Lighting. This project is still awaiting sub-projects to be engineered. This will be an ongoing project which will add pedestrian lighting based on community requests.

-CUH 896.51 - Street Light and Pedestrian Pole Assessment. Project is ongoing and currently in Phase II. Phase I is completed and has assessed 23,219 street light poles to date. Phase II is underway and has assessed 1,275 poles to date.

-CUH 896.52 - San Bruno Street Light Improvement. This project is complete and fully operational.

-CUH896.52 Streetlight Pole Rehabilitation. We have completed the replacement of 626 deteriorated poles to date. The poles are identified by pole inspections.

-CUH 896.40 Series Loop Conversions. We have completed 6 conversions to date and have 2 remaining to complete the project. We are estimating completion in June 2022.

-CUH896.27 LED Street Light Conversion Project. We have completed 21,100 LED conversions to date. The cobra head portion of this project is completed. Maintenance and the decorative portion of this project is ongoing.

-CUH896.47 Tenderloin Street Light Improvements. Phase 1 has been completed and Phase 2 is in design.

-CUH896.30 Street Light Repair and Replacement. This is an ongoing project for replacement of street light facilities requested through 311 or by the Board of Supervisors.

-CUH896.31 Street Light Area Improvements. This is an ongoing project for addition of street light facilities requested through 311 or by the Board of Supervisors.

-CUH896.DA- Distributed Antenna System. This is an ongoing project to install wireless 4G and 5G equipment on City-owned streetlights. The existing 12-year license agreements with wireless telecommunications providers will expire in 2027 but may be extended indefinitely. To date, there are 811 DAS sites on City-owned poles. Installation is on-going as carriers continue to submit requests to add poles to their agreements.

Issues and Challenges:

Schedule variance was due to CUH896.DA which the existing agreement would expire in 2027.

CUH870 - Distribution Services Retail Customers

Project Description: A program to develop SFPUC-owned transmission and electrical distribution facilities along the Bayside of San Francisco has been initiated. The objective is to receive transmission level voltage from PG&E Potrero substation at 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. The scope of Phase One of the program encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. The balance of the Bay Corridor Transmission Distribution (BCTD) project will be built in subsequent stages, with the SFPUC substation to be built in parallel with the Phase One distribution work.

Program: Retail Services	**Project Status:** Multiple Phase	**Environmental Status:** Completed (CatEx)

Project Cost:		**Project Schedule:**		
Approved	$40.00 M	Approved Dec-15		Jul-20
Forecast	$168.45 M	Forecast Dec-15		Jun-22
Actual	$52.35 M	Project Percent Complete: 28.1%		

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	Various	Various	Various	Various

Progress and Status:

CUH870 has 5 subprojects:

1. CUH870.01 Distribution Services Retail Customers: This subproject holds unallocated budget for use by other subprojects.
2. CUH870.02 Bay Corridor Transmission Distribution (BCTD): This subproject contains multiple contracts. Forecasted cost at completion is $154M.
3. CUH870.03 Distribution Interface - New Customers: This subproject will be ongoing for the foreseeable future.
4. CUH870.04 Electrical Service Improvements: This subproject will be ongoing for the foreseeable future.
5. CUH870.05 HHP-EE Programs for New Retail Customers: This subproject will be ongoing for the foreseeable future.

CUH870.02 is the only active subproject in CUH870.

(a) Contract DB-128R2: Final Completion (FC) date is being negotiated.

(b) Contract DB-129.1: Construction work occurring. Construction completion in 2021.

(c) Contract DB-129.2: Design and construction work occurring. Construction completion in 2021.

(d) Contract DB-130: Construction work occurring. Construction completion in 2021.

Issues and Challenges:

None at this time.

CUH891 - Metering and Load Monitoring

Project Description: The purpose of this project is to upgrade existing metering to revenue quality meters, and to upgrade any associated equipment as needed. Metering and communication equipment will be installed and replaced according to the meter data acquisition strategy developed by CUH972 Load Meter Project.

Program: Retail Services	**Project Status:** Multiple Phase	**Environmental Status:** Completed

Project Cost:

Approved		$0.70 M
Forecast		$0.70 M
Actual		$0.34 M

Project Schedule:

Approved	Jul-95	Mar-22
Forecast	Jul-95	Jun-22

Project Percent Complete: 96.2%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	09/26/16✓	N/A	03/01/19✓	06/30/22

Progress and Status:

Progress: The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020, and installation of the third phase of DCUs will begin in April 2021.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH972.

No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

CUH972 - Load Meter Program

Project Description: The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System. The project will also consider the feasibility of replacing all or a portion of the 2000 PG&E meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or, in the alternative, the Power Enterprise purchasing these meters from PG&E.

Program: Transmission / Distribution	**Project Status:** Multiple Phase	**Environmental Status:** Completed

Project Cost:

Approved	$4.75 M
Forecast	$4.75 M
Actual	$2.68 M

Project Schedule:

Approved	Jul-05	Mar-22
Forecast	Jul-05	Jun-22

Project Percent Complete: 95.8%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion
Current Forecast	09/26/16✓	N/A (B) 11/30/16✓	(A) 07/01/05✓ (B) 03/01/19✓	(A) 03/31/09✓ (B) 06/30/22

+ The project includes multi-phase construction: (A) Phase 1; (B) Phase 2

Progress and Status:

The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020, and installation of the third phase of DCUs will begin in April 2021.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH891.

No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than $1 million.

8. PROJECTS IN CLOSE-OUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date
Efficiency				
CUH995 - Enterprise Fund Dept - Energy Efficiency	06/29/18	03/31/20	$ 1,195,720	$ 1,111,089
TOTAL			$ 1,195,720	$ 1,111,089

9. COMPLETED PROJECTS*

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Generation				
CUH99302 - Alvarado Elementary School -- Solar Electric (completed)	01/04/13	01/04/13	$ 582,170	$ 580,224
CUH99307 - North Beach Library Solar -- Renewable/Generation - Small Renewables (completed)	09/26/14	09/26/14	$ 212,160	$ 127,077
CUH99308 - SF Academy Solar Carport	02/01/19	12/17/20	$ 2,097,949	$ 2,454,340
Efficiency				
CUH986 - Energy Efficiency General Fund Program	06/30/21	09/25/20	$ 36,877,376	$ 26,690,051
Retail Services				
CUH973 - Distribution System Assessment (completed)	11/28/16	06/13/18	$ 1,000,000	$ 1,319,755
Street Lights				
CUH91503 - San Bruno Street Light Improvement Project (completed)	03/25/17	03/25/17	$ 1,240,000	$ 1,226,894
TOTAL			$ 42,009,655	$ 32,398,341

** This table only includes projects listed in the 10-Year CIP Plan for FY2017-2026.*

10. PROJECTS WITHIN BUDGET AND SCHEDULE

CUH983 - Civic Center Sustainable District Program

Project Description: This project funds planning, design, and construction of projects in the green district of the Civic Center in accordance with the partnership Memorandum of Understanding (MOU) with the Clinton Climate Initiative. This effort will employ new technologies in energy efficiency for whole-building retrofits and will pursue Leadership in Energy and Environmental Design (LEED) certification from the US Green Building Council (USGBC). The program and its related projects will demonstrate the City's leadership by transforming the historic Civic Center into a green and sustainable resource district by maximizing energy efficiency and showcasing sustainable concepts and technologies.

Program: Efficiency	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved		$6.65 M
Forecast		$6.65 M
Actual		$4.18 M

Project Schedule:

Approved	Jan-08	Dec-21
Forecast	Jan-08	Dec-21

Project Percent Complete: 63.0%

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion
Current Forecast	TBD	Multiple Small JOCs	Various	Various

+ This is one of the programmatic projects, which include multiple construction contracts.

Progress and Status:

The Civic Center Sustainable District Program for this quarter continued to focus on energy efficiency services, retro-commissioning, and LEED certification for the City's building portfolio in the Civic Center including: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, and the San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

• JOC 64-11 City Hall Interior Dome LED Lighting Project: The San Francisco Planning Department - Environmental Planning Division approved the exemption request under the Environmental Quality Act (CEQA) Section 15301, Class 1 (Existing Facilities). The project is in the construction phase with Rubecon Builders and Paganini Electric. Construction management and engineering services are being provided by professional service contractor kW Engineering through PRO.0106.A Task Order 3.

• City Hall Heat Pumps Replacement Project is in the construction phase with ACCO Engineered Systems. Construction management and engineering services are being provided by professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 7.

• City Hall Cooling Towers Replacement Project performance specification is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 10.

• City Hall Fuel Switching Feasibility Study is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 11.

• Additional projects related to HVAC and lighting retrofits are being identified and evaluated for funding requirements.

Issues and Challenges:

None at this time.

10033821 - Intervening Facilities

Project Description: Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

Program: Transmission / Distribution	**Project Status:** Multiple Phase	**Environmental Status:** Not Applicable

Project Cost:		**Project Schedule:**	
Approved	$99.50 M	Approved Dec-18	Jun-28
Forecast	$99.50 M	Forecast Dec-18	Jun-28
Actual	$3.71 M	Project Percent Complete: 2.3%	

Approved; Actual Cost; * Forecast Status: Meet Requirements Need Attention Exceed Limits

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	N/A	N/A	N/A	N/A

Progress and Status:
No updates on schedule or progress.

Issues and Challenges:
Intervening facilities may be required at various new construction and development projects where PG&E requires primary electric service. Each project is scheduled based on when the customer needs electric service.

APPENDICES

APPENDIX A. PROJECT DESCRIPTIONS

A1-A HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

CUH10001-HCIP - San Joaquin Pipeline Rehabilitation (Completed)

The purpose of the San Joaquin Pipeline Rehabilitation (SJPL) is to extend the useful life of these water conveyance facility assets, including tunnels and pipelines. Baseline dates and budgets for the subprojects below were presented to and approved by the Commission on 09/08/15. Since they are now considered to be active HCIP subprojects, they have been moved from CUH100 R&R.

CUH10003 - Lower Cherry Aqueduct

The Lower Cherry Aqueduct (LCA) delivers water from Cherry Creek to supplement the primary Hetch Hetchy reservoir supply during a drought year. Due to current drought conditions, as described in the Declaration of Emergency issued on February 21, 2014, there is a need for this reliable backup water supply to be re-established in the LCA. However, due to damage during the Rim Fire Emergency and age, the LCA is in need of restoration before it can become a reliable asset. This project consists of improvements such as emergency debris removal and tunnel cleaning, temporary structures installation, monitoring and instrumentation, and forebay and diversion dam repairs.

10035574 - SJPL Tesla Valves Replacement

This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all 4 San Joaquin Pipelines (SJPL). In addition, all cross- over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major

upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

10033156 – Moccasin Reservoir Perimeter Security Fence

Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security camera will be considered as part of the design.

CUH100PD – WATER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

POWER INFRASTRUCTURE

CUH10102 - Holm and Other Powerhouse Projects

This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 13.8 kV equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (HHWP) of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation & cleanup.

CUH10113 - Kirkwood Penstock

Kirkwood Penstock was built in 1964 and conveys the SFPUC water supply from Canyon Tunnel to KPH. Kirkwood Penstock has experienced significant foundation movement without impact to the service utility. In February 2007, however, there was significant movement on the penstock, and the penstock partially detached from one fixed saddle directly below anchor block 2. The scope of this project includes an internal and external inspection; development of an Emergency Action Plan and a Penstock Monitoring Plan; repairs to the damaged saddle; installation of a

monitoring system; and procurement of emergency spare equipment.

CUH10114 - Moccasin Powerhouse and GSU Rehabilitation

The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

CUH10115 - Warnerville Substation Rehabilitation

Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components, including grounding, fence, circuit breaker, control room, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

CUH10116 - Moccasin Penstock

The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. The lower 1,084 foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

CUH10119 - Early Intake Switchyard Slope Hazard Mitigation

The Hetch Hetchy Water and Power (HHWP) Early Intake Switchyard (ISY) is a 230 kV switchyard located alongside the Tuolumne River, downstream of HHWP's Kirkwood Powerhouse (KPH). The switchyard is a critical HHWP asset that provides the transmission of electrical power generated at Kirkwood and

Holm powerhouses to Moccasin, as well as the local distribution of power to HHWP's upcountry facilities. The slope requiring hazard mitigation, located next to ISY, was severely burned in the Rim Fire. The purpose of the project is to reduce the risk of slope failure which may cause damage to the switchyard and loss of power transmission capability.

CUH101PD - POWER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

JOINT INFRASTRUCTURE

10032903 – O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the OSD release system. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

CUH10214 – Moccasin Facilities New Construction

The existing HHWP shops and buildings are original and vary in age from between 45 to 80 years old. Some maintenance crews are currently working in buildings that were not originally intended to be used as shops. Many of these facilities do not meet current codes, require extensive repairs, and are not efficient work environments. The primary objective of this project is to build a 10,000-square-foot, combined-function building consisting of a plumbing shop, vegetation management shop, right-of-way shop, electric technician chop, lockers, shower facilities, break room, and new materials bins.

CUH10215 – Canyon Tunnel Rehabilitation

Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009 and the tunnel is in generally good condition, with the exception of the Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new reinforced concrete plug downstream of the existing plug.

CUH10216 – Cherry Dam Outlet Works Rehabilitation

The outlet facilities for Cherry Dam have reached the end of their service life at nearly 60 years old. The stream release assets must work sufficiently well to meet U.S. Department of

Interior's stream flow requirements, and these requirements cannot currently be met at low lake elevations. The 66" valves will be replaced in order to safely operate the dam during storm conditions with heavy inflows to Cherry Lake. The valves are critical for maintaining maximum carryover storage and meeting the SFPUC's water supply objectives. The scope of work includes replacement of the stream release valves and associated piping as well as the Low Level Outlet (LLO) 66" hollow jet valves. The project also replaced both butterfly valves that serve as isolation valves upstream of the hollow jet valves as change orders during construction.

CUH10220 – Mountain Tunnel Inspection & Repairs (Completed)

The objective of this project is to assess the current condition of the Mountain Tunnel and complete any urgent interim repairs to reduce the risk of tunnel lining failure until the completion of the long-term Mountain Tunnel Improvements project in 2026. The project consists of:

- A tunnel inspection in 2017 to update the Condition Assessment conducted in 2008; and
- Short term repairs in 2017 and 2018-19 to reduce the risk of failures in the concrete lining.

CUH10221 – Mountain Tunnel Improvement Project

Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides:

- Initial evaluation of alternatives for the Mountain Tunnel facility, and
- Eventual design and construction of the preferred engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

The 2016 scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including:

- Rehabilitation of the existing tunnel,
- Relining the existing tunnel,
- Construction of a new bypass tunnel within the tunnel right-of-way, and
- Construction of a new bypass tunnel outside the tunnel right-of-way.

In 2017, the existing tunnel was shut down for 60 days and a detail inspection was performed. The inspection and subsequent condition assessment found many defects in the tunnel lining. However, all the defects were repairable, and the tunnel was still structurally sound. This substantiated the viability of the rehabilitation alternative with downstream valve control, and the City adopted this as the preferred project for design and construction in July 2017. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of:

- Repairs of all significant concrete lining defect with wire mesh reinforcement and shotcrete,
- Contact grouting of the entire lining to further reinforce and seal the lining to the surround rock,
- A new downstream flow control facility at Priest Reservoir with valving to meter flows and keep the tunnel running full during all operations and mitigate future erosion of the lining,
- A new tunnel adit at Priest Reservoir to allow maintenance access to Mountain Tunnel without having to drain the reservoir in order to expose the current access portal,
- An extension of the South Fork Siphon crossing under the Tuolumne River to bypass a problematic section of the tunnel that infiltrates excessive groundwater into the tunnel, and causes adverse water quality issues,

• An enlarged concrete portal at Early Intake to accommodate maintenance equipment access at the upstream section of the tunnel,
• Access road widening and improvements to accommodate safer maintenance access to Adit 5/6 and Adit 8/9, and
• Temporary construction staging areas, environmental mitigations, and site restoration improvements.

CUH10223 – OSH Dam Access and Drainage Improvements
The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:
• Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
• Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) compliant ladders and landings with safety cage and/or install fall restraint systems.
• Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
• Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
• Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

10035086 – Bridge Replacement (4 Bridges)
HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

CUH102PD – JOINT - PROJECT DEVELOPMENT
The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

2018 MOCCASIN STORM EVENT

10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements

On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of SF, Mark E Farrell officially declared the storm damage a Local Emergency Event. This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

A1-B HETCHY RENEWAL AND REPLACEMENT PROGRAM

WATER INFRASTRUCTURE

CUH10001 - SJPL Rehabilitation
The San Joaquin Pipelines (SJPLs) convey water from Foothill Tunnel to Coast Range Tunnel. The asset varies in age from 5 to almost 80 years old. Hetch Hetchy Water and Power (HHWP) have developed an annual program to inspect, monitor and manage the SJPLs and extend the life of the asset prior to replacement.

CUH10005 - Priest Pipe Recoating (Completed)
The coating on a 24" pipe located in a tunnel at Priest Reservoir has failed. The project scope will be to recoat the pipe.

POWER INFRASTRUCTURE

CUH10103 - Powerhouse Control Upgrade (Completed)
This project will upgrade the powerhouse protection, control, indication, and monitoring system. The electromechanical relays will be replaced with multifunction digital relays to improve reliability and functionality of the electrical protection system. The scope of work includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Digital relays have diagnostics that will notify or alarm the operator if there is relay trouble, thus preventing potential consequential failures, damage, and electrical safety hazards. The existing electromechanical type relays do not have diagnostic capability and present a higher overall risk of failure. If an electromechanical relay does fail, there is a loss of protection on the electric system that could prevent generation. Furthermore, the digital type requires less maintenance at once every five years instead of annually as required for the electromechanical type under regulatory requirement PRC-005.

CUH10108 - Step-Up Transformers (Completed)
These projects include replacing step-up transformers at Kirkwood and Cherry Ridge Line.

CUH10109 - Moccasin Low Head Rehabilitation Project (Completed)
This project is for the rehabilitation of the Moccasin Low Head Powerhouse, which includes the following components: Replace Roof - Repair or replacement of the aging powerhouse roof. Oil Spill Containment / Prevention - Provision on an oil separation system or other modification should be installed inside the powerhouse to prevent contamination. Upgrade Excitation System - Replacing the existing excitation system with a modern digital excitation system to improve unit availability. A reliable, functioning excitation system is required for unit generation. Upgrade Electrical Protective System - Replace the single function, solid state relays with multifunctional digital relays to improve reliability and functionality of the electrical protection system. The scope includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Upgrade Unit Control System - this project upgrades the unit control system and re-locates the control panel to improve safety conditions for operations personnel. Governor Upgrades - this project provides for the upgrade of the mechanical governor to digital governor. This project is required so we can backfeed from the low head for the Moccasin Compound while upgrades are performed at Moccasin Switchyard.

CUH10110 - Early Intake Switchyard (Completed)
This project is for the rehabilitation of the Early

Intake Switchyard, which includes the following work: replace existing oil circuit breakers (OCBs) with new gas powered circuit breakers on Kirkwood and Holm section of 230kv bus; install gas powered circuit breakers and related components including bus conductors, structural steel, control cables, and galvanized rigid steel conduits. Install City furnished capacitive voltage transformer (CVTs) and surge arresters. Replace main bus-side and line-side disconnects bay 1 through 7, replace Aux bus disconnects bays 1 through 7, replace main bus-side breaker and aux bus disconnect within bay 0. Replace cap and pin insulator stacks with equivalent replacement post insulators within the main and aux buses, including underhung T-drop bus supports. Replace insulators associated with main bus sectionalizing switch. Removal of wave trap remnants, install new support structures. Remove and dispose of existing above grade oil transfer piping system. Connect into new programmable logic controllers (PLC) system. Install a Shoe-fly-bypass using a job order contract (JOC) contractor.

CUH10111 - Moccasin GSU Transformers & Oil Containment (Completed)

This project will provide replacement for two Generator Step Up transformers. The project scope also includes the concurrent design of oil containment of the specified transformers. The assessment will provide a cost estimate to develop the scope and specification criteria to be provided to a consultant engineer to develop construction drawings and specifications.

CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV (Completed)

This project will provide funding for the rehabilitation of Kirkwood Powerhouse to increase life expectancy of the asset as well as improve safety by replacement of the two turbine shutoff valves (TSOVs). The scope of work for the proposed project includes the following:

- Remove and replace TSOVs for Unit 1 and Unit 2 at Kirkwood Powerhouse.
- Replace the 480V breakers, complete switchgear lineup, Motor Control Centers (MCCs) and panel board with provision for an additional.
- Refurbish / replace various auxiliary systems including: cooling generators, exciters, turbines, transformers, building mechanical equipment, and building structure.
- Add Partial Discharge Analysis Instrumentation to Generator Unit 3 which includes monitoring the Unit 3 generator stator winding insulation and generator with a partial discharge analysis (PDA) instrument.
- Upgrade Vibrator Monitor System including removing the existing system, installing three independent systems with associated sensors and cabling, and incorporating systems into unit controls.

CUH10117 - Transmission Clearance

Moccasin Powerhouse Generators No. 1 and No. 2 were completed in 1969 and generate a combined maximum output of 110 Megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace the Generator No.1 and/or No. 2 stator cores and coils to uprate from 57.5 (MVA) to new rating of 61 MVA. The scope of work also include rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and to supply a new rotor rim for each generator following inspection and testing.

CUH10121 - MPH Bypass Valves

Following the 2013 Rim-Fire, the City was invited to apply for a FEMA Hazard Mitigation Grant. A grant application was prepared and submitted in 2014 to provide

mitigation measures for the potential hazards posed by the steep mountainside situated southeast of the Early Intake Switchyard (ISY). In the past there have been damage and shutdowns of the switchyard due to mudflows, rock falls, and landslides. The Rim Fire burned vegetation from much of the slope, thereby increasing the likelihood of future damage.

JOINT INFRASTRUCTURE

CUH10203 - Reservoirs and Dams
This project includes a condition assessment on all reservoirs and dams as well as more immediate projects to address safety or environmental concerns. The project includes a condition assessment of all storage and regulating reservoirs (six total) to identify work to be performed. Work is being prioritized and included in the Hetch Hetchy 10-Yr CIP Plan.

CUH10205 - Small Water Systems Upgrades (Completed)
Upgrade small water systems at Moccasin Compound, O'Shaughnessy and Early Intake in order to meet state regulatory compliance requirements. HHWP must upgrade their small water systems with ultraviolet (UV) treatment equipment.

CUH10207 - Existing Hetchy Facilities (Outside Moccasin) (Completed)
This project will fund the rehabilitation of all HHWP facilities outside of Moccasin (approximately 80 facilities). Within the work included are: Maintenance - Painting, Roof Replacement, Gutters, Dry Rot, Foundations and Drainage upgrades. Hazardous Material Abatement - Lead and asbestos removal. Building and Electrical Code Violations, Water Distribution System, Waste Water and or Septic Tanks and Energy Efficient Projects. The scope of work on the Industrial Buildings will consist of repairs to the Arc Flash deficiencies and provide Emergency Power for the Support Facilities.

CUH10208 - Remote Terminal Unit Replacement (Completed)
The project includes removing the unit annunciator remote terminal unit and installing a Modicom I/O rack, wiring signals to new I/O, and migrating signals through the new programmable logic controllers for access by the new supervisory control and data acquisition system. This project is an upgrade to the existing system and will improve reporting and operations. This project is part of an ongoing HHWP program to upgrade the SCADA and unit controls for both the water and power systems.

CUH10209 - Road Improvements
This project includes maintaining almost 50 miles of paved roads and rehabilitation of eleven bridges. Preliminary findings in the condition assessment indicate that some of the bridges will require replacement and/or retrofit. Also, signage, reflectors, guardrails, slope stabilization, and selective road widening will be required to enhance the safety of road users.

CUH10210 - Hetchy Fiber Projects (Completed)
This project will install fiber between Modesto and Moccasin Peak on lines 5/6 and lines 7/8, as well as replace the fiber system within the Moccasin compound. Fiber will become the primary means of communication, with our existing licensed microwave functioning as the redundant system. Communication channels will include the business network, control network, security network, protection network, and voice over internet protocol (VoIP) network. The upgraded system will not only meet regulatory requirements but provide a more secure, reliable communication and power protection system. By 2022, the fiber electronic hardware will have reached the end

of its technical life expectancy and will require upgrades.

CUH10211 - Facilities Security Project
HHWP is updating security fences and installing card access at remote locations. HHWP is also evaluating new security requirements that are now required to meet North American Electric Reliability Corporation (NERC) regulatory requirements. HHWP only has door alarms at many remote sites. Increased security is required including fencing, card access and camera monitoring to minimize the risk of intrusion at these facilities. In addition, HHWP has to address regulatory security requirements.

CUH10212 - Moccasin Penstock
Moccasin Penstock was built in the early 1920s and conveys the SFPUC water supply from Moccasin Tunnel to Moccasin Powerhouse. HHWP is currently in the process of performing a penstock condition assessment. The penstock includes about four miles of hammer-forged welded steel penstock and may be subject to failure. In addition, issues have been identified regarding the anchor/saddle system. The short-term program includes completing the condition assessment, performing repairs at locations with significant corrosion, and addressing concerns with the anchor/saddle system. In 2015, coating and lining issues will be addressed on the non-hammer-forged welded sections. The long-term project is to replace the hammer-forged welded section if this is the most cost-effective alternative identified during the condition assessment.

CUH10213 - Communication System Upgrade
The project will provide funding for replacement and expansion of the HHWP two-way radio system resulting in better coverage in the up-country river canyons as well as inter-divisional communication with other water enterprise operating divisions in the Bay Area. In addition, the project will extend 6GHz microwave communication to remote locations such as O'Shaughnessy and Cherry Valley Dams and Cherry Pump Station, allowing for remote monitoring and control of assets, enhanced security capabilities as well as business network connectivity at those sites. Lastly, this project will complete redundant paths of communication for control network systems between critical facilities such as HPH, KPH, and ISY using both microwave and fiber technology for those short hops.

A2 SAN FRANCISCO POWER ENTERPRISE

GENERATION

CUH94763 - Go Solar SF Program
GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between $2 and $5 Million per year in incentives. This program does not result in construction or capital projects that the City owns and operates. The City simply pays incentives to residents for projects that the resident contracts for and may own or lease from a solar contractor.

CUH99302 - Alvarado Elementary School -- Solar Electric (Completed)
The project scope consists of the design and the installation of a 50kW solar electric system on top of the Alvarado Elementary School. The Design Phase includes DC/AC electrical and structural design for the photovoltaic (PV) stationary rack mounted array and equipment pad area. The Construction Phase includes installation of approximately 250 solar modules and installation of inverters and supporting electrical equipment with interconnection onto the PG&E distribution system. There are no advertisement dates or bid/award dates (not applicable) since this project will be designed by the SFPUC and constructed by DPW.

CUH99307 - North Beach Library Solar - Renewable/Generation - Small Renewables (Completed)
The project scope consists of the design and the installation of a 10.0kW solar electric system on top of the newly constructed North Beach Library. The Design Phase includes DC/AC electrical and structural design for a photovoltaic (PV) stationary rack mounted array and equipment area. The Construction Phase includes installation of approximately 35 solar modules and installation of an inverter and supporting electrical equipment with interconnection onto the PG&E distribution system.

CUH99308 - SF Academy Solar Carport
The project consists of the design and installation of carports mounted with a solar electric system in the existing carpark located at the San Francisco Police Academy, 350 Amber Drive, in the Diamond Heights Neighborhood. The design phase includes electrical and structural design for the carport structure and integrated photovoltaic (PV) array. The Construction Phase will include the installation of the carports and mounting of a grid-connected PV system of approximately 220kW in size. Once completed, the PV system will be interconnected to the PG&E electrical distribution system and supply the building load.

CUH99309 - Marina Middle School Solar
The project scope consists of the design and the installation of a rooftop solar electric system at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The Construction Phase will include the installation of a grid connected PV system. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

EFFICIENCY

CUH983 - Civic Center Sustainable District Program
The Civic Center Sustainable District Program involves retrofitting City buildings and facilities in the Civic Center to create a substantial reduction in building carbon footprint, electricity, natural gas, and operating costs, while improving operations and

occupant comfort. Buildings and facilities included in this program are: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

CUH986 - Energy Efficiency - General Fund Program
This project funds the planning, design and construction of Energy Efficiency (EE) projects at General Fund facilities. Energy retrofits include lighting, heating and ventilation, energy management systems, and demand response projects. These EE projects provide reductions in greenhouse gas emissions, upgrades to these public facilities, and result in long-term utility cost savings for the General Fund. The FY15 funds the staff and consultants to implement projects from previous fiscal years, along with limited other project technical and implementation expenses for new EE projects. FY16 and later fiscal year budgets will primarily fund staff expenses and will focus on project planning and development (for non-PUC funding sources), support for departments which have project funds available, and lower-cost EE projects and services (e.g. building retro-commissioning). Budgets also support staff and consultants related to the Benchmarking and Auditing Ordinance.

CUH995 - Energy Efficiency - Enterprise Fund Program
This project funds planning and operating energy efficiency services for new residential and other customers (e.g., at Hunter's Point Shipyard and Treasure Island), Enterprise Departments, and direct-paying customers of the Power Enterprise. Municipal customers served by this capital fund include the Port and Port Tenants, San Francisco Airport, SFPUC, MUNI, Convention Facilities, City College and, San Francisco Unified School District (SFUSD). There are multiple sub-projects under this program. Milestones for individual sub-projects are not shown.

STREET LIGHTS

CUH896 - Streetlight Replacement
The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting programs; street light engineering and capital support services; electric vehicle charger installations; community benefits capital projects; small and large street lighting capital projects; and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and ending dates.

CUH91503 - San Bruno Street Light Improvement Project (Completed)
San Bruno Street Light (SL) Improvement Project will upgrade the streetlights at San Bruno Ave. between Silver Ave. and Wilde Ave. Approximately 51 Light-emitting diode (LED) fixtures, 68-Lumec Optima Post-top light poles with High Pressure Sodium Vapor (HPSV) luminaires, will be replaced with LED luminaires. The proposed new poles will match the existing 16 foot poles with post top fixtures. The majority of the scope of work includes LED swapping of HPS luminaires, sidewalk removal, trenching, foundation and electrical conduit work, installation of light poles and fixtures, and more than 37 Pacific Gas and Electric Company (PG&E) power connections. Several Department of Public Works (DPW) banner poles would be utilized as streetlights.

RETAIL SERVICES

CUH870 - Distribution Services Retail Customers
A program to develop SFPUC-owned electrical

transmission and distribution facilities along the Bayside of San Francisco has been initiated. The long term geographical area of interest stretches from City of Brisbane boundary in the South, to China Basin in the North. System planning studies are currently being conducted by PG&E. The objective is to have a transmission agreement with PG&E to receive transmission level voltage from PG&E Potrero substation at 115kV or 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. A pool of 4 qualified contractors has been selected for distribution work. A Request for Bids (RFB) (DB-128R) will be issued to these qualified bidders February 2017, with a planned contract award date at end of March 2017. The scope of Phase One of the program (DB-128R plus other supplementary contracts) encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. Contract arrangements, and design and construction of the SFPUC substation will proceed in parallel with the Phase One distribution project. The balance of the Bay Corridor Transmission Distribution project will be built in subsequent stages.

CUH891 - Metering and Load Monitoring
The purpose of this project is to install metering and communication infrastructure to cost effectively collect reliable meter data from existing and future PUC customers in geographically dispersed areas. Replacement of outdated EMON meters at Moscone Center, Pier 80 and other locations are within the scope of this project. Based upon the evaluation performed by CUH972, the following procurements may be pursued by the Power Enterprise: (1) procurement of an AMI system for meter data communication as part of CUH891, (2) replacement of all or a portion of the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or (3) purchase of PG&E owned meters from PG&E.

CUH973 - Distribution System Assessment (Completed)
This project will fund a feasibility study to assess the general condition of Pacific Gas and Electric Company's (PG&E) electric distribution system within the boundaries of the City and County of San Francisco. In particular, this will include an assessment of the general condition (age, condition, and technology) of the facilities (including overhead/underground wires, poles, substations, transformers, and meters) and an assessment of the connection of the distribution system to the existing grid. This feasibility study is the first phase toward evaluating the costs and benefits of either purchasing PG&E's distribution system or constructing a City-owned distribution system. The specific focus of this study will be to assess the feasibility of installing intervening facilities and distribution in order to aggregate current load served under the PG&E Interconnection Agreement (IA), additional load on City-owned property (such as the Port), and redevelopment load (such as the Transbay Terminal) under new Wholesale Distribution Tariff Agreements after the IA expires. Total Estimated Cost: $1,000,000. This project is a study with no physical construction envisioned.

TRANSMISSION - DISTRIBUTION SYSTEM

CUH972 - Load Meter Project
The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project

will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System with the intent to identify a meter data acquisition strategy that is technically and financially in the best interest of the PUC. Based upon this evaluation, the Power Enterprise may opt to procure an AMI system. The feasibility study will entail a needs assessment to determine the SFPUC operational requirements, followed by an evaluation of contractual and regulatory factors, meter and wireless communication systems capabilities, equipment and software cost, and the feasibility of using PG&E's existing AMI infrastructure to gather municipal meter data. In tandem, a meter inventory will be performed. Alternatives will be developed, including among others (1) replacing all or a portion of the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, and (2) the Power Enterprise purchasing these meters from PG&E. A cost benefit analysis will be performed on each alternative to determine the preferred strategy. The remote meter data acquisition strategy that provides the greatest value for SFPUC customers will be identified, followed by system procurement and implementation.

CUH985 - Transbay Transit Center

The City and County of San Francisco ("the City"), through its Public Utilities Commission (SFPUC), will provide construction and permanent electric services to the new Transbay Transit Center, including adjacent bus ramps, and the new bus storage facility at Stillman Street, in San Francisco, California. The SFPUC, in agreement with the Transbay Joint Powers Authority (TJPA), will provide electric service to the Transit Center by installing two 12-kilovolt (kV) electric circuits, 12-kV switchgears, transformers, and other electrical equipment.

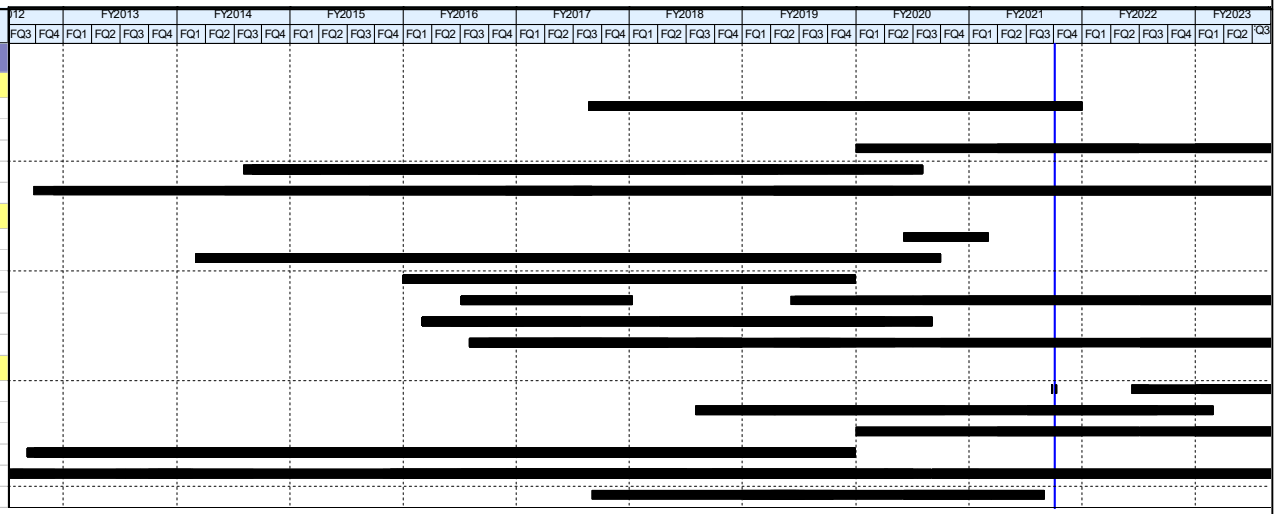
10033821 - Intervening Facilities

Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

This page is intentionally left blank.

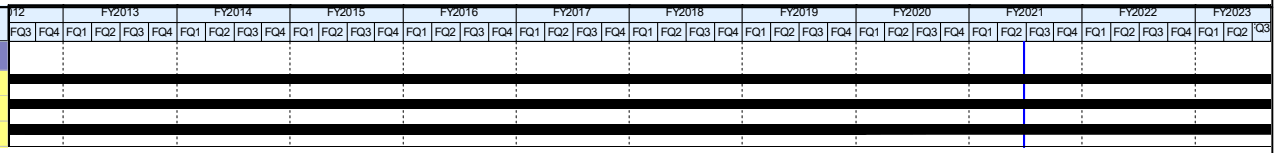
APPENDIX B. Hetch Hetchy Enterprise Approved Project Level Schedules

Project Name	Start	Finish
Hetchy Capital Improvement Projects	03-Oct-11	30-Jun-28
Water Infrastructure	26-Mar-12	30-Jun-28
10033156 Moccasin Reservoir Perimeter Security Fence	20-Feb-17	01-Jul-21
10035574 SJPL Tesla Valves Replacement	02-Jan-20	28-Jun-24
10035575 SJPL Valve and Safe Entry Improvement	01-Jul-19	01-Jul-25
CUH10003 Lower Cherry Aqueduct	01-Feb-14	31-Jan-20
CUH100PD WATER ONLY/PROJ DEV	26-Mar-12	30-Jun-28
Power Infrastructure	03-Sep-13	31-Dec-24
10035721 Transmission Lines 7/8 Upgrades	02-Dec-19	31-Aug-20
CUH10102 Holm and Other Powerhouse Projects	03-Sep-13	30-Mar-20
CUH10113 Kirkwood Penstock	01-Jul-15	28-Jun-19
CUH10114 Moccasin Powerhouse and GSU Rehabilitation	04-Jan-16	28-Jun-24
CUH10115 Warnerville Substation Rehabilitation	01-Sep-15	04-Mar-20
CUH10116 Moccasin Penstock	01-Feb-16	31-Dec-24
Joint Infrastructure	03-Oct-11	01-Jul-27
10014115 Cherry Dam Spillway - Short Term Improvements	22-Mar-21	01-Jul-27
10032903 O'Shaughnessy Dam Outlet Works Phase I	01-Feb-18	25-Aug-22
10035086 Bridge Replacement (4 - Bridges)	01-Jul-19	30-Dec-25
CUH10214 Moccasin Facilities New Construction	05-Mar-12	28-Jun-19
CUH10221 Mountain Tunnel Improvement Project	03-Oct-11	31-Dec-26
CUH10223 OSH Dam Access and Drainage Improvements	01-Mar-17	26-Feb-21



APPENDIX B. Hetch Hetchy Enterprise Approved Project Level Schedules

Project Name	Start	Finish
Hetchy Renewal and Replacement Program (R&R)	22-Dec-09	30-Jun-28
Water Infrastructure	04-Nov-10	30-Jun-28
Power Infrastructure	22-Dec-09	30-Jun-28
Joint Infrastructure	02-May-11	30-Jun-28



APPENDIX B. Hetch Hetchy Enterprise Approved Project Level Schedules

Project Name	Start	Finish
San Francisco Power Enterprise Capital Improvemen	01-Jul-95	30-Jun-28
Generation	01-Jul-08	31-Jan-19
CUH94763 Go Solar SF Program	01-Jul-08	29-Jun-18
CUH99309 Marina Middle School Solar	01-Mar-16	31-Jan-19
Efficiency	01-Jan-08	30-Dec-21
CUH995 Enterprise Fund Dept - Energy Efficiency	01-Dec-09	29-Jun-18
CUH983 Civic Center Sustainable District Program	01-Jan-08	30-Dec-21
Streetlight	08-Sep-08	12-May-25
CUH89600 Streetlight Replacement	08-Sep-08	12-May-25
CUH896.30 Streetlight Replacement & Repair	01-Sep-10	12-May-25
CUH896.27 LED Streetlight Conversion Project	22-Oct-09	01-Aug-19
CUH896.31 Streetlight Area Improvements	28-Mar-16	12-May-25
CUH896.40 Series Loop Conversion	01-Jan-12	25-Jun-19
CUH896.32 Van Ness - Bus Rapid Transit (BRT)	01-Mar-11	30-Dec-20
CUH896.48 3rd St Corridor Rehabilitation (completed)	01-Aug-14	31-Dec-18
CUH896.49 Holiday & Festival Pole Use	30-Jun-15	12-May-25
CUH896.50 Pedestrian Lighting	30-Jun-15	12-May-25
CUH896.51 Street & Pedestrian Pole Assessment (completed)	01-Jul-14	12-May-25
CUH896.52 Streetlight Pole Rehabilitation (completed)	01-Jul-14	12-May-25
Retail Services	01-Jul-95	01-Mar-22
CUH891 Metering and Load Monitoring	01-Jul-95	01-Mar-22
CUH870.03 Distribution Interface (10014228)	03-Jan-17	02-Jul-20
CUH870.04 Electrical Service Improvements (10014229)	03-Jan-17	02-Jul-20
CUH870.05 Energy Efficiency Retail Customers (10014230)	03-Jan-17	02-Jul-20
10014227 Bay Corridor Transmission & Distribution (CUH87002)	01-Dec-15	31-Dec-18
10014226 Distribution Services Retail Customers (CUH87001)	01-Dec-15	02-Jul-20
Transmission - Distribution System	01-Jul-05	30-Jun-28
CUH972 Load Meter Program	01-Jul-05	01-Mar-22
10033821 Intervening Facilities	31-Dec-18	30-Jun-28

APPENDIX C. LIST OF ACRONYMS

AC	Alternating Current
AMI	Advanced Metering Infrastructure
BCTD	Bay Corridor Transmission Distribution
CATEX	Categorical Exemption
CCSF	City and County of San Francisco
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CIP	Capital Improvement Program
CM	Construction Management
COVID-19	Coronavirus Disease of 2019
CVT	Capacitor Voltage Transformers
DB	Design, Build
DC	Direct Current
DC/AC	Direct Current/Alternating Current
DCU	Data Collection Unit
DPH	Department of Public Health
DPW	Department of Public Works
EE	Energy Efficiency
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
Ghz	Gigahertz
GSU	Generator Step-Up
GWH	Gigawatt Hours
HCIP	Hetchy Capital Improvement Projects
HH	Hetch Hetchy
HHWP	Hetch Hetchy Water and Power
HMGP	Hazard Mitigation Grant Program
HPH	Holm Powerhouse
HVAC	Heating, Ventilation, and Air Conditioning
IA	Interconnection Agreement
ISY	Intake Swithyard
JOC	Job Order Contract
KPH	Kirkwood Powerhouse
kV	kiloVolt
kW	kilowatt
LCA	Lower Cherry Aqueduct
LED	Light Emitting Diodes
LEED	Leadership in Energy and Environmental Design
LLO	Low Level Outlet
MOU	Memorandum of Understanding
MPH	Moccasin Powerhouse
MUNI	Municipal Railway
MW	Megawatt
NERC	North American Electric Reliability Corporation
NHPA	National Historic Preservation Act
NPS	National Park Service
NTP	Notice to Proceed
O&M	Operations and Maintenance
OCA	Office of Contract Administration
OCB	Oil Circuit Breakers
OSD	O'Shaughnessy Dam
OSHA	Occupational Safety and Health Administration
PD	Project Development
PG&E	Pacific Gas and Electric Company
PLC	Programmable Logic Controllers
PUC	Public Utilities Commission
PV	Photovoltaic
R&R	Renewal and Replacement
RFP	Request for Proposal
ROW	Right-of-Way
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SF	San Francisco
SFO	San Francisco Airport
SFPUC	San Francisco Public Utilities Commission
SFUSD	San Francisco Unified School District
SJPL	San Joaquin Pipeline
SJVH	San Joaquin Valvehouse
TBD	To be determined
TI/YBI	Treasure Island/Yerba Buena Island
TJPA	Transbay Joint Powers Authority
TTC	Transbay Transit Center
TTF	Tesla Treatment Facility
TUV	Tesla Ultra Violet
USFS	United States Forest Service
USGBC	United States Green Building Council
VoIP	Voice Over Internet Protocol
WDT	Wholesale Distribution Tariff
WSIP	Water System Improvement Program