THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Report

Engineering Services Group

- **Engineering Services Monthly Activities for April 2024**

Summary

This monthly report provides a summary of Engineering Services Group activities for April 2024 in the following key areas:

- Distribution System Reliability Program
- Prestressed Concrete Cylinder Pipe (PCCP) Reliability Program
- Colorado River Aqueduct (CRA) Reliability Program
- Treatment Plant Reliability Program
- System Reliability Program
- Protecting the Public and Metropolitan's Assets – Safety of Dams
- Value Engineering Program
- Pure Water Southern California Program
- System Flexibility | Supply Reliability Program

Purpose

Informational

Attachments

Attachment 1: Detailed Report - Engineering Services Group's Monthly Activities for April 2024

Date of Report: 5/13/2024

Engineering Services Key Activities Report

April 2024

Engineering Services manages and executes projects within the Capital Investment Plan (CIP) to maintain infrastructure resiliency, ensure regulatory compliance, enhance sustainability, and provide flexibility in system operations to address uncertain water supply conditions.

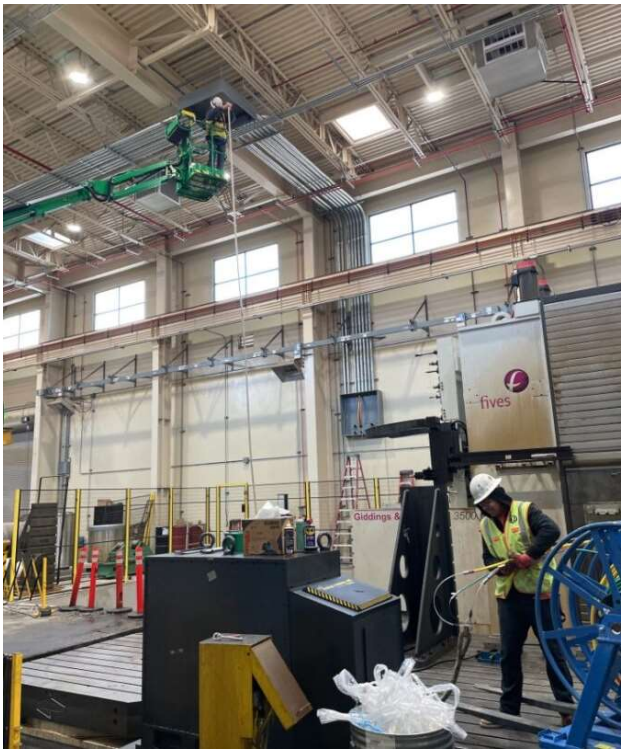
Recent activities on CIP programs and other key engineering functions are described below.

Protect public health, the regional economy and Metropolitan's assets

Distribution System Reliability Program

This capital program maintains reliable water deliveries through specific rehabilitation and upgrade projects on Metropolitan's pipelines, reservoirs, and control structures. Recent activities include the following:

- La Verne Shops Building Completion Stage 4—This project will complete the La Verne Shops building improvements and install Metropolitan-furnished shop equipment. The contractor continued installing electrical conduits for branch circuits and accessways for the new electrical ductbank; began installing reinforcing steel for the new blast booth and foundation concrete formwork for the blast booth pit walls; and is installing new underground natural gas lines. Construction is approximately 78 percent complete and is scheduled to be complete in August 2024.
- Garvey Reservoir Rehabilitation—This project will replace the aging reservoir floating cover and liner, structurally strengthen the inlet/outlet tower, upgrade the on-site water quality laboratory building, rehabilitate the junction structure, and replace the existing standby generator and a portion of the security perimeter fence. The draft Environmental Impact Report (EIR), including the environmental documentation for this rehabilitation effort, is scheduled to be released in July 2024, followed by a presentation to the Monterey Park City Council on this same subject. Final design is approximately 25 percent complete and is scheduled to be complete in April 2025.
- Lake Mathews Pressure Control Structure (PCS) and Electrical System Upgrades—This project will replace the aging Lake Mathews discharge facility and electrical system. The project includes construction of a new PCS with a bypass pipeline alongside the existing forebay and upgrade the electrical system to accommodate future power needs. This project will utilize a progressive design-build (PDB) project delivery method. It is anticipated that an RFQ for Phase 1 will be advertised at the end of 2024 and a Design-Builder selected in early 2025.



La Verne Shops – Installation of Electrical Conduits

- Lake Mathews Wastewater System Improvements—This project consists of replacing the existing septic tank system at Lake Mathews with a new wastewater collection system. The new wastewater system connects to a nearby off-site Western Municipal Water District main wastewater line. The contractor has completed all work and a notice of completion was issued in April 2024.
- Rialto Pipeline Rehabilitation—This project replaces a 35-foot long, 121.5-inch diameter section of welded steel pipe on the Rialto Pipeline in the city of Upland, where the mortar lining has failed. This project also replaces the deteriorating pipe spool and isolation valve at the CB-11 service connection. Final design is complete and board award of a construction contract is scheduled for August 2024.
- Foothill Hydroelectric Plant and Control Building Seismic Upgrade—This project rehabilitates and strengthens the Foothill Hydroelectric Plant and Control Building to withstand a major earthquake and retain its functionality as an essential facility. The contractor has completed the seismic strengthening of the roof and is now excavating to perform work on the foundation. Construction is 40 percent complete and is scheduled to be complete by December 2024.
- San Diego Canal Relining—This project replaced damaged concrete lining at three locations along the San Diego Canal. The contractor has completed all work, and a notice of completion was issued in April 2024.
- Sepulveda Electrical Improvements—This project replaces deteriorated electrical components, makes other upgrades at three Sepulveda Feeder underground structures, and installs two blind flanges after removing a spool on the West Valley Feeder No. 1. The contractor completed installation of the power pedestal, lighting, and receptacles in all vaults, and began cutover of electrical devices to the new power pedestal. Construction is 85 percent complete and scheduled to be complete in May 2024.

Prestressed Concrete Cylinder Pipe (PCCP) Reliability Program

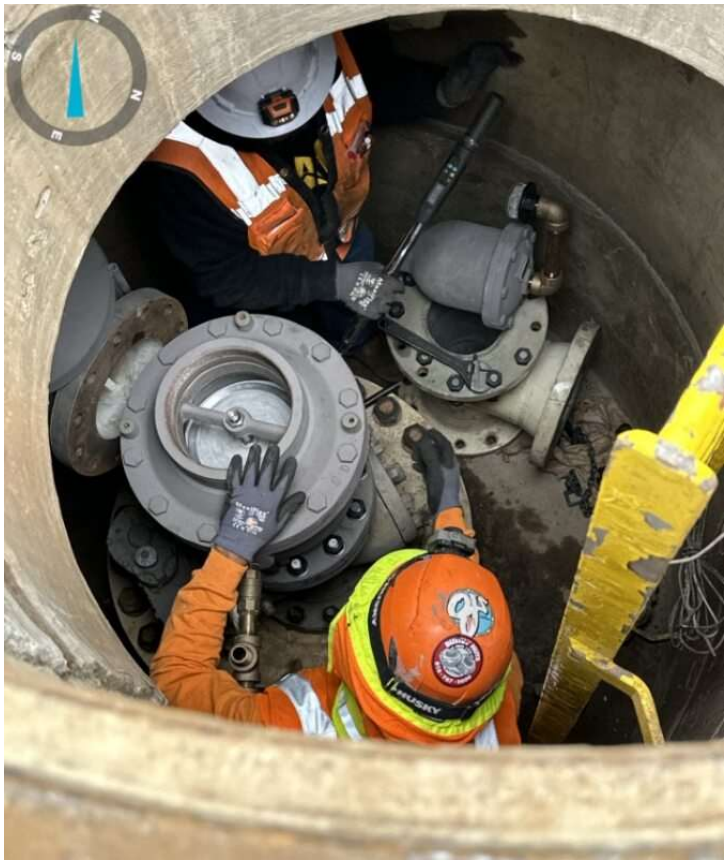
This capital program was established to enhance the reliability of Metropolitan's water distribution system and to reduce the risk of costly emergency repairs of PCCP. The priority pipelines included in the program are the Second Lower Feeder, Sepulveda Feeder, Calabasas Feeder, Rialto Pipeline, and the Allen-McColloch Pipeline. A total of 100 miles of PCCP pipelines will be refurbished under this multi-year program. Recent activities include the following:

- Second Lower Feeder Valves—This procurement contract provides 13 conical plug valves for the Second Lower Feeder PCCP rehabilitation. Metropolitan's Board awarded a procurement contract for the valves in December 2018. Ten valves have been delivered as of January 2024. The eleventh and twelfth valves are scheduled to be shipped in the Fall of 2024. Fabrication of the final valve will be completed in late 2024, and delivery is projected for early 2025.
- Second Lower Feeder PCCP Rehabilitation Reach 3B—This project installs steel lining and three conical plug valves (described above) along a 3.7-mile-long portion of the Second Lower Feeder that traverses the cities of Lomita, Los Angeles, and Torrance. The first shutdown was successfully completed in April. The Second Lower Feeder is back in service, and the temporary bypass at the Palos Verdes Reservoir will remain inactive until the second shutdown. During the first shutdown, 62 percent of the reach was relined, all service connection valves were replaced, and ten access structures were rehabilitated. A second shutdown is planned for winter 2024/25 which will allow for the installation of the three valves and complete the lining of the pipeline reach. Overall construction effort on the project is 49 percent complete and is scheduled to be complete in September 2025.
- Sepulveda Feeder Urgent Carbon Fiber—This project rehabilitates three distressed Sepulveda Feeder PCCP segments in the Van Nuys, Sherman Oaks, and Brentwood neighborhoods of the City of Los Angeles using carbon fiber-reinforced polymer lining. In April 2024, the contractor completed carbon fiber installation and the pipeline was disinfected. All construction will be completed in May 2024.
- Allen-McColloch Pipeline Urgent PCCP Rehabilitation—This project will perform urgent relining of distressed PCCP segments of the Allen-McColloch Pipeline (AMP) discovered during a recent inspection. Relining of the AMP will be performed in stages to minimize impacts to member agencies. The first stage focused efforts on the northern portion and was successfully completed in April 2024. The second stage, to be performed from May to December 2024, will address the southern portion of the pipeline. Final design for Stage 2 is complete and a board action to award a construction contract is planned for May 2024.

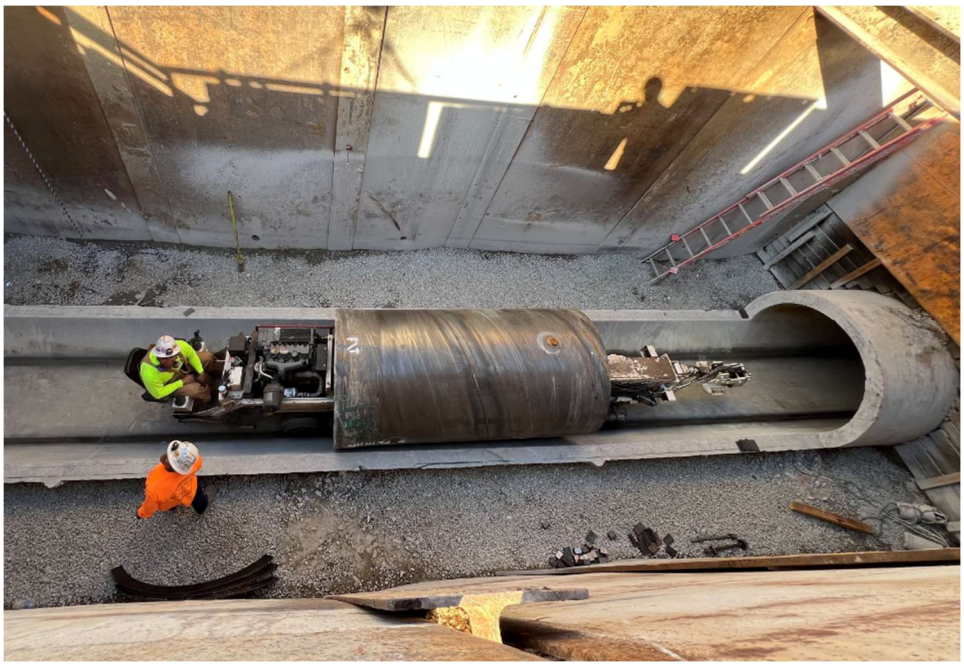
Colorado River Aqueduct (CRA) Reliability Program

This capital program maintains the reliability of Metropolitan's CRA conveyance system. Recent activities include the following:

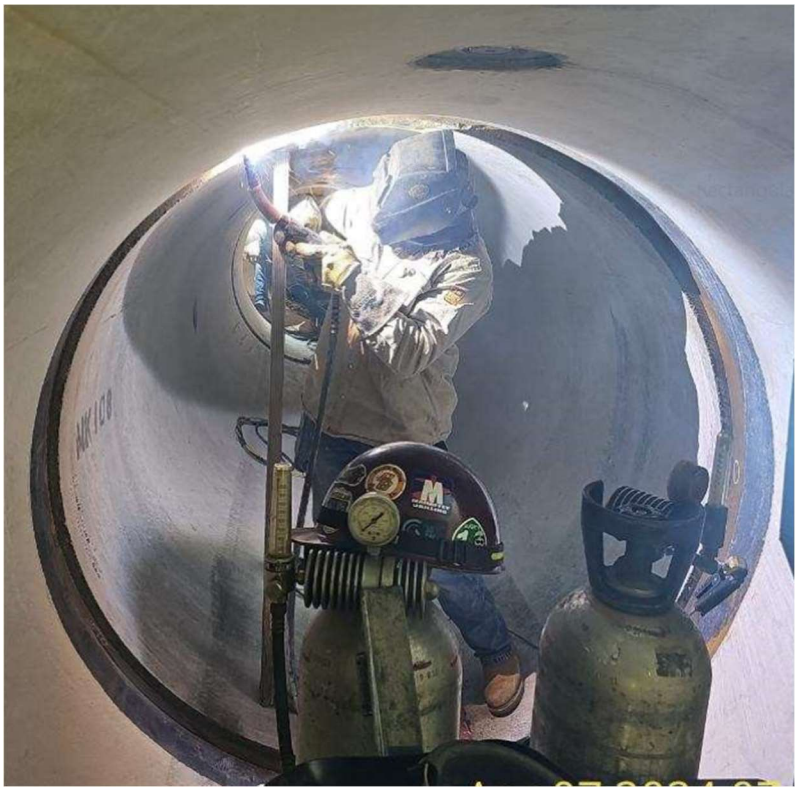
- Flow Level Monitoring Stations—This project will install 12 flow monitoring stations at remote locations along the Colorado River Aqueduct. The contractor has completed the modifications of the existing access structures and has placed the concrete for the building foundation at Mile Marker 54.25. Construction is 26 percent complete and is scheduled to be complete in July 2024.



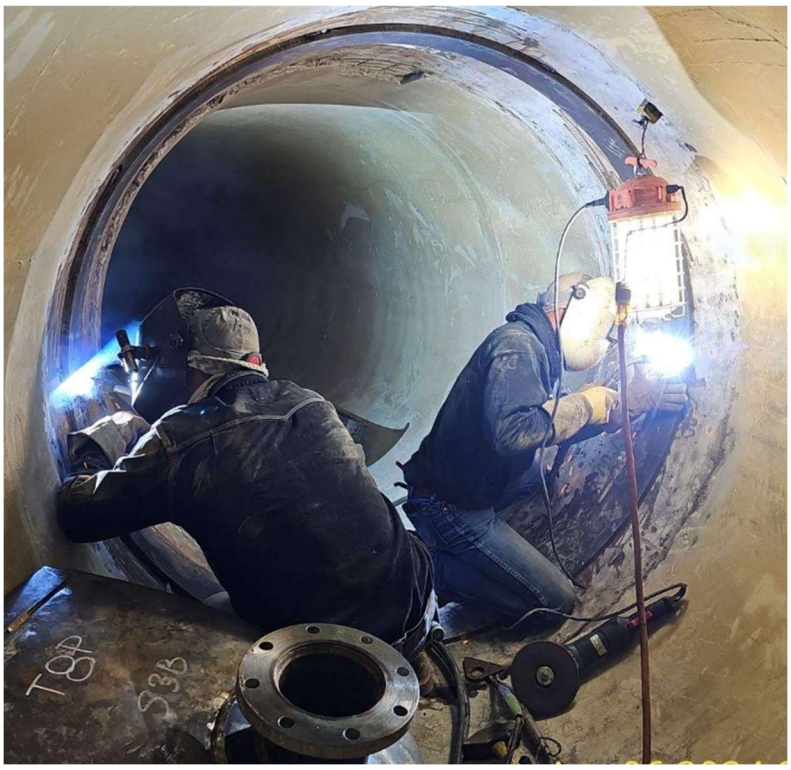
Second Lower Feeder Reach 3B—Valve Installation



Allen-McColloch Pipeline Urgent PCCP Rehabilitation—Installation of Liner Pipe



Allen-McColloch Pipeline Urgent PCCP Rehabilitation—
Welding of Joints on New Liner Pipe



Allen-McColloch Pipeline Urgent PCCP Rehabilitation—Welding of Steel Band for Bulkhead

- Cabazon Radial Gate Replacement—This project will replace an inline and wasteway radial gate at the facility as well as install security, electrical, and safety upgrades. Final design is 65 percent complete and is scheduled to be complete in July 2024.
- Domestic Water Treatment System Upgrades—This project upgrades the domestic water treatment systems at all five CRA pumping plants, including the replacement of the water treatment units. Fabrication of the temporary treatment skids was completed, and the contractor will begin temporary treatment connections in May 2024. Construction is 39 percent complete and anticipated to be completed in early 2026.
- Erosion Control Improvements—This project will install erosion control features at 23 conduit locations along the CRA, which are vulnerable to erosion during storm events. Preliminary design has been completed. A request for authorization of a new agreement for final design is planned for the May 2024 board meeting.
- CRA Main Transformer Replacement—This project replaces the 35 230 kV and 69 kV step-down transformers that are used to run the main pumps at all five of Metropolitan's Colorado River Aqueduct pumping plants. Preliminary design was completed in June 2023. The transformer procurement is currently advertising as a best-value procurement, and staff is responding to questions from prospective bidders. Award of the procurement contract and authorization of a consulting agreement for final design is scheduled for the August 2024 board meeting.

Treatment Plant Reliability Program

This capital program was initiated to maintain reliability and improve the operating efficiency of Metropolitan's water treatment plants through specific improvement projects. Recent activities include the following:

- Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation—This project rehabilitates major mechanical and structural components of Basins 5–8 and Filter Building No. 2 at the Weymouth plant, including the flocculation/sedimentation equipment, sludge pumps, baffle boards and walls, launders, inlet gates, and outlet drop gates. Rehabilitation work also includes seismic upgrades of basin walls and inlet channel, hazardous material abatement, and replacement of filter valves and actuators in Filter Building No. 2. The contractor completed all rehabilitation work and startup testing in Basins 7 and 8, continued rehabilitation of Filter Building No. 2, and began construction activities in Basins 5 and 6. Construction for this contract is 65 percent complete and is scheduled to be complete in June 2025.
- Weymouth Administration Building Upgrades—This project upgrades the Weymouth Administration Building to withstand a significant earthquake. The planned upgrades include structural strengthening consistent with current seismic standards for essential facilities as well as accessibility and fire/life safety improvements, architectural modifications near the areas of structural upgrades, and improvements associated with the preservation of historic architectural features. Final design is approximately 40 percent complete and is scheduled to be complete in March 2025.

Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation—
Filling Basin with Water for Initial Operational Testing

Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation—Installing Joint Sealant at Basin 7

- Mills Electrical Upgrades—This project upgrades the electrical system with dual-power feeds to key process equipment to comply with current codes and industry practice, improve plant reliability, and enhance worker safety. Stage 1 construction is complete. Stage 2 improvements will add a second incoming 12 kV service from Riverside Public Utilities, reconfigure the existing 4160-volt switchgear, and replace the standby generator switchgear and the emergency generator programmable logic controller. The contractor completed installation of the electrical conduits at the standby generator building and continued installation of the electrical conduits and cable trays inside the ORP Switchgear Building. Construction is approximately 50 percent complete and is scheduled to be complete in August 2025.
- Jensen Ozone PSUs Replacement—This project rehabilitates the ozone generation system at the Jensen plant by replacing four existing ozone power supply units (PSUs) and four sets of generator dielectrics. The project also makes required modifications to the associated electrical, control, and cooling water systems. Metropolitan's Board awarded a construction contract in June 2022. All PSUs and dielectrics have been manufactured and delivered. Replacement of the PSUs has been staged to ensure continuous use of ozone during construction. The contractor completed installation and startup testing of two PSUs, began installation of the two remaining PSUs, and continued replacing the ozone generator dielectrics. Construction is 85 percent complete and is scheduled to be complete in June 2024.
- Diemer Filter Rehabilitation—This project rehabilitates the Diemer plant's filters to improve their performance and enhance plant reliability. The planned rehabilitation includes replacing filter media, improving the existing surface wash system, modifying the distribution flumes, and replacing filter elements, such as underdrains and troughs. Final design is approximately 30 percent complete and is scheduled to be completed in December 2024.

System Reliability Program

The System Reliability Program consists of capital projects to improve or modify facilities located throughout Metropolitan's service area to use new processes and/or technologies and improve facility safety and overall reliability. Recent activities include the following:

- Headquarters Physical Security Upgrades—This project implements comprehensive security upgrades for the Metropolitan Headquarters Building. These upgrades are consistent with federally recommended best practices for government buildings. The work has been prioritized and staged to minimize rework and impacts on day-to-day operations within the building. Stage 1 work is complete and provides enhanced security related to perimeter windows and doors. Stage 2 work is complete and provides security system upgrades inside the building with a focus on the main entry rotunda area, boardroom, executive dining lounge, and security control room. Construction of Stage 3 improvements is underway and will provide security system upgrades around the perimeter of the building. The contractor continued installation of the ornamental fence within the courtyard and concrete placement for the fixed bollards. Construction is 65 percent complete and is scheduled to be complete in June 2024.
- SCADA System Upgrades—This project will upgrade Metropolitan's entire control system in incremental stages, spanning the Colorado River Aqueduct, the five water treatment plants, and the conveyance and distribution system. The first stage of this project replaces the control system at the Mills plant, starting with a pilot effort on one of the plant's remote terminal units to demonstrate the

proposed technology and the consultant's approach for the plant and the overall project. Staff continued evaluating the results of the recently installed pilot equipment. The pilot phase is approximately 99 percent complete and is scheduled to be complete in June 2024. The system upgrades at the Mills plant are scheduled to be complete in October 2026.

Protecting the Public and Metropolitan's Assets—Safety of Dams

Engineering Services continued to develop state-mandated Emergency Action Plans (EAPs) for Metropolitan's state-regulated dams to help ensure long-term public safety. This month, the EAPs for the Weymouth Finished Water Reservoir and the Goodhart Canyon Detention Basin were officially approved by Cal OES. All of Metropolitan's 13 state-required EAPs have now been fully approved by Cal OES.

The first of several planned comprehensive dam safety assessments was also initiated in April, which included a Potential Failure Modes Analysis (PFMA) workshop followed by a risk assessment workshop for the Lake Mathews dams, outlet towers, spillway, and forebay structures.

Value Engineering Program

La Verne Water Quality Laboratory Building Upgrade—Technical Assessment

This project includes laboratory functional upgrades in conjunction with seismic upgrades and an expansion of the existing building footprint from a single-story 60,000-square-foot building to a single-story 90,000-square-foot building. In April, Engineering Services completed a technical assessment for the La Verne Water Quality Laboratory Building Upgrade project. The technical assessment examined design alternatives to potentially reduce construction cost and duration. The assessment team included Metropolitan and consultant staff specializing in construction management and construction costs and scheduling. This project is in preliminary design and a formal value engineering workshop is planned for September.

Main Entrance to Water Quality Laboratory Building

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Adapt to changing climate and water resources

Pure Water Southern California Program

The Pure Water Southern California (PWSC) Program is a large regional recycled water project that will provide a new local source of safe and reliable drinking water for Southern California. PWSC currently focuses in four areas: demonstration testing, environmental planning, technical studies, and preliminary design of initial pipeline reaches. PWSC will produce 150 million gallons per day (mgd) of purified water from the Advanced Water Purification Facility (AWPF) in Carson, for indirect potable reuse (IPR) and direct potable reuse (DPR) applications, with the initial deliveries by 2030 and completion by 2035.

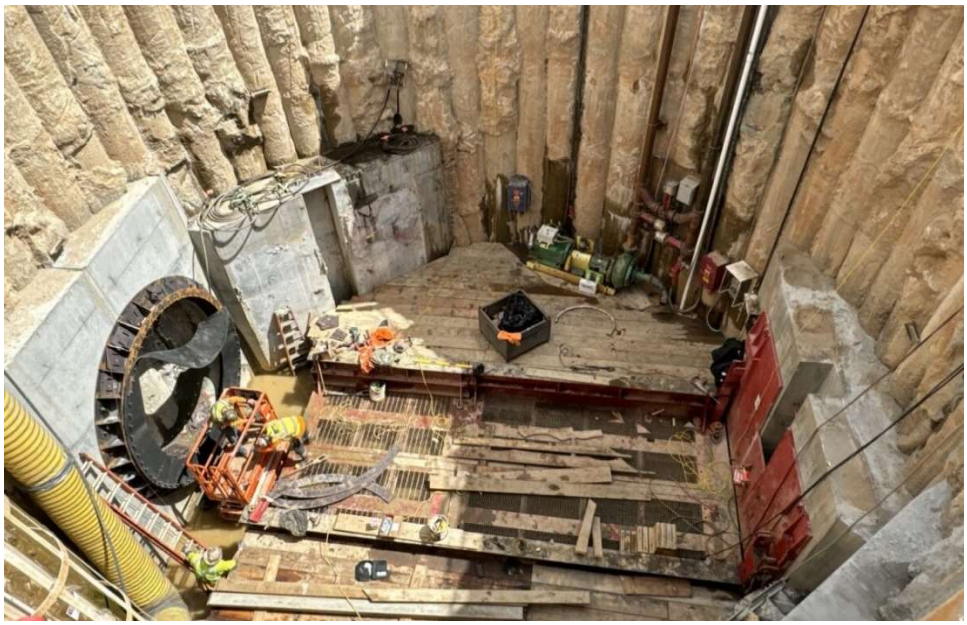
- Demonstration Testing: Demonstration testing began in 2019 with N-only tertiary membrane bioreactor (tMBR) testing completed in 2021 and secondary MBR (sMBR) testing completed in 2023. Modifications for tMBR optimization testing have been completed. The system is online and currently operating in the nitrification/denitrification mode.
- Environmental Planning: The Environmental Planning Phase began in 2020 with the goal of preparing an Environmental Impact Report (EIR) for approval in 2025. Various technical studies have been prepared to support the effort. The draft EIR is currently scheduled for publication in early-2025, with board certification of the document in the third quarter of 2025. Staff continues to finalize the project description, perform additional technical studies, incorporate changes to the program due to inclusion of the LADWP Operation NEXT pipe upsizing, and development of the draft EIR. The Board authorized an amendment to the existing agreement with Helix Environmental Planning Inc. in March 2024 to address the program changes and allow additional planning studies for NEPA documents required by federal funding.
- Program Management: PWSC program management efforts lead the planning for the Program, including project controls, scheduling, budget development, risk management, coordination with Program partners and stakeholders, grants and funding, and preparation of various plans and studies.
    - A PWSC cost estimate update was presented to the PWSC/Regional Conveyance Subcommittee in November 2023. A cost estimate methodology technical memorandum was prepared to document the cost details developed for the AWPF and conveyance systems and provided to the Subcommittee in January 2024.
    - A draft construction sequencing memorandum has been prepared to identify the milestones and construction contracts needed to meet the projected completion of the AWPF, the backbone pipeline, and full delivery for IPR in 2032. The memorandum will be finalized by April 2024.
    - A Large-Scale Water Recycling grant application requesting $125 million was submitted to the US Bureau of Reclamation (USBR) in November 2023. Successful applicants will be notified in the second quarter of 2024. To receive funding, Metropolitan prepared and submitted a feasibility study in January 2024 to meet the USBR requirements.

- Advanced Water Purification Facility: The AWPF will purify wastewater from LACSD's A.K Warren facility (formerly the JWPCP) using membrane bioreactors (MBRs), reverse osmosis (RO), and ultraviolet/advanced oxidation (UV/AOP).
    - A draft conceptual facilities plan has been prepared to document key assumptions of AWPF components.
    - The program team is evaluating the use of progressive design build to design and construct the advanced treatment plant facilities.
    - A proposed Request for Qualifications (RFQ) from qualified firms to design and construct the AWPF is currently in development and is scheduled for advertisement in the third or fourth quarter of 2024. Authorization of this procurement is planned for early-2025.
    - The Method of Services (MOS) study agreements with Southern California Edison (SCE) have been finalized so that SCE can evaluate electrical infrastructure needed to meet AWPF power requirements.
    - The program team reached out to agencies to collect information on their operational practices and lessons learned for product water stabilization.
- Direct Potable Reuse (DPR): The California Division of Drinking Water (DDW) published the final DPR regulations in December 2023. Metropolitan has completed bench-scale testing to screen the potential DPR treatment processes that could be used for the program. Planning of pilot-scale testing is in progress. A technical workshop was held with the Independent Scientific Advisory Panel (ISAP) in March 2024, to discuss bench-scale testing data and proposed DPR treatment train. A DPR white paper is currently being developed to establish Metropolitan's DPR implementation approach via the PWSC Program.
- Conveyance Pipeline System: The program's backbone conveyance system consists of over 40 miles of pipeline and two pump stations. Metropolitan's Board authorized consulting agreements for preliminary design of the first two pipeline reaches in March 2023. Metropolitan surveyors used a new high-definition mobile LiDAR system, which is mounted to the back of a truck, to survey all 14 miles of the proposed alignment for Reaches 1 and 2 in one day. This device captures over 500,000 survey measurements per second. The data is being processed and will assist with project planning and preliminary design.
    - Reach 1—This reach is approximately six miles long and runs through the city of Carson. Current work includes utility field investigation and geotechnical work. Preliminary design is 55 percent complete and is scheduled to be complete by late-2024.
    - Reach 2—This reach is approximately eight miles long and runs through the cities of Long Beach and Lakewood. Current work includes ground penetrating radar and obtaining permits for geotechnical work. Preliminary design is 20 percent complete and is scheduled to be complete by late-2024.

System Flexibility | Supply Reliability Program

Projects under this capital program will enhance the flexibility and/or increase the capacity of Metropolitan's water supply and delivery infrastructure to meet current and projected service demands. Projects under this program address climate change affecting water supply, regional drought, and alternative water sources for areas dependent on State Project Water.

- Perris Valley Pipeline—This project will complete construction of the Perris Valley Pipeline and provide service connections to Eastern and Western Municipal Water Districts. This project installs 3,000 linear feet of tunnel that crosses the Interstate 215 freeway. The contractor has completed construction of all the shafts and completed construction of the first tunnel segment. Excavation of the second tunnel reach commenced on the eastern side of Interstate 215 in mid-April 2024. Overall construction is 45 percent complete and is scheduled to be complete in early 2025.
- 84-Inch Diameter Valve Procurement for Drought Projects—This project will furnish three 84-inch diameter butterfly valves for use in the Wadsworth Pumping Plant Bypass, Inland Feeder–Rialto Pipeline Intertie, and the Badlands Tunnel Surge Protection. The valves have been fabricated and tested. They are currently being prepared for shipment. The work is approximately 75 percent complete. These projects will allow the delivery of Diamond Valley Lake (DVL) water to the Rialto Pipeline.
- Sepulveda Feeder Pumping Stations, Stage 1—This project installs new pump stations at the existing Venice and Sepulveda Canyon pressure control facilities, providing the ability to reverse flow in the Sepulveda Feeder and deliver 30 cubic feet per second from the Central Pool to portions of the Jensen plant exclusive area. This project utilizes a progressive design-build (PDB) project delivery method. Engineering and Operations staff are reviewing initial submittals and collaborating through a series of design workshops, planned through the end of the year, to support upcoming design work. The contractor and Metropolitan are coordinating with both Southern California Edison and the Los Angeles Department of Water and Power on upgrades to the incoming power service at both locations. Phase 1, which includes site investigation, design to the 70 percent level, environmental planning, and preparation of long-lead-item procurement documents, is scheduled to be complete in September 2024. Work progress is on track to complete the first major milestone, delivery of the Basis of Design Report (BODR), in May 2024. The project team presented at the national Design Build Institute of America (DBIA) 2024 Water/Wastewater Conference on Metropolitan's initial PDB project.
- Wadsworth Pumping Plant Bypass—This project installs a bypass pipeline and an isolation valve to interconnect the Wadsworth Pumping Plant with the Eastside Pipeline. This is one of several projects needed to deliver water from DVL to the Rialto Pipeline. A shutdown to tie the new bypass pipeline into the Wadsworth outlet line and install a new tee was conducted in April 2024. Construction is approximately 72 percent complete and is scheduled to be complete in July 2024.



Perris Valley Pipeline—
Installation of tunneling equipment for the second tunnel segment drive

Sepulveda Pump Stations Design Build Team presents to 2024 DBIA Water/Wastewater Conference
(Left to right: Stephanie Fong, David Pier (Carollo Engineers), Jeannie Chu, and Doug Hathaway)

Wadsworth Pumping Plant Bypass—emoving Section of Pumphouse Conduit

Wadsworth Pumping Plant Bypass—Welding Buttstrap for the Tee Section

Wadsworth Pumping Plant Bypass—
Constructing Forms For Encasement at the Tee Section