



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Board Report

Engineering Services Group

• Engineering Services Monthly Activities for January 2024

Summary

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

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

Purpose

Informational

Attachments

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

Engineering Services

Key Activities Report for January 2024

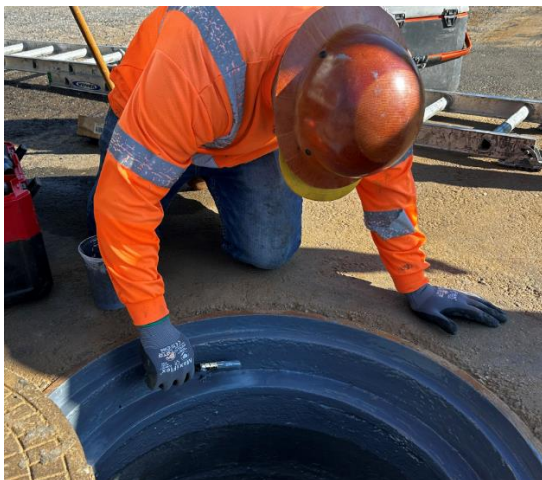
Core Business Function – Execute Capital Investment Plan projects

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.

Distribution System Reliability Program

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

- **Lake Mathews Wastewater Replacement** – This project consists of replacing the existing septic tank system with a wastewater collection system at Lake Mathews. The new wastewater system connects to a nearby off-site Western Municipal Water District main wastewater line. The contractor is continuing to coat the accessway, inspect the sewer line, and restore the surface asphalt. Construction is approximately 97 percent complete and is scheduled to be complete in April 2024.
- **San Diego Canal Concrete Lining Rehabilitation** – This project will replace damaged concrete lining at three locations along the San Diego Canal. The contractor is currently transmitting submittals for review. Construction is approximately 10 percent complete and is scheduled to be completed 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 failed pipe spool and isolation valve at the CB-11 service connection. Final design is complete and board award of a construction contract is planned for May 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. Final design is approximately 15 percent complete and is scheduled to be complete in April 2025. A notice of preparation was issued in January 2024 for the environmental documentation for this rehabilitation effort.

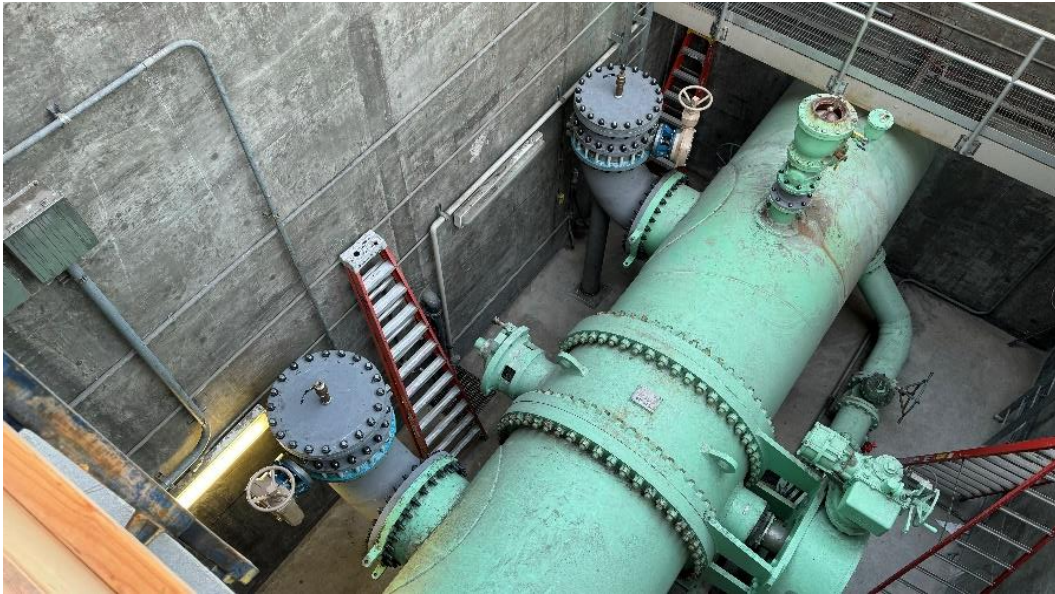


Lake Mathews Wastewater Replacement – Testing manhole ring coating

Prestressed Concrete Cylinder Pipe (PCCP) Reliability Program

This 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, Calabazas Feeder, Rialto Pipeline, and the Allen-McColloch Pipeline. A total of 100 miles of PCCP pipelines will be refurbished under this 20-year program. Recent activities include the following:

- **Sepulveda Feeder Reach 2** – This project installs steel lining along 3.9 miles through several cities including the cities of Torrance and Los Angeles. Final design is approximately 97 percent complete and is scheduled to be complete by February 2024.
- **Allen-McColloch Pipeline Urgent Relining** – This project will perform urgent relining of distressed PCCP segments of the Allen-McColloch Pipeline (AMP). A recent inspection on the AMP discovered several segments under distress. Staff completed design of a 24" bypass valve at OC-88 which will allow the operating pressure in the AMP south of OC-88 to be reduced. The bypass spool and isolation valves were fabricated in December and January and installed during a shutdown of the AMP in January. The remaining work on the bypass will be completed in February.
Relining of the AMP will be performed in stages to minimize impacts to member agencies. The first stage will focus efforts on the northern portion and will be performed in April 2024. The second stage, performed from May to December 2024, will address the southern portion of the pipeline. A bulkhead will be utilized to provide flows to the northern portion of the line during an extended outage of the southern portion. A board action is scheduled for February 2024 to authorize change orders to three existing contracts to expedite the work.
- **Sepulveda Feeder Urgent Carbon Fiber Relining** – This project rehabilitates three deteriorated 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. The contractor is currently preparing submittals for Metropolitan staff review. The shutdown and pipeline construction work activities have been moved from the November/December timeframe to the March/April timeframe to accommodate the longer than expected timeline to acquire traffic control permits and other city approvals. Construction is 10 percent complete, representing the work on the submittals, and is scheduled to be completed in May 2024.
- **Foothill Feeder Acoustic Fiber Optic System** – This project will install an acoustic fiber optic monitoring system within the Foothill Feeder to allow continuous monitoring of the PCCP portions without the need for expensive prolonged shutdowns. Design has been completed, and a board action is scheduled for February 2024 to award an agreement to a specialty consultant to furnish the monitoring system.



Allen-McColloch Pipeline Urgent Relining – Left: New OC-88 bypass line isolation valves and fittings (in grey) ready to receive larger, 24-inch pressure reducing valve, which will help reduce pipe operating pressures.

Colorado River Aqueduct (CRA) Reliability Program

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

- **Conduit Structural Protection** – This project consists of installing new reinforced concrete slab protection crossings over portions of the cut-and-cover conduits on the Colorado River Aqueduct. Metropolitan’s Board awarded a construction contract in April 2024. The contractor is currently performing grading and installation of form work for concrete pads at multiple sites. Construction is 36 percent complete and is scheduled to be completed in January 2025.
- **Freda Siphon Seals** – This project consists of installing internal seals at over 80 locations along the Freda Siphon to address existing cracks and leaks. Metropolitan’s Board awarded a construction contract in September 2023. The Notice to Proceed was sent to the Contractor in October 2023. The contractor is preparing submittals for review. Construction is scheduled to be complete in May 2024.
- **Domestic Water Treatment System Upgrades** – This project upgrades the domestic water treatment systems at all five CRA pumping plants, including replacement of the water treatment units. Metropolitan’s Board awarded a construction contract in December 2021. The contractor is excavating utilities at Gene and Iron as well as fabricating the temporary treatment skids. Construction is 35 percent complete and anticipated to be completed in 2026.
- **Main Transformer Replacement** – This project replaces the thirty-five 230 kV and 69 kV step-down transformers that are used to run the main pumps at the five Colorado River Aqueduct pumping plants. Preliminary design was completed in June 2023. The transformer procurement will be advertised as a best value procurement in early 2024. Award of a consulting agreement for final design is scheduled for the June 2024 board meeting.
- **Gene Communication System Upgrade** – This project will construct a new fiber optic cable line from Parker Dam to Gene Pumping Plant. The new line is predominantly located within Metropolitan fee property on new power poles with a small underground portion of the alignment within the Bureau of Reclamation’s property. Metropolitan’s Board awarded a construction contract in November 2023. The Notice to Proceed

was issue in December 2023. Construction is approximately five percent complete and is scheduled to be complete in September 2024.



Domestic Water Treatment System Upgrades – Installing above ground conduit systems at Iron Mountain

System Flexibility/Supply Reliability

Projects under this 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.

- **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 Diamond Valley Lake (DVL) to the Rialto Pipeline. Metropolitan’s Board awarded a construction contract in January 2023. Construction of the valve structure and relocation of utilities in the area is underway. Construction is approximately 70 percent complete and is scheduled to be complete in August 2024.
- **Badlands Tunnel Surge Protection** – This project installs a new open-to-atmosphere surge tank at the south portal of the tunnel, which will protect the Inland Feeder from hydraulic transients when pumping water from DVL to the Rialto Pipeline through the Inland Feeder. Metropolitan’s Board awarded a construction contract in November 2023. Construction is approximately five percent complete and is scheduled to be complete in March 2025.
- **Inland Feeder-Rialto Pipeline Intertie** – This project installs an interconnection pipeline and isolation valve structure between the Inland Feeder and Rialto Pipeline, so that water can be delivered from DVL to the Rialto Pipeline. Metropolitan’s Board awarded a construction contract in September 2023. The contractor

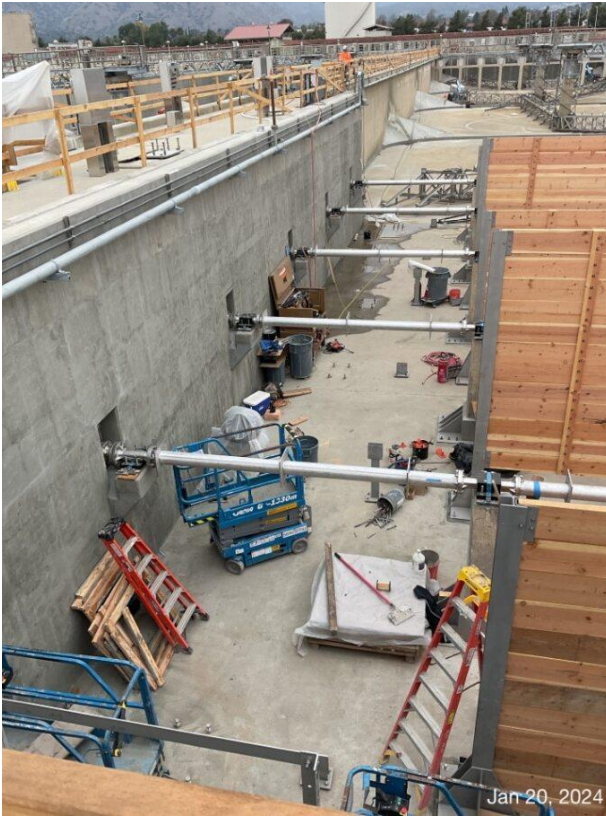
is currently transmitting submittals for Metropolitan's staff review. Construction is approximately 5 percent complete and is scheduled to be complete in March 2025.

- **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 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 30 percent design package and the Basis of Design Report (BODR), in April 2024.

Treatment Plant Reliability Program

This 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 construction of new clarifier and flocculator equipment in Basins 7 and 8, continued installation of baffle walls, handrails, piping and electrical conduits, and began startup testing of filter valves, piping, and electrical components in Filter Building No. 2. Construction is 60 percent complete and is scheduled to be complete in June 2025.
- **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, and a construction contract for Stage 2 improvements was awarded in November 2021. 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 roofing and HVAC systems and continued installation of the electrical conduits inside the ORP Switchgear Building. Construction is approximately 45 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. Installation of two PSUs is complete and dielectrics for two ozone generators have been replaced. The cooling water system piping has been completed and hydrotested. The contractor is preparing for start-up testing of the newly installed PSUs. Construction is 75 percent complete and is scheduled to be complete in April 2024.



Weymouth Basin 8 – Flocculator Shaft Installation

System Reliability Program

The System Reliability Program consists of projects to improve or modify facilities located throughout Metropolitan’s service area to utilize 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 Metropolitan’s Union Station Headquarters. These upgrades are consistent with federally recommended best practices for government buildings. This 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. Stage 3 improvements will provide security system upgrades around the perimeter of the building. Metropolitan’s Board awarded the third and final contract in December 2022. The contractor began fabrication of the ornamental fence within the courtyard and began concrete placement for the fixed bollards. Construction is 55 percent complete and is scheduled to be complete in May 2024.
- **Headquarters Building Fire Alarm and Smoke Control System Upgrades** – This project upgrades Metropolitan’s Union Station Headquarters fire life safety systems, which includes replacement of the fire detection and alarm system and HVAC system improvements for smoke control. The fire alarm and smoke control systems in Metropolitan’s Headquarters Building provide detection, notification, and control of building functions so that occupants and visitors can safely exit in the event of a fire. The contractor continued final testing and sign-off of the fire alarm and smoke control systems by the LAFD and Los

Angeles Department of Building and Safety. Construction is 95 percent complete and is scheduled to be complete in February 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. The consultant has installed the pilot equipment, and is now performing equipment verification, and developing control narratives and a training plan. The pilot phase is approximately 95 percent complete and is scheduled to be complete in April 2024. The system upgrades at the Mills plant are scheduled to be complete in October 2026.
- **Foothill Hydroelectric Plant and Control Building Seismic Upgrade** - This project strengthens the Foothill Hydroelectric Plant and Control Building to withstand a significant earthquake, by removing and replacing the roofing system; adding encasements to enlarge and strengthen concrete columns; and reinforcing shallow foundations. The contractor continued performing abatement activities on the building's roof, demolition of existing exhaust fans, and installation of structural steel roof plates. Construction is approximately 30 percent complete and is scheduled to be complete in December 2024.

Value Engineering Program

Cabazon Radial Gate Facility Improvements Constructability Review

In January, the Technical Control Team in Engineering Services Group conducted a constructability review workshop examining the final design drawings and specifications for the Cabazon Radial Gate Facility Improvements project. Metropolitan expects to advertise this project in the third quarter 2024. Once completed, this capital project will restore the original operational capability at this facility which was constructed in 1936 as part of the CRA. The purpose of the Cabazon facility is to provide a means to divert CRA flow to the San Geronio Wash under certain emergency conditions and protect the downstream San Jacinto Tunnel from over-pressurization. The scope of the project includes replacement of two 17-ft wide radial gates and making security and other operational improvements at the facility.

The constructability review focused on the planned work to ensure that the required activities could be safely accomplished during the scheduled shutdown of the CRA. The review team included Metropolitan staff from Engineering, Operations and other stakeholder groups, the consultant design staff, and subject matter experts with decades of experience in planning and accomplishing similar work.

The workshop recommendations will improve the bid documents and confirm that the necessary work will be completed in a safe and efficient manner within the available shutdown window.



Location of Cabazon Radial Gate Facility between Whitewater Tunnel and San Jacinto Tunnel



Digital design file of new Cabazon Wasteway Radial Gate and roof structure.

Foothill Feeder HEP Control System Upgrade Constructability Review

Also in January, TCT conducted a constructability review for the Foothill Feeder HEP Control System Upgrade project. The Foothill Pressure Control Structure was constructed to receive untreated State Water Project supplies from Castaic Lake and discharge those supplies into the Foothill Feeder for conveyance to the Jensen Water Treatment Plant. In 1981, Metropolitan expanded the facility to add two hydroelectric turbines and associated control equipment to enable power generation. Although the facility is operating and is regularly maintained, the equipment used to monitor and control the turbine operations has been in place more than 40 years and is nearing the end of its useful life. In recent years more frequent repairs have been required and replacement parts have become difficult to obtain. The project, currently in final design, will replace the existing control system which utilizes mechanical-

based relays with a more industry standard PLC-based control system, and implement other needed electrical and mechanical equipment upgrades.

This constructability review examined the current design package and focused on construction activity sequencing and planning to ensure that construction activities can safely be performed while maintaining operation of the pressure control functions at the facility. The team also reviewed construction cost estimates and long lead-time procurement alternatives for Metropolitan to consider, as well as specific project risks and mitigation steps.

The team included a broad interdisciplinary group of Metropolitan Engineering, WSO and support staff, consultant design staff, and subject matter experts experienced in hydroelectric plant upgrades and control system integration work. The resulting workshop recommendations will inform the remaining design process and ensure the successful upgrade and continued operation of this electrical power generation system.



Foothill Pressure Control Structure



Foothill hydroelectric turbine Unit No. 1



Foothill hydroelectric power plant control panel

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 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. Maintenance and modifications for tMBR optimization testing have been completed. The system is online and currently operating in the nitrification/denitrification mode. Roof replacement of three on-site trailers supporting demonstration plant operations and public outreach efforts has also been completed.
- **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 develop text for the draft EIR.
- **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 March 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 early 2024. To receive funding, Metropolitan prepared and submitted a feasibility study on 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 ultra violet/advanced oxidation (UV/AOP).
 - A draft conceptual facilities plan has been prepared to document key assumptions of AWPF components.
 - The AWPF team is evaluating the use of progressive design build to design and construct the treatment plant facilities.
 - A proposed Request for Qualifications (RFQ) from qualified firms to design and construct the AWPF is scheduled for April 2024. Authorization of this procurement is planned for late 2024.
- **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.

- **Conveyance Pipeline System:** The program's backbone conveyance system consists of over 40 miles of pipeline and pump stations. Metropolitan's Board authorized consulting agreements for preliminary design in March 2023.
 - **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 35 percent complete and is scheduled to be complete by mid-2024.
 - **Reach 2** – This reach is approximately 8 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 10 percent complete and is scheduled to be complete by late-2024.

Protecting the Public and Metropolitan's Assets

Engineering Services continued to develop state-mandated Emergency Action Plans (EAPs) for Metropolitan's state-regulated dams to help ensure long-term public safety. In January the EAPs for Garvey Reservoir and Palos Verdes Reservoir were approved by the Cal OES. The EAPs for Live Oak Reservoir and the Weymouth Finished Water Reservoir were submitted to the Cal OES and are currently under review. To date, ten of Metropolitan's 13 state required EAPs have been fully approved by Cal OES.