THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Report

Engineering Services Group

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

Summary

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

- Colorado River Aqueduct (CRA) Program
- Dams & Reservoirs Program
- Distribution System Program
- Additional Facilities and Systems Program
- Prestressed Concrete Cylinder Pipe (PCCP) Program
- Water Treatment Plants Program
- Pure Water Southern California
- Drought Mitigation – State Water Project Dependent Areas
- Value Engineering Program
- Workforce Development
- ESG Brown Bag Technical Series
- Community Outreach
- MetWorks Event

Purpose

Informational

Attachments

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

Date of Report: November 18, 2024

Engineering Services Key Activities Report for October 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. In addition, Engineering Services provides technical services to enhance reliable system operation and real property planning, valuation, acquisition, and disposition services to protect Metropolitan's assets. Engineering Services empowers our staff and partners with our business partners and the communities we serve to accomplish Metropolitan's mission.

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

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

Colorado River Aqueduct (CRA) Program

The CRA program is composed of CIP projects to replace or refurbish facilities and components of the CRA system to reliably convey water from the Colorado River to Southern California.

- CRA Domestic Water—This project upgrades the domestic water treatment systems at all five CRA pumping plants, including the replacement of the water treatment units. The temporary treatment skid system installation at Intake Pumping Plant was installed and is undergoing water quality testing. The temporary skid will remain in operation until installation and testing of the new system is completed by the contractor. Construction is 42 percent complete and is anticipated to be complete in March 2026.
- CRA Storage Buildings—This project furnishes and installs pre-engineered steel metal storage buildings at Hinds, Eagle Mountain, and Iron Mountain pumping plants and constructs associated site improvements. The contractor is currently performing site work at Iron Mountain and Hinds pumping plants and has started erecting the building at Eagle Mountain Pumping Plant. Construction is 45 percent complete and is scheduled to be completed in April 2026.
- Black Metal Mountain Electrical—This project replaces the existing single-phase 2.4 kV power line delivering power to the Black Metal Mountain communication site with a more robust three-phase power line rated for 4.16 kV usage. The project will also enhance the main access road to the

communications sites. Final design is 5 percent complete and is scheduled to be completed in August 2024.

- Cabazon Radial Gate—This project will replace an inline and wasteway radial gate and install security, electrical, and safety upgrades. Final design is 90 percent complete and is scheduled to be completed in March 2025.

CRA Storage Buildings — Eagle Mountain Pumping Plant - installing framing

Dams & Reservoirs Program

The Dams & Reservoirs Program is composed of CIP projects to upgrade or refurbish Metropolitan's dams, reservoirs, and appurtenant facilities to reliably meet water storage needs and regulatory compliance.

- Garvey Reservoir Rehabilitation—This project will replace the aging reservoir floating cover and liner, structurally strengthen the 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. Certification of the final Environmental Impact Report (EIR) for this rehabilitation effort will be considered in a November board action. Final design is approximately 48 percent complete and is scheduled to be completed in September 2025.
- Lake Skinner Dam Drainage Improvements—This project will replace the concrete drainage system at the toe of the dam, which has exceeded its service life. Design is complete, and the board award of a construction contract is scheduled for December 2024.
- 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 the

construction of a new PCS with a bypass pipeline alongside the existing forebay and upgrading the electrical system to accommodate future power needs. This project uses a progressive design-build project delivery method. The Board authorized owner's advisor services in August 2024. Conceptual design is now underway. It is anticipated that an RFQ for Phase 1 to be advertised in Spring 2025, and selection of a Design-Builder will be made in Fall 2025. The project is anticipated to be complete by 2031.

Distribution System Program

The Distribution System Program is composed of CIP projects to replace, upgrade, or refurbish existing facilities within Metropolitan's distribution system, including pressure control structures, hydroelectric power plants, and pipelines, to reliably meet water demands.

- 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 all tunneling, is in the process of installing the final liner pipe, and is now preparing for an upcoming shutdown in November to tie into the existing line. Overall construction is 85 percent complete and is scheduled to be completed in early 2025.
- East Lake Skinner Bypass Slide Gates— This project replaces three corroded slide gates on the East Lake Skinner Bypass Channel, which is used during bypass flow conditions in Lake Skinner. A procurement contract was awarded for three slide gate assemblies with actuators in March 2024. Delivery of the gates is expected in late Spring 2025.
- 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 has completed installing the building's roof and continues placing concrete around the lower half of the existing concrete columns. Construction is approximately 75 percent complete and is scheduled to be completed in December 2024.
- Red Mountain Pressure Control Structure (PCS) Sleeve Valve—This project will replace a deteriorated sleeve valve at the Red Mountain PCS facility. The Board awarded the procurement contract in October 2024. The valve is expected to be delivered in the fourth quarter of 2025.
- San Diego Canal Liner—This project will replace damaged concrete lining at one location in the San Diego Canal. Final design is complete, and the Board awarded the construction contract in October 2024.

Perris Valley Pipeline—Preparation of Shaft 3 Accessway Encasement

Additional Facilities and Systems Program

The Additional Facilities and Systems Program is composed of CIP projects to refurbish, replace, upgrade, or provide new facilities and systems that support Metropolitan's business and district-wide operations.

- Headquarters Building Fire Alarm and Smoke Control System Upgrades—This project upgrades the Metropolitan Headquarters Building 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 Los Angeles Fire Department and Los Angeles Department of Building and Safety. Construction is 99 percent complete and will be deemed complete upon final certification by these agencies.
- La Verne Shop Improvements—This project improves the La Verne Shops building and installs Metropolitan-furnished shop equipment. The contractor continued installing electrical conduits for branch circuits, began installing reinforcing steel for the new blast booth foundation, continued installing maintenance holes for the new electrical ductbank, began installing concrete formwork for

the blast booth pit walls, and installing new underground natural gas lines. Construction is approximately 94 percent complete and is scheduled to be completed in March 2025.

- Colorado River Aqueduct Kitchens & Lodging—This project will replace the existing kitchens and lodges at Eagle and Iron Mountain pumping plants and construct a second lodge at the Gene Pumping Plant. An amendment to the existing consultant agreement for final design services of the Stage 1 improvements is scheduled for November 2024 for board approval.

La Verne Shop Improvements—New Plasma cutter and water table

Prestressed Concrete Cylinder Pipe (PCCP) Program

The PCCP Program is composed of CIP projects to refurbish or upgrade Metropolitan's PCCP feeders to maintain water deliveries without unplanned shutdowns.

- Second Lower Feeder Reach 3B—This project installs steel lining and three conical plug valves 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 completed in April of 2024, and the Second Lower Feeder was returned to service. A temporary bypass line serving two service connections at the Palos Verdes Reservoir will remain in service through April 2025. The contractor is currently performing non-shutdown-related work like street restoration, installation of maintenance hole assemblies, vent stack replacement, procurement of permits, etc. A second shutdown is planned for December 2024 to complete the relining and replace three 42-inch valves with three 48-inch valves. Continued installation of air-release/vacuum-valve (AR/VV) piping at several locations. Construction is 76 percent complete and is scheduled to be completed in September 2025.

- Allen-McColloch Pipeline (AMP) Urgent Relining—This project will perform urgent relining of approximately three miles of distressed PCCP segments of the Allen-McColloch Pipeline (AMP) that were discovered during an inspection in 2023. The urgent relining of the AMP is being performed in stages. Stage 1 includes carbon fiber reinforced polymer (CFRP) lining of four segments and steel relining of approximately 4,500 feet of pipeline. Stage 1 was completed in October 2024. Stage 2 work consists of 12,600 feet of steel liner installation and appurtenant work. Pipe installation at four sites is over 90 percent complete, portal development at three sites is in progress, and excavation at one site was started in October 2024. The Stage 2 work is approximately 57 percent complete and is expected to be completed in January 2025.
- Foothill Feeder Acoustic Fiber Optic (AFO) Installation—This project will install an acoustic fiber optic monitoring system within the 201-inch diameter Foothill Feeder to allow continuous monitoring of the 6.5 miles of PCCP portions, minimizing the need for expensive prolonged shutdowns. Final design is approximately 40 percent complete and is planned for completion by February 2025. Installation of the AFO system is scheduled during the Foothill Feeder Shutdown in January 2026.

Second Lower Feeder Reach 3B—AR/VV-Concrete Placement

Allen-McColloch Pipeline (AMP) Urgent Relining 2024—Welding of 60-inch Diameter Steel Liners

Water Treatment Plants Program

The Water Treatment Plants Program comprises CIP projects to replace or refurbish facilities and components at Metropolitan's five water treatment plants and the Chemical Unloading Facility to continue to reliably meet treated water demands.

- 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 in Basins 7 and 8 and continued construction activities, including structural wall modifications and equipment installation in Basins 5 and 6 and Filter Building No. 2. Construction is approximately 80 percent complete and is scheduled to be completed in July 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. The project

constructability review workshop was completed in July 2024. Final design is approximately 80 percent complete and is scheduled to be completed in June 2025.

- Mills Electrical Upgrades, Stage 2—This project upgrades the electrical system with dual-power feeds to key process equipment to comply with current codes and industry practices, 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 4.16 kV switchgear, and replace the standby generator switchgear and the emergency generator programmable logic controller. The contractor continued bench testing and began installation of the switchgear doors inside the Ozone Switchgear Building. Construction is approximately 70 percent complete and is scheduled to be completed in August 2025.
- Diemer Filter Rehabilitation—This project rehabilitates the 48 filters at the Diemer plant to enhance filter performance, minimize filter media loss, and rehabilitate or replace aging components. The project upgrades include replacing filter media, filter valve actuators, and instruments and modifying the filter upstream influent weir and surface wash laterals. The planned upgrades also include improving the coal grit removal facilities for the east and west sides of the plant. Final design is approximately 85 percent complete and is scheduled to be completed in January 2025.

Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation—Setting concrete formwork at Basin 5

Adapt to changing climate and water resources

Pure Water Southern California

The Pure Water Southern California (PWSC) Program is a large regional recycled water program that will provide a new local source of safe and reliable drinking water for Southern California. PWSC currently focuses on four areas: demonstration testing, environmental planning, technical studies, and preliminary design of initial pipeline reaches. PWSC will produce up to 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.

- 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. Modifications to the system are in progress to allow testing of potential DPR processes and to include additional safety features.
- Environmental Planning—The environmental planning phase began in 2020. 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 early 2026. Biological surveys were completed, and staff continues to prepare and review individual draft technical sections.
- Program Management—PWSC program management efforts lead the planning for the PWSC 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.
    - Metropolitan received notice in May 2024 that it was one of the recipients of the U.S. Bureau of Reclamation (USBR) Large-Scale Water Recycling Projects (LSWRP) grant. The USBR announced that they intend to grant Metropolitan up to $99,199,096 to advance the PWSC planning and design efforts. A second grant application to the LSWR program was prepared and submitted to the USBR in May for up to $26 million dollars, or the difference between the initial grant request of $125 million and the amount awarded. Staff provided an update to the Board on the grant in August 2024. A November board action is planned to adopt a resolution to support the USBR grant application. Following discussions with USBR on the terms and scope of the agreement, staff plans to return to the Board in January 2025 to authorize the grant agreement.
    - In September 2024, the Board approved an amended and restated agreement with Los Angeles County Sanitation Districts (LACSD) and LACSD's Board approved the amendment in October. With this amendment, LACSD assumes responsibility for the pretreatment system, including the MBR. This strategic update clarifies each agency's responsibilities, enabling them to leverage their unique expertise to optimize the project's success.

- Program status, phasing options, and the DPR white paper were presented at the September 2024 PWSC/Regional Conveyance Subcommittee meeting.
- Technical studies are underway to support planning of DPR implementation, EIR analysis on per- and polyfluoroalkyl substances (PFAS) compounds, and further development of program phasing options.

- Advanced Water Purification Facility—The AWPF will purify treated wastewater from LACSD's A.K. Warren Water Resource Facility (Warren Facility) using membrane bioreactors (MBRs), reverse osmosis (RO), and ultraviolet/advanced oxidation (UV/AOP). With its expertise in biological wastewater treatment, LACSD will assume the responsibility of implementing the AWPF pretreatment, including the MBR facilities.
  - A draft conceptual facilities plan has been prepared to document key assumptions of AWPF components. The final draft plan is currently being prepared.
  - Southern California Edison (SCE) is performing a Method of Services (MOS) study to identify infrastructure needed to meet AWPF power requirements. The MOS investigation is anticipated to be complete later this year.
- Direct Potable Reuse (DPR)—The California Division of Drinking Water (DDW) published the final DPR regulations in December 2023. On August 6, 2024, the California Office of Administrative Law approved these DPR regulations, which took effect on October 1, 2024. 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 DPR white paper has been developed to establish Metropolitan's DPR implementation approach and was presented at the September 2024 PWSC subcommittee.
- Conveyance Pipeline System—The PWSC conveyance system consists of: (1) the backbone pipeline, which extends over 40 miles from the AWPF in the city of Carson to as far north as the city of Azusa; (2) a re-purposed existing pipeline owned by the San Gabriel Valley Municipal Water District; and (3) a new DPR pipeline to convey water to Metropolitan's Weymouth Plant in the city of La Verne. It also includes several pump stations, service connections, isolation valves, and other pipeline appurtenances. As part of the current environmental planning phase efforts, the project team is preparing the Conveyance Facilities Conceptual Design Report to support the environmental studies and permitting processes required by CEQA. The final draft report was completed in September, with the final report anticipated by the end of the year. In addition, Metropolitan's Board authorized two consulting agreements for preliminary design of the first two pipeline reaches in March 2023, and preliminary design of these two reaches is anticipated to be complete by mid-2025. Additional progress updates are provided below.
  - Reach 1—This reach is approximately 6.3 miles long, primarily within public rights of way in the city of Carson, with service connections for LADWP and West Basin MWD. Current work includes utility field investigation and geotechnical work, incorporating value engineering comments and assessing the need for more tunneling to minimize project risks. Additional investigations will be conducted over the next several months to optimize the extent of tunneling.

- Reach 2—This reach is approximately 7.5 miles long, primarily within public rights of way in the cities of Long Beach and Lakewood, with a service connection for Long Beach Utilities District. Current work includes utility field investigation and geotechnical work, incorporating value engineering comments, as well as coordination with Long Beach Utilities District, Caltrans, and other permitting entities for the major tunnel crossing of the I-710 and Los Angeles River.

Drought Mitigation—State Water Project Dependent Areas

The Drought Mitigation—State Water Project (SWP)-Dependent Areas Program is composed of CIP projects to replace, refurbish, upgrade, or construct new facilities, which are identified to mitigate the vulnerability experienced by specific member agencies that are affected during shortages of State Water Project supplies.

- Inland Feeder/Foothill Pump Station Interconnection—This project will connect Metropolitan's Inland Feeder to San Bernardino Valley Municipal Water District's (SBVMWD) Foothill Pump Station. The project is one of four Rialto Pipeline service area supply reliability improvement projects. Foothill Pump Station will provide the hydraulic lift needed for direct water delivery from Diamond Valley Lake to the Rialto Pipeline. The project will install supply and discharge bypass pipelines, isolation valves and their vault, and a surge protection system. The project requires permits from CA Fish and Wildlife and U.S. Fish and Wildlife. The project will receive a $5 million dollar U.S. Bureau of Reclamation (USBR) grant. Metropolitan continues to provide data to support USBR's development of NEPA documents and the funding agreement. Final design is 85 percent complete and is scheduled to be completed by January 2025.
- Sepulveda Feeder Pump 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 uses a progressive design-build (PDB) project delivery method. The Board awarded a Phase 1 PDB agreement in September 2023. Phase 1 includes preliminary design and development of a Guaranteed Maximum Price (GMP) for completion. The contractor is proceeding with the purchase of long lead items, including pumps, large valves, and electrical switchgear and transformers recently authorized by the Board. Authorization of Phase 2 of Stage 1 of this project, which includes the completion of final design and construction, is anticipated in early 2025.

Sustain Metropolitan's mission with a strengthened business model

Value Engineering Program

Engineering Services conducts a Value Engineering (VE) program to review capital projects and identify opportunities and alternatives to enhance project performance, optimize the use of funding for CIP projects, and demonstrate responsible use of public funds. The objective of the VE program is to improve the overall value of CIP projects by applying an industry-accepted assessment methodology to examine a project's

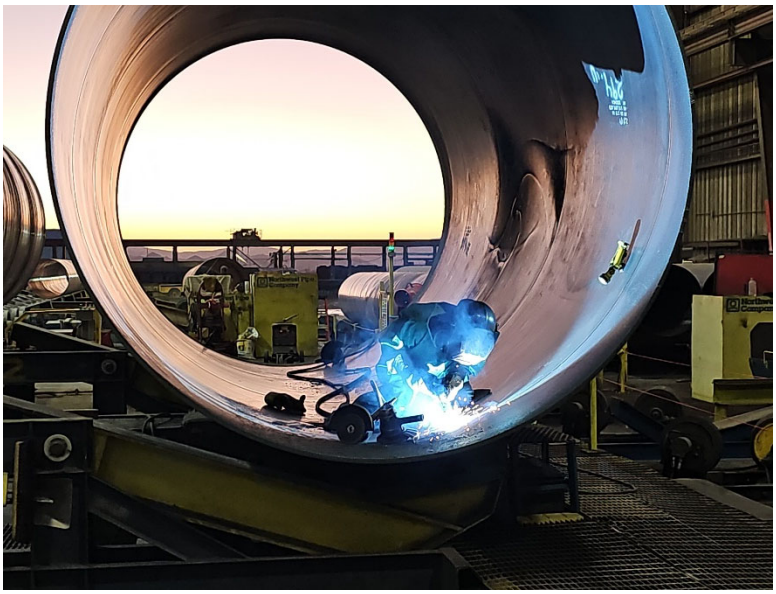
function, design, equipment, material selections, and contracting approach. This comprehensive assessment is conducted at multiple stages in a project's life cycle.

- Lakeview Pipeline Rehabilitation Constructability Review Workshop—Engineering conducted a Constructability Review for the Lakeview Pipeline Rehabilitation Stage 2 project in early October. The Lakeview Pipeline was placed into service in 1973 and provides a critical part of Metropolitan's Distribution System.

  During recent years, pipeline inspections have documented significant deformation of the 11-foot diameter steel pipe over much of its length. This deformation has resulted in numerous leaks, loss of mortar lining, and corrosion of the steel. To repair the entire pipeline, Metropolitan formed a project to address the leaks and restore structural integrity by installing steel liners instead of repairing individual leaking joints. This approach is expected to address the leaks, improve pipe stiffness, provide a permanent repair, and reduce the risk of unplanned outages.

  The Constructability Review Team included in-house staff responsible for preparation of the final design documents, Operations—C&D managers responsible for operating and maintaining the pipeline, Construction Management staff familiar and experienced with similar pipeline rehabilitation projects, and internal stakeholders from Real Property, Environmental Planning, and Operations Planning. Internal staff was supplemented by consultant Subject Matter Experts in pipeline construction and cost estimating, as well as a Certified Value Specialist to lead the workshop.

  The workshop focused on evaluating the final design package for biddability and constructability, shutdown planning, and identifying construction-related risks and mitigations to ensure a safe, environmentally compliant construction project.



Fabrication of Steel Liner for Lakeview Pipeline

Empower the workforce and promote diversity, equity, and inclusion

Workforce Development

As a part of Metropolitan's workforce development initiative, Engineering rolled out several events to highlight for the month. It started with one of a series of modules for Engineering's Management Mentoring Program that focused on "Facilitating Technical Decision Making" to provide additional guidance and tools to new team managers as they navigate the complexities of management. In another key area, Engineering hosted a two-day Design-Build workshop taught by the Water Collaborative Delivery Association to build up staff knowledge on design-build concepts and practices. This training specifically introduced collaborative delivery methods, focusing on progressive design-build and CM/GC, identifying best practices, and their practical application in a project environment. For Engineering's Program Management (PM) Section and a cross-section of interdependent organizations in Engineering, a PM Leadership Training was launched with an overview of program management for the first module, which highlighted the roles and responsibilities of a project manager and the work needed to support Metropolitan's Capital Investment Plan. The remaining seven modules of the PM leadership training program will include modules on project funding and documentation, the board letter process, and partnering and collaboration.

Interim Assistant Group Manager, Howard Lum, conducting a session on Facilitating Technical Decision Making for a group of new team managers and their mentors

Engineering and Member Agency Staff attended this hybrid design-build workshop presented by the Water Collaborative Delivery Association

Program Management Section kicked off its PM Leadership Training series with Unit Manager Jorge Alvarado and Team Manager Ish Singh presenting

ESG Brown Bag Technical Series

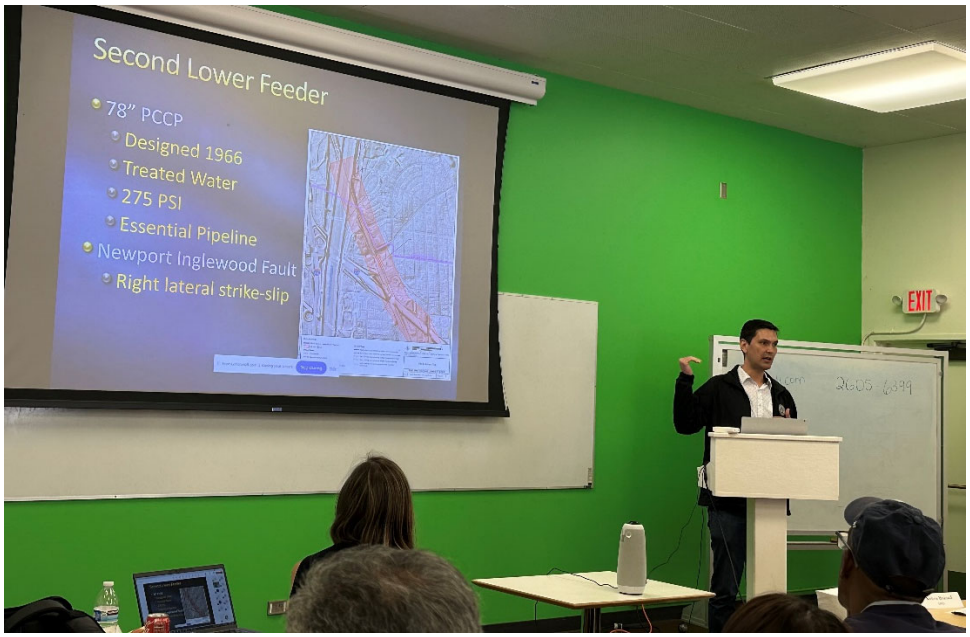
This past month, the Engineering Services and Sustainability, Resilience, and Innovation Groups collaborated and presented on Metropolitan's Climate Adaptation Master Plan for Water (CAMP4W) to support workforce development in a cozy lunch and learn setting. Section Managers John Shamma and Carolyn Schaffer each presented different aspects of CAMP4W. They shared Metropolitan's plans to address climate change and provided insight on how CAMP4W is being developed and the overall decision-making process.

Section Managers Carolyn Schaffer and John Shamma presented "CAMP4W Convo" at Engineering Service's Brown Bag Technical Series

Partner with interested parties and the communities we serve

Community Outreach

Metropolitan staff participated in a one-day workshop at the UC Berkeley Center for Smart Infrastructure hosted by UC Berkeley and the East Bay Municipal Utility District. The workshop focused on building and testing hazard-resilient pipe systems. This event offered an opportunity to explore solutions to strengthen the resilience of critical infrastructure.



Andrew Brainard, Pipeline Design Team Manager, at the UC Berkeley Center for Smart Infrastructure, detailing Metropolitan's planned approach to improve pipeline earthquake resiliency

MetWorks Event

On October 17, over 500 participants attended the MetWorks event in Anaheim to engage in networking activities and learn more about public works projects and zero-emissions vehicle infrastructure upgrades. Metropolitan, along with the cities of Anaheim, Fullerton, and Santa Ana, Irvine Ranch and South Coast Water Districts, and San Diego County Water Authority, presented the upcoming public works contracting and consulting opportunities.

Interim Assistant General Manager John Bednarski welcoming MetWorks participants

Interim Assistant General Manager John Bednarski and Directors Erdman, Dennstedt, McCoy, and Seckel at the MetWorks event