



- **Board of Directors**
Engineering, Operations, and Technology Committee

11/18/2025 Board Meeting

7-1

Subject

Authorize agreements with (1) HDR Engineering Inc. in an amount not to exceed \$1.80 million for a comprehensive investigation of Metropolitan's 230 kV transmission system; and (2) Towill Inc. in an amount not to exceed \$270,000 to perform an aerial survey of the 230 kV transmission system; the General Manager has determined that the proposed action is exempt or not subject to CEQA

Executive Summary

Metropolitan's 230 kV transmission system provides power to the Colorado River Aqueduct (CRA) pumping plants. The 230 kV transmission system is in good condition; however, system components are showing signs of deterioration after 90 years of service in the harsh desert environment. A comprehensive investigation and condition assessment is recommended to improve the reliability of the 230 kV transmission system. In addition, this project will investigate adding a fiber optic communication path to the Iron Mountain, Eagle Mountain, and Hinds pumping plants along the 230kV transmission system. Fiber optic cables provide higher bandwidths and speeds, making them ideal for the core network in the desert region.

This action authorizes agreements with (1) HDR Engineering Inc. (HDR) for a comprehensive investigation of the CRA 230 kV transmission line system; and (2) Towill Inc. to perform an aerial survey of the 230 kV transmission system. See **Attachment 1** for the Allocation of Funds, **Attachment 2** for a list of Subconsultants, and **Attachment 3** for the Location Map.

Proposed Action(s)/Recommendation(s) and Options

Staff Recommendation: Option #1

Option #1

- Authorize an agreement with HDR Engineering Inc. in an amount not to exceed \$1.8 million for a comprehensive investigation of Metropolitan's 230 kV transmission system; and
- Authorize an agreement with Towill Inc. in an amount not to exceed \$270,000 to perform an aerial survey of the 230 kV transmission system.

Fiscal Impact: Expenditure of \$2.7 million in capital funds. Approximately \$700,000 in capital funds will be incurred in the current biennium and have been previously authorized. The next capital investment plan budget will fund the remaining capital expenditures.

Business Analysis: This option will address aging infrastructure while enhancing the reliability and efficiency of the communication system to support CRA operations, ensure regulatory compliance, and enhance long-term system resiliency.

Option #2

Do not proceed with the project at this time.

Fiscal Impact: None

Business Analysis: This option will increase the risk of unexpected transmission line failures and extended power outages, which could compromise water delivery operations, escalate emergency repair costs, and diminish confidence in the reliability of the CRA infrastructure.

Alternatives Considered

Staff initiated the CRA 230 kV Transmission Line Rehabilitation project as a stand-alone effort centered on the need to inspect and assess the need to rehabilitate the entire transmission line system to provide reliability and long-term system resiliency. A separate Capital Investment Plan project, the Fiber Installation at Iron Mountain (Iron Mtn.), Eagle Mountain (Mtn.), and Hinds Pumping Plants, seeks to provide a fiber optic communication path to all Metropolitan desert facilities. Metropolitan currently uses microwave radio equipment to transmit voice, data, video, and supervisory control and data acquisition data between the desert facilities and all other Metropolitan facilities. Fiber optic cables offer significantly higher bandwidth and speeds, making them ideal for core networks.

The selected alternative combines the rehabilitation of the CRA's 230 kV transmission line with fiber installation at Iron Mtn., Eagle Mtn., and Hinds pumping plants. This alternative uses the 230 kV transmission line network to support a fiber optic line from Gene Pumping Plant to Eagle, Hinds, and Intake pumping plants. This alternative will reduce construction costs by utilizing existing Metropolitan infrastructure and easements, provides higher bandwidth capacity than is available from fiber connections at the individual pumping plants, and offers an opportunity to install security features at the transmission lines.

Applicable Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Related Board Action(s)/Future Action(s)

By Minute Item 53598, dated April 9, 2024, the Board appropriated a total of \$636.5 million for projects identified in the Capital Investment Plan for Fiscal Years 2024/25 and 2025/26.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is exempt from CEQA because it consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These may be strictly for information gathering purposes or as part of a study leading to an action that a public agency has not yet approved, adopted, or funded. (State CEQA Guidelines Section 15306.)

CEQA determination for Option #2:

None required

Details and Background

Background

The CRA is a 242-mile-long conveyance system that transports water from the Colorado River to Lake Mathews. It consists of five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons, and reservoirs. The aqueduct was constructed in the late 1930s and was placed into service in 1941.

Metropolitan owns and operates over 305 miles of 230 kV and 69 kV transmission lines that supply power to the five CRA pumping plants within the desert region. Two parallel 230kV lines, the Westline and Eastline, originate from Hoover Dam and traverse through the desert to Metropolitan's Camino Switching Station. The Westline was constructed during the original CRA construction and dates to the 1930s, while the Eastline was added during the 1950s CRA expansion. The Eastline extends 60 miles from the switching station to supply power to the Gene

Pumping Plant, while the Westline stretches 93 miles to power Iron Mountain, Eagle Mountain, and Hinds Pumping Plants. Intake Pumping Plant is supplied by a 2.5-mile-long 69 kV transmission line that originates from the Gene Pumping Plant and traverses the Whipple Mountains. These transmission lines are supported by over 1,200 steel towers with an average span of 1,200 feet between towers.

The CRA transmission lines consist of structural towers; conductors, the cables that carry the electricity; a static line, which is a conductor that protects the main power conductors from lightning strikes; and insulator components that prevent electricity from flowing to the towers. They also include hardware like cross arms to mount the components, dampers to reduce vibration, and various clamps and connectors to join the hardware and cables. In 2013, tower foundations were rehabilitated on a 6.5-mile-long section of the Westline that passes through the Danby Dry Lake area just north of Iron Mountain Pumping Plant.

The 230 kV transmission system is in good condition; however, staff has observed deterioration of some components of the 90-year-old electrical system. For example, spans between the towers average 1,200 feet, and the vertical clearance between the lowest conductor and the ground can vary with temperature, wind speeds, and power loads. Over the years, operating under maximum power loads and extreme desert temperatures may have led power lines to sag, resulting in insufficient vertical clearances as required by current electrical standards. Staff also observed severe corrosion and deterioration of some static line splices. The splices were added to extend the conductor line at the time of construction. In July 2024, an initial assessment concluded that some splices were vulnerable to corrosion from water intrusion since these splices are encased in outer sleeves; other sections use a single-piece splice without any outer sleeves, and these are in good condition. Staff will also evaluate the condition of insulators and other connection hardware.

Staff recommends proceeding with a comprehensive investigation for the entire 230 kV transmission system to define the scope of rehabilitation needed to enhance electrical system reliability and reduce the risk of unplanned outages. The scope of the investigations and analysis is listed below. Additionally, this effort will include assessing and planning for the integration of fiber optic interconnection utilizing the 230 kV transmission system to enhance all CRA facilities' communications and system monitoring capabilities, as discussed in the Alternatives Considered section above. Finally, this project will provide information that could be used to assess protection options if electrical energy development in proximity to Metropolitan's 230kV system adversely impacts the system's operations. The remedial actions will address impacts along several dimensions including steady-state thermal loading, steady-state transient, and post-transient voltage stability impacts.

CRA 230 kV Transmission Line and Fiber Optic Improvements – Comprehensive Investigations

Planned activities include: (1) detailed field investigations and visual inspections of the entire transmission system; (2) performing conductor and electrical load capacity analysis; (3) modeling of the entire system to analyze structural integrity of the towers, sag and tension, and line clearances; (4) performing analysis for fiber optic integration; (5) developing construction cost estimates for recommended improvements; and (6) preparing the comprehensive investigation report. HDR will perform these activities as discussed below. Comprehensive investigation activities will be conducted with a hybrid effort of consultants and Metropolitan staff. Metropolitan staff will perform project management, provide background information and technical oversight, and review the consultant's work.

A total of \$2.7 million is required for this work. Allocated funds include \$1.8 million for a comprehensive investigation report by HDR and \$270,000 for an aerial survey by Towill Inc. under new agreements described below. Allocated funds for Metropolitan staff activities include \$270,000 for the technical oversight and review of the consultant's work; \$265,000 for project management, establishing survey controls, environmental support, and project controls; and \$95,000 for the remaining budget.

Engineering Services (HDR Engineering Inc.) – New Agreement

HDR is recommended to complete the comprehensive investigations for the CRA 230 kV Transmission Line and Fiber Optic Improvements within Metropolitan's desert region. HDR was prequalified via Request for Qualifications No. 1404 and selected for this project based on its design expertise in the discipline-specific technical aspects of this project, technical approach, and experience with similar projects.

The planned activities for HDR include: field investigations and visual site assessments such as signs of wear, corrosion, physical damage, rust or cracks of the entire 305-mile transmission line system; conductor and electrical load capacity analysis; modeling to analyze tower structure integrity and usage identifying overstressed tower steel members, conductors and hardware; conductor usage and analysis for thermal capacity loading; sag and tension, and line clearances; risk assessment analysis identifying short- and long-term equipment failures with potential non-compliance to the current codes; fiber optic integration analysis; preparing construction cost estimates, preparation of a comprehensive investigation report, and analysis of multiple system impact studies to Metropolitan's 230kV transmission system and network as impacted by potential third party connections.

This action authorizes an agreement with HDR for a not-to-exceed amount of \$1.8 million to provide engineering services to complete a comprehensive investigation for the 230 kV transmission line and fiber optic improvements within the desert region. Metropolitan has established a Small Business Enterprise (SBE) participation level of 25 percent for this agreement. HDR has agreed to meet this level of participation. See **Attachment 2** for a listing of the subconsultants.

Engineering Services (Towill Inc.) – New Agreement

Towill Inc. is recommended to complete the aerial survey of the 230 kV transmission system. Towill Inc. was prequalified via Request for Qualifications No. 1354 and was selected for this project based on its technical approach, aerial LiDAR survey expertise, and demonstrated experience with similar projects.

The planned activities for Towill Inc. include the following: establishing geodetic control points, conducting airborne LiDAR data acquisition along the 230 kV transmission system, and processing and classifying the collected data to be used in modeling efforts for the detailed analysis of the 230 kV transmission system, as described above.

This action authorizes an agreement with Towill Inc. for a not-to-exceed amount of \$270,000 to provide engineering services to perform an aerial LiDAR survey of the 230 kV transmission system. Towill Inc. is certified as an SBE firm and thus achieves a 100 percent SBE participation level. There are no subconsultants for this agreement.

Project Milestone

March 2027 – Completion of comprehensive investigations

	10/27/2025
Mai M. Hattar	Date
Chief Engineer	
Engineering Services	
	10/27/2025
John V. Bednarski	Date
Interim General Manager	

Attachment 1 – Allocation of Funds

Attachment 2 – Subconsultants

Attachment 3 – Location of Map

Ref# es12703950

Allocation of Funds for CRA 230 kV Transmission Line and Fiber Optic Improvements

	Current Board Action (Nov. 2025)
Labor	
Preliminary Investigations	\$ 270,000
Final Design	-
Owner Costs (Program mgmt., envir. monitoring)	265,000
Submittals Review & Record Drwgs.	-
Construction Inspection & Support	-
Metropolitan Force Construction	-
Materials & Supplies	-
Incidental Expenses	-
Professional/Technical Services	-
HDR Engineering Inc.	1,800,000
Towill Inc. (Aerial Survey)	270,000
Equipment Use	-
Contracts	-
Remaining Budget	95,000
Total	\$ 2,700,000

The total amount expended to date is approximately \$242,000. The total estimated cost to complete the 230 kV Transmission Line and Fiber Optic Improvements, including the amount appropriated to date, funds allocated for the work described in this action, and future construction costs, is anticipated to range from \$20 million to \$26 million.

The Metropolitan Water District of Southern California**Subconsultants for Agreement with HDR Engineering Inc.
CRA 230 kV Transmission Line and Fiber Optic Improvements**

Subconsultant and Location	Service Category; Specialty
DRP Engineering Inc. Monterey Park, CA	CAD Services
Magna Consulting and Design Irvine, CA	Transmission Engineering & CAD Services
GIS Surveyors, Inc San Diego, CA	CAD Modeling & Drone Services
Global Engineering Management Solutions Inc. (GEMS) Los Angeles, CA	Field Inspection & Assessment Services
Partners In Diversity Inc. Santa Fe Springs, CA	Field Inspection & Assessment Services

Location Map

