



- Board of Directors
Engineering and Operations Committee

3/13/2012 Board Meeting

7-7

Subject

Appropriate \$340,000; and authorize (1) final design for repair of the San Jacinto East Adit on the Colorado River Aqueduct; and (2) amendment to an agreement with Jacobs Associates (Approp. 15373)

Description

This action authorizes final design to repair the San Jacinto East Adit on the Colorado River Aqueduct (CRA), and authorizes an amendment to an existing professional services agreement with Jacobs Associates. The adit provides the main access into the San Jacinto Tunnel for inspection, maintenance, and repair.

Timing and Urgency

The San Jacinto Tunnel is one of 30 tunnels on the CRA which convey water from the Colorado River to Lake Mathews. The San Jacinto Tunnel East Adit has developed longitudinal and transverse cracks in its concrete lining. An investigation has concluded that shifting soils above the adit have caused the cracks, and that cracking will continue over time. The investigation also concluded that the adit is vulnerable to damage from potential shaking generated by earthquakes on nearby faults. Because this adit provides the main access into the San Jacinto Tunnel for inspection, maintenance, and repair, staff recommends proceeding with final design to strengthen the adit at this time.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Replacement and Rehabilitation project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2011/12.

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 San Jacinto Tunnel is 13 miles long and extends below the San Jacinto Mountains between Cabazon and Gilman Springs in San Bernardino County. The San Jacinto Tunnel was constructed between 1933 and 1938, and was placed into service in 1941. An adit was positioned near the tunnel's midpoint to serve as one of the main access points for construction of the eastern portion of the tunnel.

The San Jacinto Tunnel East Adit is 300 feet long, horseshoe-shaped, and has overall dimensions of 16 feet high by 16 feet wide. The adit was constructed using drill-and-blast methods into hard rock over the first 106 feet and through soft soil over the remaining length. The excavation is supported by timber sets and is lined with unreinforced concrete. The adit provides the only location where maintenance equipment can enter the San Jacinto Tunnel, and serves as the primary entrance for tunnel inspection.

In 2003, Metropolitan staff discovered cracks along a 100-foot reach of the San Jacinto East Adit, beginning at its entrance portal. These cracks include longitudinal, transverse and oblique cracking in the crown, walls and invert. The adit has been monitored closely since that initial discovery. In 2007, a survey of the tunnel showed that the cracking had progressed. As a result, tunnel access through the adit has been restricted since 2007.

A structural analysis completed in June 2010 concluded that the cracks have weakened the adit, increasing its vulnerability to seismic events. Multiple active faults are located within the vicinity of the San Jacinto Tunnel adit, including the San Andreas Fault and the San Jacinto Fault. Specifically, the southern San Andreas Fault is capable of generating approximately a magnitude 8.0 seismic event. A seismic-induced failure of the adit could cause an extended shutdown of the CRA.

In October 2010, Metropolitan's Board authorized preliminary design of repairs to the San Jacinto East Adit. Preliminary design has been completed, and staff recommends proceeding with final design of the repairs. The recommended work consists of installing steel support frames, known as sets, within the adit to resist ground and seismic loading. The steel sets will be encased with concrete for additional structural strength and corrosion protection.

San Jacinto East Adit Repair - Final Design (\$340,000)

Planned activities include engineering design, preparation of drawings and specifications, receipt of competitive bids, development of a construction cost estimate, and all other activities in advance of award of a construction contract. Final design will primarily be performed by Jacobs Associates, as discussed below. Metropolitan staff will perform civil design of adit entrance features, prepare environmental documentation, and perform technical review of the consultant's design.

This action appropriates \$340,000 and authorizes final design phase activities for the San Jacinto East Adit repair. The requested funds include \$262,000 for final design; \$49,000 for permitting, receipt of bids, and project management; and \$29,000 for technical review of the consultant design. The final design cost as a percentage of the estimated construction cost is approximately 15 percent. Engineering Service's goal for design of projects with construction cost less than \$3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from \$1.5 million to \$2 million. Staff will return to the Board at a later date for award of a construction contract.

Specialized Technical Support by Jacobs Associates – Agreement Amendment

Jacobs Associates performed preliminary design of the East Adit repairs and is recommended to perform final design under an existing professional services agreement. This work is highly specialized, and Metropolitan has insufficient technical resources in-house to conduct the design without the assistance from a specialty consultant. Jacobs Associates will perform rock modeling, prepare detailed drawings and specifications, develop a construction cost estimate, and provide technical support during the bidding process.

Jacobs Associates was selected through a competitive process via Request for Qualifications No. 931. Amendment of the existing Jacobs Associates agreement is consistent with the agreement's scope of work, and with the planned approach for project implementation.

This action authorizes an increase of \$215,000 to the existing agreement with Jacobs Associates, for a new not-to-exceed total of \$365,000. For this agreement, Metropolitan has established a Small Business Enterprise participation level of 18 percent.

Summary

This action appropriates \$340,000; authorizes final design to repair the San Jacinto Tunnel East Adit; and authorizes an amendment to the existing professional services agreement with Jacobs Associates. This work is included within capital Appropriation No. 15373, the CRA Conveyance Reliability Program, which was initiated in fiscal year 2001/02. Other projects authorized under Appropriation No. 15373 include replacement of the CRA canal liner, installation of internal seals within the CRA siphons, replacement of cast iron flanges throughout the CRA system, and repairs to the Big Morongo Siphon. With the present action, the total funding for Appropriation No. 15373 will increase from \$82,668,000 to \$83,008,000.

This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2011/12 capital expenditure plan. See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

Project Milestone

July 2012 – Completion of final design for repair of the San Jacinto Tunnel East Adit

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

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

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves the funding; final design; and minor alterations, reconstruction or replacement of existing public facilities along with the construction of minor appurtenant structures with no expansion of use and no possibility of significantly impacting the physical environment. In addition, the proposed project involves minor modifications in the condition of land, water, and/or vegetation which does not involve removal of healthy, mature, scenic trees. Accordingly, the proposed action qualifies under Class 1, Class 2, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15302, 15303, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under four Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; Class 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and

- a. Appropriate 340,000;
- b. Authorize final design for repair of the San Jacinto Tunnel East Adit; and
- c. Authorize increase of \$215,000 to the existing agreement with Jacobs Associates, for a new not-to-exceed total of \$365,000.

Fiscal Impact: \$340,000 in budgeted funds under Approp. 15373

Business Analysis: This action will restore access for inspections, maintenance, and repair of the San Jacinto Tunnel; protect Metropolitan's assets; increase service reliability to member agencies; and reduce the risk of costly emergency repairs.

Option #2

Do not proceed with the adit repairs at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity to enhance reliability of the CRA, and could result in an unplanned shutdown in the event of an earthquake.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer,
Engineering Services
2/23/2012
Date



Jeffrey Kightlinger
General Manager
2/29/2012
Date

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Ref# es12615697

Financial Statement for CRA Conveyance Reliability Program

A breakdown of Board Action No. 17 for Appropriation No. 15373 for the San Jacinto East Entrance Adit Repairs¹ is as follows:

	Previous Total Appropriated Amount (Jan. 2012)	Current Board Action No. 17 (Mar. 2012)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 3,293,300	\$ -	\$ 3,293,300
Final Design (Civil portion)	4,258,687	47,000	4,305,687
Owner Costs (Envir. doc., program mgmt)	5,015,600	78,000	5,093,600
Submittal Reviews & Record Dwgs.	231,000	-	231,000
Construction Inspection & Support	5,894,220	-	5,894,220
Metropolitan Force Construction	7,984,620	-	7,984,620
Materials & Supplies	1,710,300	-	1,710,300
Incidental Expenses	392,800	-	392,800
Professional/Technical Services	3,923,000	-	3,923,000
Jacobs Associates	-	215,000	215,000
Right of Way	10,000	-	10,000
Equipment Use	211,450	-	211,450
Contracts	46,632,413	-	46,632,413
Remaining Budget	3,110,610	-	3,110,610
Total	\$ 82,668,000	\$ 340,000	\$ 83,008,000

Funding Request

Program Name:	CRA Conveyance Reliability Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15373	Board Action No.:	17
Requested Amount:	\$ 340,000	Capital Program No.:	15373
Total Appropriated Amount:	\$ 83,008,000	Capital Program Page No.:	285
Total Program Estimate:	\$ 120,459,000	Program Goal:	I-Infrastructure Reliability

¹The total amount expended to date on the San Jacinto Tunnel East Adit Repair project is approximately \$96,000

Location Map

