



● **Board of Directors**  
***Engineering and Operations Committee***

2/8/2011 Board Meeting

---

**7-2**

**Subject**

---

Appropriate \$285,000; and authorize design of two Colorado River Aqueduct rehabilitation projects (Approp. 15438)

**Description**

---

This action authorizes two Colorado River Aqueduct (CRA) rehabilitation projects: (1) final design to rehabilitate the turnout for Desert Water/Coachella Valley Service Connection DW-CV-2T; and (2) preliminary design to rehabilitate piping and access structures in the main sumps at all five CRA pumping plants.

**Timing and Urgency**

These two projects are needed to improve reliability of the CRA. Numerous components of Service Connection DW-CV-2T have reached the end of their service lives, and must be refurbished or replaced to reduce the risk of an unplanned outage of the CRA.

At the Intake, Gene, Iron Mountain, Eagle Mountain, and Hinds pumping plants, the 70-year-old sump piping systems and support structures are deteriorating and have exceeded their service lives. A failure of these systems could expose major plant equipment to costly flood damage. Replacement of corroded sump valves, piping, and support structures will enhance CRA pumping plant reliability.

These projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and are categorized as Infrastructure Upgrade projects. Both projects are budgeted within Metropolitan's CIP for fiscal year 2010/11.

**Background**

The CRA is a 242-mile-long conveyance system which 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.

From the CRA's Whitewater Canyon siphons in Riverside County, Metropolitan delivers Colorado River water to the Desert Water Agency (DWA) and the Coachella Valley Water District (CVWD) in exchange for State Water Project (SWP) entitlements under the existing Metropolitan/CVWD/DWA Water Exchange (1983) and Advance Delivery (1984) Agreements. These agreements allow Metropolitan to pre-deliver up to 600,000 acre-feet of DWA's and CVWD's SWP water at any time during the term of the agreement, via Service Connection DW-CV-2T and several related connections, in exchange for DWA's and CVWD's obligation to return the same amount of SWP water to Metropolitan. Under the 1984 Advance Delivery Agreement, Metropolitan assumed ownership and responsibility for operation of Service Connection DW-CV-2T in exchange for the benefits received from advance delivery of DWA's and CVWD's SWP supply, including increased operation flexibility and improved supply reliability. Service Connection DW-CV-2T serves both agencies with a delivery capacity of up to 70 cubic feet per second (cfs). This service connection is one of several located at Whitewater Canyon in Riverside County, which together are capable of delivering up to 720 cfs of Colorado River water to CVWD and DWA's spreading basins.

The turnout for Service Connection DW-CV-2T consists of two valves arranged in series: a 24-inch isolation valve which has been in operation for over 50 years, and a 16-inch discharge valve which has been in operation for over 25 years. The isolation valve currently leaks several gallons per minute, and has reached the end of its service life. The discharge valve is still serviceable but its actuator has deteriorated due to exposure to the severe environment. If both valves were to fail simultaneously, an outage of the CRA would be required to repair or replace the valves. In addition to the deteriorated valves, adjacent piping has corroded and needs to be replaced. In April 2010, Metropolitan's Board authorized preliminary design to rehabilitate Service Connection DW-CV-2T. Preliminary design is complete and staff recommends proceeding with final design at this time.

Each of the five CRA pumping plants has two independent main sumps that collect water leakage from the main pumps and discharge valves. Each main sump is approximately 9 feet wide, 20 feet long, and 35 feet deep, and can hold up to 48,000 gallons, or approximately one day worth of leakage water. The sump piping system pumps this water back to the pumping plant's main intake manifold or to its forebay, depending on the plant. In addition, there are circulating water pipes which supply water to the pumping plant cooling, fire, and potable water systems, that also run through the sumps. Failure of the sump piping system has the potential to cause extensive flooding and damage to valves and pumps within the pumping plant. Due to deterioration of the sump piping system, and a recent leak of corroded piping which required emergency repairs, an assessment study of the system was initiated in March 2010. This study has been completed and staff recommends proceeding with preliminary design to rehabilitate the sump piping system.

**Project No. 1 – Service Connection DW-CV-2T Turnout Rehabilitation – Final Design Phase and Procurement (\$180,000)**

The scope of this project will include replacing the 24-inch diameter isolation valve and the discharge valve actuator, replacing corroded discharge piping, and improving safety by relocating ladders and installing code-compliant landings. The recommended work will maintain present water delivery capabilities at Whitewater, improve safety and security, and enhance CRA reliability.

Final design phase activities will include preparation of drawings and specifications, and development of a construction cost estimate. Procurement activities will include advertisement of specifications, receipt of bids and award of a procurement contract, and fabrication inspection. The procurement contract for the valves is planned to be awarded under the General Manager's Administrative Code authority. Staff will return to the Board at a later date for authorization of construction and installation of the valves, which is scheduled for a planned CRA shutdown in 2012.

This action appropriates \$180,000 in budgeted funds and authorizes final design phase activities to rehabilitate the turnout for Service Connection DW-CV-2T. Requested funds include \$50,000 for valve procurement; \$78,700 for final design of the turnout rehabilitation project; \$5,000 for fabrication inspection of the valves; \$29,000 for project management, bidding process, and environmental monitoring; and \$17,300 for remaining budget.

All final design and procurement activities will be performed by Metropolitan staff. The anticipated cost of final design is approximately 13 percent of the estimated total construction cost. Engineering Services' goal for design of projects with construction costs less than \$3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from \$500,000 to \$600,000.

**Project No. 2 – Pumping Plant Sump System Rehabilitation – Preliminary Design Phase (\$105,000)**

Rehabilitation of the pumping plant sump systems will include replacement of corroded sump mechanical equipment, piping, and access structures at all five CRA pumping plants. The scope of work also includes bringing access features up to current building codes by replacing corroded catwalks, ladders and handrails within the sumps.

Preliminary design phase activities will include selection of replacement valves and other materials; preparation of a preliminary design report with mechanical and structural layout; development of a conceptual cost estimate; and preparation of environmental documentation.

This action appropriates \$105,000 in budgeted funds and authorizes preliminary design phase activities to rehabilitate the CRA pumping plant sump piping systems. All activities will be performed by Metropolitan staff. Staff will return to the Board at a later date for authorization of final design and equipment procurement.

### Summary

This action appropriates \$285,000 and authorizes two CRA rehabilitation projects. This work will be performed under the CRA Reliability – Phase II Program (Appropriation No. 15438), which was initiated in fiscal year 2006/07. Past work authorized under Appropriation No. 15438 includes the CRA 6.9 kV Fault Current Protection Upgrades, the Eagle Mountain and Iron Mountain Standby Generator Replacements, and the CRA 230 kV Disconnect Switches Replacement Project. The total appropriated amount for this program will increase from \$16,726,000 to \$17,011,000.

This work has been evaluated and recommended by Metropolitan’s CIP Evaluation Team, and funds have been included in the fiscal year 2010/11 capital budget. See [Attachment 1](#) for the Financial Statement, and [Attachment 2](#) for the Location Map.

These two projects are consistent with Metropolitan’s goals for sustainability by enhancing reliability of the existing conveyance and distribution system in order to maintain reliable water deliveries in the future.

### Project Milestones

July 2011 – Completion of final design for the turnout to Service Connection DW-CV-2T

August 2011 – Completion of preliminary design for the sump piping rehabilitation

### Policy

---

Metropolitan Water District Administrative Code Section 5108: Appropriations

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

### California Environmental Quality Act (CEQA)

---

CEQA determination for Option #1:

The proposed actions are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, minor alterations and replacement of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed actions qualify under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed actions qualify under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

### Board Options

---

#### Option #1

Adopt the CEQA determination and

- a. Appropriate \$285,000;
- b. Authorize final design to rehabilitate Service Connection DW-CV-2T; and
- c. Authorize preliminary design to rehabilitate the CRA pumping plant sump systems.

**Fiscal Impact:** \$285,000 in budgeted funds under Approp. 15438

**Business Analysis:** This option will enhance CRA reliability and reduce the risk of unplanned outages.

**Option #2**

Do not proceed with the two projects at this time.

**Fiscal Impact:** None

**Business Analysis:** In the event of valve failure at the Service Connection DW-CV-2T turnout, a shutdown of the CRA may be required to make repairs. Deferral of the pumping plant sump piping rehabilitation will further expose the pumping plants to the risk of equipment damage in the event of failure of the sump piping system. Equipment failures at either facility may impact CRA deliveries.

**Staff Recommendation**

---

Option #1

 Roy L. Wolfe Manager, Corporate Resources	<u>1/18/2011</u> Date
 Jeffrey Kightlinger General Manager	<u>1/24/2011</u> Date

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Map**

Ref# cr12607690

**Financial Statement for CRA Reliability – Phase II Program**

A breakdown of Board Action No. 12 for Appropriation No. 15438 for the rehabilitation of Service Connection DW-CV-2T\* and the CRA pumping plant sumps\*\* is as follows:

	<b>Previous Total Appropriated Amount (Oct. 2010)</b>	<b>Current Board Action No. 12 (Feb. 2011)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies and Investigations	\$ 1,196,000	\$ 65,800	\$ 1,261,800
Final Design	1,399,600	78,300	1,477,900
Owner Costs (Program mgmt., bidding process, envir. doc.)	1,966,090	56,300	2,022,390
Submittals review	180,100	-	180,100
Construction Inspection and Support	628,800	4,200	633,000
Metropolitan Force Construction	1,301,700	-	1,301,700
Materials and Supplies	2,172,405	-	2,172,405
Turnout valves	-	50,000	50,000
Incidental Expenses	90,800	2,000	92,800
Professional/Technical Services	1,527,000	-	1,527,000
Equipment Use	-	-	-
Contracts	5,301,000	-	5,301,000
Remaining Budget	962,505	28,400	990,905
<b>Total</b>	<b>\$ 16,726,000</b>	<b>\$ 285,000</b>	<b>\$ 17,011,000</b>

**Funding Request**

<b>Program Name:</b>	CRA Reliability – Phase II Program		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15438	<b>Board Action No.:</b>	12
<b>Requested Amount:</b>	\$ 285,000	<b>Capital Program No.:</b>	15438-I
<b>Total Appropriated Amount:</b>	\$ 17,011,000	<b>Capital Program Page No.:</b>	283
<b>Total Program Estimate:</b>	\$ 45,170,000	<b>Program Goal:</b>	I-Infrastructure Reliability

\* The total amount expended to date on the Service Connection DW-CV-2T rehabilitation is approximately \$60,000.

\*\* The total amount expended to date on the Sump System Rehabilitation project is approximately \$56,000.

### Location Map

