



- Board of Directors
Engineering and Operations Committee

8/16/2011 Board Meeting

8-6

Subject

Appropriate \$7.7 million; and award \$4,818,000 contract to Southern Contracting Company for replacement of 230 kV disconnect switches on the Colorado River Aqueduct (Approp. 15438)

Description

This action authorizes construction to replace outdated 230 kilovolt (kV) disconnect switches at the Gene, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants. These high-voltage switches provide the primary means for isolating the pumping plants' main transformer banks and circuit breakers for maintenance and repair, and are critical to maintaining reliable Colorado River Aqueduct (CRA) deliveries.

Timing and Urgency

Replacement of the 230 kV disconnect switches is needed to maintain CRA reliability. These motor-actuated switches are the primary means of isolating substation equipment. The switches were installed in the 1930s and 1950s, and are at risk of failure due to deterioration resulting from normal wear and tear. Spare parts are no longer available.

Replacement of the deteriorated switches is needed to safeguard plant staff from electrical shock during routine maintenance activities. Whenever a planned CRA power outage is initiated to maintain or repair electrical equipment, disconnect switches must reliably operate to isolate the equipment so that maintenance and repair can be completed in a safe and timely manner.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and staff recommends moving forward with construction in order to enhance CRA reliability. This project is categorized as an Infrastructure Refurbishment project and is budgeted within Metropolitan's CIP for fiscal year 2011/12.

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.

Rehabilitation of the CRA was initiated in 2001. The program includes a comprehensive multi-year effort to assess the various components of the CRA, prioritize upgrades, and execute projects. The primary focus of the program is on the water conveyance system (canals, siphons, tunnels and infrastructure), the pumping plants (mechanical and structural upgrades), the electrical system (transmission lines, switchgear, and motors), and on compliance with environmental regulations (discharge prevention). Over \$117 million have been expended to date on rehabilitation of the CRA. The work included in this action addresses electrical components located at the CRA pumping plants.

Each of the CRA's five pumping plants has an electrical substation which converts high-voltage transmission grid power (230 kV or 69 kV) to 6.9 kV, which is utilized by the plants' main pumps. Each substation consists of two

transformer banks and associated buses, circuit breakers, and disconnect switches. The disconnect switches provide the primary means for isolating equipment in the substations to protect staff from electrical shock while performing equipment maintenance and repair.

The existing disconnect switches were installed in the 1930s and 1950s as part of the original CRA construction and expansion. The switches are operated during planned or emergency outages in order to isolate electrical equipment such as the main pumping plant transformers, the transformer bank circuit breakers, or sections of the 230 kV transmission lines. The high-voltage disconnect switches have exceeded their typical service life. Over time, normal use has led to wear and tear on the bearings and linkages, and misalignment of the switch mechanism. Worn-out switches eventually become inoperable and require a shutdown in order to realign the switch mechanism. Spare parts are no longer available.

In October 2010, Metropolitan's Board authorized final design for replacement of the 230 kV disconnect switches in order to reduce the risk of extended outages due to inoperable switches. The 230 kV disconnect switches are located at Gene, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants. There are no 230kV disconnect switches at Intake Pumping Plant. Final design has been completed and construction is recommended to move forward at this time.

CRA 230 kV Disconnect Switch Replacement – Construction (\$7,700,000)

Planned activities at the Gene, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants include the demolition of existing disconnect and ground switches, motor actuators, and linkages; and installation of 36 new disconnect and ground switches, along with fiber-optic communication lines for switch status monitoring. Installation of operator ground mats for high-voltage disconnect switch actuators are also planned for all five CRA pumping plants. These improvements will maintain safe and reliable pumping plant operation. Major construction is scheduled to take place during two shutdowns planned for March 2012 and February 2013.

Specifications No. 1698 for the CRA 230 kV Disconnect Switch Replacement was advertised for bids on June 3, 2011. As shown in [Attachment 2](#), two bids were received and opened on July 19, 2011. The low bid from Southern Contracting Company, in the amount of \$4,818,000, complies with the requirements of the specifications. The other bid amount was \$9,146,713, while the engineer's estimate was \$5.85 million. For this contract, Metropolitan established a Small Business Enterprise (SBE) participation level of at least 20 percent of the bid amount. Southern Contracting Company is an SBE firm and will thus achieve 100 percent participation.

This action appropriates \$7.7 million and awards a \$4,818,000 construction contract to Southern Contracting Company. In addition to the amount of the contract, the appropriated funds include \$1,377,000 for support by Metropolitan forces, which includes establishing grounding and electrical clearances, electrical acceptance testing, shutting down and restarting all five CRA pumping plants, and dewatering and refilling the system for two shutdown events. The total cost of construction is \$6,195,000. Requested funds also include \$809,000 for construction inspection; \$133,000 for submittals review and technical support by Metropolitan staff and the design consultant, Lee & Ro, Inc.; \$171,000 for environmental monitoring and project management; \$88,000 for preparation of record drawings; and \$304,000 in remaining budget.

Construction inspection will be performed by Metropolitan staff. For this project, the anticipated cost of inspection is approximately 13 percent of the total construction cost. Engineering Services' goal for inspection of construction contracts greater than \$3 million is 9 to 12 percent. Inspection costs for this project are expected to exceed the goal because of the round-the-clock specialized inspection required for two 18-day CRA shutdowns, and the multiple remote locations and long travel times between sites.

Technical Support by Lee & Ro, Inc. (No Action Required)

Technical support during construction is recommended to be provided by the design consultant, Lee & Ro, Inc., under a new professional services agreement. As the Engineer of Record, Lee & Ro will review submittals, respond to requests for information, advise inspection staff on technical issues as they may arise, and prepare record drawings. Lee & Ro was selected through a competitive process via Request for Qualifications No. 927. For this agreement, Metropolitan has established an SBE participation level of 18 percent. The estimated cost for

Lee and Ro's services is \$80,000. This agreement is planned to be awarded under the General Manager's Administrative Code authority.

Summary

This action appropriates \$7.7 million and awards a contract for the CRA 230 kV Disconnect Switch Replacement project. 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, and the Eagle Mountain and Iron Mountain Standby Generator Replacements. The total appropriated amount for this program will increase from \$18,631,000 to \$26,331,000.

This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2011/12 capital budget. See [Attachment 1](#) for the Financial Statement, [Attachment 2](#) for the Abstract of Bids, and [Attachment 3](#) for the Location Map.

This project is consistent with Metropolitan's goals for sustainability by enhancing reliability of the existing CRA pumping plants in order to maintain reliable water deliveries in the future.

Project Milestones

February 2013 – Completion of CRA shutdown

March 2013 – Completion of construction

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 overall activities involve the funding, design, minor alteration 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 action qualifies 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 action qualifies 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 \$7.7 million; and
- b. Award \$4,818,000 contract to Southern Contracting Company for replacement of 230 kV disconnect switches on the CRA.

Fiscal Impact: \$7.7 million in budgeted funds under Approp. 15438

Business Analysis: This option will reduce the risk of extended outages due to inoperable disconnect switches, and will enhance CRA reliability.

Option #2

Do not award the construction contract and re-advertise in an attempt to receive more favorable bids.

Fiscal Impact: None

Business Analysis: This option may or may not result in more favorable bids and would defer the 230 kV disconnect switch replacement work until other CRA shutdowns can be scheduled, further exposing the CRA to the risk of disruption of maintenance and outage activities.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer,
Engineering Services
7/21/2011
Date



Jeffrey Kightlinger
General Manager
7/29/2011
Date

Attachment 1 – Financial Statement

Attachment 2 – Abstract of Bids

Attachment 3 – Location Map

Financial Statement for CRA Reliability – Phase II Program

A breakdown of Board Action No. 15 for Appropriation No. 15438 for the CRA 230 kV Disconnect Switch Replacement project* is as follows:

	Previous Total Appropriated Amount (May 2011)	Current Board Action No. 15 (Aug. 2011)	New Total Appropriated Amount
Labor			
Preliminary Design	\$ 1,261,800	\$ -	\$ 1,261,800
Final Design	1,586,900	-	1,586,900
Owner Costs (Program mgmt., envir monitoring)	2,118,390	168,000	2,286,390
Submittals Review & Record Drawings	216,100	141,000	357,100
Construction Inspection & Support	788,000	809,000	1,597,000
Metropolitan Force Construction	1,351,700	1,308,000	2,659,700
Materials & Supplies	2,222,405	69,000	2,291,405
Incidental Expenses	107,800	3,000	110,800
Professional/Technical Services	1,527,000	-	1,527,000
Lee & Ro, Inc.	-	80,000	80,000
Equipment Use	-	-	-
Contracts	6,333,945	4,818,000	11,151,945
Remaining Budget	1,116,960	304,000	1,420,960
Total	\$ 18,631,000	\$ 7,700,000	\$ 26,331,000

Funding Request

Program Name:	CRA Reliability – Phase II Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15438	Board Action No.:	15
Requested Amount:	\$ 7,700,000	Capital Program No.:	15438-I
Total Appropriated Amount:	\$ 26,331,000	Capital Program Page No.:	283
Total Program Estimate:	\$ 47,184,000	Program Goal:	I-Infrastructure Reliability

* The total amount expended to date on the CRA 230 kV Disconnect Switch Replacement project is approx. \$626,479.

The Metropolitan Water District of Southern California

Abstract of Bids Received on July 19, 2011 at 2:00 P.M.

Specifications No. 1698

CRA 230kV Disconnect Switch Replacement

This contract consists of demolition of 38 existing disconnect and ground switches, demolition of control cables, and installation of 36 new disconnect and ground switches, new fiber-optic communication lines, and operator ground mats at Intake, Gene, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants.

Engineer's estimate: \$5,850,000

Bidder and Location	Total	SBE \$	SBE %	Met SBE¹
Southern Contracting Company, San Marcos, CA	\$ 4,818,000	\$ 4,818,000	100%	Yes
Cupertino Electric, Inc., Cupertino, CA	\$ 9,146,713	N/A	N/A	N/A

¹ SBE (Small Business Enterprise) participation set at 20 percent

Location Map

