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

June 11, 2002 Board Meeting

8-1

Subject

Authorize $19.66 million for three Capital Investment Plan appropriations for the Colorado River Aqueduct Reliability Programs, and award a $8,968,550 construction contract to Griffith Company for the canal repair project (Approps. 15373, 15384 and 15385)

Description

The Colorado River Aqueduct (CRA) is a 242-mile conveyance system designed to transport water from Lake Havasu on the Colorado River to Lake Mathews. The CRA consists of five pumping plants, 63 miles of concrete-lined canal, 55 miles of cut and cover conduit, and 124 miles of tunnels, inverted siphons, and reservoirs. The CRA was originally designed to operate at a maximum capacity of 1,605 cubic feet per second (cfs). Modifications implemented in the 1980s enabled the system to be operated at a maximum capacity of 1,800 cfs.

The CRA conveyance structures have been in operation for more than 60 years. In the mid-1980s, major rehabilitation work was performed on the pump units at each of the five pumping plants. The balance of the system is now in need of major refurbishment as the result of wear and tear and due to operation of the system for prolonged periods in excess of its original design capacity. In addition, some equipment needs to be replaced to improve operational efficiency. Staff recommends that the rehabilitation, repair or replacement of equipment and facilities be undertaken to ensure continued reliable performance of the CRA. Consistent with Metropolitan's approach to manage projects in the most cost-effective manner and provide opportunities for staff, Metropolitan forces will perform those tasks that are critical to overall program success including project management, preparation of drawings and specifications, field coordination, and data collection and evaluation. Contractors will be used for construction work that cannot be completed by Metropolitan staff within the required time frame.

Two initial shutdowns of the CRA are scheduled for this rehabilitation work: a 14-day shutdown in October 2002 and a 14-day shutdown in February 2003. Coordination of these shutdowns with other planned projects in Metropolitan's distribution system, including the Lake Mathews Outlet Facilities Program, is critical to ensure that member agencies' delivery needs are met.

Recommended Improvements

Four CRA reliability programs were identified through Metropolitan's Infrastructure Reliability and Protection Plan which was initiated in fiscal year 2000/01. In August 2001, the Board authorized the initial investigations for two of the programs (the Conveyance Reliability and the Pumping Plant Reliability programs). In January 2002, the Board authorized investigations for the remaining two programs (Electrical/Power System Reliability and the Discharge Containment programs) and final design and construction for specific projects. At this time seven projects within three of the programs are ready to proceed into final design and construction as discussed below. Approval of these projects at this time is recommended to meet the scheduled shutdowns of the aqueduct. The long lead-times for the Iron Mountain circuit breaker project and the valves for conversion of the blowoffs necessitate the award of contracts prior to July 2002 in order to be available for the aqueduct outage construction. In addition, the conveyance rehabilitation contractor must fabricate the trash racks prior to the October shutdown, necessitating board action at this time.

CRA Conveyance Reliability Program (Approp. 15373)

- **CRA Conveyance Rehabilitation –** This is the first of potentially several major projects that will improve the reliability of the CRA canals, tunnels, siphons and reservoirs. This project was evaluated and recommended by the Capital Investment Plan (CIP) Evaluation Team. Approval of this board action will authorize the award of a unit price construction contract in the amount of $8,968,550 to Griffith Company, the low bidder, to implement canal repairs, reservoir lining repairs, trash rack replacement and headgate repairs. This bid is partially based on unit prices for estimated quantities stated in the specifications. The $8,968,550 bid price will be adjusted, as necessary, in accordance with actual quantities. The construction will occur primarily during the two planned shutdowns of the aqueduct beginning in October 2002 and February 2003. The on-going investigations will determine if additional rehabilitation projects are needed. Recommendations for resulting rehabilitation work will be included in the CIP planning process for future fiscal years.

- **CRA Pumping Wells Conversion –** The CRA has blowoffs for dewatering below-grade sections of the aqueduct (siphons). Several of these blowoff valves are non-functional and need to be replaced. Additionally, there is risk that the connecting piping may fail under seismic conditions. This project, which will convert 34 blowoffs to pump wells, can most economically be constructed during a complete shutdown of the aqueduct. To take advantage of the upcoming shutdowns and in light of the long lead-time for the procurement of valves, it is recommended that the project proceed at this time. This project is not included in the budget for FY 2001/02. If the Board approves this recommendation, the FY 2001/02 CIP expenditure plan will be adjusted as needed. It is recommended that the Board authorize funding of $1.45 million for this project and delegate authority to the Chief Executive Officer (CEO) to award an equipment procurement contract not to exceed $350,000. Metropolitan staff will perform the design and construction.

The CRA Conveyance Reliability Program estimate for FY 2001/02 is $14.5 million. The current authorization request increases the appropriated funds to $20.82 million. This increase is due to: (1) additional identified work in the conveyance rehabilitation project, and (2) inclusion of the pumping wells conversion project. Inspections conducted during final design of the conveyance rehabilitation project revealed a greater number of required canal repairs than were previously identified. The conveyance rehabilitation project scope was also expanded to provide more extensive repair of canal access covers, headgate repairs at Hinds and the removal of debris from siphons. If the Board approves this recommendation, the FY 2001/02 CIP expenditure plan will be adjusted.

CRA Electrical/Power System Reliability Program (Approp. 15384)

Four of the Electrical/Power System Reliability projects that have been identified during initial studies can most economically be constructed during a complete shutdown of the aqueduct. This program was evaluated and recommended by the Capital Investment Plan (CIP) Evaluation Team and the funds are included in the FY 2001/02 capital budget for the following projects:

- **Upgrade 230 kV Transformer Protection Relays at All Pumping Plants –** The protection relays for the 230kV transformers are aging. They require frequent maintenance which requires a temporary reduction in plant flows, and it has become increasingly difficult to find replacement parts. Thus replacement of this equipment with new equipment is needed. Metropolitan staff will perform the design and construction. It is recommended that the Board authorize $620,000 for design and construction of this project.

- **230 kV Circuit Breaker Installation at Iron Mountain Pumping Plant –** Currently, the main electrical power feed for the Iron Mountain Pumping Plant has only manual disconnect switches in the Camino West Line. The disconnect switches are unable to automatically isolate the plant when faults occur on the Camino West Line, which affects plant reliability. To provide automatic isolation, it is recommended that a 230 kV circuit breaker be added. Metropolitan staff will perform the design and an outside contractor will perform the construction. It is recommended that the Board authorize $1.65 million and delegate authority to the CEO to award a construction contract not to exceed $1.2 million for this project.

- **Replacement of 6.9 kV Transformer Bushings at Gene Pumping Plant –** The 6.9 kV bushings on the 230/69/6.9 kV transformers at the Gene Pumping Plant have aged and need to be replaced to prevent damage to the transformers. Metropolitan staff will perform the design and installation of the new bushings. It is recommended that the Board authorize $50,000 for design and construction of this project.
- **Lightning Arrester Replacement at All Pumping Plants –** Electrical tests indicate that degradation of 230 kV, 69 kV and 6.9 kV lightning arresters has occurred and that they require replacement. Metropolitan staff will perform the design and construction. It is recommended that the Board authorize $450,000 for design and construction of this project.

CRA Discharge Containment Program (Approp. 15385)

As the result of a Regional Water Quality Control Board inspection, Metropolitan is required to modify the equipment drain systems at Gene and Iron Mountain pumping plants. Metropolitan is precluded from using the equipment until the modifications have been implemented. This requires some equipment to be taken offsite for cleaning and makes onsite cleaning of other equipment more labor intensive. This project was originally scheduled to be implemented in FY 2002/03. However, to expedite the return of this equipment to service, it is recommended that the Board authorize this project to proceed at this time. If the Board approves this recommendation, the FY 2001/02 CIP expenditure plan will be adjusted as needed. Metropolitan staff will perform the design and construction. It is recommended that the Board authorize $240,000 for design and construction of this project.

See **Attachment 1** for the Detailed Report, **Attachment 2** for the Abstract of the Bids, and **Attachment 3** for the Financial Statements.

Policy

Metropolitan Water District Administrative Code § 5108: Capital Project Appropriation

California Environmental Quality Act (CEQA)

CEQA determination for Staff Recommendation:

The proposed projects previously identified in the three Capital Investment Plan programs have been evaluated pursuant to CEQA and the State CEQA Guidelines. Some of the proposed projects were analyzed in the previously adopted Mitigated Negative Declaration for the CRA Conveyance Reliability Program, 2002 Shutdown Repairs (Metropolitan Report No. 1177), while others were deemed exempt from CEQA. The proposed projects have been grouped together by their similar CEQA determinations and discussed below.

CRA Conveyance Reliability Program (Approp. 15373): CRA Conveyance Rehabilitation and CRA Pumping Well Conversions.

To comply with the CEQA, Metropolitan as the Lead Agency prepared a Mitigated Negative Declaration (MND) on several activities that included these two proposed projects. The MND was distributed for a 30-day public review period that began on October 26, 2001. The Board later adopted the MND and the mitigation monitoring and reporting program on January 8, 2002. Hence, the previously adopted environmental documentation in conjunction with the two proposed projects fully complies with CEQA and the State CEQA Guidelines. As such, no further environmental documentation is necessary for the Board to act on with respect to these two proposed projects.

The CEQA determination is: Determine that the two proposed projects have been previously addressed in the 2002 adopted MND and that no further environmental analysis or documentation is required.

CRA Electrical/Power System Reliability Program (Approp. 15384)*:* Upgrade 230 kV transformer protection relays at all pumping plants, 230 kV circuit breaker installation at Iron Mountain Pumping Plant, replacement of 6.9 kV transformer bushings at Gene pumping plant, and lightning arrester replacement at all pumping plants.

***CRA Discharge Containment Program (Approp. 15385)**:* Modification of equipment drain systems at Gene and Iron Mountain pumping plants.

The five proposed projects within the two Capital Investment Plan programs are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed activities involve the design, funding, and construction or modification of existing Metropolitan facilities associated with the CRA involving negligible or no expansion of use and no possibility of significantly impacting the physical environment. As such, the five proposed projects qualify under a Class 1 Categorical Exemption (Section 15301 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the five proposed projects qualify under a Categorical Exemption (Class 1, Section 15301 of the State CEQA Guidelines).

Staff Recommendation

Adopt the CEQA determination for the projects described herein and

a. Appropriate $19.66 million in budgeted and non-budgeted funds;
b. Award a construction contract in the amount of $8,968,550 to Griffith Company for the CRA Conveyance Rehabilitation; and
c. Delegate to the CEO the authority to award competitively bid contracts, not to exceed (1) $1.2 million for the Iron Mountain circuit breaker construction contract, and (2) $350,000 for the CRA Pumping Wells Conversion equipment procurement contract.

Fiscal Impact: $19.66 million of budgeted and unbudgeted CIP funds under the following appropriations:

- Appropriation 15373 (CRA Conveyance): $10.33 million budgeted
- Appropriation 15373 (CRA Conveyance): $6.32 million unbudgeted
- Appropriation 15384 (CRA Electrical/Power): $2.77 million budgeted
- Appropriation 15385 (CRA Discharge Containment): $240,000 unbudgeted

Roy L. Wolfe 4/25/2002
Roy L. Wolfe *Date*
Manager, Corporate Resources

Ronald R. Gastelum 5/20/2002
Ronald R. Gastelum *Date*
Chief Executive Officer

Attachment 1 – Detailed Report

Attachment 2 – Abstract of the Bids

Attachment 3 – Financial Statement

BLA #1563

Detailed Report

Purpose/Background

The CRA conveyance structures have been in operation for more than 60 years. In the mid-1980s, staff performed major rehabilitation work on the pump units at each of the five pumping plants. The balance of the system is now in need of major refurbishment. In 2000, Metropolitan staff initiated the Infrastructure Reliability and Protection Plan (IRPP). The purpose of the IRPP is to evaluate Metropolitan's infrastructure (pumping plants, water treatment plants, conveyance systems, and all associated components) to ensure that Metropolitan can continue to supply reliable, high-quality drinking water to its entire service area. Staff formed a team to implement the IRPP for the CRA conveyance system. The system includes the CRA canals, tunnels, siphons, reservoirs, pumps, pump support systems, power and electrical systems, and containment and waste discharge systems. The projects are organized into four programs as described in the FY 2001/02 CIP: the CRA Conveyance Reliability Program, the CRA Pumping Plant Reliability Program, the CRA Electrical/Power System Reliability Program, and the CRA Discharge Containment Program.

In August 2001, the Board authorized the initial study and investigation for the Conveyance Reliability Program and the Pumping Plant Reliability Program. By January 2002, some of the initial studies had been completed and the Board authorized funds for final design and advertising of the Conveyance Reliability Program, Part 1, and for the repair and replacement of selected pumping plant equipment. Also in January 2002, the initial study and investigation for the Electrical/Power System Reliability and the Discharge Containment Programs, and Conveyance Reliability Program, Part 2, were authorized.

Several of the studies and projects previously authorized by the Board have progressed to the design and construction phase. The CRA Conveyance Rehabilitation, Part 1 project has been advertised and bids received. In this action, it is recommended that the Board authorize funds for final design, for District Force construction, and authorize award of construction and procurement contracts for the projects in three of the CRA Reliability Programs discussed below.

Recommended Improvements

(1) CRA Conveyance Reliability Program (Approp. 15373)

- **CRA Conveyance Rehabilitation, Part 1 Project**

  Project Description

  The work for this project has been developed under Specifications 1445. The work scope includes:

  Canal Lining Repairs and Associated Work
  Reservoir Lining Repairs
  Trash Rack Replacement at Eagle Mountain, Iron Mountain and Hinds pumping plants
  Head-Gate Structure Leaks and Gate Repairs at all pumping plants

  Bids Received

  Nine (9) bids were received and opened under Specifications No. 1445, as amended, for CRA Conveyance Rehabilitation, Part 1. The bids are shown on the attached Abstract of Bids (Attachment 2). The low bid from Griffith Company in the amount of $8,968,550 complies with the requirements of the specifications, is $920,338 below the next lowest bid, and is $2,731,450 below the Engineer's Estimate.

  Due to the difficulty in quantifying certain components of the work, the bidder is required to provide a unit price for performing these work components based on the estimated quantities in the specifications. The bids are based on unit prices for estimated quantities. The actual price paid for the work will vary depending on the quantities encountered during construction.

Business Outreach

Specifications No. 1445 established a Small Business Enterprise (SBE) requirement of 20 percent. The Griffith Company has met the requirement by committing to a SBE participation of 24.5 percent of the project.

- **CRA Pumping Well Conversions**
  The Colorado River aqueduct has numerous blowoffs associated with below grade sections of the aqueduct (siphons). The blowoffs are comprised of valves and associated piping that are used to dewater the siphons for maintenance. Several of these blowoff assembly valves are not functional and/or there is risk of the connecting piping failing under seismic conditions. The failure of the assemblies could lead to an uncontrolled loss of water from the aqueduct, potentially requiring an extended shutdown of the aqueduct for repairs. The project will reconfigure the piping and replace valves to enable the facilities to be operated as pump wells for removing water from the siphons. This project can most economically be constructed during a complete shutdown of the aqueduct and thus it is recommended that the project proceed at this time.

(2) CRA Electrical/Power System Reliability Program (Approp. 15384)

Four of the Electrical/Power System Reliability projects that have been identified to date can be constructed most economically with a complete shutdown of the aqueduct. It is recommended that the Board authorize these projects to proceed. The projects include:

- **Upgrade 230 kV Transformer Protection Relays at All Pumping Plants**

  The protection relays for the 230kV transformers were provided at the time of the original installation of the transformers. The existing protection relays require frequent maintenance and it is becoming increasingly difficult to find replacement parts. In addition, testing of the existing relays is time consuming and requires the capacity of a pumping plant to be decreased temporarily to 4-pump capacity to perform the testing. It is recommended that the Board authorize the replacement of the protection relays with new equipment that will provide for rapid change-out, enhanced transformer monitoring capability, and self-checking features. The new equipment can be maintained without reducing the flow in the CRA.

- **230 kV Circuit Breaker Installation at Iron Mountain Pumping Plant**

  Currently, the main electrical power feed for the Iron Mountain Pumping Plant has only manual disconnect switches in the Camino West Line. These switches are used to isolate the plant from the 230 kV power feed from Hoover Dam. These disconnect switches are presently unable to automatically isolate the plant when faults occur on the Camino West Line. Accordingly, there is a delay in returning the pumping plant to service when these faults occur. This leads to spilling of up to 300 acre-feet (AF) of water during transients and other switching operations. It is recommended that a 230 kV gas circuit breaker be added at Iron Mountain to allow automatic switching.

- **Replacement of 6.9 kV Transformer Bushings at Gene Pumping Plant**

  The 6.9 kV bushings on the 230/69/6.9 kV transformers at the Gene Pumping Plant have aged and are leaking. In this condition, moisture can leak past the bushings and potentially damage the high cost transformers. It is recommended that the Board authorize the replacement of the bushings.

- **Lightning Arrester Replacement at all Pumping Plants**

  Electrical tests indicate degradation of 230 kV, 69 kV, and 6.9 kV lightning arresters. Spare parts for the aging equipment are no longer available and thus the arresters must be replaced. Some of the arresters will be relocated to provide better equipment protection. It is recommended that the Board authorize the replacement of the lightning arresters.

(3) CRA Discharge Containment Program (Approp. 15385)

One of the CRA Discharge Containment Program projects is ready to go forward. The project involves the connection of equipment drain systems to leach fields. This project is mandated by the Regional Water Quality Control Board and involves modifications of the existing systems at Gene Pumping Plant and Iron Mountain Pumping Plant. At Gene plant, some of the equipment area drains are not connected to leach fields. Additional piping and pumping equipment will be required to direct the drains to an existing leach field. At Iron Mountain, the heavy equipment vehicle wash area is to be connected to the existing leach field. To comply with the Regional Board requirements, a concrete slab with an awning also needs to be constructed at Iron Mountain. Metropolitan is precluded from using the equipment until the modifications have been implemented. In lieu of having the drain systems available, some equipment is taken offsite for cleaning and spills in the equipment maintenance areas need to be locally contained and disposed offsite. This involves extra labor and expense.

ABSTRACT OF THE BIDS

Specifications No. 1445, (as Amended)
Colorado River Aqueduct Conveyance Rehabilitation, Part 1
Bid Opening: March 26, 2002, at 2:00 p.m.
Project # 103201
Engineer's Estimate: $11,700,000
Small Business Enterprise Requirement: 20%

RANK	BIDDER & LOCATION	TOTAL ITEMS 1 THROUGH 2	SBE % (20%)	SBE MET?	Amount Over Next Lowest Bidder	Percent Over Next Lowest Bidder	Percent Over Low Bidder	
1	Griffith Company Santa Fe Springs, CA	$ 8,968,550.00	24.50%	Yes				
2	Cone Engineering Contractors San Ramon, CA	$ 9,888,888.00			$ 920,338	10.26%	10.26%	
3	Granite Construction Company Indio, CA	$ 10,514,375.00			$ 625,487	6.33%	17.24%	
4	J. F. Shea Construction, Inc. Walnut, CA	$ 10,666,341.00			$ 151,966	1.45%	18.93%	
5	Buso Constructors, Inc. La Mirada, CA	$ 11,170,000.00			$ 503,659	4.72%	24.55%	
6	American Civil Constructors West Coast, Inc. Benicia, CA	$ 13,990,000.00			$ 2,820,000	25.25%	55.99%	
7	Steve Bubalo Construction Co. Monrovia, CA	$ 14,221,000.00			$ 231,000	1.65%	58.57%	
8	Steve P. Rados, Inc. Santa Ana, CA	$ 15,017,000.00			$ 796,000	5.60%	67.44%	
9	Kiewit Pacific Co. Santa Fe Springs, CA	$ 15,715,930.00			$ 698,930	4.65%	75.23%	
				Average Bid			$ 12,239,120	36.47%
				Median Bid			$ 11,170,000	24.55%
				Engineer's Estimate			$ 11,700,000	30.46%

Financial Statement for CRA Conveyance Reliability Program

A breakdown of Board Action No. 3 for Appropriation No. 15373 for the CRA Conveyance Reliability Program described in this board action is as follows:

	Previous Board Action No. 2 (Jan. 2002)	Current Board Action No. 3 (June 2002)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 1,225,000	$ 0	$ 1,225,000
Design and Specifications	240,000	100,000	340,000
Owner Costs (Program Management, Environmental Docs., Bidding Process)	1,145,000	490,000	1,635,000
Construction Management		2,450,000	2,450,000
Metropolitan Force Installation and Construction		870,000	870,000
Materials and Supplies		590,000	590,000
Incidental Expenses	25,000	5,000	30,000
Professional/Technical Services	900,000	0	900,000
Equipment Use		6,450	6,450
Contracts		8,968,550	8,968,550
Remaining Budget	635,000	3,170,000	3,805,000
Total	**$ 4,170,000**	**$ 16,650,000**	**$ 20,820,000**

Funding Request

Program Name:	Colorado River Aqueduct Conveyance Reliability Program		
Source of Funds:	Construction Funds (General Obligation, Revenue Bonds, Pay-Go Fund)		
Appropriation No.:	15373	**Board Action No.:**	3
Requested Amount:	$ 16,650,000	**Capital Program No.:**	01204
Total Appropriated Amount:	$ 20,820,000	**Capital Program Page No.:**	E-18
Program Estimate:	$ 14,500,000*	**Program Goal:**	I-Infrastructure Reliability

* Amount shown in FY01/02 CIP Appendix. The Total Program Estimate for FY02/03 is increased to $22,700,000, which reflects added projects and bids received.

Financial Statement for CRA Electrical/Power System Reliability Program

A breakdown of Board Action No. 2 for Appropriation No. 15384 for the CRA Electrical/Power System Reliability Program described in this board action is as follows:

	Previous Board Action No. 1 (Jan. 2002)	Current Board Action No. 2 (June 2002)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 185,000	$ 0	$ 185,000
Design and Specifications	0	280,000	280,000
Owner Costs (Program Management, Environmental Docs., Control System Integration, Bidding Process)	150,000	67,000	217,000
Construction Management	0	195,000	195,000
Metropolitan Force Installation and Construction	0	410,000	410,000
Materials and Supplies	0	410,000	410,000
Incidental Expenses	25,000	35,000	60,000
Equipment Use	0	3,000	3,000
Contracts	0	1,000,000	1,000,000
Remaining Budget	50,000	370,000	420,000
Total	**$ 410,000**	**$ 2,770,000**	**$ 3,180,000**

Funding Request

Program Name:	Colorado River Aqueduct Electrical/Power System Reliability Program		
Source of Funds:	Construction Funds (General Obligation, Revenue Bonds, Pay-Go Fund)		
Appropriation No.:	15384	**Board Action No.:**	2
Requested Amount:	$ 2,770,000	**Capital Program No.:**	01207
Total Appropriated Amount:	$ 3,180,000	**Capital Program Page No.:**	E-19
Program Estimate:	$ 7,800,000*	**Program Goal:**	I-Infrastructure Reliability

* Amount shown in FY01/02 CIP Appendix.

Financial Statement for CRA Discharge Containment Program

A breakdown of Board Action No. 2 for Appropriation No. 15385 for the CRA Discharge Containment Program described in this board action is as follows:

	Previous Board Action No. 1 (Jan. 2002)	Current Board Action No. 2 (June 2002)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 116,000	$ 0	$ 116,000
Design and Specifications	0	32,000	32,000
Owner Costs (Program Management, Environmental Docs., Bidding Process)	100,000	32,000	132,000
Construction Management	0	17,000	17,000
Metropolitan Force Installation and Construction	0	82,000	82,000
Materials and Supplies	0	33,000	33,000
Incidental Expenses	30,000	3,000	33,000
Equipment Use	0	10,000	10,000
Contracts	0	0	0
Remaining Budget	25,000	31,000	56,000
Total	**$ 271,000**	**$ 240,000**	**$ 511,000**

Funding Request

Program Name:	Colorado River Aqueduct Discharge Containment Program		
Source of Funds:	Construction Funds (General Obligation, Revenue Bonds, Pay-Go Fund)		
Appropriation No.:	15385	**Board Action No.:**	2
Requested Amount:	$ 240,000	**Capital Program No.:**	01209
Total Appropriated Amount:	$ 511,000	**Capital Program Page No.:**	E-20
Program Estimate:	$ 4,690,000*	**Program Goal:**	R-Regulatory-Other

* Amount shown in FY01/02 CIP Appendix.