



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

November 10, 2009 Board Meeting

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**7-2**

**Subject**

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Appropriate \$390,000; and authorize final design of two Colorado River Aqueduct rehabilitation projects (Approp. 15438)

**Description**

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This action authorizes final design to upgrade the flow and chlorine monitoring station at Mile 12 of the Colorado River Aqueduct (CRA) and to construct storage buildings at Gene Pumping Plant. The existing monitoring equipment at Mile 12 is critical for monitoring aqueduct flow rates and chlorine levels, and is severely corroded due to age and exposure to chlorine vapors. The replacement of storage buildings at Gene Pumping Plant will protect and secure existing equipment from the extreme desert environment.

**Timing and Urgency**

Failure of the Mile 12 monitoring station would reduce reliability of CRA operations. Not having the flow and chlorine concentration information from Mile 12 could lead to: pumping less water than available; pumping more water than the aqueduct's capacity, which could cause spills; or injecting inadequate amounts of chlorine for quagga mussel control. Because of the advancing state of corrosion at Mile 12, staff recommends proceeding with the upgrades at this time.

Gene Pumping Plant currently has inadequate storage for CRA-related maintenance equipment due to damage and previous demolition of the existing storage buildings. The CRA equipment is currently stored outside. Staff recommends proceeding with construction of replacement buildings to protect Metropolitan's investment in this equipment and to prevent premature failure or theft.

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 2009/10.

**Project No. 1 – Mile 12 Monitoring Station Upgrades – Final Design Phase (\$210,000)**

The Mile 12 monitoring station is located approximately 5 miles downstream of Copper Basin reservoir at an isolated site. Monitoring equipment includes a set of flow meters with instrumentation, chlorine analyzers, communication equipment, solar panels, and batteries. The information collected at the monitoring station is used to adjust flow rates at the pumping plants and reservoir outlet gates, and to adjust chlorine injection rates at Copper Basin Reservoir.

The Mile 12 monitoring station is presently located below ground within a manhole structure, directly above a pipeline portion of the aqueduct. The existing monitoring equipment was put into operation in the early 1990s. Typically these types of devices have a useful service life of approximately 15 years. Although the equipment has performed well, it has exceeded its life span and is beginning to fail which has led to unreliable readings, and interruptions in transmission of data. The vendor also no longer manufactures much of the equipment and replacement parts are difficult to obtain. In addition, following the introduction of chlorine at Copper Basin reservoir in 2007 to control the quagga mussel population, equipment at the monitoring station became exposed to residual chlorine vapors. Chlorine vapors are extremely corrosive to a number of metals. This exposure has accelerated the deterioration of key equipment components. At the present time, Water System Operations staff

makes frequent trips to this isolated site to verify the flow rates and the chlorine residual measurements. Prior to entering the structure, chlorine concentrations must be tested to ensure that the manhole is safe to enter.

In April 2008, Metropolitan's Board authorized preliminary design for upgrades to the Mile 12 monitoring station. Staff has completed preliminary design and recommends proceeding with final design at this time. Planned improvements include replacement of the existing deteriorated flow meters with new ultrasonic models that are compatible with other meters in use throughout the CRA; relocation of the data and communications equipment from the underground manhole to a new aboveground monitoring station; and construction of a reliable power source. Relocating the sensitive electrical equipment into an aboveground structure, away from the chlorine vapors, will extend the life of the new equipment and provide a safer working environment for staff.

The equipment at Mile 12 is currently powered through small solar panels and batteries. Moving the equipment into an aboveground structure will require air-conditioned cabinets to ensure proper operation of the new equipment, which will increase the electrical load and annual consumption. Staff investigated the possibility of enlarging the solar panel array to power the additional load, but concluded that installation of a power line would be more cost-effective and unobtrusive. For the Mile 12 installation, the new power demand is estimated to be 2.5 kilowatts (kW). For facilities with small continuous electrical demands such as this, it is typically more cost-effective to buy power from the local provider than to install a solar power system, which would require battery storage for off-peak electrical consumption. Rebates for installation of solar panels are not available for this location, as an existing metered connection is required through a utility in order to obtain rebates from the California Solar Initiative (CSI) program. Finally, the local electricity rate (approximately \$0.03/kW hour) is extremely favorable due to Metropolitan's wholesale hydroelectric rates for the CRA facilities.

This action appropriates \$210,000 and authorizes final design phase activities for the Mile 12 Monitoring Station Upgrades. Final design will be performed by Metropolitan staff. The work includes engineering design, preparation of drawings, environmental surveys, and development of a construction cost estimate. The final design cost as a percentage of the total estimated construction cost is approximately 14.5 percent. Engineering Services' 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 \$650,000 to \$750,000. Staff will return to the Board at a later date for the authorization of construction by Metropolitan forces.

#### **Project No. 2 – Gene Pumping Plant Storage Building Replacement – Final Design Phase (\$180,000)**

Gene Pumping Plant serves as headquarters for maintenance of the CRA system. Equipment stored at the plant includes boats, pumps, maintenance tools, and water quality test equipment. Three 70-year-old metal-sided buildings were formerly used to store this equipment. Due to severe structural deficiencies, two of these buildings were recently demolished. Rehabilitation of the remaining building, which has corroded metal siding and roofing, and deteriorated timber frames, would involve substantial modifications to bring it up to current building codes.

In April 2008, Metropolitan's Board authorized preliminary design to replace the three old storage buildings with two new prefabricated, code-compliant buildings. Staff has completed preliminary design for the layouts of the buildings, and has established the design parameters required for procurement of the buildings and for permit approvals. The two prefabricated buildings will be constructed of steel and will have a storage space of 7,000 square feet, which will be approximately equal to the size of the three original buildings. The replacement buildings will be installed on new concrete slab foundations. Minor grading will be performed at the site to facilitate access and allow for proper drainage.

This action appropriates \$180,000 and authorizes final design phase activities for the Gene Storage Building Replacement project. Final design will be performed by Metropolitan staff. The work includes engineering design, preparation of drawings and specifications, development of a construction cost estimate, receipt of bids, and all other activities in advance of award of a construction contract. The final design cost as a percentage of the total estimated construction cost is approximately 14 percent. Engineering Services' 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 \$620,000 to \$700,000. Staff will return to the Board at a later date for award of the construction contract.

See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

These projects are consistent with Metropolitan's goals for sustainability by enhancing reliability of the existing conveyance facilities and by providing for prudent use and management of assets.

### ***Project Milestones***

February 2010 – Completion of final design of the Gene Pumping Plant storage building replacement

March 2010 – Completion of final design of the Mile 12 monitoring station upgrades

## **Policy**

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Metropolitan Water District Administrative Code Section 5108: Appropriations

### **California Environmental Quality Act (CEQA)**

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CEQA determination for Options #1 and #2:

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 #3:

None required

## **Board Options**

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### **Option #1**

Adopt the CEQA determination and

- a. Appropriate \$390,000;
- b. Authorize final design of upgrades to the CRA Mile 12 Monitoring Station; and
- c. Authorize final design of equipment storage buildings at Gene Pumping Plant.

**Fiscal Impact:** \$390,000 in budgeted funds under Approp. 15438

**Business Analysis:** These projects will enhance CRA reliability, improve operational efficiency and workplace safety, and protect Metropolitan's assets.

### **Option #2**

Adopt the CEQA determination and

- a. Appropriate \$210,000;
- b. Authorize final design of upgrades to the CRA Mile 12 Monitoring Station; and
- c. Do not authorize final design of equipment storage buildings at Gene Pumping Plant.

**Fiscal Impact:** \$210,000 in budgeted funds under Approp. 15438

**Business Analysis:** Upgrade of the Mile 12 monitoring station would improve operational efficiency and workplace safety. This option would forego an opportunity to replace the storage buildings at Gene Pumping Plant; staff will continue to store existing equipment outdoors, which could lead to accelerated deterioration of the equipment.

### **Option #3**

Do not authorize the two CRA reliability projects.

**Fiscal Impact:** None

**Business Analysis:** This option would forego an opportunity to reduce operating costs and enhance reliability. Staff will continue the increased frequency of inspection at the Mile 12 chlorine monitoring station. The existing equipment will continue to function at a lower level of reliability, including a reduced degree of control for quagga mussels. This action does not provide a consistent level of reliability and maintenance of Metropolitan's assets throughout the CRA system.

**Staff Recommendation**

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Option #1

  
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Roy L. Wolfe  
Manager, Corporate Resources

10/20/2009  
Date

  
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Jeffrey Kightlinger  
General Manager

10/28/2009  
Date

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Map**

BLA #6756

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

A breakdown of Board Action No. 6 for Appropriation No. 15438 for the Mile 12 Monitoring Station Upgrades project\* and the Gene Pumping Plant Storage Building Replacement project\*\* is as follows:

|   | <b>Previous Total<br/>Appropriated<br/>Amount<br/>(Oct. 2009)</b> | <b>Current Board<br/>Action No. 6<br/>(Nov. 2009)</b> | <b>New Total<br/>Appropriated<br/>Amount</b> |
|---|---|---|--|
| Labor   |   |   |  |
| Studies and Investigations                                  | \$ 961,800  | \$ -  | \$ 961,800                                   |
| Final Design  | 350,500   | 207,600   | 558,100                                      |
| Owner Costs (Program mgmt.,<br>bidding process, permitting) | 758,690   | 114,000   | 872,690                                      |
| Construction Inspection and Support                         | 28,800  | -   | 28,800                                       |
| Metropolitan Force Construction                             | 53,300  | -   | 53,300                                       |
| Materials and Supplies                                      | 1,495,405   | -   | 1,495,405                                    |
| Incidental Expenses   | 39,400  | 7,000   | 46,400                                       |
| Professional Services                                       | 522,000   | 10,000  | 532,000                                      |
| Equipment Use   | -   | -   | -  |
| Contracts   | -   | -   | -  |
| Remaining Budget  | 492,105   | 51,400  | 543,505                                      |
| <b>Total</b>  | <b>\$ 4,702,000</b>   | <b>\$ 390,000</b>                                     | <b>\$ 5,092,000</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>         | 6                            |
| <b>Requested Amount:</b>          | \$ 390,000  | <b>Capital Program No.:</b>      | 15438                        |
| <b>Total Appropriated Amount:</b> | \$ 5,092,000  | <b>Capital Program Page No.:</b> | 283                          |
| <b>Total Program Estimate:</b>    | \$ 25,350,000   | <b>Program Goal:</b>             | I-Infrastructure Reliability |

\* The total amount expended to date on the Mile 12 Monitoring Station Upgrades project is approximately \$134,000.

\*\* The total amount expended to date on the Gene Pumping Plant Storage Building Replacement project is approximately \$96,000.

### CRA Rehabilitation Projects

