



- Board of Directors  
*Engineering and Operations Committee*

10/9/2012 Board Meeting

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**7-2**

## **Subject**

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Appropriate \$130,000; and authorize preliminary design to replace the heating, ventilating, and air conditioning system at Metropolitan's Water Quality Laboratory in La Verne (Approp. 15391)

## **Executive Summary**

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This action authorizes preliminary design to replace a chiller, boilers, cooling tower, and other associated heating, ventilating and air conditioning (HVAC) equipment at Metropolitan's Water Quality Laboratory, which is located on the site of the F. E. Weymouth Water Treatment Plant.

### **Timing and Urgency**

Metropolitan's Water Quality Laboratory at La Verne conducts more than 300,000 water quality analyses each year to ensure that water deliveries to member agencies meet the highest water quality standards. Samples from throughout the distribution system and from Metropolitan's treatment plants are analyzed at the laboratory on a daily basis, in order to comply with state and federal drinking water standards.

The existing HVAC system for the southern half of the Water Quality Laboratory building is over 27 years old, is nearing the end of its service life, and is no longer energy-efficient. Replacement of this equipment is needed to maintain the capability to conduct mandatory water quality analyses and submit regulatory reports without the risk of interruption, to continue the facility's compliance with laboratory safety standards, and to enhance worker safety under the laboratory fume hoods. Moving forward with this project will provide an up-to-date, energy-efficient, maintainable HVAC system, and will minimize the risk of system failure. The HVAC system serving the northern portion of the building is in good condition, and does not require major rehabilitation work at this time.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria and is categorized as an Infrastructure Reliability project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2012/13.

## **Details**

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### **Background**

The Water Quality Laboratory was originally constructed in 1985 to perform water quality testing for all of Metropolitan's treatment plants and the distribution system, and to support Metropolitan's efforts to assess emerging contaminants and future treatment technologies. In 1996, the laboratory was expanded to provide new workspace for applied research, regulatory compliance, and administrative needs.

The laboratory was constructed in two phases. As a result, it has two HVAC systems to meet the facility's climate control and code-required ventilation needs. The first system serves the original 27,000-square-foot southern portion of the building, where a majority of the analytical testing work is performed on a daily basis. The second system serves the 30,000-square-foot northern portion of the building, which houses both offices and analytical testing areas.

Much of the HVAC equipment serving the building's original laboratory area is over 27 years old. It is comprised of a 175-ton cooling capacity chiller, two 1.2-million-Btu/hour hot water boilers, and a 175-ton cooling tower, as well as miscellaneous pumps, balancing valves, fan coil units, fume hoods, pneumatic control systems, and other mechanical components. To maintain temperature control for individual zones within the southern portion of the building, cold water and hot water generated by the chiller and boilers are pumped to 24 distributed fan coil units. At each fan coil unit, outdoor air is filtered and drawn across a dual-purpose cooling/heating coil to condition the air as required. The conditioned air is then discharged into each laboratory area. Exhaust fans for the laboratory's fume hoods draw conditioned air from the workspace into the fume hoods, which exhaust the fumes outside of the building.

The southern portion of the laboratory needs an operable HVAC system that can maintain samples and calibrated laboratory equipment at appropriate temperatures while providing ventilation air to the fume hoods during use by laboratory technicians. Laboratory safety procedures require that the building's HVAC system operate whenever chemists and microbiologists work on samples under the fume hoods.

The existing southern HVAC system is near the end of its service life, is inefficient, and needs to be replaced. Over the past five years, the HVAC system has required increasingly frequent repairs, while replacement parts have become more difficult and costly to obtain. In addition, the refrigerant used within the existing cooling equipment is being phased out by the USEPA. Coolant maintenance will soon become cost-prohibitive and impractical due to phase-out of the refrigerant. Replacement of the HVAC equipment provides an opportunity for Metropolitan to install more advanced HVAC controls which have recently become available. These control systems can provide greater energy efficiency, track and manage building energy use, and provide superior control over environmental conditions.

The HVAC system serving the northern portion of the building is in good condition at this time, and no major rehabilitation work is anticipated for this system. However, under the planned project, staff will investigate the potential benefits and costs of integrating the HVAC controls for both the northern and southern portions of the building with a modern advanced control system.

Staff recommends moving forward with preliminary design to replace the southern HVAC system with up-to-date, energy-efficient equipment in order to maintain reliable operation of the laboratory. Short-term failure of the HVAC system could allow temperatures to exceed acceptable workplace limits as the building has no openable windows, or could cause sample analyses or equipment calibration to fail quality control parameters. Major HVAC equipment failure could result in delays to water quality compliance testing, potential breakdown of expensive laboratory equipment, and/or costly outsourcing of laboratory analyses.

#### **Water Quality Laboratory HVAC Replacement – Preliminary Design Phase (\$130,000)**

Planned improvements to the HVAC system include replacement of the chiller, boilers, and cooling tower equipment. Field investigations will also be conducted to confirm whether the building's fan coil units, fume hoods, and temperature control systems also need to be replaced.

The preliminary design phase activities include an evaluation of alternative cooling refrigerants; a condition assessment of the fan coil units, fume hoods, and system controls; preparation of an installation sequencing plan to maintain the laboratory in operation during replacement of the equipment; hazardous materials testing; development of design criteria; initiation of permitting activities; and preparation of a detailed cost estimate.

This action appropriates \$130,000 and authorizes preliminary design phase activities for the Water Quality Laboratory HVAC Replacement project. All work will be performed by Metropolitan staff. This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2012/13 capital expenditure plan. See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

This project is included within capital Appropriation No. 15391, the Power Reliability and Energy Conservation Program. Other projects authorized under Appropriation No. 15391 include the La Verne Facility Lighting Upgrades, the Skinner Solar Power Generation Facility, the Treatment Plant Energy Management System

Installation, and the OC-88 Energy Savings Modifications. With the present action, the total funding for Appropriation No. 15391 will increase from \$33,797,000 to \$33,927,000.

### ***Project Milestone***

May 2013 – Completion of preliminary design for the Water Quality Laboratory HVAC Replacement

### **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 Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists of basic data collection and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies as a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

### **Board Options**

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#### **Option #1**

Adopt the CEQA determination and

- a. Appropriate \$130,000; and
- b. Authorize preliminary design to replace the original HVAC system at Metropolitan's Water Quality Laboratory in La Verne.

**Fiscal Impact:** \$130,000 in capital funds under Approp. 15391

**Business Analysis:** This option will enhance reliability of the Water Quality Laboratory HVAC system and reduce energy consumption.

#### **Option #2**

Do not proceed with the HVAC replacement project at this time.

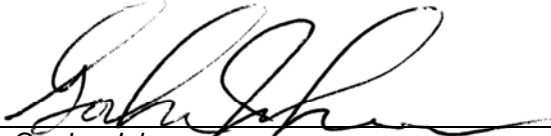
**Fiscal Impact:** None

**Business Analysis:** This option would forego an opportunity to enhance reliability of the Water Quality Laboratory HVAC system while reducing energy consumption. Staff will continue to replace existing HVAC equipment and/or coolant when breakdowns occur, as long as replacement parts and refrigerant are available. At some future time, continued repair of the existing equipment will be infeasible and/or cost-prohibitive because the chiller refrigerant is being phased out and replacement parts will be unavailable.

**Staff Recommendation**

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Option #1

  
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Gordon Johnson  
Manager/Chief Engineer  
Engineering Services

9/18/2012  
Date

  
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Jeffrey Kightlinger  
General Manager

9/26/2012  
Date

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Map**

Ref# es12619817

**Financial Statement for Power Reliability and Energy Conservation Program**

A breakdown of Board Action No. 9 for Appropriation No. 15391 for the Water Quality Laboratory HVA Replacement project<sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount (Sept. 2009)</b>	<b>Current Board Action No. 11 (Oct. 2012)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 510,000	\$ 98,600	\$ 608,600
Final Design	847,000	-	847,000
Owner Costs (Program mgmt., permitting)	1,242,700	25,400	1,268,100
Submittals Review & Record Drwgs.	481,500	-	481,500
Control Systems Integration	156,500	-	156,500
Construction Inspection & Support	2,372,250	-	2,372,250
Metropolitan Force Construction	391,000	-	391,000
Value Engineering	60,000	-	60,000
Materials & Supplies	1,020,000	-	1,020,000
Incidental Expenses	140,105	-	140,105
Professional/Technical Services	3,220,000	-	3,220,000
Equipment Use	-	-	-
Contracts	22,447,000	-	22,447,000
Remaining Budget	908,945 <sup>2</sup>	6,000	914,945
<b>Total</b>	<b>\$ 33,797,000</b>	<b>\$ 130,000</b>	<b>\$ 33,927,000</b>

**Funding Request**

<b>Program Name:</b>	Power Reliability and Energy Conservation Program		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15391	<b>Board Action No.:</b>	9
<b>Requested Amount:</b>	\$ 130,000	<b>Capital Program No.:</b>	15391-E
<b>Total Appropriated Amount:</b>	\$ 33,927,000	<b>Capital Program Page No.:</b>	325
<b>Total Program Estimate:</b>	\$ 105,253,000	<b>Program Goal:</b>	Other

<sup>1</sup> This action is the initial appropriation for the Water Quality Laboratory HVAC Replacement project.

<sup>2</sup> Includes previous reallocation of Remaining Budget for the following projects: (1) \$120,000 for specialized assistance in preparation of the Energy Management and Reliability Study for Metropolitan’s Energy Management Plan; and (2) \$224,000 for preparation of an addendum to the Mitigated Negative Declaration, minor design changes, design coordination with the Weymouth Electrical Upgrades project, and revision of Specifications No. 1678 for the Weymouth Solar Power Facility.

# F.E. Weymouth Water Treatment Plant

