



- Board of Directors
Engineering and Operations Committee

8/20/2013 Board Meeting

7-4

Subject

Appropriate \$610,000; and authorize final design and procurement of heating, ventilating, and air conditioning equipment for Metropolitan's Water Quality Laboratory (Approp. 15391)

Executive Summary

This action authorizes final design to replace a chiller, boilers, cooling tower, and associated heating, ventilating, and air conditioning (HVAC) equipment at Metropolitan's Water Quality Laboratory in La Verne. This action also authorizes procurement and installation of a new air-cooled chiller.

Timing and Urgency

Metropolitan's Water Quality Laboratory 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 compliance 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 and has begun to fail. Replacement of the HVAC equipment is required to maintain the capability to conduct water quality analyses and submit regulatory reports without the risk of interruption, and to continue complying with laboratory safety standards. In March 2013, the chiller unit that provides cooling for the HVAC system failed. A temporary unit was installed to keep the laboratory in operation at a cost of approximately \$7,500 per month. The planned project will replace principal components of the HVAC system in the southern portion of the laboratory building, beginning with procurement of a new chiller to replace the rental unit. Moving forward with this project will provide a reliable and energy-efficient HVAC system, and will minimize the risk of future system failures. The HVAC system serving the northern portion of the building is presently in good condition, and does not require major rehabilitation work at this time.

This project has been reviewed with Metropolitan's 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 2013/14.

Details

Background

The Water Quality Laboratory is located on the grounds of the F. E. Weymouth Water Treatment Plant in La Verne. The southern portion of the laboratory was constructed in 1985 to perform water quality testing for Metropolitan's treatment plants and the distribution system, and to support 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.

Due to its construction in two phases, the Water Quality Laboratory 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 chiller for cooling, 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 and hot water are generated by the chiller and boilers, and are then pumped to 24 distributed fan coil units within the building. At each fan coil unit, outdoor air is filtered and drawn across a dual-purpose cooling/heating coil to condition the air as required for the space it serves. Exhaust fans for the laboratory's fume hoods draw conditioned air from the workspace into the fume hoods, which then exhaust any fumes outside of the building.

The southern portion of the laboratory needs a reliable HVAC system which can maintain samples and calibrated laboratory equipment at appropriate temperatures while providing ventilation air to the fume hoods used 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. Short-term failure of the HVAC system could allow temperatures to exceed acceptable workplace limits or could cause sample analyses or equipment calibrations 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.

The existing southern HVAC system has begun to fail, is inefficient, and needs to be replaced. In addition, the refrigerant used by the laboratory's existing cooling equipment is being phased out by the U. S. Environmental Protection Agency and will soon become cost-prohibitive and impractical to obtain. In October 2012, Metropolitan's Board authorized preliminary design to replace the HVAC system in the southern portion of the Water Quality Laboratory. Preliminary design has been completed, and staff recommends proceeding with final design at this time.

In March 2013, the chiller unit experienced multiple tube failures. In response, a temporary rental chiller costing approximately \$7,500 per month was installed. Staff recommends that procurement and installation of a new air-cooled chiller move forward as an initial measure, in order to maintain reliable operation of the existing HVAC system in the short term.

The HVAC system serving the northern portion of the laboratory is in good condition at this time, and no major rehabilitation work is anticipated for this system. During the preliminary design effort, staff investigated the potential benefits and costs of integrating the HVAC controls for both the northern and southern portions of the building with an advanced control system. Initial findings indicate that an integrated control system may be beneficial. A detailed assessment of installing an integrated control system will be conducted during the final design effort.

Water Quality Laboratory HVAC Upgrades - Final Design & Procurement (\$610,000)

Planned improvements to the HVAC system include replacement of the chiller, boilers, pumps, and supervisory control system. Final design phase activities will include detailed engineering design, preparation of plans and specifications for replacement of HVAC equipment, receipt of bids, development of a construction cost estimate, and all other activities in advance of award of a construction contract. Staff recommends that final design of the HVAC upgrades be performed by Carollo Engineers, as discussed below. Upon completion of final design, staff will return to the Board for award of a construction contract.

An air-cooled chiller is recommended to be procured and installed at this time to replace the rental chiller unit which is currently serving the southern portion of the building. The new unit will be installed by Metropolitan forces. Replacement of the chiller at this time will provide a reliable, permanent installation and will eliminate monthly rental charges.

This action appropriates \$610,000; authorizes procurement and installation of a new air-cooled chiller; and authorizes final design phase activities for replacement of the HVAC system for the Water Quality Laboratory.

The appropriated funds include \$210,700 for final design; \$183,200 for procurement of the chiller and related materials; \$81,100 for Metropolitan force installation of the chiller; \$61,000 for permitting, bidding, and project management; and \$74,000 for remaining budget. The anticipated cost of final design is approximately 12.8 percent of the estimated construction cost. The construction cost for this work is anticipated to range from \$1.4 million to \$1.7 million. Engineering Services' goal for design of projects with construction cost less than \$3 million is 10 to 15 percent.

Specialized Technical Support (Carollo Engineers) – No Action Required

Design of the HVAC upgrades is recommended to be performed by Carollo Engineers, Inc., under an existing professional services agreement. The planned scope includes preparation of drawings and specifications for the HVAC upgrades, and preparation of procurement specifications for the chiller. Carollo Engineers was selected through a competitive process via Request for Qualifications No. 927. The estimated cost for these services is \$183,900. No amendment to the existing agreement with Carollo is required at this time.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2013/14 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. With the present action, the total funding for Appropriation No. 15391 will increase from \$33,927,000 to \$34,537,000.

The total estimated cost to complete this project, including the amount expended to date, the current funds requested, and future construction costs, is \$2.5 million to \$2.7 million.

Project Milestone

May 2014 – Completion of final design to replace the HVAC system at the Water Quality Laboratory

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 funding and design; minor alterations and replacement of existing public facilities; and minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. In addition, these activities involve negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 2, and Class 4 Categorical Exemptions (Sections 15301, 15302, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; and Class 4, Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed action is categorically exempt and

- a. Appropriate \$610,000;
- b. Authorize final design to replace the HVAC system at Metropolitan’s Water Quality Laboratory; and
- c. Authorize procurement and installation of a new chiller unit.

Fiscal Impact: \$610,000 in capital funds under Approp. 15391

Business Analysis: This option will improve reliability of the Water Quality Laboratory’s 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 improve reliability of the Water Quality Laboratory’s HVAC system. Staff would continue renting the temporary chiller unit. At some future time, continued repair of the existing HVAC equipment will be infeasible and/or cost-prohibitive.

Staff Recommendation

Option #1



7/29/2013
Date

Gordon Johnson
Manager/Chief Engineer,
Engineering Services



7/31/2013
Date

Jeffrey Kightlinger
General Manager

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Financial Statement for Power Reliability & Energy Conservation Program

A breakdown of Board Action No. 10 for Appropriation No. 15391 for the Water Quality Laboratory HVAC Replacement project¹ is as follows:

| | Previous Total Appropriated Amount (Oct. 2012) | Current Board Action No. 10 (Aug. 2013) | New Total Appropriated Amount |
|---|---|--|--|
| Labor | | | |
| Studies & Investigations | \$ 633,550 | \$ - | \$ 633,550 |
| Final Design | 847,000 | 35,000 | 882,000 |
| Owner Costs (Program mgmt., bidding, permitting) | 1,328,100 | 61,000 | 1,389,100 |
| Submittals Review & Record Drwgs | 481,500 | - | 481,500 |
| Construction Inspection & Support | 2,372,250 | - | 2,372,250 |
| Metropolitan Force Construction | 547,500 | 27,000 | 574,500 |
| Materials & Supplies | 1,020,000 | 5,000 | 1,025,000 |
| Incidental Expenses | 140,105 | - | 140,105 |
| Professional/Technical Services | 3,220,000 | 183,900 | 3,403,900 |
| Equipment Use | - | 49,100 | 49,100 |
| Contracts | 22,447,000 | 175,000 | 22,622,000 |
| Remaining Budget | 889,995 | 74,000 | 963,995 |
| Total | \$ 33,927,000 | \$ 610,000 | \$ 34,537,000 |

Funding Request

| | | | |
|-----------------------------------|---|--------------------------------|---------------|
| Program Name: | Power Reliability and Energy Conservation Program | | |
| Source of Funds: | Revenue Bonds, Replacement and Refurbishment or General Funds | | |
| Appropriation No.: | 15391 | Board Action No.: | 10 |
| Requested Amount: | \$ 610,000 | Budget Page No.: | 325 |
| Total Appropriated Amount: | \$ 34,537,000 | Total Program Estimate: | \$105,253,000 |

¹ The total amount expended to date on the Water Quality Laboratory HVAC Replacement project is approximately \$68,100. The total estimated cost to complete this project, including the amount expended to date, current funds requested, and future construction costs, is \$2.5 million to \$2.7 million.

Distribution System

