

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

November 14, 2000 Board Meeting

8-4

Subject

Authorize funding for two Capital Investment Plan projects: (1) \$244,000 to replace two existing domestic water system pumps at the F. E. Weymouth Filtration Plant (Appn. 15355); and (2) \$1.033 million for staged replacement of Accusonic flow meter control units and installation of SCADA remote terminal units (Appn. 15359)

Description

The following two projects were evaluated and recommended by the Capital Investment Plan (CIP) Evaluation Team, and are included in the Capital Budget for Fiscal Year 2000/01: 1) F. E. Weymouth Filtration Plant - replace existing domestic water system pumps, and 2) replace aging Accusonic flowmeters and install Supervisory Control and Data Acquisition System (SCADA) Remote Terminal Units (RTUs).

1) F.E. Weymouth Filtration Plant - Replace Existing Domestic Water System Pumps (\$244,000)

The Weymouth plant requires a reliable domestic water system to operate its chlorine disinfection and chemical feed systems, provide required firewater flows for fire hydrants, and meet facility domestic water needs. Currently, the plant's domestic water system is comprised of a pump station which has two fixed-speed pumps and a single Variable Frequency Drive (VFD) pump. The two fixed-speed pumps have experienced excessive wear, and cannot meet the maximum system flow demand requirements if the lead VFD pump fails. To maintain the reliability of the plant's potable water system, it is recommended that the two fixed-speed domestic water pumps be replaced with two high efficiency, VFD pumps.

See [Attachment 1](#) for the Detailed Report, [Attachment 2](#) for the Financial Statement and [Attachment 3](#) for the Location Map for this project.

2) Replace Aging Accusonic Flowmeters and Install SCADA Remote Terminal Units (\$1.033 million)

Since the early 1980's, Metropolitan has installed more than 60 Accusonic acoustic flowmeters. These meters are installed at several service connections to measure and record the amount of water delivered to member agencies and at other locations such as treatment plant influent conduits, the desert pumping plants and mainline feeders to provide information that is critical to the operation of the system. Thirty-three of these meters are older models for which replacement parts are no longer available. Many have exceeded their life expectancy and are beginning to fail. To maintain accurate billing information as well as system reliability, it is recommended to purchase and store a supply of the newer model of acoustic flowmeters from the same manufacturer. The new meters would then be installed as needed to replace the existing meters. Procuring the new models from the same manufacturer under a sole-source purchase agreement would significantly reduce replacement costs because the existing flow sensors and cables unique to Accusonic could be re-used. Twenty of the thirty-three sites that require new flowmeters will also require the installation of new SCADA RTUs because the existing RTU's are not compatible with the new flowmeters. The RTUs store and transmit data to Metropolitan's Eagle Rock Operations Control Center.

See [Attachment 4](#) for the Detailed Report, [Attachment 5](#) for the Financial Statement and [Attachment 6](#) for the Location Map for this project.

Policy

Metropolitan Water District Administrative Code Section 5108: Capital Project Appropriation and Metropolitan Water District Administrative Code Section 8113: Construction Contract Award.

Board Options/Fiscal Impacts

Option #1

- a) Appropriate \$244,000 and authorize the General Manager to have all work performed to replace two existing domestic water system pumps at the Weymouth plant. Also, determine that pursuant to the California Environmental Quality Act (CEQA) the proposed action qualifies for a Categorical Exemption (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).
- b) Appropriate \$1.033 million; authorize the General Manager to have all work performed for staged replacement of Accusonic flowmeter control units and installation of SCADA remote terminal units; and authorize the General Manager to execute procurement contracts exceeding \$250,000. Also, determine that pursuant to the California Environmental Quality Act (CEQA), the proposed action for the purpose of procuring the flowmeters qualifies for a Categorical Exemption (Class 1, Section 15301 of the State CEQA Guidelines).

Fiscal Impact: \$1.277 million of budgeted funds

Option #2

Act on each item individually.

Fiscal Impact: Up to \$1.277 million of budgeted funds

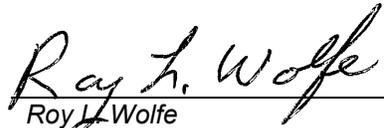
Option #3

- a) Do not fund replacement of existing domestic water system pumps at the Weymouth plant at this time; however, not performing the work this year may negatively impact operational performance, plant reliability, water quality, and facility fire safety.
- b) Purchase and replace the flowmeters as they fail and accept the current factory delivery time of four months. This alternative could result in reliance on erroneous meter readings until the flowmeter are replaced. Also, determine that pursuant to the California Environmental Quality Act (CEQA), the proposed action qualifies for a Categorical Exemption (Class 1, Section 15301 of the State CEQA Guidelines).

Fiscal Impact: Increased costs over time

Staff Recommendation

Option #1.


 Roy L. Wolfe
 Manager, Corporate Resources

10/23/2000
 Date


 Ronald R. Jester
 General Manager

10/24/2000
 Date

Attachment 1 – Detailed Report, Domestic Water System Pumps

Attachment 2 – Financial Statement, Domestic Water System Pumps

Attachment 3 – Location Map, Domestic Water System Pumps

Attachment 4 – Detailed Report, Accusonic Flowmeters

Attachment 5 – Financial Statement, Accusonic Flowmeters

Attachment 6 – Location Map, Accusonic Flowmeters

F.E. Weymouth Filtration Plant – Replace Existing Domestic Water System Pumps

Project Cost \$244,000

Detailed Report

The domestic water pump station was originally constructed in 1990 to provide potable water for the entire Weymouth plant site's demands. These demands included the critical needs of the plant's chemical feed systems, all facility domestic water demands, and the site's firewater flow requirements. Major components constructed and installed at that time included the pump station's three fixed-speed pumps, a piping distribution system, and communication lines to the plant control system. In 1999, one fixed-speed pump was replaced with a new, higher capacity Variable Frequency Drive (VFD) pump. This replacement served to increase the pump station's reliability, increase energy efficiency, and partially address domestic water system flow capacity concerns resulting from increased chlorination and chemical feed requirements and the expanded Water Quality Laboratory.

The remaining two original fixed-speed pumps have lost efficiency and have experienced excessive wear due to increased intermittent operation as a result of the increased demands on the domestic water system. Additionally, because the domestic water system demands have continued to increase beyond those that were forecasted in the original 1990 study, the two fixed-speed pumps can no longer meet the maximum system flow demand requirements if the lead VFD pump fails.

To maintain the reliability of the plant's potable water system which includes the facility's fire water system and the raw water chlorine disinfection system, it is recommended that the two existing fixed-speed domestic water pumps be replaced with two high efficiency VFD pumps.

The Capital Investment Plan budget for Fiscal Year 2000/01 included \$1.2 million for the "Capital Program for Projects Costing Less Than \$250,000." In July 2000, the Board appropriated \$572,900 and authorized work to be performed on three projects under this program. Approval of this recommendation will appropriate an additional \$244,000 and authorize the General Manager to undertake all work for the design, purchase of equipment, and construction for the Weymouth Domestic Water System Pumps project.

Alternatives Considered

Defer the replacement of the Weymouth plant domestic water pumps. However, deferring replacement of the existing pumps will jeopardize the ability of the pump station to reliably meet the demands of the existing water treatment process chlorination system and the domestic water system. The inability to meet these water system demands could lead to a reduction in plant treatment capacity and/or the inability to meet fire water system demands.

CEQA Compliance / Environmental Documentation

The request for appropriation for Metropolitan's proposed replacement of the two existing domestic water pumps is categorically exempt under the provisions of the California Environmental Quality Act (CEQA). The overall activities involve minor alterations of existing public facilities, replacement in kind, with negligible expansion of use and no possibility of significantly impacting the physical environment. As such, this proposed action qualifies as both Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

Actions and Milestones

- February 2001 – Complete design work
- June 2001 – Complete procurement
- July 2001 – Commence pump installation
- September 2001 - Project completion

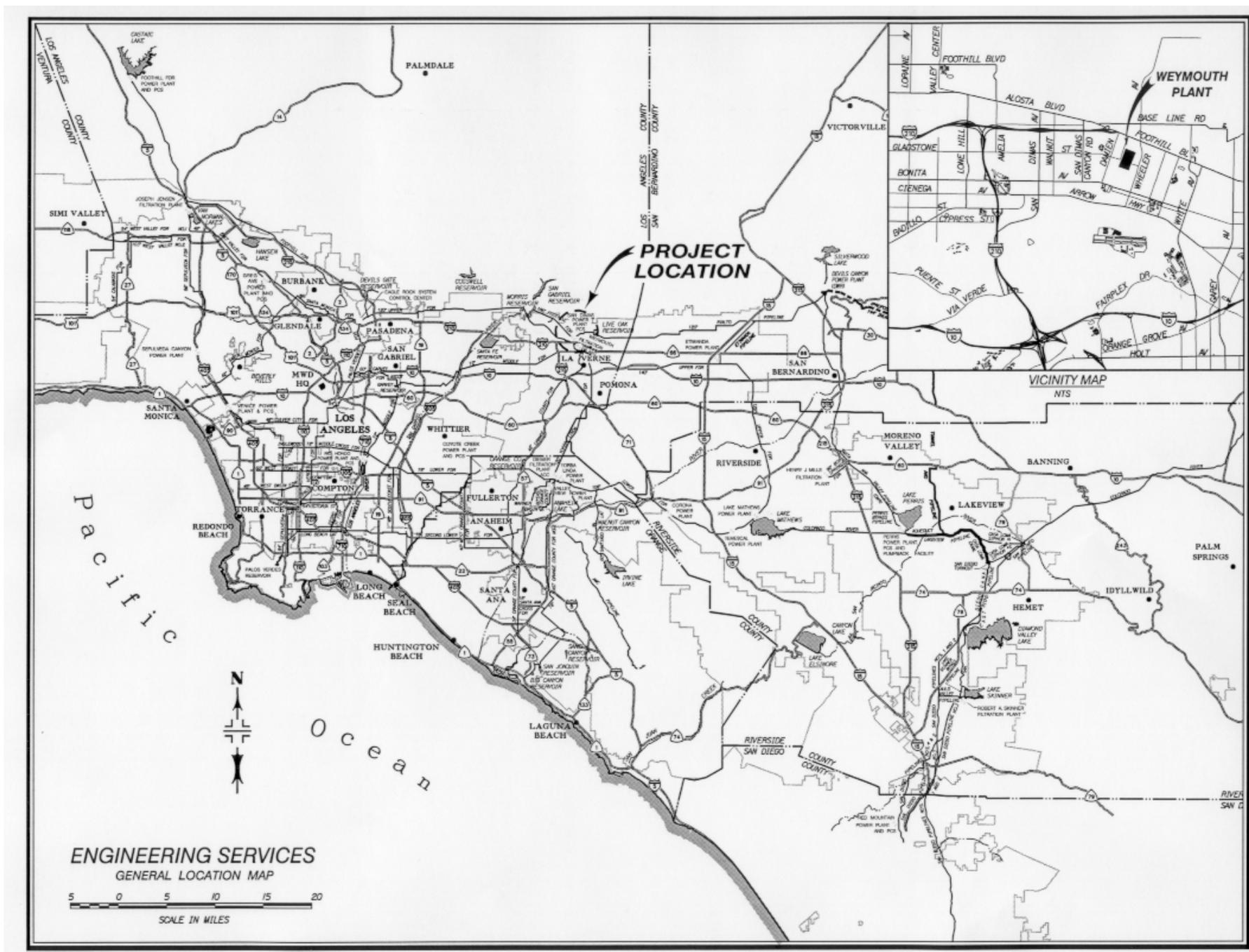
1. FINANCIAL STATEMENT

Board Action No. 2 for Appropriation No. 15355 to finance design, procurement and installation of domestic water system pumps at the Weymouth plant:

	BOARD ACTION NO. 1 (July 2000)	BOARD ACTION NO. 2 (Nov. 2000)
Labor:		
Owner Costs (Project Mgmt, Purchasing, Environmental Compliance/Permitting)	\$ 51,050	\$ 78,050
District Forces Construction	197,400	244,400
Subtotal Labor	\$ 248,450	\$ 322,450
Materials and Supplies	221,300	357,300
Incidental Expenses	17,000	22,000
Operating Equipment	4,000	4,000
Remaining budget	82,150	111,150
Total	\$572,900	\$ 816,900

FUNDING REQUEST

Program Name:	Capital Program for Capital Projects Costing Less than \$250,000 for Fiscal Year 2000/01		
Source of Funds:	Pay-As-You-Go Fund		
Appropriation No.:	15355	Board Action No.:	2
Requested Amount:	\$ 244,000	Capital Program No.:	00103-R
Total Appropriated Amount:	\$ 816,900	Capital Program Page No.:	E-7R
Total Program Estimate:	\$1,200,000	Program Goal:	R-Reliability



Replace Aging Accusonic Flowmeters and Install SCADA Remote Terminal Units

Project Cost \$1,033,000

Detailed Report

Since the early 1980's, Metropolitan has installed 61 Accusonic acoustic flowmeters. The acoustic flowmeters consist of control units installed in wall-mounted or free-standing meter cabinets, and sensors that are either mounted inside the pipeline or inserted through the pipe wall via specially designed "feed-through" assemblies. The internally mounted sensors are utilized on existing pipeline installations where the cost of constructing a new access vault around a buried pipeline is cost prohibitive. The flowmeters are installed at several service connections to measure and record the amount of water delivered to Member Agencies, and at other locations such as treatment plant influent conduits, the desert pump plant discharge lines, and mainline feeders to provide information that is critical to the operation of the system. The service connection meters are used in calculating the monthly water delivery charges to the member agencies. Although the flowmeter control units have performed exceptionally well, many of them have exceeded their useful life and are beginning to fail. Thirty-three of the units are older models for which replacement parts are no longer available.

A second element of this program is to replace SCADA Remote Terminal Units (RTUs) at twenty of the thirty-three meter locations that have been recommended for an upgrade. The RTUs store and transmit water use data to the Eagle Rock Operations Control Center for system operation as well as billing purposes. The existing RTU units need to be replaced because they are not compatible with the new, proposed, flow control units. The inability to remotely monitor flow via the SCADA system would require switching to manual control and would increase monitoring costs. The remaining thirteen metered sites do not require remote monitoring and reporting.

It is recommended to replace the old flowmeter control units with newer models from the same manufacturer because of their demonstrated past performance and the opportunity to utilize the existing flow sensors and cables unique to Accusonic, thereby significantly reducing replacement and installation costs. As many as ten new meters would be purchased at a time to avoid the higher cost of single purchases, and installed as needed to replace the existing meters. Additionally, new SCADA RTUs would be installed at twenty of the meter replacement locations to maintain remote monitoring and control capability.

This program has been reviewed and recommended by the Capital Investment Plan (CIP) Evaluation Team, for implementation as a staged project. Approval of this recommendation will appropriate \$1.033 million and authorize the General Manager to undertake all work for the purchase and installation of equipment for this project as described above. The program is scheduled to be complete by late 2006.

Alternatives Considered

One alternative would be to purchase and replace the meters as they fail. This option is not recommended because the manufacturer of Accusonic flowmeters requires four months lead time for delivery. This delay in delivery would require staff to operate the system without the benefit of accurate flow readings until the failed meters are replaced. Additionally, purchasing meters individually would result in the loss of quantity purchase discounts (which are available in lots of 10 meters) as well as increased administrative costs to process numerous purchase orders. The current failure rate of the Accusonic flowmeters is two to three per year.

A second alternative would be to replace the meters with units from manufacturers of similar design to the Accusonic flowmeter. Unfortunately, these alternative units are not compatible with the existing sensors that are already installed in the pipelines. This alternative would require shutdown of the affected pipeline and the replacement of the sensors. The estimated additional cost for materials alone is approximately \$29,000 per meter. As a result, an additional cost of approximately \$960,000 would be incurred if the Accusonic meters were replaced with units from competing manufacturers.

A third alternative would be to replace the flowmeters with a totally different type of unit such as with venturi or magnetic meters. Replacement with another type of meter would also require pipeline outages, which would result in disrupted service, additional costs and is not feasible hydraulically at all locations. Increased procurement, fabrication, and construction costs would also result. The total additional cost that would be incurred by replacing the Accusonic flowmeters with another type of meter is approximately \$5.6 million.

CEQA Compliance / Environmental Documentation

The request for appropriation for Metropolitan's proposed replacement of the flowmeters and SCADA RTUs is categorically exempt under the provisions of the California Environmental Quality Act (CEQA). The overall activities involve the minor alterations of existing public facilities with no expansion use and no possibility of significantly impacting the physical environment. As such, this proposed action qualifies as a Class 1 Categorical Exemption (Section 15301 of the State CEQA Guidelines).

Actions and Milestones

- December 2000 - Begin procurement of new meters and RTU's
- April 2001 - Begin installation as needed
- July 2001 - Continue assessment of replacement needs; proceed with subsequent "block" purchases and installations as needed
- December 2006 - Estimated program completion

FINANCIAL STATEMENT

Board Action No. 1 for Appropriation No. 15359 to finance management, procurement and installation of 33 acoustic flowmeter replacements and 20 new RTU's is as follows:

	BOARD ACTION NO. 1 (Nov 2000)
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Labor:	
Owner Costs (Project Mgmt, Purchasing, Environmental Compliance/Permitting)	\$ 35,000
District Forces Construction	85,600
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Subtotal Labor	\$ 120,600
Materials and Supplies	758,400
Incidental Expenses	5,000
Operating Equipment	10,000
Professional/Technical Services	20,000
Remaining budget	119,000
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Total	\$1,033,000

FUNDING REQUEST

Program Name:	Replace Aging Accusonic Flowmeters and Install SCADA Remote Terminal Units		
Source of Funds:	Pay-As-You-Go Fund		
Appropriation No.:	15359	Board Action No.:	1
Requested Amount:	\$ 1,033,000	Capital Program No.:	00104-R
Total Appropriated Amount:	\$ 1,033,000	Capital Program Page No.:	E-1
Total Program Estimate:	\$ 1,033,000	Program Goal:	R-Reliability

