



- Board of Directors
Engineering and Operations Committee

8/20/2013 Board Meeting

7-6

Subject

Appropriate \$175,000; and authorize preliminary design of two distribution system rehabilitation projects (Approp. 15441)

Executive Summary

This action authorizes preliminary design of two rehabilitation projects within Metropolitan's distribution system: (1) upgrades to the surge tank system at the OC-88 Pumping Plant, which protects the Allen-McColloch Pipeline (AMP) from pressure surges; and (2) replacement of a 42-inch sectionalizing valve on the Santiago Lateral, which is used to isolate sections of that feeder.

Timing and Urgency

The OC-88 Pumping Plant conveys treated water from the AMP line to the South County Pipeline, which has 28 service connections for the Municipal Water District of Orange County (MWDOC). Recent testing of the surge tank system at the OC-88 Pumping Station identified that the system needs to be upgraded to adequately protect the pipelines from surges caused by pump failure or sudden pump starts and stops. Prestressed concrete cylinder pipe (PCCP) feeders like the AMP are susceptible to damage from high pressure surges or "water hammers". The surge tank system should be upgraded to prevent such surges from damaging the pipelines.

The Santiago Lateral conveys untreated water from the Lower Feeder to Irvine Lake. A 42-inch sectionalizing valve used to isolate a portion of the Santiago Lateral is deteriorated, does not fully close, and leaks downstream. This valve should be replaced to minimize the loss of unmetered water from Metropolitan's system.

These projects have been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria, and are categorized as Infrastructure Reliability projects. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2013/14.

Details

Background

The OC-88 Pumping Plant was constructed in 1990 and is located in the city of Lake Forest. Treated water from the Diemer plant is conveyed through the AMP to the OC-88 Pumping Plant, which in turn pumps water directly into MWDOC's South County Pipeline. The South County Pipeline extends a distance of 25 miles through south Orange County to San Clemente. In 2005, the OC-88 Pumping Plant was modified to improve operating efficiency by changing the pump system to provide a direct piped connection from the AMP. By utilizing the pressure in the AMP, energy costs at the pumping plant were significantly reduced. However, the existing air compressor was not upgraded at that time to provide optimal performance of the surge tank system.

The surge tank system protects the AMP and the South County Pipeline from pressure surges. Surges may be caused by sudden changes in flow velocity that result from pump failure or sudden starting and stopping of a pump. When a surge is generated, a water wave travels down the pipeline which can cause an increase in pressure beyond a pipe's normal operating range. Surge tank systems are used to control surges by dissipating excess pressure within the tanks so that pressure increases within the pipelines are minimized. Surge tanks typically

have an air compressor which provides air padding to absorb the surge wave within the tanks. Two new surge tanks were added when the OC-88 Pumping Plant modifications were completed in 2005. However, the air compressor was not upgraded at that time. A recently completed high-flow test at the OC-88 Pumping Plant identified that a second air compressor should be installed to adequately protect the AMP and the South County Pipeline.

The Santiago Lateral is a 7.4-mile-long precast concrete pipeline which extends southerly from the Santiago Control Tower in the city of Anaheim Hills to Irvine Lake in the city of Irvine. The Santiago Lateral has five service connections and delivers water to the city of Anaheim and MWDOC. The feeder uses a 42-inch sectionalizing valve located in Weir Canyon, approximately four miles downstream from the control tower, for two purposes: (1) to isolate a portion of the Santiago Lateral; and (2) to enable water deliveries to service connection OC-13A. This valve is normally closed and is typically opened only when deliveries are requested by the member agency. Flows of less than 10 cfs are delivered via a 10-inch bypass valve. Deliveries greater than 10 cfs require operation of the 42-inch valve.

After 58 years of continuous service, the 42-inch valve has deteriorated beyond repair and needs to be replaced. The valve currently leaks at a rate exceeding one cfs. Leakage flows through the valve are below the range of the existing service connection meter, resulting in loss of revenue to Metropolitan. During a recent detailed inspection, staff determined that the valve cannot be refurbished. The valve is located within a concrete vault structure which is 28 feet below grade, adjacent to a public street. Modifications within the vault to improve safety are recommended, including the relocation of ladders and a platform to provide a level work surface for maintenance of the new valve. The valve will be equipped with a new actuator and control system capable of remote operation. In addition, the size of the bypass valve is recommended to be increased to 20 inches to convey bypass flows up to 40 cfs.

Project No. 1 – OC-88 Pumping Plant Surge Tank Upgrades – Preliminary Design Phase (\$80,000)

Planned preliminary design activities include: conducting hydraulic analyses, developing conceptual layout drawings, preparing environmental documentation; and developing a construction cost estimate. This action appropriates \$80,000 and authorizes preliminary design phase activities to upgrade the surge tank system at the OC-88 Pumping Plant. Requested funds include \$62,000 for preliminary design; and \$18,000 for permitting, preparation of environmental documentation, and for project management. All preliminary design activities will be performed by Metropolitan staff.

The total estimated cost to complete the OC-88 Pumping Plant Surge Tank Upgrades is anticipated to range from \$550,000 to \$650,000.

Project No. 2 – Santiago Lateral Sectionalizing Valve Replacement – Preliminary Design Phase (\$95,000)

Planned preliminary design phase activities include: conducting field surveys and hydraulic analyses; preparing environmental documentation; initiating local agency permitting; hazardous material testing; and developing a preliminary construction cost estimate.

This action appropriates \$95,000 and authorizes preliminary design to replace the Santiago Lateral sectionalizing valve. Requested funds include \$74,000 for preliminary design; and \$21,000 for permitting, preparation of environmental documentation, and for project management. All preliminary design activities work will be performed by Metropolitan staff.

The total estimated cost to complete the Santiago Lateral Sectionalizing Valve Replacement is anticipated to range from \$700,000 to \$800,000.

Summary

This action appropriates \$175,000 and authorizes preliminary design of upgrades to the OC-88 Pumping Plant surge tank system and for replacement of the Santiago Lateral sectionalizing valve. These projects have 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.

Both projects are included under the Conveyance and Distribution System Rehabilitation Program – Phase 2 (Appropriation No.15441), which was initiated in fiscal year 2001/02. With the present action, the total funding for Appropriation No. 15441 will increase from \$46,329,000 to \$46,504,000.

Project Milestones

December 2013 – Completion of preliminary design to upgrade the surge tank system at the OC-88 Pumping Plant

January 2014 – Completion of preliminary design to replace the Santiago Lateral valve

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determinations for Options #1 and #2:

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 #3:

None required

Board Options

Option #1

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

- a. Appropriate \$175,000;
- b. Authorize preliminary design to upgrade the surge tank system at the OC-88 Pumping Plant; and
- c. Authorize preliminary design to replace a sectionalizing valve on the Santiago Lateral.

Fiscal Impact: \$175,000 of capital funds under Approp. 15441

Business Analysis: These projects will protect Metropolitan assets, enhance service reliability to member agencies, and reduce the risk of costly emergency repairs.

Option #2

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

- a. Appropriate \$80,000;
- b. Authorize preliminary design to upgrade the surge tank system at OC-88 Pumping Plant; and
- c. Do not authorize preliminary design to replace a sectionalizing valve on the Santiago Lateral.

Fiscal Impact: \$80,000 of capital funds under Approp. 15441

Business Analysis: Under this option, the OC-88 Pumping Plant surge tank upgrades would proceed in order to protect the AMP and South County Pipeline from potential surges. Staff would continue to operate the existing valve at Santiago Lateral and make repairs as it deteriorates. This approach could lead to increased repair costs and continued loss of revenue.

Option #3

Do not proceed with the two projects at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity to protect facilities and enhance the reliability of water deliveries to member agencies.

Staff Recommendation

Option #1


Gordon Johnson
Manager/Chief Engineer
Engineering Services

7/31/2013

Date


Jeffrey Kightlinger
General Manager

8/7/2013

Date

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Ref# es12625331

**Financial Statement for Conveyance and Distribution System Rehabilitation Program –
FY 2006/07 Through FY 2011/12**

A breakdown of Board Action No. 57 for Appropriation No. 15441 for the OC-88 Surge Tank Upgrades and Santiago Lateral Sectionalizing Valve Replacement¹ is as follows:

	<u>Previous Total Appropriated Amount (July 2013)</u>	<u>Current Board Action No. 57 (Aug. 2013)</u>	<u>New Total Appropriated Amount</u>
Labor			
Studies & Investigations	\$ 2,989,000	\$ 136,000	\$ 3,125,000
Final Design	4,286,293	-	4,286,293
Owner Costs (Program mgmt., envir. doc.)	5,606,400	37,000	5,643,400
Submittals Review & Record Dwgs	351,670	-	351,670
Construction Inspection & Support	2,191,550	-	2,191,550
Metropolitan Force Construction	9,136,710	-	9,136,710
Materials & Supplies	2,330,400	-	2,330,400
Incidental Expenses	941,900	2,000	943,900
Professional/Technical Services	2,551,000	-	2,551,000
Right-of-Way	550,000	-	550,000
Equipment Use	325,200	-	325,200
Contracts	12,957,801	-	12,957,801
Remaining Budget	2,111,076	-	2,111,076
Total	\$ 46,329,000	\$ 175,000	\$ 46,504,000

Funding Request

Program Name:	Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through FY 2011/12		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15441	Board Action No.:	57
Requested Amount:	\$ 175,000	Budget Page No.:	284
Total Appropriated Amount:	\$ 46,504,000	Total Program Estimate:	\$ 106,335,000

¹ This is the initial appropriation for the OC-88 Surge Tank Upgrades and Santiago Lateral Sectionalizing Valve Replacement. The total estimated cost to complete the OC-88 Surge Tank Upgrades is anticipated to range from \$550,000 to \$650,000. The total estimated cost to complete the Santiago Lateral Sectionalizing Valve Replacement is anticipated to range from \$700,000 to \$800,000.

Distribution System

