



- Board of Directors
Engineering and Operations Committee

7/10/2012 Board Meeting

7-2

Subject

Appropriate \$380,000; and authorize two rehabilitation projects at the F. E. Weymouth Water Treatment Plant (Approp. 15477)

Description

This action authorizes two rehabilitation projects at the F. E. Weymouth Water Treatment Plant: (1) Preliminary design to replace the treatment basin inlet gates, and (2) Preliminary design of seismic upgrades to the basin inlet channels.

Timing and Urgency

Reliable performance of the flocculation and sedimentation processes within the Weymouth plant's treatment basins is essential for successful plant operation. Treatment Basins Nos. 1 through 4 have been in service for 60-70 years, while Basins Nos. 5 through 8 have been in service for over 50 years. After these extended years of service, many of the treatment basin inlet gates have deteriorated and therefore leak excessively. In order to provide the isolation capability needed to take a basin out of service, these gates need to be replaced or refurbished. In addition, two sections of the basin inlet channels are vulnerable to damage in the event of a significant earthquake and require structural upgrades.

Both projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria and are categorized as Infrastructure Rehabilitation projects. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2012/13.

Background

The Weymouth plant was placed into service in 1941 with an initial capacity of 100 million gallons per day (mgd), and was expanded twice to its current capacity of 520 mgd. The plant delivers a blend of waters from the Colorado River Aqueduct and State Water Project to Metropolitan's Central Pool portion of the distribution system.

The Weymouth plant has eight treatment basins. Basins Nos. 1 and 2 were constructed in 1940 as part of the original plant construction, Basins Nos. 3 and 4 were added in 1949 during the first plant expansion, and Basins Nos. 5 through 8 were added in 1962 during the second expansion. Each basin has a flocculation and sedimentation section. The flocculation section is used to gently mix coagulant chemicals with the incoming untreated water. These chemicals adhere to the water's suspended solids and form large particles called floc which settle in the sedimentation section. Settled residual solids are then pumped to the solids thickeners, while the clarified water flows to the plant's filters.

Project No. 1 – Basin Inlet Gate Improvements – Preliminary Design Phase (\$210,000)

The basin inlet gates were installed during the original construction of the basins. Each of the four oldest basins has two 8-foot by 10-foot inlet gates. Basins Nos. 5 through 8 each have six 3-foot by 4-foot inlet gates. All 32 of the gates are fabricated of carbon steel with a coal tar coating for corrosion protection. Each of the gates has a motor-operated actuator which is controlled manually at each gate. The actuators are not connected to

Metropolitan's supervisory control and data acquisition (SCADA) system, so the gates cannot be monitored or controlled remotely. The inlet gates are normally open when a basin is operating, but are closed when a basin is taken out of service due to low-treated water demands, or is dewatered in order to perform needed maintenance and equipment repairs.

Over the years, the gates' coatings have deteriorated and the steel has corroded. The corrosion is more advanced on the older gates and they leak excessively. Leaky gates increase the duration of needed maintenance in the basins, and water that accumulates in out-of-service basins must be pumped out with portable pumps and returned to the water treatment process. This project will replace the basin inlet gates, gate guides, and actuators, and will automate their control.

Planned preliminary design phase activities include: evaluation of alternatives for either refurbishment or replacement of the basin gates, guides, and actuators; assessment of alternative materials of construction; development of final design criteria; and development of a conceptual cost estimate. Preliminary design will also assess the feasibility of upgrading the actuators and instrumentation so that the gates can be connected to the SCADA network, which will allow remote actuation and position monitoring.

This action appropriates \$210,000 and authorizes preliminary design phase activities to replace the basin inlet gates at the Weymouth plant. Requested funds include \$139,000 for the assessment of materials, field investigations, identification of needed electrical modifications, and preparation of a preliminary design report; \$36,000 for hazardous material identification and project management; and \$35,000 for remaining budget. All work will be performed by Metropolitan staff.

Project No. 2 – Basin Inlet Channel Seismic Upgrades – Preliminary Design Phase (\$170,000)

The Weymouth plant was constructed in accordance with the building codes of the early 1940s. Since that time, knowledge of earthquakes and seismic design has greatly improved, leading to the development of more stringent, modern seismic codes. The Weymouth plant is located approximately 1.5 miles from the Sierra Madre Fault, which is capable of generating a 7.0 magnitude earthquake. In 2003, based on updated geotechnical information and current seismic codes, staff initiated a seismic assessment of the Weymouth plant. Through this effort, several facilities were identified to be in need of structural upgrade. The resulting projects have been prioritized and their schedules coordinated with other work planned at the Weymouth plant. Final design of seismic upgrades to the filter buildings and washwater tanks is presently underway. Upgrade of the plant's Junction Structure was completed in 2011, while the original inlet conduit was relocated and upgraded in 2011. This project addresses two sections of the treatment basin inlet channels which need to be strengthened: the east-west channel serving Basins Nos. 5 through 8, and the north-south channel serving Basins Nos. 1-4.

The east-west basin inlet channel, which was constructed in 1962, is a concrete box culvert with a width that varies from 10 feet to 4 feet, and a height of approximately 13 feet. The east-west inlet channel wall is approximately 670 feet long. The north-south inlet channel, which was constructed in 1940, is 20 feet wide by 13 feet tall, and is approximately 506 feet long.

The inlet channel adjacent to Basins Nos. 5 through 8 and the inlet channel serving Basins Nos. 1 through 4 are structurally inadequate to resist a strong earthquake. A failure of these inlet channels would cause the Weymouth plant to shut down or limit its treatment capacity until the damage could be repaired.

Rapid mix facilities are used to add treatment chemicals needed for coagulation. Metropolitan's practice is to add treatment chemicals immediately upstream of each pair of basins. Since the inlet channel is common for Basins Nos. 1 through 4, the two rapid mix facilities for Basins Nos. 1 and 2 and Basins Nos. 3 and 4 jointly feed chemicals to Basins Nos. 1 through 4. As part of the preliminary design effort, staff will investigate longitudinally separating the inlet channel of Basins Nos. 1 and 2 from Basins Nos. 3 and 4 in order to seismically upgrade the inlet channel and to provide independent rapid mix trains to each of the basin pairs.

Planned preliminary design phase activities include: detailed structural analyses; development of rehabilitation concepts to strengthen the walls of the inlet channels by adding reinforcement to the existing walls; and preparation of final design criteria and a preliminary cost estimate.

This action appropriates \$170,000 and authorizes preliminary design phase activities to seismically upgrade the Weymouth treatment basin inlet channels. Requested funds include \$124,000 for structural analyses, development of conceptual design drawings, and preparation of a preliminary design report; \$19,000 for project management; and \$27,000 for remaining budget. All work will be performed by Metropolitan staff.

Summary

This action appropriates \$380,000 and authorizes preliminary design phase activities to rehabilitate the Weymouth basin inlet gates, and to seismically upgrade the treatment basin inlet channels. Both projects have 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.

These two projects are included within capital Appropriation No. 15477, the Weymouth Improvements Program – FY 2012/13 through FY 2017/18. This is the initial action for this appropriation.

Project Milestones

March 2013 – Completion of preliminary design for the Basin Inlet Gate Improvements

May 2013 – Completion of preliminary design for the Basin Inlet Channel Seismic Upgrades

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

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 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 and

- a. Appropriate \$380,000;
- b. Authorize preliminary design to rehabilitate the Weymouth treatment basin inlet gates; and
- c. Authorize preliminary design of seismic upgrades to the basin inlet channels.

Fiscal Impact: \$380,000 in capital funds under Approp. 15477

Business Analysis: This option would enhance reliability of the Weymouth plant during normal operating conditions and seismic events.

Option #2

Adopt the CEQA determination and

- a. Appropriate \$210,000;
- b. Authorize preliminary design to rehabilitate the Weymouth treatment basin inlet gates; and
- c. Do not authorize preliminary design of seismic upgrades to the basin inlet channels at this time.

Fiscal Impact: \$210,000 in capital funds under Approp. 15477

Business Analysis: This option would forego an opportunity to improve the Weymouth plant's ability to remain in operation following a major seismic event.

Option #3



Do not proceed with the two rehabilitation projects at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity to enhance the plant's reliability and its ability to remain in operation following a major seismic event.

Staff Recommendation

Option #1

	6/19/2012
Gordon Johnson Manager/Chief Engineer, Engineering Services	Date
	6/26/2012
Jeffrey Hightlinger General Manager	Date

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Ref# es12618362

Financial Statement for Weymouth Improvements Program – FY 2012/13 through FY 2017/2018

A breakdown of Board Action No. 1 for Appropriation No. 15477 for the Weymouth Basin Inlet Gate Improvements and Basin Inlet Channel Seismic Upgrades¹ is as follows:

	Current Board Action No. 1 (July 2012)
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Labor	
Studies & Investigations	\$ 258,000
Owner Costs (Program mgmt, haz. material testing)	55,000
Materials & Supplies	-
Incidental Expenses	5,000
Professional/Technical Services	-
Equipment Use	-
Contracts	-
Remaining Budget	62,000
Total	<hr/> \$ 380,000 <hr/>

Funding Request

Program Name:	Weymouth Improvements Program – FY 2012/13 Through FY 2017/18		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15477	Board Action No.:	1
Requested Amount:	\$ 380,000	Capital Program No.:	15477-I
Total Appropriated Amount:	\$ 380,000	Capital Program Page No.:	94
Total Program Estimate:	\$ 131,264,000	Program Goal:	I-Infrastructure & Reliability

¹ This action is the initial appropriation for the Weymouth Basin Inlet Gate Improvements and Basin Inlet Channel Seismic Upgrades.

F.E. Weymouth Water Treatment Plant

