



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

October 13, 2009 Board Meeting

7-2

Subject

Appropriate \$470,000; and authorize preliminary design of post-filtration chlorination capacity increase at the Diemer and Weymouth plants (Approp. 15346)

Description

This action authorizes preliminary design of facilities to increase the chlorination capacity at the outlet of the filters at both the Robert B. Diemer and F. E. Weymouth Water Treatment Plants. The increase in the post-filtration chlorination capacity will aid in compliance with water quality regulations when the ozonation facilities are completed at these two plants.

Timing and Urgency

The existing chlorine systems at the Diemer and Weymouth plants do not have sufficient post-filtration chlorination capacity to ensure meeting water quality goals at maximum flow conditions, once the ozonation facilities become operational and the filters become biologically active. Metropolitan's Board previously authorized similar increases to the post-filtration chlorination capacities at the Mills, Jensen, and Skinner plants.

For the Diemer plant, construction of the ozonation facilities is underway and is planned to be completed in mid-2012. In order to match this schedule, preliminary design activities for the Diemer chlorination capacity increase should proceed at this time.

In September 2009, Metropolitan's Board authorized completion of final design for the Weymouth Oxidation Retrofit Program (ORP). To better coordinate construction, a portion of the chlorination capacity increase scope may be included in the Weymouth ORP construction documents. As a result, preliminary design of the Weymouth chlorination work should proceed at this time so that the final design may proceed in parallel with design of the Weymouth ORP.

These projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and are categorized as Water Quality projects. Both are budgeted within Metropolitan's CIP for fiscal year 2009/10.

Background

The Diemer plant was placed into service in 1963 and has a current treatment capacity of 520 million gallons per day (mgd). It delivers a blend of waters from the Colorado River and the State Water Project to Orange County and to parts of Metropolitan's Central Pool portion of the distribution system. The Weymouth plant was placed into service in 1941 and also has a current treatment capacity of 520 mgd. It delivers a blend of waters from the Colorado River Aqueduct and State Water Project to Metropolitan's Central Pool.

Chlorine was originally used as the primary disinfectant at all five of Metropolitan's treatment plants. In response to stricter water quality regulations, Metropolitan's Board established the ORP to add ozonation at all five plants in order to meet the maximum contaminant level and treatment technique requirements of the U.S. EPA's Disinfectants/Disinfection By-Products Rule.

During the ozonation process, filters are allowed to become biologically active to remove nutrients that would otherwise be released into the distribution system and cause regrowth of bacteria. Following biological filtration, a chloramine disinfectant residual of 2.5 mg/L is required to limit bacteriological growth in the distribution system. To sustain this chloramine residual, staff recommends increasing the post-filtration chlorine dose from 4 to 6 mg/L at the Diemer and Weymouth plants to ensure that this level of disinfectant can be maintained at high-flow conditions, and to help ensure compliance with water quality regulations.

Diemer and Weymouth Chlorination Capacity Increase – Preliminary Design Phase (\$218,000 – Diemer; \$252,000 - Weymouth)

When ozone disinfection is implemented at the Diemer and Weymouth plants, the required chlorine dosage supplied at the filter outlet channel will increase while the chlorine dosage at upstream locations will be eliminated or significantly reduced. The filter outlet chlorine increase will have minimal impact on the formation of chlorinated byproducts such as trihalomethanes, as ammonia is added to form chloramines, which produce significantly fewer chlorinated byproducts.

As part of the planned project scope, staff will identify modifications needed at the Diemer and Weymouth plants to meet the increased filter outlet chlorine dose. Potential modifications include increasing the capacity of existing chlorinators serving the filter outlet injection points; replacing existing ejectors with higher capacity ejectors; adding new ejectors; modifying existing chlorine piping; and adding new piping to supply chlorine gas and potable water to the new ejectors.

This action appropriates \$470,000 and authorizes preliminary design phase activities to increase the filter outlet chlorination capacity at the Diemer and Weymouth plants. The level of effort required at the Weymouth plant is greater than for Diemer due to the more complex modifications required for the Weymouth chlorination system in order to accommodate the plant's new inlet conduit and multiple flash mix systems in a parallel project. Preliminary design activities include: field investigations; evaluation of alternatives; definition of the scope of final design and the design criteria; preparation of a preliminary design report; preparation of environmental documentation; and development of a preliminary cost estimate. All work will be performed by Metropolitan staff.

See [Attachment 1](#) for the Financial Statement, and [Attachment 2](#) for the Location Map.

These two projects are consistent with Metropolitan's goals for sustainability by enhancing the reliability of the existing treatment in order to maintain reliable water deliveries in the future.

Project Milestones

March 2010 – Completion of preliminary design of the Weymouth Chlorination Capacity Increase project

March 2010 – Completion of preliminary design of the Diemer Chlorination Capacity Increase project

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 \$470,000; and
- b. Authorize preliminary design of the Diemer and Weymouth Chlorination Capacity Increase projects.

Fiscal Impact: \$470,000 of budgeted funds under Approp. 15346

Business Analysis: Both projects are needed at this time to reliably meet Metropolitan’s water quality objectives and to comply with drinking water disinfection regulations when the Diemer and Weymouth plants’ new ozonation facilities are operational.

Option #2

Adopt the CEQA determination and

- a. Appropriate \$218,000;
- b. Authorize preliminary design of the Diemer Chlorination Capacity Increase project; and
- c. Do not authorize preliminary design of the Weymouth Chlorination Capacity Increase project at this time.

Fiscal Impact: \$218,000 of budgeted funds under Approp. 15346

Business Analysis: Deferral of the Weymouth Chlorination Capacity Increase project until after the Weymouth ORP construction contract is awarded will forego an opportunity to efficiently integrate the design efforts of both projects, which could lead to interferences during construction.

Option #3

Do not proceed with the two Chlorination Capacity Increase projects.

Fiscal Impact: None

Business Analysis: When the ozonation facilities become operational and the filters are biologically active, the plants would not achieve a chloramine disinfectant residual of 2.5 mg/L under maximum flow deliveries, which could impact downstream water quality.

Staff Recommendation

Option #1


 _____ 9/22/2009
 Roy L. Wolfe Date
 Manager, Corporate Resources


 _____ 9/28/2009
 Jeffrey Nightlinger Date
 General Manager

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Financial Statement for Chlorine Containment and Handling Facilities Program

A breakdown of Board Action No. 18 for Appropriation No. 15346 for the Diemer and Weymouth Chlorination Capacity Increase project* is as follows:

	Previous Total Appropriated Amount (Mar. 2009)	Current Board Action No. 18 (Oct. 2009)	New Total Appropriated Amount
Labor			
Studies and Investigations	\$ 1,545,000	\$ 370,000	\$ 1,915,000
Final Design	1,982,650	-	1,982,650
Owner Costs (Program mgmt., envir. doc.)	3,579,162	90,000	3,669,162
Construction Inspection and Support	9,931,874	-	9,931,874
Metropolitan Force Construction	5,286,600	-	5,286,600
Materials and Supplies	3,833,129	-	3,833,129
Incidental Expenses	508,500	10,000	518,500
Professional/Technical Services	8,409,747	-	8,409,747
Right of Way Fees	118,000	-	118,000
Land Cost	7,050,000	-	7,050,000
Equipment Use	495,500	-	495,500
Contracts	75,112,651	-	75,112,651
So. Cal. Gas Co.	50,000	-	50,000
Remaining Budget	5,997,187 **	-	5,997,187
Total	\$ 123,900,000	\$ 470,000	\$ 124,370,000

Funding Request

Program Name:	Chlorine Containment and Handling Facilities Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15346	Board Action No.:	18
Requested Amount:	\$ 470,000	Capital Program No.:	15346-W
Total Appropriated Amount:	\$ 124,370,000	Capital Program Page No.:	200
Total Program Estimate:	\$ 175,900,000	Program Goal:	W-Water Quality

* This action is the initial appropriation for the Diemer and Weymouth Chlorination Capacity Increase project.

** Includes prior reallocation of Remaining Budget to cover: (1) construction change orders and associated labor for the Skinner, Mills, and Jensen Chlorine Containment Facilities; (2) additional professional services and labor for final design of the Jensen filter outlet chlorination capacity increase; and (3) security upgrades for the Diemer Chlorine Containment Facility.

Robert B. Diemer and F. E. Weymouth Water Treatment Plants

