



- Board of Directors
Engineering and Operations Committee

5/10/2011 Board Meeting

7-6

Subject

Appropriate \$1.88 million for completion activities and documentation for the Diemer Oxidation Retrofit Program; and authorize amendment to existing agreement with Camp Dresser and McKee, Inc. (Approps. 15389 and 15380)

Description

This action authorizes several completion activities for the Diemer Oxidation Retrofit Program (ORP). These activities include preparation of record drawings, preparation of operation and maintenance (O&M) manuals, California Emergency Management Agency (Cal EMA) inundation mapping, and specialized technical training. Each of these activities is budgeted within Metropolitan's fiscal year 2010/11 Capital Investment Plan (CIP). This action also authorizes an amendment to an existing professional services agreement to provide continued technical support through start-up of the ozonation facilities.

Construction of the Diemer ORP is presently approximately 75 percent complete, and the ozonation system is scheduled to commence operation in late 2012. The subject completion activities have been planned to begin at this time so that they will be substantially complete when operation commences.

Timing and Urgency

The Diemer ORP has been staged so that its major work is accomplished via multiple sequential construction contracts and an ozone equipment procurement contract. At the present time, the completed construction includes relocation of the plant maintenance facilities, addition of a new vehicle maintenance center and a new chemical tank farm, and stabilization of the plant's south-facing slope and inlet conduit. A supporting project, which involved construction of a new 66 kV incoming electrical service by Southern California Edison, has also been completed.

In July 2008, Metropolitan's Board awarded the main contract to construct the ozonation facilities, along with portions of four related rehabilitation projects. The Diemer plant's ozone generation equipment has been fabricated and is currently being installed by the ORP contractor. At this time, staff recommends that a number of ORP completion activities, which includes preparation of specialized documentation and staff training, be initiated so that start-up and operation of the new ozonation facilities may proceed efficiently. These activities include:

- Record drawing preparation, focusing initially on facilities already placed into operation
- O&M manual preparation
- Inundation mapping for the ozone contactors, which are classified as dams by the State Division of Safety of Dams (DSOD)
- Technical training of Metropolitan staff on the new ozonation process and its equipment

For large multiyear capital programs, staff's approach for seeking board authority is to schedule the Board actions incrementally over the course of the program, when major work activities are ready to commence. Typical board requests include award of contracts, authorization of agreements, appropriation of funds, and authorization of staff support activities. Initiation of the ORP completion activities at this time is consistent with the planned approach

for execution of the Diemer ORP. These activities have been reviewed with Metropolitan's updated CIP prioritization criteria, and are budgeted within Metropolitan's CIP for fiscal year 2010/11.

Background

The Diemer plant was placed into service in 1963 with an initial capacity of 200 million gallons per day (mgd). In 1969, the plant was expanded to its current capacity of 520 mgd. The plant 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.

In July 2008, Metropolitan's Board awarded the main contract to construct the Diemer ozonation facilities, along with four related rehabilitation projects. These four projects are:

- Plant Flow Meters and Vault Upgrades
- Plant Electrical Upgrades – Phase I
- Used Washwater Pump Stations' Modifications
- Main Entrance Road Refurbishment

Due to the overlapping construction schedules and common work areas for these projects, staff combined the four projects with the Diemer ORP work under a single construction contract (Specifications No. 1500). Construction of the work under Specifications No. 1500 is currently underway and is planned to be completed in mid-2012.

In early 2012, following the final Diemer ORP major plant shutdown, staff plans to return to the Board to authorize all remaining start-up activities and Metropolitan force construction in order to complete the ozonation facilities and commence operation. In late 2012, following start-up of the ozonation facilities, a "wrap-up" construction contract (i.e., paving) is scheduled to be awarded. This future contract will represent the final work planned under the Diemer ORP capital program.

Diemer ORP Completion Activities (\$1,880,000)

The Diemer ORP is a large multi-contract program with tightly planned sequential schedules. To enable the ozonation facilities to commence operation immediately after completion of the main construction contract, several time-critical activities are recommended to begin at this time.

Preparation of Record Drawings – Record drawings are prepared when construction nears completion in order to document the final condition of a facility, which typically varies somewhat from the details shown on the contract drawings. A number of major work elements under the Diemer ORP have already been placed into operation or are nearing completion. Examples of recently completed work include the Southern California Edison 66 kV electrical substation; the switchgear and emergency generator buildings; and various electrical duct banks throughout the Diemer plant. At this time, staff recommends integrating this information into electronic record drawing files to enable staff training, efficient system operation, and troubleshooting based on as-built conditions. This effort will continue as other major portions of the Diemer ORP construction are completed. These revised electronic drawings will serve as the permanent record of the construction work under the program. Camp Dresser and McKee (CDM) is the engineer-of-record for final design of the Diemer ozonation facilities and related projects, and is recommended to prepare the record drawings. The estimated cost to prepare these drawings is \$1.35 million. The level of effort required is consistent with other previous large-scale water treatment projects, including the Skinner ORP and Jensen ORP.

Preparation of Operation and Maintenance Manuals – O&M manuals include a description of the new treatment processes and equipment, with its intended operation; design criteria; performance-monitoring program; laboratory procedures; emergency response procedures; record-keeping procedures; equipment maintenance program; troubleshooting guide; and references for use by plant staff. O&M manuals are used for training and to comply with California Department of Public Health (CDPH) rules which require that all monitoring and O&M activities for the water treatment plant be performed in accordance with a CDPH-approved Operations, Maintenance, and Monitoring Plan. At this time, staff recommends commencing preparation of the O&M manuals to enable system start-up, staff training, and operation of the new and upgraded plant electrical systems, the ozonation process, and other plant improvements. The O&M manuals are recommended to be prepared by

Metropolitan staff, with specialized support by Process Applications, Inc. (PAI) and CDM. The estimated cost to develop the manuals is \$255,000.

Inundation Mapping – Due to its unique location, the Diemer ozone contactor structure is classified as a dam and falls under the jurisdiction of the California DSOD. For such dams, state regulations require that inundation maps be prepared to show approximate areas where water would flow in the event of sudden failure of the dam. In accordance with Cal EMA procedures, inundation maps must be submitted to Cal EMA for review and approval at least 60 days prior to filling the contactors. The approved maps are used by local agencies for land use and emergency planning. The Diemer ozone contactor inundation maps will be prepared by Metropolitan staff. The estimated cost to develop the maps is \$95,000.

Technical Training – To optimize operation of the ozonation system and to safely meet water quality regulations, staff must be trained on the new treatment process and its equipment in areas such as normal and emergency operating procedures, system variances and control logic, by-pass options, the ozone process control system, maintenance and troubleshooting, required water quality documentation, and required record-keeping. This specialized technical training is recommended to be provided by PAI, as discussed below. The estimated cost to provide these services is \$230,000.

Summary for ORP Completion Activities – This action appropriates \$1.88 million and authorizes completion activities and documentation for the Diemer ORP. This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2010/11 capital budget. See [Attachment 1](#) for the Financial Statements and [Attachment 2](#) for the Location Map.

The Diemer ORP is included within capital Appropriation No. 15389, which was initiated in fiscal year 2001/02. Appropriation No. 15389 also includes the Site Preparation Project, Chemical System Upgrades – Phase I, the Plant Maintenance Facility, the Vehicle Maintenance Center, and the Ozone Equipment procurement. With the present action, the total funding for Appropriation No. 15389 will increase from \$361,252,400 to \$363,032,400.

The four rehabilitation projects which are being constructed under Specifications No. 1500 are included within capital Appropriation No. 15380, the Diemer Water Treatment Plant Improvements Program, which was initiated in fiscal year 2001/02. With the present action, the total funding for Appropriation No. 15380 will increase from \$101,971,600 to \$102,071,600.

The subject projects are consistent with Metropolitan's goals for sustainability by enhancing the reliability of the existing treatment, conveyance and distribution system, in order to maintain reliable water deliveries in the future.

Technical Engineering Support (CDM) – Amendment to Existing Agreement

Camp Dresser & McKee performed final design of the Diemer ozonation facilities and the four related rehabilitation projects. Staff recommends that CDM, as the engineer-of-record, prepare the project's record drawings and assist in development of the O&M manuals. CDM has the most thorough knowledge of the design intent, drawings, and specifications, and represents the most efficient means to complete this work. The estimated cost to provide these services is \$1.35 million for record drawing preparation, and \$50,000 to develop specific portions of the O&M manuals. The funds to perform this work are included under the ORP completion activities in this action, as described previously.

CDM continues to assist Metropolitan staff with technical support on the Diemer ORP construction project. This support has been provided under an agreement authorized by Metropolitan's Board in July 2008. Examples of support provided under this agreement include review of submittals received from the contractor, responding to requests for information, advising inspection staff on technical issues as they may arise, and permitting with the Orange County Fire Authority (OCFA) to respond to recent updates in fire codes which were not in place when the Diemer ORP commenced construction in 2008.

At the present time, construction of the Diemer ORP is approximately 75 percent complete. Staff has projected the level of effort required to support the remaining construction effort, and recommends that the agreement authority for CDM be increased so that CDM's technical engineering support can be continued through the planned construction completion in mid-2012. An increase of \$1.85 million to the existing CDM agreement is

recommended for this effort. No additional funds are required to be appropriated, as sufficient funds for this effort have been previously appropriated and are available within the project appropriations. Continuing with CDM in its present role is the most cost-effective strategy to complete this portion of the project.

CDM was selected through a competitive process (Request for Qualifications No. 719), and amendment of the existing CDM agreement is consistent with the agreement's scope of work and with the planned approach for project implementation. For this agreement, Metropolitan has established a Small Business Enterprise (SBE) participation level of 15 percent.

This action authorizes an increase of \$3.2 million to the existing agreement authority with CDM, for a new not-to-exceed total of \$23,038,000, to provide continued technical support to complete the Diemer ORP.

Ozone Process Training and Optimization (PAI) - No Action Required

Process Applications, Inc. has been continuously engaged in the highly specialized field of ozone system start-up and optimization since 1983. In this role, PAI has extensive experience in the training of water agency staff throughout the United States to operate and optimize large capacity ozone systems. PAI will work with Diemer plant staff during the first year of operation to optimize the ozonation process to reduce power consumption. Staff has performed a thorough review of consultants available in this area of training and plant start-up assistance, and has determined that PAI is the only firm that has demonstrated the skills and the expertise to provide these specialized services for an ozone system of the complexity and capacity of the Diemer system.

Staff recommends that ozonation process technical training and optimization, and assistance in development of the O&M manuals be provided by PAI under a new professional services agreement. This agreement is planned to be awarded by the General Manager under his Administrative Code authority. Process Applications is an SBE firm and thus achieves 100 percent SBE participation. The estimated cost to provide these services is \$230,000 for technical training and optimization, and \$10,000 for O&M manual support.

Project Milestones

December 2011 – Completion of the final Diemer plant shutdown for the ORP

July 2012 – Completion of the ozonation facilities construction contract

December 2012 – Completion of operations manuals

July 2013 – Completion of record drawings

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 Options #1 and #2:

The proposed actions are not defined as a project under CEQA because they involve continuing administrative activities, such as personnel-related actions, general policy and procedure making (Section 15378(b)(2) of the State CEQA Guidelines). In addition, the proposed actions are not subject to CEQA because they involve other government fiscal activities, which do not involve any commitment to any specific project which may result in a potentially significant physical impact on the environment (Section 15378(b)(4) of the State CEQA Guidelines).

The CEQA determination is: Determine that the proposed actions are not subject to CEQA pursuant to Sections 15378(b)(2) and 15378(b)(4) of the State CEQA Guidelines.

Board Options

Option #1

Adopt the CEQA determination and

- a. Appropriate \$1.88 million for Diemer ORP completion activities; and
- b. Authorize increase of \$3.2 million to the existing agreement with CDM, for a new not-to-exceed total of \$23,038,000.

Fiscal Impact: \$1.78 million of budgeted funds under Approp. 15389 and \$100,000 of budgeted funds under Approp. 15380

Business Analysis: Completion of the Diemer ORP will remove blend restrictions and enhance the plant’s ability to treat water with variable source water quality.

Option #2

Adopt the CEQA determination and

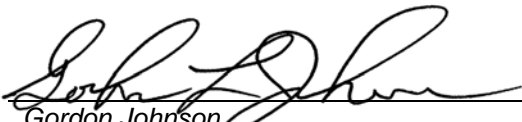

- a. Authorize increase of \$1.85 million to the existing agreement with CDM, for a new not-to-exceed total of \$21,688,000; and
- b. Do not authorize the Diemer ORP completion activities at this time.

Fiscal Impact: None

Business Analysis: Under this option, completion activities for the Diemer ORP would be delayed until the final ORP shutdown is completed in early 2012. Start-up of the ozonation facilities would also be delayed until necessary training, documentation, and record drawings are completed.

Staff Recommendation

Option #1

 _____ Gordon Johnson Manager/Chief Engineer, Engineering Services	4/25/2011 Date
 _____ Jeffrey Lightlinger General Manager	4/26/2011 Date

Attachment 1 – Financial Statements

Attachment 2 – Location Map

Financial Statement for Diemer Oxidation Retrofit Program

A breakdown of Board Action No. 11 for Appropriation No. 15389 for completion activities for the Diemer ORP* is as follows:

	Previous Total Appropriated Amount (July 2008)**	Current Board Action No. 11 (May 2011)	New Total Appropriated Amount
Labor			
Studies and Investigations	\$ 1,800,000	\$ -	\$ 1,800,000
Owner Costs (O&M manuals and mapping)	5,826,310	228,000	6,054,310
Final Design	5,903,237	-	5,903,237
Submittals Review	5,388,000	-	5,388,000
Construction Inspection and Support	28,561,000	-	28,561,000
Metropolitan Force Construction	5,708,000	-	5,708,000
Materials and Supplies	9,087,741	52,000	9,139,741
Incidental Expenses	951,404	-	951,404
Professional/Technical Services	28,188,060	-	28,188,060
CDM	-	1,260,000	1,260,000
Process Applications	-	240,000	240,000
Equipment Use	200,892	-	200,892
Contracts	254,842,526	-	254,842,526
Remaining Budget	14,795,230	-	14,795,230
Total	\$ 361,252,400 ***	\$ 1,780,000	\$ 363,032,400

Funding Request

Program Name:	Diemer Water Treatment Plant - Oxidation Retrofit Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15389	Board Action No.:	11
Requested Amount:	\$ 1,780,000	Capital Program No.:	15389-W
Total Appropriated Amount:	\$ 363,032,400	Capital Program Page No.:	284
Total Program Estimate:	\$ 373,730,000	Program Goal:	WQ/Compliance

* The total amount expended to date on the Diemer ORP is approximately \$253,650,000.

** Reflects redistribution of \$27,625,600 to the Diemer Improvements Program (Approp. 15380), as authorized by the Board in July 2008.

*** Includes previous reallocation of \$174,033 from two completed projects to Remaining Budget for work completed below budget, and from Remaining Budget to the following projects: (1) \$458,824 for Diemer Plant Maintenance Facilities due to differing site conditions and consultant errors and omissions, as reflected in the Board Action for Item 8-7 in September 2010; (2) \$668,888 for Diemer ORP Chemical Tank Farm due to abatement of hazardous materials and differing site conditions during construction; and (3) 1,143,875 for Diemer ORP ozonation facilities final design phase due to addition of a tunnel for contactor rejection, extension of the northwest upper pad and realignment of road and utilities, and increased DSOD permit fees.

Financial Statement for Diemer Water Treatment Plant Improvements Program

A breakdown of Board Action No. 20 for Appropriation No. 15380 for four rehabilitation projects* is as follows:

	Previous Total Appropriated Amount** (Mar. 2011)	Current Board Action No. 20 (May 2011)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 1,468,400	\$ -	\$ 1,468,400
Final Design	4,420,900	-	4,420,900
Owner Costs (O&M manuals)	6,809,946	9,000	6,818,946
Envir. Monitoring	97,680	-	97,680
Submittals Review	27,804	-	27,804
Construction Inspection and Support	5,694,668	-	5,694,668
Metropolitan Force Construction	2,028,768	-	2,028,768
Materials and Supplies	830,916	1,000	831,916
Incidental Expenses	341,767	-	341,767
Professional/Technical Services	10,363,375	-	10,363,375
CDM	-	90,000	90,000
Equipment Use	96,608	-	96,608
Contracts	67,614,108	-	67,614,108
Remaining Budget	2,176,660	-	2,176,660
Total	\$ 101,971,600 **	\$ 100,000	\$ 102,071,600

Funding Request

Program Name:	Diemer Water Treatment Plant Improvements Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15380	Board Action No.:	20
Requested Amount:	\$ 100,000	Capital Program No.:	15380-I
Total Appropriated Amount:	\$ 102,071,600	Capital Program Page No.:	282
Total Program Estimate:	\$ 195,943,900	Program Goal:	I-Infrastructure Reliability

* The total amount expended to date on the four rehabilitation projects is approximately: (1) Plant Flow Meters and Vault Upgrades: \$731,000; (2) Plant Electrical Upgrades – Phase I: \$9,337,000; (3) Used Washwater Pump Stations Modifications: \$983,000; and (4) Main Entrance Road Repavement: \$993,000.

** Includes a correction to reflect previous Action No. 19 in Mar. 2011. Also includes previous reallocation of \$220,100 from Remaining Budget for the Filter Outlet Conduit Seismic Upgrade project for soil borings, computer geotechnical/structural modeling, and value engineering.

Robert B. Diemer Water Treatment Plant

