



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

12/13/2016 Board Meeting

8-3

Subject

Adopt CEQA determination and appropriate \$6.2 million; award \$594,384 procurement contract to Royal Wholesale Electric; and authorize: (1) completion activities for the Oxidation Retrofit Program at the Weymouth plant; (2) upgrade of the ozone control system at the Jensen plant; and (3) increase of \$788,000 to an agreement with Suez Treatment Solutions, for a new not-to-exceed total of \$1,695,000 (Approps. 15392 and 15486)

Executive Summary

This action authorizes remaining activities needed to complete the Oxidation Retrofit Program (ORP) at the F. E. Weymouth Water Treatment Plant, including the preparation of operation and maintenance (O&M) manuals, performance testing, and ozone system start-up and integration. This action also authorizes replacement of outdated process control equipment for the ozone system at the Joseph Jensen Water Treatment Plant, along with upgrade of that plant's ozone control software.

Timing and Urgency

Construction of the Weymouth ORP has been phased so that major project elements could be accomplished in a sequential manner, minimizing impacts on plant operations and other construction underway at the La Verne site. Metropolitan's approach toward the management of long-term, multi-component capital projects is to return to the Board at major project milestones for progressive funding and authorization of work. At the present time, construction of the main ozonation facilities at the Weymouth plant is nearing completion. Once the ORP contractor has demobilized, Metropolitan staff will initiate the system integration, testing, and start-up activities needed for ozone to begin serving as the plant's primary disinfectant. This action provides funding for those completion activities.

The ozonation process includes numerous equipment items and support systems such as liquid oxygen storage tanks, ozone generators, high-voltage power supplies, cooling system, ozone contactors, destruct system, and safety and water quality monitoring equipment. Operational control of these systems is performed by a series of networked programmable logic controllers (PLCs) that interact with the plant's supervisory control and data acquisition system (SCADA). At the Jensen plant, the existing ozone control equipment has exceeded its service life and is no longer supported by the manufacturer. This equipment needs to be replaced and its control software updated to maintain reliable operation of the ozone system and to meet Metropolitan's water quality objectives. Moving forward with updating the Jensen ozone control system at this time will improve reliability by converting from a proprietary system to an open-architecture approach, and will maintain consistency across Metropolitan's treatment plants.

These projects have been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and are included in the Water Quality/Oxidation Retrofit and the Treatment Plant Reliability Programs. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2016/17.

Details

Background

The addition of ozone as the primary disinfectant at each of Metropolitan's treatment plants substantially reduces the formation of disinfection by-products (DBP) for compliance with the U. S. Environmental Protection Agency's Disinfectants/DBP rule. The use of ozone also enhances Metropolitan's ability to treat water with varying source-water quality, and provides critical operational flexibility to meet treatment challenges resulting from periodic water supply events such as drought or other source-water limitations. Further, ozonation is effective in controlling taste-and-odor causing compounds which may be present from time to time, as well as some pharmaceuticals/personal care products, endocrine disruptors, and algal toxins. In addition to these overall water quality benefits, the use of ozone provides important operational advantages, allowing Metropolitan to eliminate blend restrictions of State Water Project (SWP) and Colorado River Aqueduct (CRA) supplies. Ozone systems have been installed and are in operation at four of Metropolitan's five treatment plants. The final facility to incorporate ozone as the primary disinfectant is the Weymouth plant.

- **Weymouth ORP** - 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 CRA and SWP to Metropolitan's Central Pool portion of the distribution system, and to an exclusive service area. The plant is located in the city of La Verne.

Due to its size and complexity, execution of the Weymouth ORP was phased via multiple construction and equipment procurement contracts. In 2005, Metropolitan procured the ozone generation equipment including the liquid oxygen storage tanks, vaporizers, ozone generators, power supply systems, ozone off-gas destruct equipment, control system, and control software from Ozonia North America (now Suez Treatment Solutions) for installation by the main construction contractor. Prior to award of the contract to construct the main ozonation facilities, the plant's inlet conduit was relocated and the electrical system was upgraded to serve the increased power demand of the ozone system. In June 2012, Metropolitan's Board awarded a construction contract for the main ozonation facilities based on an initial process capacity of 260 mgd. In December 2013, the Board authorized a change order to increase the ozonation capacity to 520 mgd, which matches the full treatment capacity of the plant. In August 2015, the Board awarded a construction contract for the ORP chemical feed system. Construction of the main ozonation facilities is scheduled to be completed in early 2017, while the ORP chemical feed system is scheduled to be completed by mid-2017.

Staff recommends proceeding with system integration, testing, and start-up activities for the Weymouth ORP at this time. Testing of the SCADA and fire alarm systems, ozone generation performance testing, and extended-duration process testing will be conducted to confirm the readiness of the facility to switch over to ozone as the primary disinfectant.

Staff will return to the Board in late 2017 with the final action related to the Weymouth ORP. This action will address all remaining work for the project including final site paving, spare parts procurement, and enhancements to the ozone destruct system for operation at low SWP blends.

- **Jensen Plant** - The Jensen plant was placed into service in 1972 with an initial capacity of 400 mgd, and was expanded in the early 1990s to its current capacity of 750 mgd. The Jensen ozone system has been operating successfully since 2005. The plant treats water from the West Branch of the SWP and delivers it to Metropolitan's Central Pool and to exclusive service areas on the west side of the distribution system. The facility is located in Granada Hills.

Metropolitan's first three ozonation systems at the Jensen, Mills, and Skinner plants are equipped with a type of PLC that was introduced to the commercial market in 1988. Computer hardware from that era is now outdated, and the PLC manufacturer has announced that it will no longer produce or support this equipment. Inventories of spare parts will no longer be maintained. Further, the proprietary hardware and software used to transfer data between PLCs within the control network is obsolete. Failure of a communication module in the network could cause a disruption in the ozone control system. Staff recommends replacing the equipment

and upgrading the software for the Jensen ozone control system at this time. The upgraded system will feature Metropolitan-standard PLC's in an open-architecture approach that staff will be able to maintain and upgrade in the future.

Following successful testing of the updated ozone control system at the Jensen plant, staff will return to the Board for authorization to update the ozone control systems at the Mills and Skinner plants.

Project No. 1 – Weymouth ORP Completion Activities (\$4,590,000)

Construction of the main ozonation facilities at the Weymouth plant is nearing completion. Several important activities are recommended to move forward at this time so the new ozone system can commence operation.

- **System Integration, Testing, and Start-Up** – Once the testing of individual components has been completed by the main ozone facilities contractor, the ozone generation equipment supplier, and the chemical feed system contractor, the entire system must be integrated into the Weymouth plant's existing control system. This work includes: programming and testing of the plant's SCADA system and the ozone system PLCs; replacement of ozone system components that have deteriorated while in extended storage; testing of the fire alarm and safety systems; calibration of instruments; and performance testing and extended-duration reliability testing of the ozone generation system.
- **Permitting and Preparation of O&M Manuals and Record Drawings** – Metropolitan must obtain a permit from the California Division of Drinking Water for the Weymouth plant's new ozone system. Permit provisions will address operational issues and will require that operation and maintenance (O&M) manuals be developed. The planned O&M manuals will include: a description of the new treatment process and equipment, with its intended operation; design criteria; the ozonation process performance-monitoring program; laboratory procedures; emergency response procedures; record-keeping procedures; equipment maintenance guide; trouble-shooting guide; and references needed by plant staff. Metropolitan's maintenance management system will be updated to include the new equipment, and record drawings will be prepared to document the final condition of the facility.

Prior to its installation under this project, the Weymouth ozone generation equipment was held in storage for over seven years. During this time, the manufacturer's warranty for the equipment expired, while some equipment items deteriorated due to age. As a result, some parts will need to be replaced as the ozone system is started up and tested. The parts identified thus far that will need to be replaced include the ozone generators' power supply capacitors and the cooling water system's heat exchangers. Suez Treatment Solutions is the successor firm to the original equipment manufacturer, and is the only firm capable of providing the technical assistance and specialized parts needed for the Weymouth ozone system. Staff therefore recommends that Suez Treatment Solutions furnish the ozone system replacement parts, update the ozone system programming, and provide start-up support, as described below.

The SCADA system programming, ozone control system testing, and instrument calibration will require extensive coordination with Weymouth plant operations. Based on staff's experience starting up ozone systems at Metropolitan's four other plants, the required duration is difficult to predict, but may exceed six months. During this period, the contractor for the main ozonation system is required to expeditiously correct any deficiencies in its work that may be discovered. The start-up activities and inspection of the contractor's work will be performed by Metropolitan staff. Staff will also acquire operating permits from the Division of Drinking Water, prepare O&M manuals, and prepare record drawings for the Metropolitan-designed elements of the work.

This action appropriates \$4.59 million and authorizes completion activities for the new ozone system at the Weymouth plant. The requested funds include \$2,905,000 for system integration, testing, inspection, and start-up; \$1,185,000 for permitting, preparation of O&M manuals and record drawings, and project management; and \$500,000 for Suez Treatment Solutions to furnish replacement parts and to support ozone system start-up.

The total estimated cost to complete the Weymouth ORP, including the amount appropriated to date, current funds requested, and future construction costs, is anticipated to range from \$255 million to \$260 million. This project is included within Appropriation No. 15392, the Weymouth ORP, which was initiated in fiscal year

2001/02. With the present action, the total funding for Appropriation No. 15392 will increase from \$246,892,000 to \$251,482,000.

Project No. 2 – Jensen Ozone Control System Upgrades (\$1,610,000)

The Jensen ozone control system consists of PLCs, software, and communication equipment that includes communication switches, input/output modules, and cables. The system supervises operation of the ozone generators, ozone contactors, and off-gas destruct system. This project will replace outdated PLC units and communication modules at the Jensen plant, and will update the existing control software and its associated documentation.

Suez Treatment Solutions will update the ozone control software, install new PLCs and communication control modules, and test the updated ozone control system. The PLCs, communication hardware, and other electronic components will be furnished by Royal Wholesale Electronic through a procurement contract described below. Metropolitan staff will relocate electrical wiring outside of PLC cabinets, conduct system integration tests, and certify control system functionality following equipment tests.

Suez Treatment Solutions has specialized expertise with its proprietary ozone equipment and control systems, and has exclusive experience with the testing and integration of large capacity ozone generation equipment into Metropolitan's water treatment plants. Selection of Suez Treatment Solutions to upgrade the Jensen ozone control system represents the most cost-effective and efficient means to complete this specialized work.

This action appropriates \$1.61 million and authorizes upgrade of the Jensen ozone control system. The requested funds include \$594,384 for the equipment procurement contract; \$288,000 for Suez Treatment Solutions to update the control software; \$512,000 for equipment installation and testing, review of submittals, preparation of record drawings, and project management by Metropolitan staff; and \$215,616 for remaining budget.

The total estimated cost to complete the ozone control system upgrades is \$1.61 million. This project is included within Appropriation No. 15486, the Jensen Improvements – FY 2012/13 Through 2017/18. With the present action, the total funding for Appropriation No. 15486 will increase from \$1,375,000 to \$2,985,000.

Agreement with Suez Treatment Solutions – Amendment to Agreement

Suez Treatment Solutions is recommended to furnish replacement parts and provide start-up assistance for the Weymouth ORP, and to upgrade the ozone control system at the Jensen plant. By updating the ozone control software for both plants in a coordinated manner, the overall cost of the upgrades will be reduced, as much of the software developed for the Weymouth ozone control system will be applicable to the Jensen system. Suez Treatment Solutions has proprietary knowledge of its ozone and control system equipment, and has exclusive experience with the testing and integration of large-capacity ozone generation equipment at Metropolitan's treatment plants. Suez Treatment Solutions' predecessor firm, Ozonia North America, was previously selected through competitive bidding to furnish the ozone generation equipment for each of Metropolitan's treatment plants, and to provide training, start-up, and testing services. Per Section 8140(1)(d) of Metropolitan's Administrative Code, conducting a new competitive procurement process for the needed services would not produce an advantage. As a result, staff recommends that these services be provided by Suez Treatment Solutions via an amendment to its existing agreement.

This action authorizes an increase of \$788,000 to the existing agreement with Suez Treatment Solutions, for a new not-to-exceed total of \$1,695,000. The increase is based on \$288,000 in services for the Jensen plant, and \$500,000 for the Weymouth plant. Due to the unique nature of these services, no Small Business Enterprise participation level was established. The sole subconsultant planned for this agreement is Imalog, Inc.

Jensen Ozone Control Equipment – Award of Procurement Contract

PLCs are used throughout Metropolitan's treatment plants and distribution system to provide localized process control, alarms, and monitoring. Prior to 2009, Metropolitan had over 100 PLC installations consisting of 18 different models by ten different manufacturers, which led to an overall lack of support, coordination, spare parts, and training, as well as increased operational risk. In accordance with Administrative Code Section 8140(1)(d), Metropolitan established Allen-Bradley as the sole brand for all of Metropolitan's PLCs in 2009.

Since that date, staff has procured these units exclusively for both new and replacement applications, resulting in standardized and improved operation of Metropolitan's control systems.

The Jensen ozone control system upgrades require 14 new PLCs and related communication hardware. Royal Wholesale Electric is the sole supplier of Allen-Bradley equipment for Los Angeles County. The amount of the procurement contract negotiated with Royal Wholesale Electric is a not-to-exceed total of \$594,384. This amount is consistent with previous purchases of Allen-Bradley equipment. As a procurement contract, there are no opportunities for subcontracting.

Summary

This action appropriates \$6.2 million; authorizes completion activities for the Weymouth ORP; authorizes upgrades to the ozone control system at the Jensen plant; awards a procurement contract for communication and control equipment; and authorizes amendment of an existing agreement with Suez Treatment Solutions. These projects have been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2016/17 capital expenditure plan. See [Attachment 1](#) for the Financial Statements, and [Attachment 2](#) for the Location Map.

Project Milestones

Third Quarter 2017 – Completion of Weymouth ORP testing and start-up

December 2017 – Completion of replacement of Jensen ozone control system

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

Metropolitan Water District Administrative Code Section 8140: Competitive Procurement

California Environmental Quality Act (CEQA)

Project No. 1 - Weymouth ORP Completion Activities

CEQA determinations for Options #1 and #2:

The environmental effects from the Weymouth ORP were evaluated in the F. E. Weymouth Filtration Plant Ozonation Facilities and Site Improvements Program Final Environmental Impact Report (Final EIR), which was certified by the Board on April 12, 2005. The Board also approved the Findings of Fact (Findings), the Statement of Overriding Considerations (SOC), the Mitigation Monitoring and Reporting Program (MMRP), and the project itself. The current action is solely based on testing, start-up, and completion activities for the ORP, and not on any changes to the approved project itself. Hence, the previous environmental documentation acted on by the Board in conjunction with the proposed action fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further CEQA documentation is necessary for the Board to act on the proposed action.

The CEQA determination is: Determine that the proposed action has been previously addressed in the certified 2005 Final EIR, Findings, SOC, and MMRP, and that no further environmental analysis or documentation is required.

CEQA determination for Option #3:

None required

Project No. 2 - Jensen Ozone Control System Upgrades

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, minor alterations and replacement of existing public facilities with

negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determinations for Options #2 and #3:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed actions have been previously addressed in the certified 2005 Final EIR, Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program, and that no further environmental analysis or documentation is required; or are categorically exempt; and

- a. Appropriate \$6.2 million;
- b. Authorize completion activities for the Weymouth Oxidation Retrofit Program;
- c. Authorize upgrades to the ozone control system at the Jensen plant;
- d. Authorize increase of \$788,000 to an agreement with Suez Treatment Solutions, for a new not-to-exceed total of \$1,695,000; and
- e. Award \$594,384 procurement contract to Royal Wholesale Electric for control equipment at the Jensen plant.

Fiscal Impact: \$4.59 million of capital funds under Appropriation No. 15392 and \$1.61 million in capital funds under Appropriation No. 15486

Business Analysis: This option will enable the Weymouth ozone system to commence operation on schedule, and will enhance reliability of the ozone system at the Jensen plant.

Option #2

Adopt the CEQA determination that the proposed action has been previously addressed in the certified 2005 Final EIR, Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Program, and that no further environmental analysis or documentation is required; and

- a. Appropriate \$4.59 million;
- b. Authorize completion activities for the Weymouth Oxidation Retrofit Program;
- c. Authorize increase of \$500,000 to an agreement with Suez Treatment Solutions, for a new not-to-exceed total of \$1,407,000; and
- d. Do not authorize replacement of ozone control equipment system at the Jensen plant.

Fiscal Impact: \$4.59 million of capital funds under Appropriation No. 15392

Business Analysis: This option would enable the Weymouth ORP to commence operation. The Jensen ozone control system PLCs and communication equipment would be monitored and replaced individually as they fail. An extended outage of the ozone disinfection system at the Jensen plant could occur if critical components of the control system were to fail.

Option #3

Do not proceed with the two projects at this time.

Fiscal Impact: None

Business Analysis: Under this option, start-up of the ozonation facilities at the Weymouth plant would be delayed and replacement of the Jensen ozone system PLCs and communication equipment would be deferred. An extended outage of the ozone disinfection system at the Jensen plant could occur if critical components of the control system were to fail.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer,
Engineering Services

11/28/2016
Date



for Jeffrey Kightlinger
General Manager

11/30/2016
Date

Attachment 1 – Financial Statements

Attachment 2 – Location Map

Ref# es12643976

Financial Statement for Weymouth Oxidation Retrofit Program

A breakdown of Board Action No. 14 for Appropriation No. 15392 for the Weymouth ORP¹ is as follows:

	Previous Total Appropriated Amount (Aug. 2015)	Current Board Action No. 14 (Dec. 2016)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 1,464,000	\$ -	\$ 1,464,000
Final Design	19,159,975	-	19,159,975
Owner Costs (O&M manuals, permitting & program mgmt.)	9,544,400	1,204,000	10,748,400
Submittals Review & Record Drwgs	8,132,600	640,000	8,772,600
Construction Inspection & Support	19,720,724	540,000	20,260,724
Metropolitan Force Construction	10,447,000	1,250,000	11,697,000
Materials & Supplies	10,220,650	430,000	10,650,650
Incidental Expenses	456,000	26,000	482,000
Professional/Technical Services	17,017,732	-	17,017,732
Suez Treatment Solutions	907,000	500,000	1,407,000
Equipment Use	98,000	-	98,000
Contracts	143,433,969	-	143,433,969
Remaining Budget	6,289,950 ²	-	6,289,950
Total	\$ 246,892,000	\$ 4,590,000	\$ 251,482,000

Funding Request

Appropriation Name:	Weymouth Oxidation Retrofit Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15392	Board Action No.:	14
Requested Amount:	\$ 4,590,000	Budget Page No.:	265
Total Appropriated Amount:	\$ 251,482,000	Total Appropriation Estimate:	\$ 270,000,000

¹The total amount expended to date on the Weymouth ORP is approximately \$228 million. The total estimated cost to complete the Weymouth ORP, including the amount appropriated to date, current funds requested, and future construction costs, is anticipated to range from \$255 million to \$260 million.

²Includes previous reallocation from Remaining Budget for the following work: (1) \$2,450,780 for construction change orders on the main ozonation facilities contract; (2) \$33,000 to support warranty work on the Weymouth plant's standby generator; and (3) \$2.2 million for modifications to the Weymouth plant's domestic water system to support the switchover to ozone as the primary disinfectant.

Financial Statement for Jensen Improvements – FY 2012/13 Through FY 2017/18

A breakdown of Board Action No. 3 for Appropriation No. 15486 for upgrades to the ozone control system at the Jensen plant¹ is as follows:

	Previous Total Appropriated Amount (Aug. 2014)	Current Board Action No. 3 (Dec. 2016)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 320,000	\$ -	\$ 320,000
Final Design	549,000	36,000	585,000
Owner Costs (Program mgmt.)	296,000	105,000	401,000
Submittals Review & Record Drwgs	-	30,000	30,000
Construction Inspection & Support	-	54,000	54,000
Metropolitan Force Construction	-	227,000	227,000
Materials & Supplies	3,000	10,000	13,000
Incidental Expenses	16,000	21,000	37,000
Professional/Technical Services	146,500	-	146,500
Suez Treatment Solutions	-	288,000	288,000
Equipment Use	-	-	-
Contracts	-	-	-
Royal Wholesale Electric	-	594,384	594,384
Fire protection contractor	-	29,000	29,000
Remaining Budget	44,500 ²	215,616	260,116
Total	\$ 1,375,000	\$ 1,610,000	\$ 2,985,000

Funding Request

Appropriation Name:	Jensen Improvements – FY 2012/13 Through FY 2017/18		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15486	Board Action No.:	3
Requested Amount:	\$ 1,610,000	Budget Page No.:	239
Total Appropriated Amount:	\$ 2,985,000	Total Appropriation Estimate:	\$ 16,300,000

¹ This action is the initial appropriation upgrade the ozone control system at the Jensen plant. The total estimated cost to complete this project is \$1.61 million.

² Includes previous reallocation of \$171,500 to the Jensen Chemical Containment Upgrades projects for design to replace caustic soda feed pumps; and for design of upgrades to the chlorine containment system to meet updated fire code requirements.

Distribution System

