THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  Engineering and Operations Committee

12/10/2013 Board Meeting

8-5

Subject

Appropriate $22 million; and authorize construction contract change order for Stage 2 of the Weymouth Oxidation Retrofit Program (Approp. 15392)

Executive Summary

The F.E. Weymouth Water Treatment Plant is Metropolitan's final facility to receive the ozone disinfection process. Construction of the initial stage of the Weymouth Oxidation Retrofit Program (ORP) is now underway and is approximately 35 percent complete. This action authorizes construction of the second stage of the ORP via a change order to the current construction contract. With this action, the ozone treatment capacity of the Weymouth plant will increase from 260 million gallons per day (mgd) to the full plant capacity of 520 mgd.

Timing and Urgency

Metropolitan's Board awarded a contract to Archer Western Contractors in June 2012 to construct Stage 1 of the Weymouth ORP. Principal components of the contract include an ozone generation building, ozone off-gas destruct system, liquid oxygen storage facility, and hydrogen peroxide storage and feed facility, all of which are sized for the Weymouth plant's rated treatment capacity of 520 mgd. The contract also includes two ozone contactors that will provide ozone disinfection at a design capacity of 260 mgd, along with two bypass contactors which would be equipped for ozonation at a later stage.

The decision to stage implementation of ozone was made for three primary reasons. First, staff had concerns with overloading the Weymouth plant site with too much construction given the age of the facilities. Second, with recent low demands in the service area, staging seemed to be a good approach. Finally, Metropolitan staff was looking to cut costs where possible given low financial reserves.

Those conditions have all changed. Construction has proceeded more smoothly than expected at the Weymouth plant and has not overly burdened the work site. Demands have increased recently and full use of the Weymouth plant would greatly enhance system flexibility. And lastly, the costs to develop ozone at the Weymouth plant have been significantly less than staff had projected.

When bids were opened for the Stage 1 construction contract in early 2012, Metropolitan benefitted from the extremely competitive bidding climate of that time. Due to the favorable low bid, the estimated cost to complete the Stage 1 ORP facilities was approximately $105 million less than the amount budgeted within Metropolitan's Capital Investment Plan (CIP). The budget had been established based on historical costs to add ozonation to Metropolitan's four other treatment plants. Since the Stage 1 construction commenced, staff has monitored industry cost trends and has identified options for completion of the Stage 2 facilities.

Staff recommends moving forward at this time to increase the plant's ozonation capacity to 520 mgd. This action would take advantage of continued favorable pricing conditions and a window of opportunity with the Stage 1 construction contractor, would accommodate expected future Weymouth treated water demands, would eliminate blending restrictions associated with Metropolitan's source waters, and would provide flexibility within the Central Pool when PCCP feeders are removed from service for rehabilitation. The work would be completed most expeditiously and cost-effectively through a change order to the existing Stage 1 construction contract.

Metropolitan's Administrative Code explicitly exempts change orders from competitive procurement requirements.

The Weymouth ORP has been reviewed with Metropolitan's CIP prioritization criteria, and is categorized as a Water Quality project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2013/14.

Details

Background

The Weymouth plant was placed into service in 1941 with an initial capacity of 100 mgd, and was expanded twice to its current capacity of 520 mgd. The plant delivers a blend of waters from the Colorado River Aqueduct (CRA) and State Water Project (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.

The addition of ozone as the primary disinfectant at each of Metropolitan's treatment plants substantially reduces the formation of disinfection by-products for compliance with the U.S. Environmental Protection Agency's Disinfectants/Disinfection By-Products Rule (DBPs). 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 SWP and CRA source waters.

The Weymouth plant is Metropolitan's final facility to receive the ozone disinfection process. Ozonation has been in use at the Mills plant since 2003, and was added more recently to the Jensen, Skinner, and Diemer plants.

Favorable Construction Climate

Many of Metropolitan's construction contracts have benefitted from the recent competitive bidding climate within the public works construction industry. When bids were opened for the Stage 1 ORP contract in early 2012, the favorable low bid resulted in a program savings of approximately $105 million from the budgeted amount within Metropolitan's CIP. The budget had been established based on historical ORP costs for Metropolitan's four other treatment plants.

Since the Stage 1 construction commenced, staff has continued to monitor industry cost trends. While the bidding climate remains favorable, cost increases are being felt regionally and in specific construction materials, as reflected in industry cost indices such as those published by the Engineering News Record. As a result of the continuing gradual improvement in the overall economy, construction costs are likely to increase in the future. Staff believes there is a window of opportunity to complete the Stage 2 ORP facilities in the near-term which will produce both cost and schedule benefits to Metropolitan.

Approaches to Increasing the Weymouth Ozone Treatment Capacity

Staff investigated two project delivery approaches to increase the ozone treatment capacity of the Weymouth plant. The first approach would follow a traditional design/bid/build methodology for the Stage 2 facilities. Staff would prepare drawings and specifications for advertisement and competitive bidding. Construction would commence in 2017, following completion of the Stage 1 construction contract. Under this approach, the additional 260 mgd of ozone treatment capacity would be operational in 2019-2020. Similarly, a separate construction contract would be issued for the sulfuric acid facility. The estimated total cost for this project delivery approach, including design, construction, construction management, and Metropolitan's owner costs, would range from approximately $25 million to $28 million.

The second project delivery approach would utilize a change order to the existing Stage 1 construction contract to construct the additional 260 mgd of ozone capacity and the associated chemical facility. Under this second approach, completion of the additional 260 mgd of capacity would be accomplished for approximately

$22 million, based on a lump-sum change order price negotiated with the Stage 1 ORP contractor, Archer Western Contractors. The additional ozone capacity would be brought on-line in early 2017, shortly after the initial Stage 1 capacity of 260 mgd. The additional work will not impact the Stage 1 completion date. The lump-sum amount negotiated for the change order is $18.5 million, which is based on the cost factors contained within the Stage 1 contract. Staff has prepared an independent estimate of the cost to complete the Stage 2 work, and believes the change order amount is fair and reasonable. The total estimated cost to complete the Stage 2 work, including the amount of the change order plus construction management, technical support from design staff, and Metropolitan owner costs, would be $22 million.

The cost differential of approximately $3 million to $6 million between the two project delivery approaches is due to several factors. First, use of the current construction contract would avoid the cost of additional mobilization that new contractors would incur when initiating the future separate construction contracts for the chemical systems and Stage 2 ozonation facilities. Some work including grading and paving could also be avoided. The cost to design, bid, manage, and inspect two stand-alone construction contracts would be avoided. The new sulfuric acid storage and feed facility is located in the Stage 1 ORP contractor's work area and must be in service prior to the conclusion of the major plant shutdown when water will begin flowing through the ozone contactors. Inclusion of the sulfuric acid tank farm in the ORP Stage 2 change order will minimize risks and inefficiencies associated with two contractors working in the same area. Additionally, use of the current contract would avoid the anticipated escalation in construction contract pricing that would occur by 2016, when the Stage 2 ORP contract would be advertised for bids. Use of the current contractor would also ensure that equipment and workmanship would remain identical across all of the Weymouth ozonation facilities.

Additional benefits to the second project delivery approach include avoidance of future plant shutdowns or flow restrictions in the 2019 timeframe, as all tie-in work would be accomplished with the already-planned shutdown in early 2016. This would be advantageous to Metropolitan member agencies that are in the Weymouth plant's exclusive service area. Since the second approach would be on-line three years sooner than with the traditional design/bid/build approach, rehabilitation of Metropolitan's PCCP feeders could also proceed with fewer flow constraints within the Central Pool or shutdown restrictions.

Based on the advantages associated with the second project delivery approach, staff recommends authorizing an increase in change order authority for Contract No. 1741 with Archer Western Contractors to increase the Weymouth plant ozone treatment capacity from 260 mgd to 520 mgd.

Two remaining construction contracts are planned for the Weymouth ORP. First, a hypochlorite storage and feed facility will be located on the north side of the plant. Since the hypochlorite does not need to be on-line until near the end of ozone system testing, this facility will be constructed under a separate construction contract with other Weymouth reliability improvements. Second, a completion project is planned which will address all remaining work under the ORP, such as control system integration and final site paving. Staff will return to the Board in May 2015 and September 2016 to award these two contracts.

Weymouth Oxidation Retrofit Program – Stage 2 Construction ($22,000,000)

The Weymouth ORP Stage 2 work includes outfitting the two bypass contactors with the required piping, equipment, instrumentation, and electrical systems needed to become two fully functional ozone contactors. With four ozone contactors, the Weymouth plant will have a maximum ozonation capacity of 520 mgd. The scope for the planned change order to the existing Stage 1 construction contract includes the addition of ozone diffusers and ozone gas piping within the two bypass contactors, along with related piping, electrical equipment, vacuum and pressure relief valves, ozone suppression system, tracer injection system, foam abatement system, sample water lines, and instrumentation and control devices located in the piping gallery adjacent to the two contactors. The ozone off-gas treatment and discharge system will be expanded, the supervisory control and data acquisition (SCADA) system will be modified, and the related site utilities including electrical duct banks and chemical trenches will be constructed.

The scope for the planned change order also includes the addition of a sulfuric acid storage and feed facility located near the ozone contactors. This facility will consist of three storage tanks, a covered containment area and unloading facility, chemical feed pumps, instrumentation, and electrical and control systems.

Under Metropolitan's Administrative Code, the General Manager has the authority to execute change orders for the Weymouth ORP Stage 1 contract up to $4,774,875 (5 percent of the original contract amount). To date, the change orders have totaled less than one percent of the contract. Construction is presently approximately 35 percent complete.

This action appropriates $22 million and authorizes an increase of $18.5 million in the General Manager's authority to execute change orders for Contract No. 1741 with Archer Western Contractors to construct the Weymouth ORP Stage 2 facilities. The new change order authority will be $23,274,875. In addition to the amount of the change order, the requested funds include $300,000 for preparation of change order drawings and specifications; $345,000 for Metropolitan forces to perform control system integration; $1,050,000 for construction inspection; $495,000 for submittals review and record drawing preparation by Metropolitan staff; $229,000 for project management; and $1,081,000 for remaining budget.

Metropolitan staff will perform inspection of the Stage 2 ORP construction. The anticipated cost of inspection is approximately 5.6 percent of the change order cost. Engineering Services' goal for inspection of projects with construction cost greater than $3 million is 9 to 12 percent. For this work, the total cost of construction is $18,845,000.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds for this work 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.

This project is included within capital Appropriation No. 15392, the Weymouth Oxidation Retrofit Program, which was initiated in fiscal year 2001/02. With the present action, the total funding for Appropriation No. 15392 will increase from $216,012,000 to $238,012,000.

The total estimated cost to complete the Weymouth ORP, including the amount authorized to date, current funds requested, and future completion activities, is $263 million.

Status of Proposition 50 Grant Funding

In July 2007, Metropolitan's Board adopted a resolution to accept $20 million of state Proposition 50 "The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002" grant funding for the Weymouth ORP. The California Department of Public Health (CDPH) and Metropolitan subsequently executed a Letter of Commitment to provide $20 million for grant-eligible Weymouth ORP activities, including design, ozone generation equipment procurement, and inlet conduit construction costs, since relocation of the Weymouth inlet conduit was necessary in order to retrofit the plant with ozone contactors.

In January 2011, the CDPH executed the Weymouth ORP grant funding agreement. Through November 2013, Metropolitan has received Proposition 50 grant payments totaling $19,916,864.72 for a portion of the design, ozone equipment fabrication, and inlet conduit/electrical facilities construction costs. Staff has submitted the final invoice to CDPH for reimbursement of the remaining $83,135.28 to be provided by the grant.

Project Milestones

September 2016 – Completion of Stage 1 construction

November 2016 – Completion of Stage 2 construction

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8123: Authority of the General Manager to Amend Contracts

Metropolitan Water District Administrative Code Section 8140: Competitive Procurement

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

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, the Mitigation Monitoring and Reporting Program (MMRP), and the project itself. The current board action is solely based on award of a construction contract for the ORP, and not on any changes to the approved program 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 2007 Addendum, and that no further environmental analysis or documentation is required.

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed action was considered in the previously certified 2005 Final EIR and other documents, and

a. Appropriate $22 million; and
b. Authorize an increase in change order authority of $18.5 million for the Weymouth ORP Stage 1 construction contract, for an aggregate authority not to exceed $23,274,875.

Fiscal Impact: $22 million of capital funds under Approp. 15392.

Business Analysis: This option will increase the ozone treatment capacity of the Weymouth plant in the most expeditious and cost-effective manner. This option will remove blending restrictions at the Weymouth plant associated with Metropolitan's source waters, and will provide near-term flexibility in meeting Central Pool treated water demands when PCCP feeders within the distribution system are removed from service for rehabilitation.

Option #2

Do not authorize an increase in change order authority for the Weymouth ORP Stage 1 construction contract.

Fiscal Impact: The total cost to complete the Weymouth ORP Stage 2 facilities would be approximately $3 million to $6 million greater than under Option #1.

Business Analysis: Under this option, completion of the Weymouth ORP Stage 2 facilities would be accomplished through separate construction contracts. The full ozonation capacity of 520 mgd would be on-line in 2019-2020.

Staff Recommendation

Option #1

11/25/2013

Gordon Johnson *Date*
Manager/Chief Engineer,
Engineering Services

11/27/2013

Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement
Attachment 2 – Location Map

Ref# es12626760

Financial Statement for Weymouth Oxidation Retrofit Program

A breakdown of Board Action No. 12 for Appropriation No. 15392 to construct Stage 2 of the Weymouth ORP[1] is as follows:

	Previous Total Appropriated Amount (Jan. 2013)	Current Board Action No. 12 (Dec. 2013)	New Total Appropriated Amount
Labor			
Studies & Investigations	$ 1,464,000	$ -	$ 1,464,000
Final Design	17,357,000	300,000	17,657,000
Owner Costs (Program mgmt & permitting)	8,938,400	229,000	9,167,400
Submittals Review & Record Drwgs	7,072,600	495,000	7,567,600
Construction Inspection & Support	17,899,724	1,050,000	18,949,724
Metropolitan Force Construction	7,754,000	185,000	7,939,000
Materials & Supplies	9,437,650	150,000	9,587,650
Incidental Expenses	438,000	10,000	448,000
Professional/Technical Services	17,452,432	-	17,452,432
Contracts	116,822,189	18,500,000	135,322,189
Equipment Use	98,000	-	98,000
Remaining Budget	11,278,005 [2]	1,081,000	12,359,005
Total	**$ 216,012,000**	**$ 22,000,000**	**$ 238,012,000**

Funding Request

Program Name:	Weymouth Oxidation Retrofit Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15392	**Board Action No.:**	12
Requested Amount:	**$** 22,000,000	**Budget Page No.:**	341
Total Appropriated Amount:	**$** 238,012,000	**Total Program Estimate:**	**$** 338,510,000

[1] The total amount expended to date on the Weymouth ORP, including permitting, design, construction of the predecessor projects, ozone equipment procurement, and construction to date of the Stage 1 ozonation facilities, is approximately $101,570,000. The total estimated cost to complete the Weymouth ORP, including the amount authorized to date, current funds requested, and future completion activities, is $267 million.

[2] Includes previous reallocation from Remaining Budget of $130,000 for the Weymouth Sodium Hypochlorite and Sulfuric Acid Facilities for additional grading and stormwater work on the north side of the plant.


Distribution System
N
CASTAIC LAKE
Foothill Feeder
VENTURA COUNTY
LOS ANGELES COUNTY
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
Weymouth Plant
Upper Feeder
LIVE OAK RESERVOIR
Rialto Pipeline
GARVEY RESERVOIR
Middle Feeder
SILVERWOOD LAKE
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
Lower Feeder
Colorado River Aqueduct
LAKE PERRIS
LAKE MATHEWS
PALOS VERDES RESERVOIR
PACIFIC OCEAN
DIAMOND VALLEY LAKE
ORANGE COUNTY
RIVERSIDE COUNTY
LAKE SKINNER
RIVERSIDE COUNTY
SAN DIEGO COUNTY