THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Engineering and Capital Programs Committee

March 10, 2009 Board Meeting

7-2

Subject

Appropriate $850,000; and authorize two Jensen plant rehabilitation projects (Approps. 15371 and 15442)

Description

This action authorizes final design to repair deficiencies in the filter surface wash system at Module No. 1 at the Joseph Jensen Water Treatment Plant, and a study to correct misalignment problems with the traveling bridges for Modules Nos. 2 and 3. As the surface wash system ages, the frequency of problems is increasing, resulting in added maintenance and adverse impacts to filtered water quality due to higher turbidity and particle counts. Increasing misalignment problems with the traveling bridges reduce solids removal efficiency and increase required maintenance to realign the mechanical components (chain drives/sprockets, wheel shafts, and gear boxes). Treatment basins must be removed from service to perform the bridge repairs resulting in temporary reduction in plant capacity. The impact to the overall Jensen plant from these problems is reduced plant reliability, reduced ability to achieve treated water quality goals, and periods of reduced plant capacity. These projects are categorized as Infrastructure Rehabilitation and Replacement projects, and are budgeted within Metropolitan's Capital Investment Plan (CIP). Both projects have been reviewed with Metropolitan's updated CIP prioritization criteria, and staff recommends moving forward at this time due to the critical nature of the facilities.

Background

The Jensen plant was placed into service in 1972 with an initial capacity of 350 million gallons per day (mgd). The plant was expanded to its current capacity of 750 mgd in the early 1990s. The Jensen plant exclusively treats water from the West Branch of the State Water Project and delivers it to Metropolitan's Central Pool portion of the distribution system.

Metropolitan staff conducts regular maintenance of the Jensen plant's mechanical components and electrical equipment. Although the plant continues to perform reliably today, some of the mechanical components show signs of aging and have become less reliable over time. Two projects are recommended to proceed at this time to address needed rehabilitation work and to ensure continued reliability of the Jensen plant.

Project No. 1 - Module No. 1 Surface Wash Upgrades – Final Design Phase ($660,000)

Jensen Module No. 1 has a total of 20 granular tri-media filters that were placed into operation in 1972. To clean and break up the solids that build up during the filtration process, the filter backwash process includes spraying the top surface of each filter bed with high-pressure water through nozzles mounted on rotary arms. Despite receiving routine maintenance, the steel surface wash header pipes and appurtenances have corroded and deteriorated, the rotary wash arms often fail to rotate, and some of the discharge nozzles have plugged with rust. Following 36 years of operation, these deteriorated conditions have diminished the overall performance of the filters as evidenced by mud ball formation and uneven filter cleansing, especially in the filter bed corners. These conditions can lead to removal of filters from service due to unacceptably high outlet turbidity levels. Repair of surface wash system components and efforts to unplug nozzles have been time-consuming partly because access to the filter beds is restricted, requiring placement of protective plywood sheets across the media before staff can enter the filter. This repair work is increasing in frequency as the surface wash system continues to corrode.

In December 2006, Metropolitan's Board authorized preliminary design of the Jensen Module No. 1 Surface Wash Upgrades to correct the observed problems. Preliminary design is now complete and staff recommends proceeding with final design to replace the corroded 16-inch-diameter surface wash header pipes and to install a fixed-nozzle surface wash system, consistent with the surface wash systems at all other Metropolitan treatment plants. The upgraded system will use low-pressure water from the plant's elevated washwater tanks, and will uniformly distribute it onto the surface of the filter media from equally spaced nozzles in a pipe grid.

This action appropriates $660,000 and authorizes final design phase activities for the Jensen Module No. 1 Filter Surface Wash Upgrades. These activities include engineering design, preparation of drawings and specifications, receipt of competitive bids, development of a construction cost estimate, and all other activities in advance of award of a construction contract. All final design activities will be performed by Metropolitan staff. The anticipated cost of final design is approximately 8.5 percent of the estimated total construction cost. Engineering Services' goal for design of projects with construction cost greater than $3 million is 9 to 12 percent. The construction cost for this project is anticipated to range from $4 million to $6 million.

Project No. 2 - Modules Nos. 2 and 3 Traveling Bridge Repairs – Demonstration Study ($190,000)

Jensen Modules Nos. 2 and 3 contain eight sedimentation basins. Each basin is equipped with a traveling bridge that spans the 100-foot width of the basin and moves along its length. The bridges have wheels that ride on 425-foot-long metal rails mounted on top of the longitudinal basin walls. Each bridge carries a high-torque, slow-speed motor-drive system that moves the bridge, pumps, sweep arms, and other equipment necessary for the vacuum removal of settled solids from the sedimentation basin floor. The eight traveling bridges in Modules Nos. 2 and 3 have been in operation since the plant was expanded in the early 1990s.

A review of corrective maintenance activities at Modules Nos. 2 and 3 over the past two years highlighted frequent misalignment problems with the traveling bridges, with five incidents reported during the last twelve months. When misalignment occurs at Jensen Modules Nos. 2 and 3, the existing motor-drive system is unable to mechanically self-align the end-wheels during operation. As the equipment continues to age, the frequency of misalignment problems is increasing, resulting in increased maintenance, reduced solids removal efficiency, and reduced plant capacity as the basins are removed from service for repairs. The Mills and Skinner plants also have traveling bridges, which are equipped with motor-drive systems that are of different designs than the Jensen system design; there are no reported misalignment problems with the traveling bridges at the Mills and Skinner plants.

In recent years, a self-aligning motor drive technology has been developed for overhead cranes and gantry cranes. Since the Jensen traveling bridges' structure and movement are similar, staff recommends that a self-aligning motor drive system be procured and installed on one Module No. 2 traveling bridge in order to demonstrate the technology under full-scale operation. The self-aligning drive system consists of two variable-speed motors, one for each end-wheel, and a laser alignment unit that checks positions of the end-wheels on the rails. The speed of each end-wheel is automatically adjusted to continuously maintain bridge alignment with the rails. During the planned 6- to 12-month test period, staff will evaluate performance of the self-aligning drive system, perform market evaluation of suppliers, and develop preliminary design criteria to improve the motor-drive systems for the seven remaining traveling bridges. As alternative drive assemblies will also be investigated during this study, the design criteria and specification may be refined as a result of the test installation.

This action appropriates $190,000 and authorizes a demonstration study of the Jensen Modules Nos. 2 and 3 traveling bridges, which includes procurement and installation of one self-aligning motor-drive system for one traveling bridge. Metropolitan staff will procure and install the equipment and conduct the study. The requested funds include $49,000 for the procurement and installation by Metropolitan forces; $109,000 to conduct the study and develop design criteria; $15,000 for program management; and $17,000 for remaining budget. Upon completion of the study, staff will return to the Board to request authorization for preliminary design. The total construction cost for this project is anticipated to range from $0.9 million to $1.2 million.

Summary

This action appropriates $850,000 and authorizes two rehabilitation projects at the Jensen plant. Each project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2008/09 capital budget. See **Attachment 1** for the Financial Statements and **Attachment 2** for the Location Maps.

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

Project Milestones

April 2010 – Completion of final design of Module No. 1 Surface Wash Upgrades

April 2010 – Completion of demonstration study of Modules Nos. 2 and 3 Traveling Bridges Repairs

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)

Project No. 1 - Module No. 1 Surface Wash Upgrades – Final Design Phase

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 project involves the funding and minor alterations of existing private or public facilities, along with the construction of minor appurtenant structures, with minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. These activities would result in negligible expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15303, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #3:

None required

Project No. 2 - Modules Nos. 2 and 3 Traveling Bridge Repairs – Demonstration Study

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action involves the funding of a study and minor modifications to existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. In addition, the proposed action consists of basic data collection and resource evaluation activities which does 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 for both Class 1 and Class 6 Categorical Exemptions (Sections 15301 and 15306 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 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Options #2 and #3:

None required

Board Options

Option #1

Adopt the CEQA determinations and

a. Appropriate $850,000;
b. Authorize final design of the Jensen Module No. 1 Surface Wash Upgrades; and
c. Authorize a demonstration study for the Jensen Modules Nos. 2 and 3 Traveling Bridge Repairs.

Fiscal Impact: $190,000 of budgeted funds under Approp. 15371, and $660,000 of budgeted funds under Approp. 15442

Business Analysis: Both projects are needed at this time to correct problems with the 36-year-old surface wash system, and with mechanical components of the traveling bridges. This option will reduce maintenance costs; enhance reliability of the Jensen plant; enhance the plant's ability to meet water quality treatment goals; and reduce incidences of filters and basins being removed from service, which limits plant capacity.

Option #2

Adopt the CEQA determination and

a. Appropriate $660,000;
b. Authorize final design of the Jensen Module No. 1 Surface Wash Upgrades; and
c. Do not proceed with the Jensen Modules Nos. 2 and 3 Traveling Bridge Repairs at this time.

Fiscal Impact: $660,000 of budgeted funds under Approp. 15442

Business Analysis: This option will enhance reliability of the Jensen Module No. 1 surface wash system. Staff would continue to maintain the existing Modules Nos. 2 and 3 traveling bridges. As this equipment continues to age, misalignment problems will increase, resulting in increased maintenance; reduced solids removal efficiency; and reduced plant capacity as the basins are removed from service for repairs.

Option #3

a. Do not proceed with final design of the Jensen Module No. 1 Surface Wash Upgrades at this time; and
b. Do not proceed with the Jensen Modules Nos. 2 and 3 Traveling Bridge Repairs at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity to correct the observed problems with the Module No. 1 surface wash system and Modules Nos. 2 and 3 Traveling Bridges. The frequency of problems will increase, resulting in increased maintenance; reduced solids removal efficiency; and reduced plant capacity as filters and basins are removed from service for repairs.

Staff Recommendation

Option #1

Roy L. Wolfe 2/13/2009

Roy L. Wolfe *Date*
Manager, Corporate Resources

2/24/2009

Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statements

Attachment 2 – Location Maps

BLA #6163

Financial Statement for Jensen Improvements Program

A breakdown of Board Action No. 14 for Appropriation No. 15371 for the Modules Nos. 2 and 3 Traveling Bridges Repairs is as follows:

	Previous Total Appropriated Amount (Sep. 2008)		Current Board Action No. 13 (Mar. 2009)	New Total Appropriated Amount
Labor				
Studies and Investigations	$ 856,350		$ 109,000	$ 965,350
Final Design	2,083,401	*	-	2,083,401
Owner Costs (Program mgmt., procurement)	2,502,541		15,000	2,517,541
Construction Inspection and Support	1,606,000		-	1,606,000
Metropolitan Force Construction	1,956,400		4,000	1,960,400
Materials and Supplies	2,155,900		45,000	2,200,900
Incidental Expenses	144,933		-	144,933
Professional/Technical Services	3,770,840	*	-	3,770,840
Equipment Use	109,000		-	109,000
Contracts	12,177,226		-	12,177,226
Remaining Budget	1,131,409	*	17,000	1,148,409
Total	**$ 28,494,000**		**$ 190,000**	**$ 28,684,000**

* Includes previous reallocation of $100,000 from Remaining Budget to Final Design ($50,000) and Professional/Technical Services ($50,000) for preparation of final design drawings of the Bulk Chemical Tank Farm Upgrades project.

Funding Request

Program Name:	Jensen Improvements Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15371	**Board Action No.:**	13
Requested Amount:	$ 190,000	**Capital Program No.:**	15371-I
Total Appropriated Amount:	$ 28,684,000	**Capital Program Page No.:**	E-38
Total Program Estimate:	$ 89,700,000	**Program Goal:**	I – Infrastructure & Reliability

Financial Statement for Jensen Improvements Program - Phase II

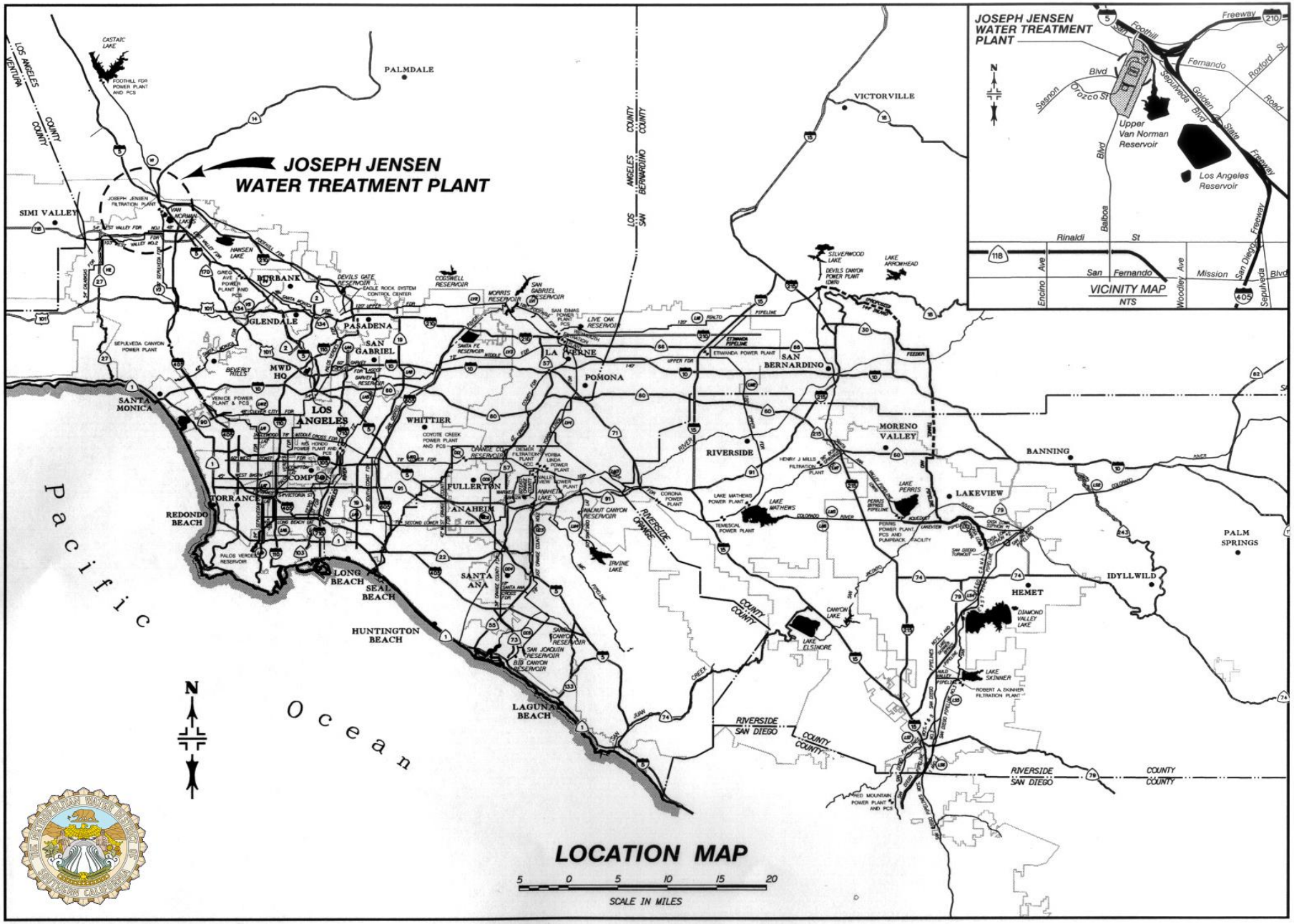
A breakdown of Board Action No. 4 for Appropriation No. 15442 for the Module No. 1 Surface Wash Upgrades is as follows:

	Previous Total Appropriated Amount (Mar. 2008)		Current Board Action No. 4 (Mar. 2009)	New Total Appropriated Amount
Labor				
Studies and Investigations	$ 353,495	*	$ -	$ 353,495
Final Design	128,000		510,000	638,000
Owner Costs (Program management)	300,000		62,000	362,000
Construction Inspection and Support	44,000		-	44,000
Metropolitan Force Construction	647,000		-	647,000
Materials and Supplies	455,000		-	455,000
Incidental Expenses	28,000		2,000	30,000
Professional/Technical Services	314,840	*	-	314,840
Equipment Use	19,000		-	19,000
Contracts	-		-	-
Remaining Budget	76,665	*	86,000	162,665
Total	**$ 2,366,000**		**$ 660,000**	**$ 3,026,000**

* Includes previous reallocation of $94,335 from Remaining Budget to Studies and Investigations ($49,495) and Professional/Technical Services ($44,840) for revision of preliminary design criteria and value engineering study of the Surface Wash Upgrades project.

Funding Request

Program Name:	Jensen Improvements Program - Phase II		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15442	**Board Action No.:**	4
Requested Amount:	**$** 660,000	**Capital Program No.:**	15442-I
Total Appropriated Amount:	**$** 3,026,000	**Capital Program Page No.:**	E-39
Total Program Estimate:	**$** 13,200,000	**Program Goal:**	I – Infrastructure Reliability


JOSEPH JENSEN WATER TREATMENT PLANT
LOCATION MAP
SCALE IN MILES
5 0 5 10 15 20
N
Pacific Ocean
PALMDALE
VICTORVILLE
SIMI VALLEY
SANTA MONICA
BURBANK
GLENDALE
PASADENA
SAN GABRIEL
MWD HQ
LOS ANGELES
WHITTIER
COMPTON
TORRANCE
REDONDO BEACH
LONG BEACH
SEAL BEACH
HUNTINGTON BEACH
LAGUNA BEACH
FULLERTON
ANAHEIM
SANTA ANA
POMONA
LA VERNE
SAN BERNARDINO
RIVERSIDE
MORENO VALLEY
BANNING
LAKEVIEW
HEMET
IDYLLWILD
PALM SPRINGS
LAKE ELSINORE
LAKE MATHEWS
LAKE PERRIS
LAKE SKINNER
DIAMOND VALLEY LAKE
CANYON LAKE
IRVINE LAKE
SILVERWOOD LAKE
LAKE ARROWHEAD
HANSEN LAKE
CASTAIC LAKE
LOS ANGELES COUNTY
VENTURA COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
ORANGE COUNTY
SAN DIEGO COUNTY
JOSEPH JENSEN WATER TREATMENT PLANT
Upper Van Norman Reservoir
Los Angeles Reservoir
Foothill Freeway
Fernando Blvd
Roxford St
Sepulveda Blvd
Golden State Freeway
Rinaldi St
San Fernando Mission
Encino Ave
Woodley Ave
Balboa Blvd
San Diego Freeway
Sepulveda Blvd
VICINITY MAP
NTS

Jensen Water Treatment Plant