MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

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

November 14, 2006 Board Meeting

7-3

Subject

Appropriate $880,000; and authorize three rehabilitation projects at the F. E. Weymouth Water Treatment Plant (Approp. 15369)

Description

The F. E. Weymouth Water Treatment Plant was placed into service in 1941 with an initial capacity of 100 million gallons per day (mgd). The plant 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. Three projects are recommended to proceed at this time to ensure plant reliability, compliance with drinking water standards, and environmental requirements.

Junction Structure Seismic Upgrades – Final Design ($332,000*)*

Metropolitan's practice has always been to design its facilities in accordance with the most current applicable codes and regulations at the time of construction. Over time, design standards and building codes have become more stringent based on new knowledge and research into events such as earthquakes. A geotechnical study that was conducted for the Weymouth plant in 2003 provided up-to-date seismic design criteria for that facility. The Sierra Madre Fault, located less than 1.5 miles from the Weymouth plant, has the capability of generating a 7.0 magnitude earthquake. As a result, Metropolitan has systematically assessed the seismic integrity of structures at the Weymouth plant. Of the 33 structures at the Weymouth plant, four structures have been upgraded; ten structures have been evaluated and found to be adequate; nine less-critical structures are under evaluation; and ten facilities require upgrades. The Junction Structure is one of these latter ten facilities.

The Weymouth Junction Structure was constructed in 1968 when SWP water was first introduced into the Weymouth plant. The 64-foot-tall reinforced concrete structure is located in the southeast corner of the plant and allows blending of untreated SWP water and untreated CRA water for delivery to both the Weymouth and Diemer plants. One of the two inlet pipelines for the Diemer plant and both of the inlet lines for the Weymouth plant pass through the Weymouth Junction Structure. This structure is a 27-foot-diameter vertical cylinder (inner ring) within a 58-foot-diameter vertical cylinder (outer ring). CRA water from the Upper Feeder enters the inner ring and is directed through three slide gate openings to blend with incoming SWP water that enters the outer ring from the La Verne Pipeline. Blending is accomplished in the annular space between the two cylinder walls. The blended waters exit the structure into the inlet pipe to the Weymouth plant and into the Yorba Linda Feeder, which delivers untreated water to the Diemer plant.

In November 2005, Metropolitan's Board authorized preliminary design of the Junction Structure Seismic Upgrades. Structural reviews of the Junction Structure using up-to-date seismic design criteria found that the inner and outer cylinders of the Junction Structure could be significantly overstressed by a 7.0 magnitude earthquake on the Sierra Madre Fault. Damage to the Junction Structure caused by a large magnitude earthquake could interrupt operation at both the Weymouth and Diemer plants. Several alternatives to reduce the risk of seismic failure, including demolition and replacement of the Junction Structure, were evaluated for constructability, cost, and implementation schedule. Staff recommends that both the inner ring wall and the outer ring wall of the existing Junction Structure be strengthened to cost-effectively meet seismic objectives. Final design is recommended to commence at this time in order to coordinate the seismic upgrade with planned Oxidation Retrofit Program (ORP) construction at the Weymouth plant.

The Junction Structure Seismic Upgrades project will strengthen the inner ring wall by relocating two of the three slide gate openings of the inner ring to a higher elevation; removing the two lower elevation slide gates and filling in the two openings with concrete; and installing post-tensioned steel hoops at several elevations on the exterior wall of the inner ring cylinder. Construction of this work will take place during Weymouth plant shutdowns planned for ORP construction.

Upgrades to strengthen the outer ring will include installation of post-tensioned steel perimeter bars at several elevations on the exterior wall of the outer structure and addition of reinforcement to the exterior areas of pipeline penetrations. Construction of this outer ring portion of the work will not impact regular operations of the Weymouth and Diemer plants and will be scheduled promptly, as there are no shutdown constraints. Proposed upgrades for both the inner ring wall and the outer ring wall will not impact the functionality of the existing Junction Structure.

This action appropriates $332,000 and authorizes final design of the Weymouth Junction Structure Seismic Upgrades by Metropolitan staff. The anticipated cost of final design is approximately 13.7 percent of the estimated construction cost. Engineering Services' goal for design of projects with construction cost less than $3 million is 9 to 15 percent.

Weymouth Perimeter Improvements Phases II & III – Additions to Final Design Scope ($128,000)

In July 2005, the Board appropriated $554,000 and authorized preliminary and final design of Phases I-III of the Weymouth Perimeter Improvements. The project has been divided into phases to allow initial portions of the work to proceed expeditiously. In September 2006, the Board awarded a construction contract for the Phase I Perimeter Improvements, which includes additional landscaping and decorative security wall/fencing along the west side of the plant and the addition of staff parking. Final design of the Phase II improvements is underway. These improvements will include landscaping and irrigation along the north and south boundaries of the plant and improvements to some areas adjacent to the existing Water Quality Laboratory parking lot. The Phase III improvements will upgrade the Weymouth plant's east entrance on Wheeler Avenue. This project includes a new guard enclosure; improved lighting and communication features for enhanced security; new entrance gate; and two traffic lanes in each direction. Final design will be completed in early 2007 in coordination with design of the Weymouth ORP. Phase IV improvements will address areas impacted by construction of the Weymouth ORP and will be completed in conjunction with the ORP in late 2009.

The scope of the Phase II and Phase III improvements is recommended to be adjusted to respond to local neighborhood concerns voiced at public meetings and to comply with new city of La Verne requirements, which were contained within the project's conditional approval document issued by the city in January 2006. These additional improvements were identified after design of the perimeter improvements had commenced in 2005. The additional improvements will include extended decorative security wall/fencing along Gladstone Street to offer a consistent viewshed at the west side of the plant, increased planting density, additional landscaping adjacent to the plant's Wheeler Avenue entrance, and additional landscaping to screen residences at the south boundary. A city of La Verne requirement is for Metropolitan to conduct a specialized traffic study to evaluate the potential need for a traffic signal at the existing Wheeler Avenue entrance.

All planned improvements are consistent with the draft La Verne Area Master Plan developed during the mid-1990s and the Weymouth Master Site Plan approved through Resolution No. 06-10 of the City Council of the city of La Verne on February 6, 2006. Benefits of these improvements will include enhanced security, screening, and continued positive relations with the city of La Verne and the local neighborhood.

This action appropriates an additional $128,000 and authorizes new additions to the scope of Phases II and III of the Weymouth Perimeter Improvements in accordance with the city of La Verne's requirements and local neighborhood requests. In addition to the previously appropriated funds, the new total appropriated amount for design-phase activities is $682,000. Tetra Design, Inc. and Carollo Engineers are currently underway on design of the Phase II and Phase III improvements, respectively, and staff recommends that these firms perform design of the additional improvements. Tetra Design, Inc. was selected through a competitive process (Request for Proposals No. 555) to provide architectural services for the Weymouth plant, and work will be performed under an existing board-authorized agreement. Tetra Design is a Small Business Enterprise (SBE). Carollo Engineers

was also selected through a competitive process (Request for Qualifications 578) and work will be performed under an existing board-authorized agreement. For the Carollo agreement, Metropolitan established an SBE participation level of 20 percent. No amendments to the existing Tetra Design or Carollo Engineers agreements are required. Staff will return to the Board to award a construction contract for the Phase II improvements in early 2007 and a construction contract for the Phase III improvements in spring 2007.

Coagulant and Polymer Chemical Feed Systems – Final Design ($420,000*)*

The primary objective of a treatment plant's coagulation process is to effectively coagulate colloidal matter present in the raw water by applying the proper amount of coagulant through rapid mixing, prior to flocculation. The Weymouth plant has eight flocculation and sedimentation basins with several different configurations and two different filter designs. To optimize the overall treatment process and minimize addition of chemicals, a coagulant feed and mixing system should be tailored to a plant's specific basin and filter designs. Despite the differences in the Weymouth plant's basin and filter designs, a single coagulant dose is currently fed at the plant's existing rapid mix facility. This practice increases the plant's coagulant usage, reduces the filter run times, and, under some raw water quality conditions, may limit the plant's capacity. Staff recommends installation of modular rapid-mix systems to optimize the coagulation process and chemical usage for the different Weymouth plant basins. This modification will provide consistency with Metropolitan's four other treatment plants, which either benefit from this feature already, or have projects underway for modular rapid-mix systems.

With upcoming construction of the Weymouth ORP, four new basin inlets will be constructed that will support the modular rapid-mix systems. This project will modify the existing plant coagulant and polymer feed systems to complement the new basin inlets and allow chemical injection to each rapid mix system rather than to the entire treatment facility. The work will include new chemical feed pumps and piping, instrumentation and controls, and a motor control center to power the new pumps and controls. Previously abandoned substructures will be removed so that interconnecting piping and electrical duct banks can be routed through this crowded area. Construction phasing, including a temporary unloading pad, temporary containment within the coagulant tank farm, and a temporary polymer feed line, is planned so that coagulant and polymer flow to the plant will be uninterrupted.

Staff recommends that these improvements be designed and constructed in conjunction with the Weymouth Chemical Tank Farm Modifications project. Metropolitan's Board authorized design of this project in July 2005. The scope of the Chemical Tank Farm Modifications includes expansion of the storage capacity of the coagulant tank farm through addition of two coagulant storage tanks, and the addition of a new polymer storage and feed facility. Constructing both projects under a single construction project will minimize disruption to plant operations and maximize efficiency. Similarly, designing both projects together will also maximize efficiency.

This action appropriates $420,000 and authorizes final design of the Coagulant and Polymer Chemical Feed Systems project. Staff recommends that MWH Americas, the firm which is currently underway with design of the Chemical Tank Farm Modifications project, also perform this final design. MWH was selected through a competitive process (Request for Qualifications 578), and work will be performed under an existing board-approved professional services agreement. No amendment to the existing MWH agreement is required. For this agreement, Metropolitan established an SBE participation level of 20 percent. For this project, the cost of final design is approximately 13.6 percent of the estimated construction cost. Engineering Services' goal for design of projects with construction cost less than $3 million is 9 to 15 percent.

Project Milestones

January 2007 – Completion of final design of the Weymouth Perimeter Improvements Phase II

February 2007 – Completion of final design of the Junction Structure Seismic Upgrades

February 2007 – Completion of final design of Coagulant and Polymer Chemical Feed Systems

March 2007 – Completion of final design of the Weymouth Perimeter Improvements Phase III

These projects have been evaluated and recommended by Metropolitan's Capital Investment Plan Evaluation Team and funds have been included in the fiscal year 2006/07 capital budget. See **Attachment 1** for the Financial Statement and **Attachment 2** for the Location Map**.**

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations
Metropolitan Water District Administrative Code Section 8117: Professional and Technical Consultants

California Environmental Quality Act (CEQA)

Junction Structure Seismic Upgrades – Final Design

CEQA determination for Options #1 and #3:

The environmental effects from the funding, designing, constructing, and operating of the improvement programs were originally evaluated in the Final Environmental Impact Report for the F. E. Weymouth Filtration Plant Ozonation Facilities and Site Improvements Program. The Final EIR was certified by the Board on April 12, 2005. The Board also approved the Findings of Fact, the Statement of Overriding Considerations, and the Mitigation Monitoring and Reporting Program. The current board actions are solely based on the final design of the Junction Structure Seismic Upgrades and not on any changes to the projects. 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 actions.

The CEQA determination is: Determine that the proposed actions have 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 #2:

None required

Weymouth Perimeter Improvements Phase II & III – Additions to Final Design Scope

CEQA determination for Options #1, #2 and #3:

The environmental effects from the funding, designing, constructing, and operating of the improvement programs were originally evaluated in the Final Environmental Impact Report for the F. E. Weymouth Filtration Plant Ozonation Facilities and Site Improvements Program. The Final EIR was certified by the Board on April 12, 2005. The Board also approved the Findings of Fact, the Statement of Overriding Considerations, and the Mitigation Monitoring and Reporting Program. The current board actions are solely based on the final design of the Weymouth Perimeter Improvements and not on any changes to the projects. 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 actions.

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

Coagulant and Polymer Chemical Feed Systems – Final Design

CEQA determination for Options #1, #2 and #3:

The environmental effects from the funding, designing, constructing, and operating of the improvement programs were originally evaluated in the Final Environmental Impact Report for the F. E. Weymouth Filtration Plant Ozonation Facilities and Site Improvements Program. The Final EIR was certified by the Board on April 12, 2005. The Board also approved the Findings of Fact, the Statement of Overriding Considerations, and the Mitigation Monitoring and Reporting Program. The current board actions are solely based on the final design of the Coagulant and Polymer Chemical Feed Systems and not on any changes to the projects. 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 actions.

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

Board Options

Option #1

Adopt the CEQA determinations and

a. Appropriate $880,000 in budgeted funds;
b. Authorize final design of the Weymouth Junction Structure Seismic Upgrades;
c. Authorize design of additional features for the Weymouth Perimeter Improvements Phases II & III; and
d. Authorize final design of the Coagulant and Polymer Chemical Feed Systems project.

Fiscal Impact: $880,000 of budgeted funds under Approp. 15369

Business Analysis: This option will ensure reliability and continued operation of the Junction Structure in the event of a significant earthquake. Construction of the needed upgrades for the Junction Structure will be coordinated with the Weymouth ORP construction and planned Weymouth plant shutdowns scheduled for 2009. Additional landscaping will strengthen Metropolitan's relationship with the city of La Verne and the local neighborhood. Modifications to the coagulant and polymer feed systems will improve plant efficiency.

Option #2

Adopt the CEQA determinations and

a. Appropriate $548,000 in budgeted funds;
b. Defer final design of the Weymouth Junction Structure Seismic Upgrades until the Weymouth ORP has been completed;
c. Authorize design of additional features for the Weymouth Perimeter Improvements Phases II & III; and
d. Authorize final design of the Coagulant and Polymer Chemical Feed Systems project.

Fiscal Impact: $548,000 of budgeted funds under Approp. 15369

Business Analysis: This option will defer construction of the Junction Structure Seismic Upgrades until 2010 when construction of Weymouth ORP ozone facilities is complete. Potential interferences between the Junction Structure and ORP contractors working in adjacent areas could be reduced, but an additional shutdown at the Weymouth plant would be required in 2011. Additional landscaping will strengthen Metropolitan's relationship with the city of La Verne and the local neighborhood. Modifications to the coagulant and polymer feed systems will improve plant efficiency.

Option #3

Adopt the CEQA determinations and

a. Appropriate $648,000 in budgeted funds;
b. Authorize preliminary design to replace the existing Weymouth Junction Structure with a new pressurized junction box and demolish the existing Junction Structure. All operational mixing, isolation and control functions of the Junction Structure would be transferred to the new junction box.
c. Authorize design of additional features for the Weymouth Perimeter Improvements Phases II & III; and
d. Authorize final design of the Coagulant and Polymer Chemical Feed Systems project.

Fiscal Impact: $648,000 of budgeted funds under Approp. 15369

Business Analysis: The new junction box would be constructed adjacent to the existing Junction Structure. This option will result in a new facility meeting all operational and seismic criteria and will cost approximately five times the construction cost of upgrades to the existing Junction Structure, and additional environmental analysis will be required. Additional landscaping will strengthen Metropolitan's relationship with the city of La Verne and the local neighborhood. Modifications to the coagulant and polymer feed systems will improve plant efficiency.

Staff Recommendation

Option #1

10/23/2006
Roy L. Wolfe *Date*
Manager, Corporate Resources

10/24/2006
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement

Attachment 2 – Location Map

BLA #4743

Financial Statement for Weymouth Water Treatment Plant Improvements Program

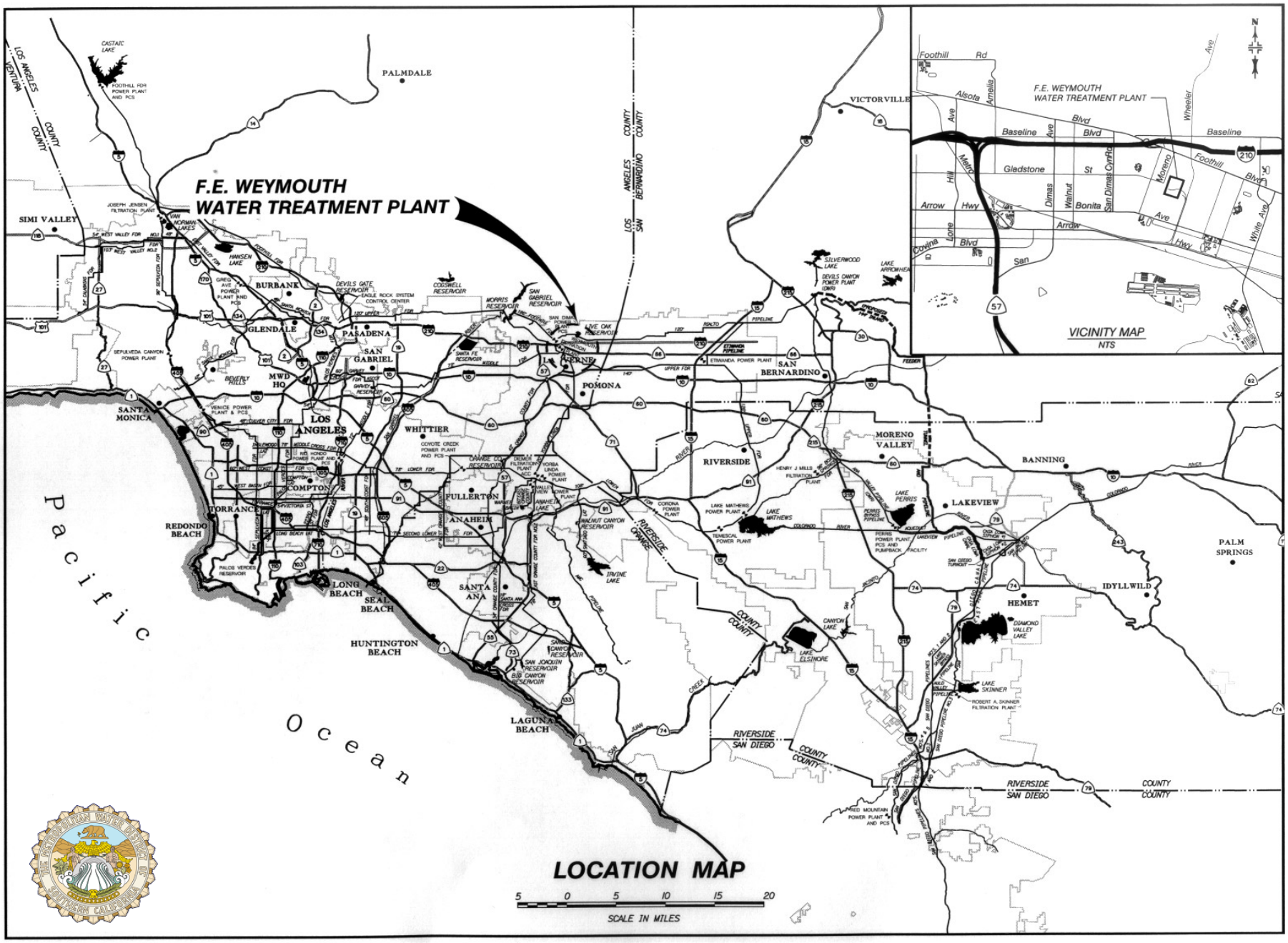
A breakdown of Board Action No. 19 for Appropriation No. 15369 is as follows:

	Previous Total Appropriated Amount (Sep. 2006)	Current Board Action No. 19 (Nov. 2006)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 1,065,477	$ -	$ 1,065,477
Final Design	752,000	291,000	1,043,000
Owner Costs (Program management)	2,348,000	153,000	2,501,000
Construction Inspection and Support	2,642,000	-	2,642,000
Metropolitan Force Construction	1,288,000	-	1,288,000
Materials and Supplies	991,000	-	991,000
Incidental Expenses	93,000	5,000	98,000
Professional Services	5,892,000		6,293,000
MWH Americas		307,000	
Carollo Engineers		47,000	
Tetra Design		47,000	
Contracts*	27,216,445	-	27,216,445
Remaining Budget *	5,893,078	30,000	5,923,078
Total	**$ 48,181,000**	**$ 880,000**	**$ 49,061,000**

*In October 2006, $121,000 were transferred from remaining funds for a unit price bid item to repair cracks in the Finished Water Reservoir as part of the FWR recoating contract.

Funding Request

Program Name:	Weymouth Water Treatment Plant Improvements Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15369	**Board Action No.:**	19
Requested Amount:	$ 880,000	**Capital Program No.:**	15369-I
Total Appropriated Amount:	$ 49,061,000	**Capital Program Page No.:**	E-70
Total Program Estimate:	$ 163,000,000	**Program Goal:**	I – Infrastructure Reliability


F.E. WEYMOUTH
WATER TREATMENT PLANT
LOCATION MAP
SCALE IN MILES
5 0 5 10 15 20
VICINITY MAP
NTS
F.E. WEYMOUTH
WATER TREATMENT PLANT
Pacific
Ocean
PALMDALE
VICTORVILLE
SIMI VALLEY
BURBANK
GLENDALE
PASADENA
SAN GABRIEL
MWD HQ
LOS ANGELES
WHITTIER
POMONA
SAN BERNARDINO
RIVERSIDE
MORENO VALLEY
BANNING
LAKEVIEW
PALM SPRINGS
IDYLLWILD
HEMET
SANTA MONICA
TORRANCE
REDONDO BEACH
COMPTON
FULLERTON
ANAHEIM
SANTA ANA
LONG BEACH
SEAL BEACH
HUNTINGTON BEACH
LAGUNA BEACH
LAKE ELSINORE
LAKE MATHEWS
LAKE PERRIS
LAKE SKINNER
IRVINE LAKE
LAKE ARROWHEAD
Foothill Rd
Alsota Ave
Amelia
Baseline Ave
Blvd
Gladstone St
Arrow Hwy
Arrow
Lone Blvd
Corona
San
Hill
Merry
Dimas
Walnut
Bonita
San Dimas Cynthia
Moreno
Foothill Blvd
Wheeler Ave
White Ave
Baseline
210
57
N