MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

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

March 12, 2002 Board Meeting

9-5

Subject

Authorize $5.63 million for preliminary design and environmental documentation for ozone or an alternative disinfectant at the Skinner and Diemer filtration plants (Approps. 15388 and 15389)

Description

The Stage 1 Microbial/Disinfection By-Products (M/DBP) Rule, which was promulgated by the U.S. Environmental Protection Agency, became effective Jan. 1, 2002. This new regulation initially impacts the Jensen and Mills filtration plants that exclusively treat State project water (SPW) supplies. Metropolitan's current board-adopted strategy to comply with this regulation is to retrofit both the Jensen and Mills filtration plants with ozonation facilities. This compliance strategy for the Jensen and Mills plants was reviewed by the Board in a Dec. 12, 2001 water quality workshop.

The impacts of the M/DBP Rule for Metropolitan's three plants which receive a blend of Colorado River water (CRW) and SPW (Skinner, Diemer and Weymouth) were also discussed at the workshop. Staff has determined that SPW blends at these plants will need to be restricted to approximately 20-25 percent on a number of occasions depending on source water quality, unless additional treatment is provided. Short-term, temporary treatment approaches include removal of total organic carbon (TOC), a precursor to DBPs, which will modestly lower DBP levels. The long-term approach is to implement an alternate disinfectant, either ozone or chlorine dioxide, that will remove blend restrictions and plant capacity limitations and substantially lower DBP levels for compliance with both Stage 1 and Stage 2 of the M/DBP Rule. Stage 2 is expected to be promulgated in 2003 with compliance required by 2010.

Metropolitan's existing schedule for implementing ozone or an alternative disinfectant at Skinner, Diemer and Weymouth by 2006, 2009 and 2012, respectively, was established in an August 1998 board action. To meet this schedule, preliminary design of new disinfection facilities at Diemer and Skinner should be initiated at this time. This schedule is reflected in the current Capital Investment Plan (CIP). Although Diemer's on-line date is more distant than for Skinner, the complexities of designing and constructing facilities for ozone or another disinfectant at Diemer will require a longer duration than for similar work at the Skinner plant. Complexities at the Diemer plant include resolving existing site constraints to permit new process connections to the existing facilities. Staff will return to the Board in the future to initiate preliminary design at the Weymouth plant.

This action funds complete preliminary designs of ozone or an alternative disinfection technology (e.g., chlorine dioxide) at the Skinner and Diemer plants. Preliminary design activities will be conducted in parallel with the Alternative Disinfectant Evaluation that will be brought to the Board in March 2002 (Approp. 15390). Upon completion of preliminary design and the Alternative Disinfectant Evaluation in the second quarter of 2003, staff will return to the Board to recommend commencing final design on either ozone or the alternative disinfectant technology at the Skinner and Diemer plants. A decision on the status of commencing work on new treatment technique facilities at the Weymouth plant will be made at a later date. This implementation approach and schedule will allow Metropolitan to place ozone or the other technology on-line in accordance with the current CIP schedule.

These projects have been evaluated and recommended by the CIP Evaluation Team as part of the Diemer, Weymouth and Skinner filtration plants -- Oxidation Retrofit Program, and have been included within the fiscal year 2001/02 CIP budget.

See **Attachment 1** for the Detailed Report, **Attachment 2** for Project Locations and **Attachment 3** for the Financial Statement.

Policy

Metropolitan Water District Administrative Code § 5108: Capital Project Appropriation

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed actions are categorically exempt under the provisions of CEQA. The proposed activities, i.e., to award consultant agreements and authorize money for the planning, study, preliminary design, and preparation of environmental documentation for the proposed projects, will consist of basic data collection and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These may be strictly for information gathering purposes, or as part of a study leading to actions which a public agency has not yet approved, adopted, or funded. As such, the proposed actions qualify under a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed actions qualify under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required.

Board Options/Fiscal Impacts

Option #1

Adopt the CEQA determination and

a. Appropriate $5.63 million in budgeted CIP funds, and delegate to the Chief Executive Officer the authority to award competitively selected consultant agreements in an amount not to exceed $500,000 per contract; and

b. Authorize the Chief Executive Officer to have all work performed as described in this letter and its attachments.

Fiscal Impact: $5.63 million of budgeted CIP funds under new Appropriation Nos. 15388 (Skinner) and 15389 (Diemer).

Option #2

Do not perform preliminary design of ozone and an alternate disinfectant at the Skinner and Diemer plants. Potentially restrict the blend of SPW and CRW supplies at these plants.

Fiscal Impact: $0 for the current FY 2001/02 budget. Implementation of this option will reduce Metropolitan's ability to fully utilize all available water sources and will reduce Metropolitan's ability to meet existing salinity goals.

Staff Recommendation

Option #1

Roy L. Wolfe 2/20/2002
Roy L. Wolfe *Date*
Manager, Corporate Resources

Ronald R. Gastelum 2/21/2002
Ronald R. Gastelum *Date*
Chief Executive Officer

Attachment 1 – Detailed Report

Attachment 2 – Project Location Map

Attachment 3 – Financial Statement

BLA #1472

Detailed Report

Background

The Skinner plant was placed into service in 1976 to supply treated, chloraminated water to Riverside and San Diego counties. Since its original construction, the plant has been expanded three times and now consists of six treatment modules that are operated as two distinct filtration plants (Plants 1 and 2). Plants 1 and 2 have capacities of 240 million gallons per day (mgd) and 280 mgd, respectively, for a total combined rated capacity of 520 mgd. Metropolitan's member agencies that receive water from the Skinner filtration plant include Eastern Municipal Water District, Western Municipal Water District of Riverside County, and San Diego County Water Authority.

The Diemer plant was placed into service in 1963 with an initial capacity of 200 mgd. The plant was expanded in 1969 to its current rating of 520 mgd. The plant delivers treated, chloraminated water to Metropolitan's Central Pool portion of the distribution system.

Both plants typically treat a blend of State project water (SPW) and Colorado River water (CRW).

Water Quality and Water Supply Issues

The Stage 1 Microbial/Disinfection By-Products (M/DBP) Rule became effective January 1, 2002. The rule includes two components: (1) new and reduced maximum contaminant levels (MCLs) for disinfection by-products, and (2) implementation of a treatment technique (e.g., ozone disinfection, chlorine dioxide disinfection or total organic carbon removal) for many surface waters. Water utilities must comply with both components of the rule.

The precursors that form disinfection by-products differ widely in Metropolitan's two sources of supply. SPW supplies contain higher concentrations of disinfection by-product precursors (e.g., total organic carbon and bromide) than CRW and form more disinfection by-products when chlorinated. Also, the nature of the organic carbon in SPW is different from that found in CRW. As such, Metropolitan's filtration plants that treat SPW exclusively must implement a treatment technique to comply with the M/DBP rule.

Water from the Colorado River contains fewer disinfection by-product precursors and the organic precursors in CRW are more difficult to remove than in SPW. For this reason, when 100 percent CRW is treated at any of Metropolitan's plants, no additional treatment is required to meet either the treatment technique or the maximum contaminant level provisions of Stage 1 of the M/DBP Rule. However, depending on the blend of SPW and CRW, additional treatment may be required. This "critical" blend typically occurs with 20 to 25 percent SPW but this critical blend varies as source water quality varies. To meet Metropolitan's salinity goal and the goal of maximizing use of available water supplies, blending of SPW and CRW at the Skinner, Diemer, and Weymouth plants is expected to continue.

Stage 2 of the M/DBP Rule was recently negotiated and is expected to be promulgated in 2003, with compliance required for large systems, such as Metropolitan, by 2010. Basically, this rule is more stringent than Stage 1. In Stage 2, the current practice of determining compliance by averaging DBP results from all sampling sites within a distribution system will be eliminated. Instead, compliance will be determined at each sampling site within the distribution system. Under this proposed method, a violation at any sampling location will result in the entire system being out of compliance. Even though Stage 1 MCLs will remain the same in Stage 2, the requirement to comply with DBP MCLs at each sampling site is expected to significantly reduce overall exposure to DBPs.

Metropolitan is retrofitting plants that exclusively treat SPW with ozonation facilities to meet the "treatment technique" component of the Stage 1 M/DBP Rule. Startup for ozonation facilities at the Mills and Jensen plants is scheduled for 2003 and 2005, respectively.

As a long-term strategy, new treatment technologies such as ozone disinfection and an alternative disinfection technology (chlorine dioxide) are being considered for the Skinner, Diemer, and Weymouth filtration plants.

Until recently, the use of chlorine dioxide in drinking water had not been feasible in the State of California. Stringent regulations enacted in 1990 by the California Department of Health Services (CDHS) precluded the use

of chlorine dioxide. However, the CDHS recently changed its conservative approach to the use of chlorine dioxide.

These new technologies under consideration for Skinner, Diemer and Weymouth filtration plants would ensure disinfection, reduce disinfection by-products, meet the treatment technique, and allow unrestricted blending of SPW and CRW. Increased coagulant dosages have been implemented as interim strategies to allow greater SPW blends to be treated while maintaining compliance with new regulations.

Related Issues

Presently, Metropolitan's Capital Investment Plan (CIP) schedule shows that ozonation facilities (or alternative disinfection technologies) will be on-line at the Skinner, Diemer and Weymouth plants by 2006, 2009 and 2012, respectively. The board adopted this schedule in August 1998.

To meet the scheduled on-line date of 2006 for the Skinner plant, preliminary design of facilities must begin. In March 2001, a site engineering study and detailed environmental documentation for the Skinner Improvements Program were authorized. The study will optimize the locations of Module 7, oxidation retrofit facilities (ozonation and chlorine dioxide), and other new facilities to support the environmental analysis and conceptual design of Module 7. The Skinner Improvements Program Final Environmental Impact Report (FEIR) is scheduled to be brought to the board for certification in the second quarter of 2003.

In January 2001, the Diemer Improvements Program FEIR (Diemer FEIR) was certified. The Diemer FEIR considered the potential environmental impacts of Diemer ozonation facilities, including necessary site grading, stabilization, and preparation. However the Diemer FEIR did not address the potential use of chlorine dioxide, as this disinfectant was not determined to be acceptable by the CDHS at that time. As discussed earlier, the constraints to using chlorine dioxide have been removed by the CDHS. Consequently, a review of the Diemer FEIR will be conducted to ensure that if chlorine dioxide is implemented, the CEQA clearance for the Diemer Improvements Program is maintained. As appropriate, revisions to the Diemer FEIR, to address the use of chlorine dioxide, will be brought back to the Board in early 2004 in conjunction with a request for funding of final design for such modifications to the Diemer plant.

In March 2002, a request to study Alternative Disinfectant Treatment Evaluations (Approp. 15390) will be brought to the Board to examine the use of chlorine dioxide replacement for pre-chlorination and as an enhancement to ozonation. These evaluations will provide chlorine dioxide reactor design criteria.

Preliminary design activities will be conducted in parallel with the Alternative Disinfectant Evaluations. Upon completion of preliminary design and the Alternative Disinfectant Evaluations in the second quarter of 2003, staff will return to the Board to recommend commencing final design on either ozonation facilities or the alternative disinfectant technology at the Skinner and Diemer plants. A decision on the status of commencing work on new treatment technique facilities at the Weymouth plant will be made at a later date. This implementation approach and schedule will allow Metropolitan to place ozone or another technology on-line in accordance with the current CIP and Board schedule.

The preliminary design effort for the Diemer plant will involve a number of special studies and investigations that are not required at the Skinner or Weymouth plants. While the scheduled on-line date for new facilities at Diemer is 2009, work should start immediately due to the inherent complexities related to facility design and construction at this plant. The Diemer plant is situated on top of a hill with few remaining areas that are suitable for new facility construction. Consequently, facility relocations and slope stabilization may be required. To optimize design work and potentially minimize construction costs, staff recommends that any slope stabilization at the southwest portion of the plant be combined with the grading of the nearby northwest hill (Approp. 15227). Stabilization of the plant's southwest slope will be required to site ozonation (or alternative disinfectant) contractors or other future facilities on the main plant level. Additionally, issues related to the plant's hydraulic gradient must be thoroughly examined in preliminary design. These site and hydraulic constraints may dictate the use of unique configurations and the relocation of existing facilities to accommodate the construction of either ozone or an alternate disinfectant.

The projects for Diemer and Skinner are now recommended in anticipation of a long-term compliance strategy to enhance Metropolitan's ability to treat higher volumes of California SPW at all plants and to provide compliance

with the M/DBP Rule. Staff will return to the Board at a later date to initiate preliminary design of the Weymouth plant which is scheduled to be on-line in 2012.

Project Descriptions

Preliminary design activities for each project will include, as appropriate: investigations of existing conditions; site specific process criteria development; alternative process units and facilities' sizing and siting; hydraulic analyses; utility supply analyses; major pipeline routing; architectural and landscaping theme development; detailed discipline design criteria; cost estimating; identification of permits; and environmental documentation.

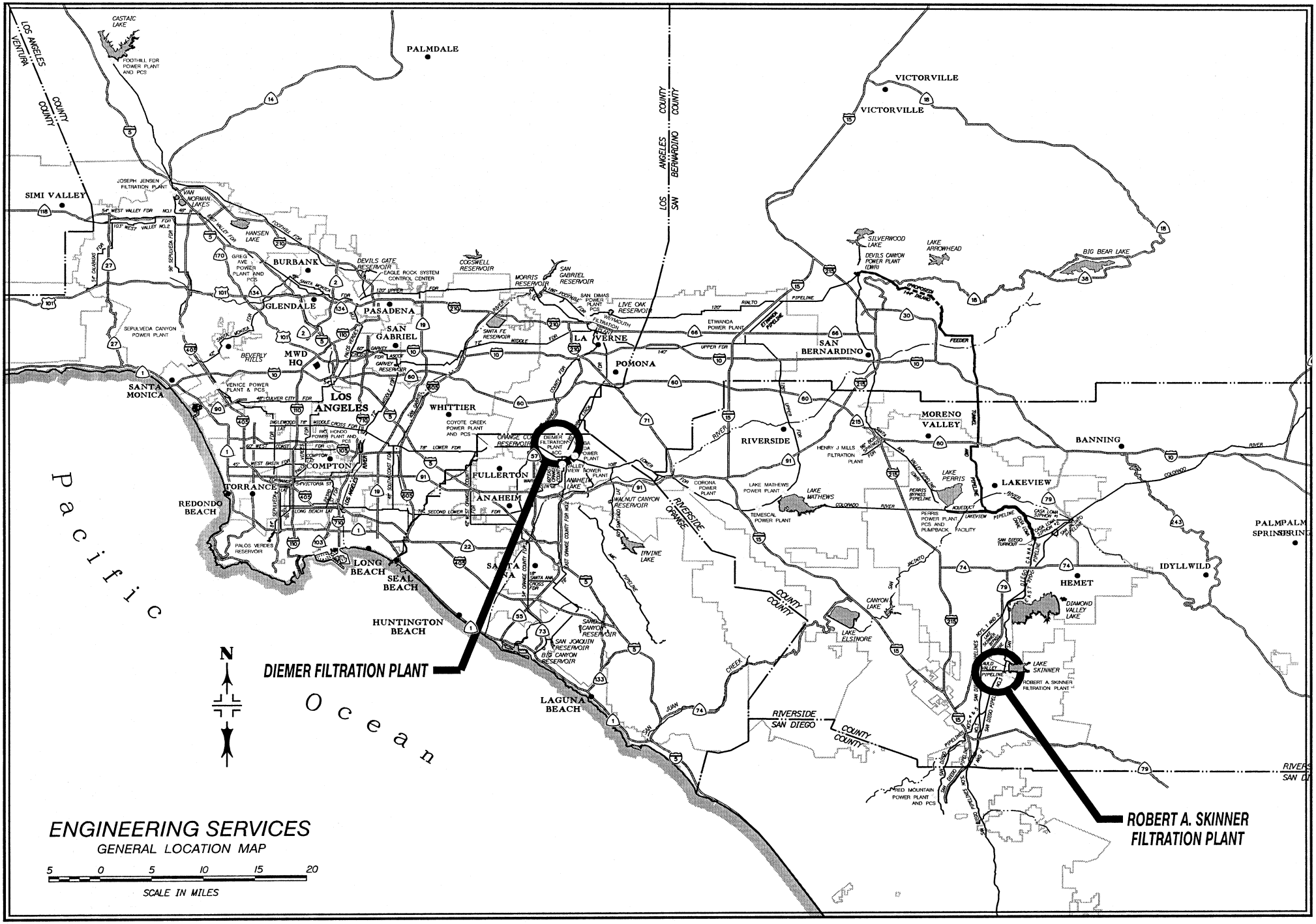
Actions and Milestones

- March 2002 – Board authorization and funding for preliminary design of ozone or an alternative disinfection technology at Skinner and Diemer filtration plants.
- March 2003 – Complete preliminary design of ozone or an alternate disinfection technology at the Skinner plant.
- April 2003 – Board authorization and funding for final design of ozone or an alternative disinfection technology at the Skinner plant.
- April 2004 – Board authorization and funding for final design of ozone or an alternative disinfection technology at the Diemer plant.
- December 2006 – Construction complete with ozone or an alternative disinfection technology on-line at the Skinner plant.
- December 2009 – Construction complete with ozone or an alternative disinfection technology on-line at the Diemer plant.

Cost Estimate

The funding for Skinner plant preliminary design effort (Approp. 15388) for ozone and an alternative disinfection technology is $2.66 million. The funding for Diemer plant preliminary design effort (Approp. 15389) for ozone and an alternative disinfection technology is $2.97 million. The recommended activities have been budgeted within the FY 2001/02 Capital Investment Plan (CIP). Consistent with Metropolitan's approach of managing projects in the most cost effective manner and providing opportunities for staff, Metropolitan forces will perform those tasks that are critical to overall program success including project management and site-specific preliminary design activities. Supplemental process engineering, architectural, landscape architectural, and geotechnical preliminary design activities will be performed by consultants obtained through the Request for Proposals (RFP) process for professional/technical service contracts. In order to streamline award of contracts, this letter seeks the Board's delegation of authority to the Chief Executive Officer to award agreements following competitive selection process in accordance with Section 8113 of the Metropolitan Water District Administrative Code.

Attachment 3 shows the breakdown of the total estimated costs for these appropriations.


DIEMER FILTRATION PLANT
ROBERT A. SKINNER FILTRATION PLANT
ENGINEERING SERVICES
GENERAL LOCATION MAP
5 0 5 10 15 20
SCALE IN MILES
N
Pacific Ocean
PALMDALE
VICTORVILLE
SIMI VALLEY
BURBANK
GLENDALE
PASADENA
SAN GABRIEL
LA VERNE
POMONA
SAN BERNARDINO
SANTA MONICA
LOS ANGELES
WHITTIER
RIVERSIDE
MORENO VALLEY
BANNING
COMPTON
FULLERTON
ANAHEIM
TORRANCE
REDONDO BEACH
LONG BEACH
SEAL BEACH
HUNTINGTON BEACH
LAGUNA BEACH
LAKEVIEW
PERRIS
IDYLLWILD
HEMET
LAKE ELSINORE
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
ORANGE COUNTY
RIVERSIDE ORANGE COUNTY
RIVERSIDE SAN DIEGO COUNTY

Financial Statement for Skinner Oxidation Retrofit Program

A breakdown of Board Action No.1 for Approp. No. 15388 for authorizing funds for preliminary design and environmental documentation for ozone or an alternative disinfectant at the Skinner filtration plant is as follows:

	Board Action No. 1 (Mar. 2002)
Labor	
Studies and Investigations	$ 1,540,000
Owner Costs (Program Management, Environmental Docs.)	195,000
Water System Operations (Metropolitan Force Installation and Construction, Water Quality)	50,000
Materials and Supplies	10,000
Incidental Expenses	10,000
Professional/Technical Services	380,000
Equipment Use	25,000
Remaining Budget	450,000
Total	**$ 2,660,000**

Funding Request

Program Name:	Skinner Oxidation Retrofit Program		
Source of Funds:	Construction Funds (possibly General Obligation, Revenue Bonds, Pay-As-You-Go Fund)		
Appropriation No.:	15388	**Board Action No.:**	1
Requested Amount:	$ 2,660,000	**Capital Program No.:**	95620-W
Total Appropriated Amount:	$ 2,660,000	**Capital Program Page No.:**	E-21
Total Program Estimate:	$ 2,660,000*	**Program Goal:**	WQ/Compliance

* Program estimate will be revised once preliminary design is completed and a decision is made as to which technology (ozone or an alternate disinfectant) is to be constructed.

Financial Statement for Diemer Oxidation Retrofit Program

A breakdown of Board Action No.1 for Approp. No. 15389 for authorizing funds for preliminary design and environmental documentation for ozone or an alternative disinfectant at the Diemer filtration plant is as follows:

	Board Action No. 1 (Mar. 2002)
Labor	
Studies and Investigations	$ 1,800,000
Owner Costs (Program Management, Environmental Documentation)	230,000
Water System Operations (Metropolitan Force Installation and Construction, Water Quality)	50,000
Materials and Supplies	10,000
Incidental Expenses	10,000
Professional/Technical Services	400,000
Equipment Use	20,000
Remaining Budget	450,000
Total	**$ 2,970,000**

Funding Request

Program Name:	Diemer Oxidation Retrofit Program		
Source of Funds:	Construction Funds (possibly General Obligation, Revenue Bonds, Pay-As-You-Go Fund)		
Appropriation No.:	15389	**Board Action No.:**	1
Requested Amount:	$ 2,970,000	**Capital Program No.:**	95620-W
Total Appropriated Amount:	$ 2,970,000	**Capital Program Page No.:**	E-21
Total Program Estimate:	$ 2,970,000*	**Program Goal:**	WQ/Compliance

* Program estimate will be revised once preliminary design is completed and a decision is made as to which technology (ozone or an alternate disinfectant) is to be constructed.