- **Board of Directors**
  Water Planning and Resources Committee

July 11, 2000 Board Meeting

9-8

Subject

Appropriate $2,276,200 for the fourth year funding of the Desalination Research and Innovation Partnership for treatment of brackish water sources. Appropriation No. 15301.

Description

The Desalination Research and Innovation Partnership (DRIP) has completed the third year of applied research to develop and demonstrate new technologies to substantially reduce the cost of desalinating Colorado River water and other brackish water sources. DRIP is a public/private consortium formed in 1997 and the participating member agencies/subagencies include San Diego County Water Authority, West Basin Municipal Water District, and Orange County Water District. Approval of this request will authorize an increase of $2,276,200 in Appropriation No. 15301 to a total of $4,686,600 to cover the fourth year of the project.

Major planned objectives for the fourth year of DRIP include:

(1) demonstrating the feasibility of large-scale pretreatment and reverse osmosis technologies for Colorado River water;

(2) evaluating particle removal (pretreatment) technologies prior to large-scale desalination;

(3) demonstrating ultraviolet (UV) light technologies for disinfection of microorganisms and oxidation of micropollutants;

(4) assisting DRIP partners in developing desalination technologies to treat brackish groundwater, municipal wastewater and agricultural drainage water; and

(5) continuing investigations of brine handling and disposal technologies.

Applied research results obtained in the first three years of DRIP indicate that the program is on track to achieve the major program objectives of demonstrating cost-effective desalination and UV technologies for a variety of source waters. Technological advancements in either or both of these areas could have a significant positive impact on several major water resource programs impacting Metropolitan, our member agencies and the state of California. Specifically, successful achievement of the DRIP objectives would help promote the broad goals of the Integrated Resources Plan, the Salinity Management Plan, and the CALFED process addressing Bay/Delta issues.

The total amount of outside funding received to date by the DRIP is $2,975,100, over half of which has gone to the three participating member agencies/subagencies, while $1,033,775 has been received by Metropolitan. The total program estimate for Metropolitan's portion of the DRIP activities is $14.7 million, with an assumption that at least half of this cost will be met from outside grants. Pursuit of additional outside funding for DRIP is ongoing, and several very promising potential funding sources are actively being explored. It is expected that the increased appropriation will be significantly leveraged by new, outside funding.

Additional information on the DRIP program is given in **Attachment 1**. A financial statement is shown in **Attachment 2**.

Policy

Prior Board direction, reference board letter 8-8 dated June 21, 1999.

Board Options/Fiscal Impacts

Option #1

Appropriate $2,276,200 for the fourth year funding of the Desalination Research and Innovation Partnership.
Fiscal Impact: $2,276,200

Option #2

Do not appropriate $2,276,200 for the fourth year funding of the Desalination Research and Innovation Partnership.
Fiscal Impact: The long-term cost of failing to fully implement the DRIP applied research program cannot be determined at this time. However, a large and ongoing cost is expected if cost-effective desalination technologies are not implemented in our service area. In addition, opportunities to manage salinity would be limited, and potential technological solutions to address some of the issues in the CALFED process would not be developed.

Staff Recommendation

Option #1.

Jill T Wicke 6/14/2000
Jill T Wicke *Date*
Acting Manager, Water System Operations

Ronald R Gastelum 6/27/2000
General Manager *Date*

Attachment 1—Detailed Report
Attachment 2—Financial Statement

BLA #241

DETAILED REPORT

Background

The Desalination Research and Innovation Partnership (DRIP) has completed the third year of a planned eight-year applied research program to demonstrate innovative technologies to reduce the cost of desalinating various brackish waters, and to demonstrate scaled-up ultraviolet (UV) technologies for potable water oxidation and disinfection. The Board approved the first three years of the program in July 1997, October 1998, and July 1999, respectively.

As shown in Table 1, DRIP currently consists of fourteen participants, including Orange County Water District, San Diego County Water Authority and West Basin Municipal Water District. Three northern California water agencies are also active in DRIP. Each of these six water agencies has recently sent a letter supporting the DRIP program, and committing to future DRIP applied research activities.

Achievement of the DRIP program objectives will allow development of additional local water supplies, help reduce the region's dependence on imported supplies, reduce damages due to corrosion and scaling of plumbing fixtures which result from use of high-salinity water, and could enhance or provide potential alternatives for a Bay-Delta solution. Metropolitan is focusing on Colorado River water, and other DRIP partners are addressing brackish groundwater, municipal wastewater, and agricultural drainage water.

Actions and Milestones

The accomplishments of the third year of DRIP and the goals for the fourth year are shown in Table 2. The overall schedule for the eight-year DRIP program is shown in Figure 1. The applied research results from DRIP are scheduled to be available in 2005, allowing time to incorporate the advanced technologies developed by DRIP into a potential Bay-Delta solution.

Outside Funding

A summary of the outside funding received to date by DRIP is shown in Figure 2. The partnership has received $2,975,100 in outside-grant funding, of which $1,033,775 has been allocated to Metropolitan.

Table 3 summarizes the funding efforts for DRIP that are currently ongoing. Three of these efforts are briefly discussed below.

- California Energy Commission (CEC)--In April 2000, the DRIP consortium submitted a final proposal entitled "Improving Energy Usage, Water Supply Reliability and Water Quality Using Advanced Water Treatment Processes" to the CEC for funding under its Public Interest Energy Research (PIER) program. CEC staff has indicated that funding for this work (i.e., $2 million) has been included in the FY 1999/2000 PIER program budget. Upon acceptance of the proposal by the CEC, Metropolitan, on behalf of DRIP, will enter into contract negotiations for an interagency agreement with the CEC.

- U.S. Environmental Protection Agency (USEPA)--Metropolitan, on behalf of DRIP, has received $475,100 in funding from the USEPA. This money was earmarked for DRIP in the FY 1999/2000 USEPA budget. The contract for this work is currently being developed.

The USEPA is very actively involved in the CALFED process, which is addressing Sacramento-San Joaquin Bay Delta issues. The USEPA's project manager for this funding has indicated that the DRIP program objectives in the areas of desalination and UV are very supportive of some of the goals of the CALFED process. Based on this, future funding opportunities for DRIP through the USEPA appear quite promising. Metropolitan's Washington D.C. Legislative Office is currently pursuing earmarked funding in the USEPA's FY 2000/2001 budget.

- Water Resources Development Act (WRDA)--The WRDA of 1992 reauthorizes the Army Corps of Engineers' civil works construction program to improve the Nation's infrastructure, and provides for the "conservation and development of water and related resources." There is a potential for DRIP to obtain funding under this act, and these possible opportunities are being pursued by Metropolitan's Washington D.C. Legislative Office in conjunction with the DRIP Team.

TABLE 1

DESALINATION RESEARCH AND INNOVATION PARTNERSHIP

PARTICIPANTS TO DATE (April 2000)

* Metropolitan Water District of Southern California
* Orange County Water District
* San Diego County Water Authority
* West Basin Municipal Water District
* Alameda County Water District
* Sonoma County Water Agency
* Santa Clara Valley Water District
* University of California
* California Energy Commission
* California Department of Water Resources
* U.S. Bureau of Reclamation
* U.S. Environmental Protection Agency
* American Water Works Association Research Foundation
* Electric Power Research Institute

TABLE 2

DESALINATION RESEARCH AND INNOVATION PARTNERSHIP ACCOMPLISHMENTS AND GOALS

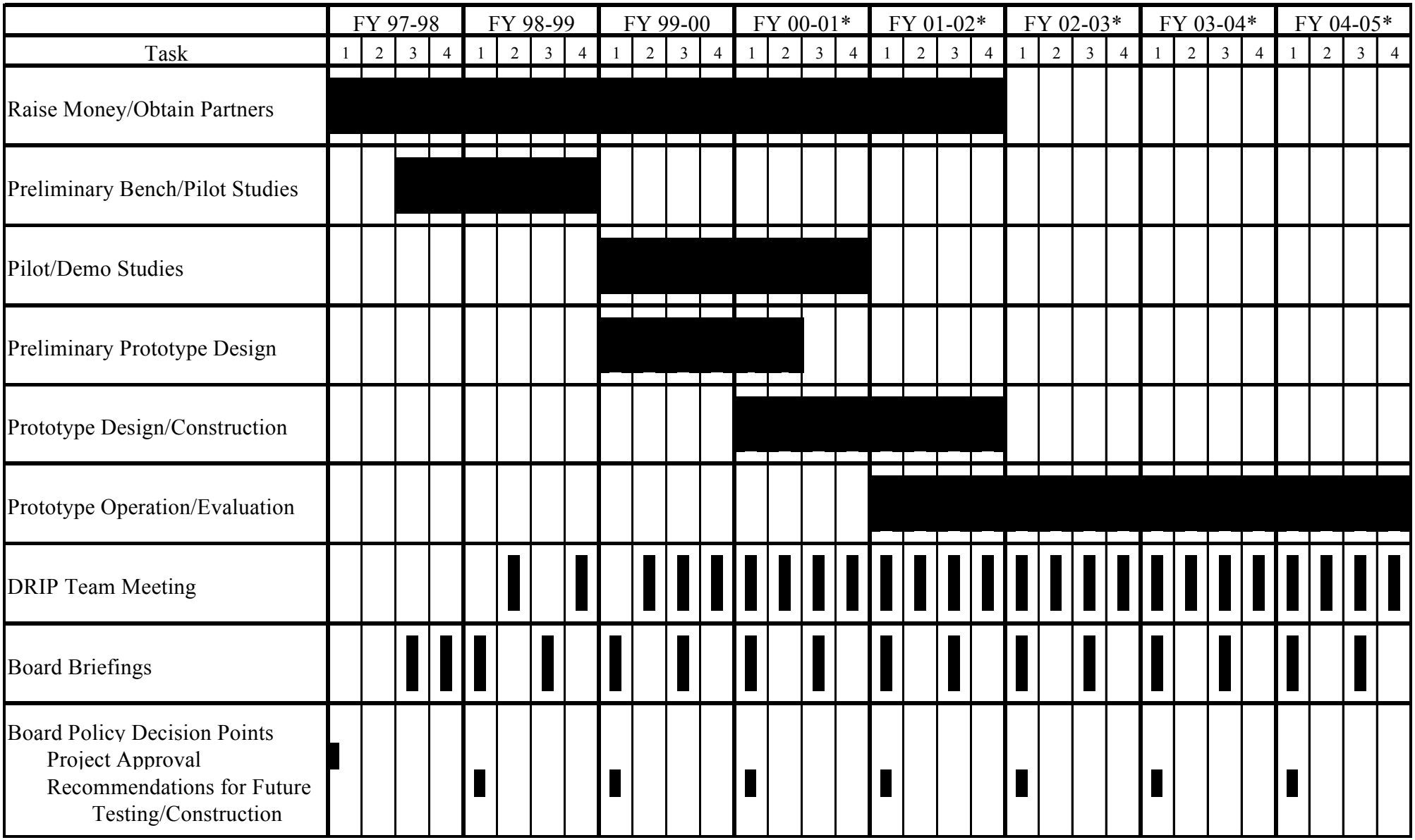
Project Tasks	Third Year Accomplishments	Fourth Year Goals
Raise Money/Obtain Partners	• Obtained $475,100 in funding from the USEPA to support DRIP applied research being conducted by the San Diego County Water Authority, West Basin Municipal Water District, Orange County Water District, and Metropolitan. • Obtained $100,000 from the U.S. Bureau of Reclamation (USBR) under its Desal R&D program to study precipitative fouling of reverse osmosis (RO) membranes. • Obtained letters of commitment for the DRIP program from northern California water agencies—Alameda County Water District, Sonoma County Water Agency, and the Santa Clara Valley Water District. • Coordinated closely with the California Energy Commission (CEC) to optimize chances of obtaining additional Public Interest Energy Research (PIER) funding.	• Obtain additional research partners, as appropriate, and raise funds from state and federal sources. • Continue efforts to secure significant funding from the CEC's PIER program. • Continue efforts to secure federal funding from the USEPA, USBR, and the U.S. Department of Energy. • Explore funding opportunities from the Water Bond, CALFED, and the Water Resources Development Act (WRDA)
Treatment Evaluations	• Determined that for surface water, RO performed well using microfiltration or conventional treatment with ozone/biofiltration as pretreatment. • Determined that the primary coagulant used in the solids removal process significantly affects RO performance. • Working with membrane manufacturers, designed, built and initiated testing of a large-scale RO membrane module. • Evaluated technologies for desalination of municipal wastewater and agricultural drainage water. • Determined that microfiltration of treated municipal wastewater is suitable pretreatment for desalination by RO. • Completed comparison of pulsed-UV to more traditional UV systems, and constructed scaled-up UV system for demonstration. • Identified UV dose required for disinfection and micropollutant destruction.	• Demonstrate large-scale pretreatment and RO technologies for Colorado River water. • Evaluate particle removal technologies prior to large-scale desalination. • Demonstrate scaled-up UV technologies for disinfection of microorganisms and oxidation of micropollutants. • Evaluate low-fouling membranes for treating brackish groundwater and municipal wastewater. • Continue investigations of desalination technologies for agricultural drainage. • Continue investigations of brine handling and disposal.

TABLE 3

POTENTIAL FUNDING SOURCES FOR DRIP

Funding Source	Description	Amount Proposed	Expected Timing
California Energy Commission (CEC)	DRIP submitted a final proposal for funding under the Public Interest Energy Research (PIER) program in April 2000.	$2,000,000	CEC decision on funding expected by July 2000
U.S. Environmental Protection Agency (USEPA)	Washington D.C. Legislative Office pursuing "earmarked" funding for DRIP in the USEPA's FY 2000/2001 budget.	$2,000,000	Action expected by September 2000
U.S. Bureau of Reclamation (USBR)	Washington D.C. Legislative Office pursuing funding for DRIP in USBR's FY 2000/2001 budget.	$2,000,000	Action expected by September 2000
U.S. Department of Energy (USDOE)	Washington D.C. Legislative Office pursuing funding for DRIP in USDOE's FY 2000/2001 budget.	$2,000,000	Action expected by September 2000
Safe Drinking Water, Clean Water, Watershed Protection, and Flood Control Act (Water Bond)	Sacramento Legislative Office is evaluating funding opportunities for DRIP in the Water Bond. Efforts will focus on funding available in *Article 4 (Interim Water Reliable Supply and Water Quality Infrastructure and Management Program)*.	Not Determined	Action expected in Fiscal Year 2000/2001
CALFED	Sacramento Legislative Office is evaluating funding opportunities for DRIP in the CALFED program	Not Determined	Action expected in Fiscal Year 2000/2001
Water Resources Development Act (WRDA)	Washington D.C. Legislative Office pursuing funding opportunities for DRIP in WRDA.	Not Determined	Action expected in Fiscal Year 2000/2001
Others	To be pursued as identified.	----	----

FIGURE 1. Proposed Desalination Research and Innovation Partnership Schedule

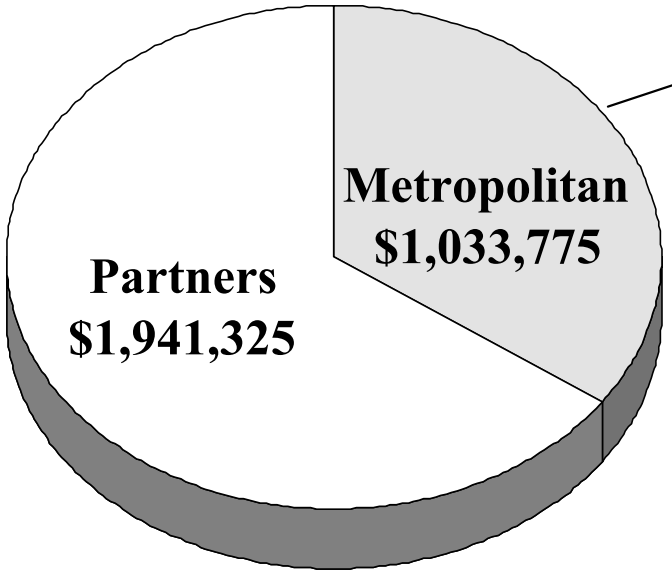


* Efforts in these years are subject to modifications based on results from the first three years of work, the amount of outside funding received, and input from the Board and the DRIP Team.

FIGURE 2

Grant Money to Partnership

(As of April 2000)



California Energy Commission	$ 525,000
Edison Technology Solutions	$ 215,000
American Water Works Association Research Foundation	$ 75,000
U.S. Bureau of Reclamation	$ 100,000
U.S. Environmental Protection Agency	$ 118,775
Total	$ 1,033,775

Total Grant Funding = $2,975,100

FINANCIAL STATEMENT

A breakdown of the Board Action No. 4 for Appropriation No. 15301 to finance the fourth year of funding for the Desalination Research and Innovation Partnership is as follows:

	BOARD ACTION NO. 4
Labor	706,792
Material and Supplies	446,250
Professional/Technical	377,658
Incidental Expenses	54,600
Operating Equipment Operating Equipment	34,650
Administrative Overhead	389,958
Contracts	
Construction	100,000
Grants	(121,000)
Contingencies	287,292
Total:	**2,276,200**

FUNDING REQUEST

Program Name:	Desalination Research and Innovation Partnership (DRIP)				
Source of Funds:	Pay-As-You-Go Fund				
Appropriation No.:	**15301**	**Board Action No.:**	**4**	**FY 99/00 Budget:**	**$1,834,200**
Requested Amount:	$2,276,200	**Capital Program No.:**	15301-W		
Total Appropriated Amount:	4,686,600	**Capital Program Page No.:**	E-**XX**		
Total Program Estimate:	$7,342,800	**Program Category:**	W-Water Quality		