

**SAN DIEGO  
COUNTY WATER AUTHORITY**



**FORTY-SECOND ANNUAL REPORT**  
**1988**

SAN DIEGO COUNTY WATER AUTHORITY

Organized June 9, 1944

# FORTY-SECOND ANNUAL REPORT

of Authority Operations  
for Fiscal Year Ending June 30, 1988

Lester A. Snow  
*General Manager*

SAN DIEGO, CALIFORNIA  
1988



*The Water Palace – Balboa Park – Circa 1915  
 Southern California Water Projects Pavilion  
 San Diego Pacific International Exposition  
 San Diego Historical Society – Ticor Collection*

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# SAN DIEGO COUNTY WATER AUTHORITY

Member Agencies, Date of Entry and  
Representative on Board of Directors on June 30, 1988

## CITIES

Del Mar .....	Nov. 23, 1962
Bob Stevens .....	
Escondido .....	Oct. 9, 1950
George M. Lohnes, Jr. ....	
National City .....	June 9, 1944
Tom Crownover .....	
Oceanside .....	June 9, 1944
James F. Turner .....	
Poway .....	April 21, 1954
Alan D. Archibald .....	
San Diego .....	June 9, 1944
Craig S. Andrews, Dr. Charles F. Cooper, Christine Frahm, Francesca M. Krauel, John M. Leach, Michael D. Madigan, Joseph Parker, Paul A. Peterson, Philip R. Pryde, John P. Starkey	

## WATER DISTRICTS

Helix .....	June 9, 1944
Nat L. Eggert, Harry Griffen .....	
Otay .....	Oct. 26, 1956
Mark W. Watson .....	
San Dieguito .....	Dec. 13, 1948
Anne Omsted .....	

## IRRIGATION DISTRICTS

Santa Fe .....	Dec. 13, 1948
John M. Cranston .....	
South Bay .....	Nov. 3, 1952
Wayne W. Smith .....	
(Includes City of Chula Vista, an independent member agency, from June 9, 1944 to November 3, 1952)	

## MUNICIPAL WATER DISTRICTS

Bueno Colorado .....	June 11, 1954
William D. Taylor .....	
Costa Real .....	June 16, 1954
Margaret J. Bonas .....	
De Luz Heights .....	June 28, 1967
Phil Berg .....	
Olivenhain .....	July 25, 1960
William Hollingsworth .....	
Padre Dam .....	June 7, 1956
W.E. Klostermann .....	
(Includes Lakeside I.D., an independent member agency, from June 9, 1944 to June 7, 1956)	

Rainbow .....	April 10, 1954
Herbert H. Stickney .....	
Ramona .....	August 27, 1957
Vernon L. Leming .....	
Rincon del Diablo .....	June 14, 1954
Sherwood A. Anderson .....	
Valley Center .....	May 9, 1955
John F. Hennigar .....	
Yuima .....	Dec. 16, 1963
James H. Singer .....	

## PUBLIC UTILITY DISTRICT

Fallbrook .....	June 9, 1944
Gordon W. Tinker .....	

## FEDERAL AGENCY

Pendleton Military Reservation .....	Dec. 16, 1977
Lawrence E. Carlson .....	

## COUNTY WATER DISTRICT

San Marcos .....	Feb. 25, 1980
Dale Mason .....	

COUNTY OF SAN DIEGO (ex officio) .....	Feb. 13, 1986
Susan Golding .....	

# OFFICERS OF BOARD OF DIRECTORS

1987-88



Chairman  
**FRANCESCA M. KRAUEL**  
City of San Diego  
7-78 to 6-88



Vice Chairman  
**DALE MASON**  
San Marcos County Water District  
3-80 to 6-88



Secretary  
**MICHAEL D. MADIGAN**  
City of San Diego  
5-79 to 6-88

# BOARD OF DIRECTORS

1987-88



**S.D. ANDERSON**  
Rincon del Diablo  
Municipal Water District  
8-78 to 6-88



**CRAIG S. ANDREWS**  
City of San Diego  
5-83 to 6-88



**ALAN D. ARCHIBALD**  
City of Poway  
10-82 to 6-88



**PHILIP BERG**  
De Luz Heights  
Municipal Water District  
3-86 to 6-88

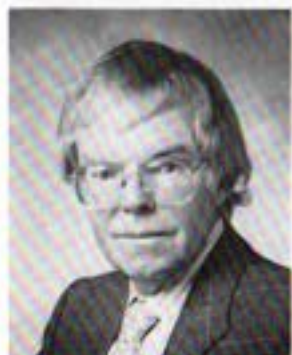


**MARGARET J. BONAS**  
Costa Real  
Municipal Water District  
3-87 to 6-88



**LAWRENCE E. CARLSON**  
Pendleton Military  
Reservation  
12-86 to 6-88

**BOARD OF DIRECTORS**  
1987-88  
(Continued)



**DR. CHARLES F. COOPER**  
*City of San Diego*  
4-73 to 6-88



**JOHN M. CRANSTON**  
*Santa Fe*  
*Irrigation District*  
10-64 to 6-88



**TOM CROWNOVER**  
*National City*  
6-76 to 6-88



**NAT L. EGGERT**  
*Helix Water District*  
10-77 to 6-88



**CHRISTINE FRAHM**  
*City of San Diego*  
3-88 to 6-88



**SUSAN GOLDING**  
*County of San Diego*  
2-86 to 6-88



**HARRY GRIFFEN**  
*Helix*  
*Water District*  
7-56 to 6-88



**JOHN F. HENNIGAR**  
*Valley Center*  
*Municipal Water District*  
10-76 to 6-88



**LAWRENCE HIRSCH**  
*City of San Diego*  
5-73 to 3-88

**BOARD OF DIRECTORS**  
1987-88  
(Continued)



**WILLIAM HOLLINGSWORTH**  
*Olivenhain Municipal*  
*Water District*  
5-86 to 6-88



**W.E. KLOSTERMANN**  
*Padre Dam Municipal*  
*Water District*  
2-83 to 6-88



**FRANCESCA M. KRAUEL**  
*City of San Diego*  
7-78 to 6-88



**JOHN M. LEACH**  
*City of San Diego*  
5-86 to 6-88



**VERNON LEE LEMING**  
*Ramona*  
*Water District*  
2-87 to 6-88



**GEORGE M. LOHNES, JR.**  
*City of Escondido*  
6-86 to 6-88



**MICHAEL D. MADIGAN**  
*City of San Diego*  
5-79 to 6-88



**DALE MASON**  
*San Marcos County Water District*  
3-80 to 6-88



**ANNE OMSTED**  
*San Dieguito*  
*Water District*  
2-87 to 6-88

**BOARD OF DIRECTORS**

**1987-88**

(Continued)



**JOSEPH PARKER**  
*City of San Diego*  
3-77 to 6-83  
5-86 to 6-88



**PAUL A. PETERSON**  
*City of San Diego*  
6-83 to 6-88



**PHILIP R. PRYDE**  
*City of San Diego*  
9-85 to 6-88



**JAMES H. SINGER**  
*Yuima*  
*Municipal Water District*  
5-86 to 6-88



**WAYNE W. SMITH**  
*South Bay*  
*Irrigation District*  
6-87 to 6-88



**JOHN P. STARKEY**  
*City of San Diego*  
10-75 to 6-88



**BOB STEVENS**  
*City of Del Mar*  
2-87 to 6-88



**HERBERT H. STICKNEY**  
*Rainbow Municipal*  
*Water District*  
3-85 to 6-88



**WILLIAM D. TAYLOR**  
*Buena Colorado*  
*Municipal Water District*  
4-88 to 6-88

**BOARD OF DIRECTORS**

**1987-88**

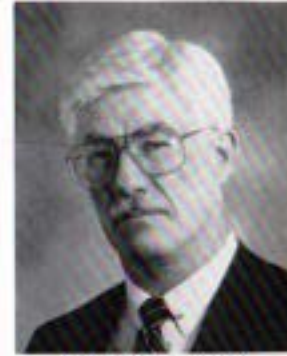
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**FRANK G. TIESEN**  
*Buena Colorado*  
*Municipal Water District*  
1-87 to 4-88



**GORDON W. TINKER**  
*Fallbrook Public*  
*Utility District*  
4-83 to 6-87



**JAMES F. TURNER**  
*City of Oceanside*  
8-86 to 6-87



**MARK W. WATTON**  
*Otay Water District*  
2-85 to 6-87



**DIRECTORS REPRESENTING SDCWA  
ON METROPOLITAN WATER DISTRICT  
BOARD OF DIRECTORS**



**HARRY GRIFFEN**  
1-63 to 6-88



**JOHN F. HENNIGAR**  
10-86 to 6-88



**FRANCESCA M. KRAUEL**  
10-83 to 6-88



**MICHAEL D. MADIGAN**  
7-82 to 6-88



**DALE MASON**  
12-86 to 6-88



**JOHN P. STARKEY**  
1-81 to 6-88

**WATER AUTHORITY MANAGEMENT  
ON JUNE 30, 1988**



**LESTER A. SNOW**  
*General Manager*



**SHIRLEY A. JACKSON**  
*Assistant General Manager—  
Administration*



**CHARLES N. RHODES**  
*Assistant General Manager—  
Resource Planning and  
Development*



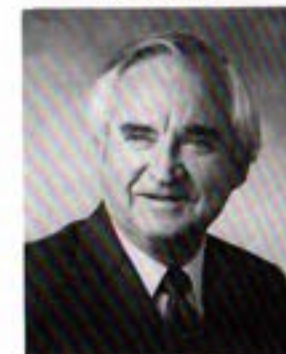
**ROBERT E. MELBOURNE**  
*Acting Chief Engineer*



**HENRY G. LOZANO**  
*Director of Finance  
and Treasurer*



**CINDY M. HEINZ**  
*Executive Secretary*



**PAUL D. ENGSTRAND**  
*General Counsel*

SAN DIEGO COUNTY WATER AUTHORITY

ROSTER OF STANDING COMMITTEES  
AS OF JUNE 30, 1988

**Administrative Policy**

Mark W. Watton, Chairman  
Nat L. Eggert, Vice Chairman  
Craig S. Andrews  
Tom Crownover  
W.E. Klostermann  
George M. Lohnes  
Dale Mason  
Anne Omsted  
Joseph Parker  
James F. Turner

**Fiscal Policy**

John P. Starkey, Chairman  
Craig S. Andrews, Vice Chairman  
Philip E. Berg  
John M. Cranston  
Nat L. Eggert  
Christine Frahm  
Harry Griffen  
William Hollingsworth  
John M. Leach  
Paul A. Peterson  
Bob Stevens

**Engineering and Operations**

Joseph Parker, Chairman  
John F. Hennigar, Vice Chairman  
Sherwood D. Anderson  
Alan D. Archibald  
Margaret J. Bonas  
Charles F. Cooper  
Christine Frahm  
Vernon Lee Leming  
George M. Lohnes  
Michael D. Madigan  
Anne Omsted  
James H. Singer

**Public Information**

Susan Golding, Chairman  
Bob Stevens, Vice Chairman  
Alan D. Archibald  
Margaret J. Bonas  
Lawrence E. Carlson  
Tom Crownover  
Vernon Lee Leming  
Dale Mason  
Philip R. Pryde  
Wayne W. Smith  
William D. Taylor  
James F. Turner  
Mark W. Watton

**Long Range Planning**

John M. Leach, Chairman  
Philip R. Pryde, Vice Chairman  
Philip E. Berg  
Lawrence E. Carlson  
William Hollingsworth  
W.E. Klostermann  
Michael D. Madigan  
Paul A. Peterson  
James H. Singer  
Wayne W. Smith  
Herbert H. Stickney  
Gordon W. Tinker

**Water Policy**

Harry Griffen, Chairman  
Charles F. Cooper, Vice Chairman  
Sherwood D. Anderson  
John M. Cranston  
John F. Hennigar  
Michael D. Madigan  
Dale Mason  
John P. Starkey  
Herbert H. Stickney  
William D. Taylor  
Gordon W. Tinker

SAN DIEGO COUNTY WATER AUTHORITY

ROSTER OF STANDING COMMITTEES  
(Continued)

**Water Reclamation**

Dale Mason, Chairman  
John M. Leach, Vice Chairman  
Margaret J. Bonas  
Charles F. Cooper  
Susan Golding  
Anne Omstead  
Joseph Parker  
Philip R. Pryde  
Sherwood D. Anderson

TEMPORARY (AD HOC) COMMITTEES

**Pamo Dam Steering**

Michael D. Madigan, Chairman  
Harry Griffen, Vice Chairman  
Craig S. Andrews  
John M. Cranston  
Francesca M. Krauel  
Paul A. Peterson  
Philip R. Pryde  
Gordon W. Tinker

**Audit Subcommittee**

Craig S. Andrews, Chairman  
Nat L. Eggert  
Harry Griffen  
Dale Mason

**Water Reclamation Ad Hoc**

Dale Mason, Chairman  
John M. Leach, Vice Chairman  
Margaret J. Bonas  
Charles F. Cooper  
Susan Golding  
Anne Omsted  
Joseph Parker  
Philip R. Pryde

**SDCWA Headquarters Office  
Siting Ad Hoc**

Paul A. Peterson, Chairman  
Tom Crownover  
Christine Frahm  
W.E. Klostermann  
Dale Mason  
John P. Starkey  
Mark W. Watton

**Subcommittee (of Administrative  
Policy Committee) on Discharge  
and Disciplinary Procedures**

Herbert H. Stickney





**SAN DIEGO COUNTY WATER AUTHORITY  
REPORT OF ACTIVITIES**

**FISCAL YEAR 1987-88**

The combination of below-average rainfall that produced very little runoff, both locally and statewide, and a steady increase in the population of San Diego County resulted in an even greater burden on the Authority's facilities than the previous year's record delivery of water. The estimated population on June 30, 1988 was 2,253,216, and the amount of water imported was 552,841 acre feet.

The 1987 Water Distribution Study was completed in November and was the basis of a \$530,000,000 capital improvement program which will take about ten years to fully implement. The Distribution Study indicated the urgency of constructing several segments of pipeline, and three consultants were engaged to proceed with the route selection and design of three critical sections of 108-inch and 96-inch diameter pipeline. The eight-mile long Ramona Pipeline also had a critical completion date; it was assigned to a consultant for design, and projected to go to bid for construction in the Fall of 1988. Preparation of environmental impact reports for these projects include many public meetings to involve the public and obtain their input as to the impacts these projects have on their communities.

The Water Authority undertook new responsibilities in the beneficial use of reclaimed water when it established a separate reclamation department in January 1988. It also assumed activities of the San Diego Region Water Reclamation Agency.

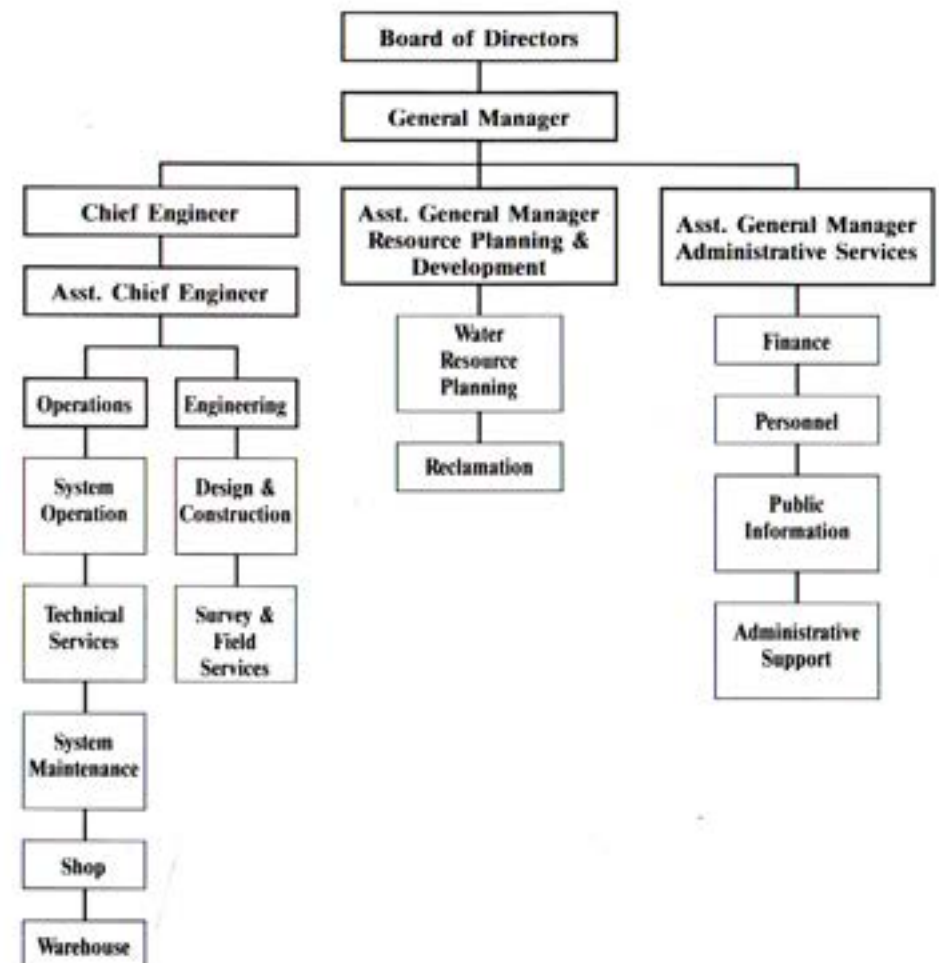
Greater emphasis was placed on public information to develop stronger public awareness and support of Authority programs, including capital improvement and reclamation programs, and also to bring the importance of conservation and state-wide water issues, such as the Bay-Delta hearings, before the public.

Early in the year, the Water Authority purchased a 3-story building at 3211 Fifth Avenue to provide the space for an expanded main office staff. Arrangements have been made to sell the old building, and the move to the new building was planned by February 1989.

This year produced the most significant change in the employee-management relationship since the Water Authority was organized. Some employees chose to be represented by the Teamsters Union, and salary and benefit negotiations became more formal. A full-time personnel specialist was appointed. Outside personnel consultants were required to establish new hiring and promotion procedures, and provision has been made to add a Director of Personnel to the staff.

The upper-level management of the Water Authority has been reorganized to spread the responsibilities of managing the expanded functions

of the old departments as well as supervising the newly established departments. The number of employees has increased from 45 at the beginning of the fiscal year to 59 on June 30, 1988. The 1988-89 budget was projected to provide for 81 full-time positions. An organizational chart reflecting these changes follows:



## BOARD OF DIRECTORS

### General

The San Diego Water Authority is comprised of 24 member agencies and the County of San Diego as ex officio member. Each member agency is represented by at least one person. A member agency is entitled to one additional representative for each full five percent of total assessed valuation contained within its boundaries. Assessed valuation is determined by the Assessor's Office of the County of San Diego. These representatives are appointed by the chief executive officer of the respective agencies with approval of the agencies' governing bodies. During the year, only two agencies were represented by more than one representative: The City of San Diego by ten; Helix Water District by two. Directors serve without pay from the Authority.

Officers of the Board of Directors are elected in July of even-numbered years. In July 1986, Francesca M. Krauel was elected Chairman; Dale Mason, Vice Chairman; and Michael D. Madigan, Secretary.

To facilitate matters, most business coming before the Board is first considered by one of its committees. Each committee then reports to the full Board which makes the necessary decisions. There are seven standing committees:

Administrative Policy	Long Range Planning
Engineering and Operations	Public Information
Fiscal Policy	Water Policy
	Water Reclamation

Temporary committees that existed during this year were:

Pamo Dam Steering	Headquarters Office Siting
Audit	Discharge & Disciplinary
Land and/or Easement	Procedures
Acquisition	Water Reclamation

During fiscal year 1987-88, one Director was presented with a service emblem:

<u>Director</u>	<u>Length of Service</u>
Nat Eggert	10 Years

During the year, the following Directors were seated or reseated:

<u>Date</u>	<u>Director</u>	<u>Agency</u>	<u>Term Expires</u>
Feb. 11, 1988	Susan Golding	County of San Diego	Jan. 12, 1994
Mar. 10, 1988	Christine Frahm (replaces Lawrence Hirsch)	City of San Diego	July 15, 1992
April 14, 1988	William D. Taylor (replaces Frank Tiesen)	Bueno Colorado M.W.D.	June 15, 1990

### SIGNIFICANT BOARD ACTION

#### July 9, 1987

Resolution: Authorized the execution and delivery of an Amendment No. 2 to Trust Agreement in Connection with Certificates of Participation and certain other actions in connection therewith.

Resolution: Established a charge against member agencies which made "in lieu" payments in the fiscal years 1975-76, 1976-77, 1977-78.

Resolution: Authorized the utilization of Metropolitan Water District data for water conservation program at a cost of \$60,000 and approved Work Order No. 28.

#### August 20, 1987

Resolution: Established the vote of representatives of member agencies as determined by assessed valuations for fiscal year 1987-88.

Motion: Authorized to forward a Resolution of Appreciation to the people who testified at the Bay Delta Hearings on behalf of the San Diego County Water Authority.

Resolution: Approved Work Order 1-67 and authorized the design and construction of Olivenhain No. 4 service connection.

Motion: Approved the purchase of special pipe fabrication for the conversion of the First Aqueduct to filtered water.

Motion: Approved the engagement of Mooney LeVine and Associates to complete the Ramona Pipeline EIR.

SAN DIEGO COUNTY WATER AUTHORITY

- Resolution: Approved Work Order 1-27 and appropriated \$12,000 for the rehabilitation of fuel tanks at the Escondido Operations Center.
- Resolution: Authorized fixing the tax rate for fiscal year 1987-1988.
- Resolution: Established an "in lieu" charge to the City of San Diego for fiscal year 1987-1988.
- Motion: Approved the engagement of Mr. Charles Hedrick to conduct a study on the relocation of the San Diego Headquarters Office and to recommend possible relocation sites for a fee of \$5,000 or one-half the commission if a new building is purchased. In addition, that Mr. Hendrick would report back to the Board in 60 days and that the contract would expire in six months.
- Resolution: Approved the Otay Valley/Palm Avenue Concurrent Annexation and requested consent of Metropolitan Water District to said annexation.
- Motion: Approved Work Order 1-29 and authorized the engagement of Stoorza, Ziegaus and Metzger to assist the Water Authority in a water conservation program.

**September 10, 1987**

- Resolution: Extended appreciation to the volunteers and to Susan Golding who participated in the Bay Delta Hearings on behalf of the Water Authority.
- Motion: Authorized Acting General Manager to enter into a contract with Richard Whitmore, Employee Relations Consultant, subject to approval by the Water Authority's General Counsel.
- Motion: Instructed Legislative Advocate Ben Clay to convey the Water Authority's support of SB 182 as a two-year bill and that it be linked with the entire Delta Package.
- Motion: Approved a \$5 water rate surcharge increase effective January 1, 1988.
- Motion: Approved the engagement of E.F. Hutton & Company as Financial Advisors to the Water Authority on an hourly basis.

BOARD OF DIRECTORS

- Motion: Approved a policy on acquisition of rights-of-way which stated that decisions would be made on a case-by-case basis.
- Motion: Approved commencement of an Environmental Review and an Engineering Design for the Recommended Water Distribution Plan.

**October 8, 1987**

- Resolution: Amended the Administrative Code to include the Water Reclamation Committee as a standing committee.
- Motion: Approved the Draft Agreement with the San Diego Region Water Reclamation Agency in concept.
- Resolution: Approved Work Order 11-53 and appropriated \$50,000 in financial assistance to the San Diego Region Water Reclamation Agency.
- Motion: Amended the Administrative Code Section 17.2 to include a section on Employee Rules and Regulations.
- Motion: Recognized the San Diego County Water Authority Employees, an affiliate of Teamsters Local 911.
- Resolution: Consented to the annexation of the territory designated as Otay Valley/Palm Avenue Annexation and fixing the terms and conditions upon which such territory may be annexed.
- Resolution: Determined that Olivenhain Municipal Water District is supplying water to certain territory which also lies within the boundaries of the City of San Diego.
- Motion: Approved a contract with the firm of Camp, Dresser and McKee, Inc. to perform design services for the Ramona Pipeline.
- Motion: Approved a contract with San Lo Aerial Survey to perform aerial photography for the Ramona Pipeline.
- Motion: Approved the commencement of the Environmental Review of the water supply features of the Recommended Water Distribution Plan including Pipeline 6.

SAN DIEGO COUNTY WATER AUTHORITY

- Resolution: Approved Work Order 1-68 for the design and construction of Rincon No. 3 service connection.
- Resolution: Approved Work Order 11-51 for the environmental work and engineering design, providing plans and specifications for the Pipeline 5 Extension.
- Resolution: Approved Work Order 11-51 for the environmental work and engineering design, providing plans and specifications for Pipeline 2A.
- Resolution: Approved Work Order 11-54 for the replacement of draft tube valves at the Alvarado Hydroelectric Plant.
- Resolution: Amended the Water Authority's Statement of Investment Policy.
- Motion: Approved the contract with E.F. Hutton and Company, financial advisors to the Water Authority.
- Motion: Authorized the Acting General Manager to enter into a contract to purchase the building located at 3211 Fifth Avenue and to do a survey of the building within 30 days.

**November 12, 1987**

- Motion: Approved the 1987-88 Public Information Work Plan which had been developed by Stoorza, Ziegau & Metzger, Inc. incorporating results of a survey to be conducted by Stoorza.
- Motion: Approved the Draft Environmental Impact Report for the Ramona Pipeline.
- Motion: Approved the San Marcos Reimbursement Agreement and authorized the Acting General Manager to execute the Agreement on behalf of the Water Authority.
- Motion: Authorized the Acting General Manager to negotiate agreements with engineering consultants to provide the preliminary design work for four Phase I Projects of the Water Distribution Improvement Plan. The consultants are: Linden R. Burzell, Boyle Engineering Corporation, James M. Montgomery, and NBS/Lowry.

BOARD OF DIRECTORS

- Resolution: Approved Work Order 1-69 for the modification of the Otay No. 5 service connection at a cost of \$45,000.
- Motion: Authorized Engineering Consultant Linden Burzell to continue discussions with member agencies in the South County regarding better utilization of local storage and treatment facilities and Water Authority participation in local projects.
- Motion: Authorized the Acting General Manager to dispose of surplus Water Authority property through the County of San Diego multi-agency sale.
- Resolution: Amended Administrative Code Section 17.2—Employees Association and adopting Section 17.4—Employee Organizations.
- Motion: Approved the purchase of the building located at 3211 Fifth Avenue on the condition that the owner of the building remove any asbestos found following testing by an expert hired by the Water Authority.
- Motion: Approved the recommendation of the Water Reclamation Committee that a representative from any agency involved in sewerage or reclamation be appointed to the Water Reclamation Advisory Committee.
- Resolution: Approved and authorized the execution of the agreement between the San Diego County Water Authority and the San Diego Region Water Reclamation Agency.
- Motion: Approved draft letter regarding water conservation ordinances and instructed staff to send the letter to the member agencies rather than to the cities.
- Resolution: Approved Revision I to the 1987-88 Water Authority Budget.
- Resolution: Approved Work Order 11-55 to purchase, remodel, and furnish new Water Authority Headquarters Office.
- Motion: Adjourned the December 10, 1987 meeting to December 17, 1987 in order to avoid conflict with the Colorado Water Users Annual Conference.
- Action: The Chairman announced the hiring of the new Water Authority General Manager, Lester A. Snow.

SAN DIEGO COUNTY WATER AUTHORITY

**December 17, 1987**

- Motion: Approved sending a letter of recommendation by the Chairman for Edwin Finster's reappointment to the State Water Resources Control Board.
- Motion: Approved the following appointments to ACWA committees: Legislative—Ben Clay, Environmental Issues—Charles Cooper, Energy—Larry Hirsch, Federal Affairs—Harry Griffen, Water Policy Coordinating—Francesca Krauel, Revenue & Dues—Henry Lozano, and Public Affairs—Pete Rios.
- Motion: Approved the placement of 30.92 percent of total Certificates of Deposit with City National Bank.
- Motion: Approved the Local Storage Agreement with the Metropolitan Water District and instructed staff to report back after one year with an analysis.
- Resolution: Approved Revision 1 to Work Order 1-27 and appropriated the sum of \$2,231.20 from the General Fund.
- Motion: Approved the closing of Work Order 11-43 and returned the balance of \$3,849.70 to the Capital Outlay Fund.
- Motion: Ratified the Draft Memorandum of Understanding with the San Diego County Water Authority Employees.
- Motion: Approved the Agreement between the Water Authority and the Confidential, Supervisory, and Management Employees.
- Motion: Appropriated \$2,000 for the Authority to support the 1988 San Diego Xeriscape Conference.
- Motion: Approved a public education program for the Pamo Dam Project to be conducted by the firm of Stoorza, Ziegus and Metzger.

**January 14, 1988**

- Resolution: Extended appreciation to Acting General Manager Ralph Grahl.

BOARD OF DIRECTORS

- Motion: Approved the Consulting Services Contract between San Diego County Water Authority and Ralph B. Grahl.
- Resolution: Approved the addition of Section 17.5—Tuition Reimbursement to the Administrative Code.
- Motion: Approved an agreement with Richard S. Whitmore to continue labor relations consulting.
- Resolution: Authorized the execution of an agreement to lower the Crossover Pipeline and approved Work Order 1-70.
- Motion: Approved 1988 San Diego Water Awareness Week to be sponsored by the Water Authority in Spring of 1988.
- Motion: Approved Water Authority membership in the National Xeriscape Council.
- Motion: Approved the expenditure of \$575 for the support of the ACWA Joint Water Quality Task Force.
- Motion: Approved an amendment to Administrative Code Section 11.6—Water Storage Agreement.
- Motion: Authorized the General Manager to negotiate an agreement with Brian F. Mooney Associates for Water Distribution Program EIR Consultant Services.
- Motion: Took a position of support on SB 34—the Ayala Delta Levee Bill.
- Motion: Approved Water Authority membership in the National Water Supply Improvement Association and the California Association of Reclamation Entities of Water.

**February 11, 1988**

- Motion: Authorized the General Manager to execute a contract with L.H. Woods and Sons, Inc., in the amount of \$68,000, to construct the First Aqueduct Intertie south of the Terminal Structure.
- Resolution: Authorized Grant of Encroachment Permit 88-2 to the City of Vista, approximate Station 140+20 of the Tri-Agencies Pipeline.

SAN DIEGO COUNTY WATER AUTHORITY

- Motion: Authorized the General Manager to select a classification survey firm and enter into a contract with the firm upon approval of form by General Counsel.
- Resolution: Amended Article 9 (Working Hours, Leave of Absence and Holidays), Article 16 (Payment of Expenses Incurred on Authority Business), and adding to Article 17 (Employee Relations).
- Resolution: Amended Administrative Code Section 14.2—Petty Cash Fund.
- Motion: Supported the report of the County of San Diego Water Conservation Technical Committee and authorizing the General Manager to testify before the San Diego County Board of Supervisors.
- Motion: Approved the request of UCSD Center for Water Research for \$50,000.
- Resolution: Authorized bank signature cards for two groups of signatures—Administrative Support and Management Control.
- Resolution: Supported, in principle, the proposed legislation for the lining of the All American Canal and the Coachella Branch.
- Motion: Approved the Water Authority Reclamation Advisory Committee Mission Statement and Policy Issues.
- Motion: Approved the sale of the existing Authority Headquarters at 2750 Fourth Avenue to the American Lung Association for a price of \$725,000.
- Motion: Approved the hiring of John Pugsley to handle the first phase of the remodeling work of the new Water Authority Headquarters.

**March 10, 1988**

- Resolution: Honored Lawrence Hirsch upon his retirement from the Water Authority Board of Directors.
- Motion: Approved the certification of the Ramona Pipeline Final Environmental Impact Report.

BOARD OF DIRECTORS

- Motion: Approved a standard form of Agreement for Professional Engineering Services which was written by General Counsel.
- Resolution: Approved Work Order 11-56 and appropriated \$33,800 from the Capital Outlay Fund for the Water Authority's one-fourth share of a pump station at Padre Dame No. 6 service connection.
- Motion: Approved a position of support for SB 1350, formerly AB 318.
- Motion: Approved a position of support for Senate Concurrent Resolution 68.
- Motion: Authorized the General Manager to engage the firm of Public Affairs Consultants, Inc. to aid in the study of various funding methods.
- Resolution: Concurred in the nomination of Henry C. Garnett to the Executive Committee of ACWA-JPIA.
- Resolution: Concurred in the nomination of Ruth Santos to the Executive Committee of ACWA-JPIA.
- Resolution: Concurred in the nomination of Ronald Vickery to the Executive Committee of ACWA-JPIA.

**April 14, 1988**

- Action: William D. Taylor was seated on the Board of Directors representing Buena Colorado Municipal Water District. Mr. Taylor replaces Frank Tiesen.
- Resolution: Honored Frank Tiesen upon his retirement from the Board of Directors.
- Resolution: Approved Work Order 11-57 for the Water Distribution Improvement Plan Environmental Impact Report and authorized the General Manager to execute an agreement with Brian F. Mooney Associates for the work.
- Motion: Authorized the General Manager to sign and record quitclaim deeds to relinquish unused easement to Home Capital Corporation, Willmark Corporation, and Grossmont-Cuyamaca Community College District.

SAN DIEGO COUNTY WATER AUTHORITY

- Motion: Authorized the General Manager to engage the Certified Public Accounting firm of Lois A. Brozey to monitor the implementation of its recommendations and to conduct the 1987-88 Audit.
- Motion: Approved the termination of the contract with Shearson Lehman Hutton, Inc. and hiring of Dennis Ciocca as financial consultant.
- Motion: Instructed the General Manager to meet with member agencies to determine whether or not there was enough time remaining to effectively implement Water Awareness Week scheduled for June 6-11, 1988.
- Motion: Approved the renovation of the Del Mar Fair Garden and the changing of the garden title to "Xeriscape Garden."
- Resolution: Authorized Grant of Encroachment Permit 88-1 to the City of Escondido.
- Motion: Authorized staff to work with the Encina Basin Subcommittee to develop a scope of work for a comprehensive water reclamation plan.
- Motion: Instructed the Legislative Advocate to convey the Water Authority's support of AB 2928.
- Motion: Approved a \$5 water rate increase effective July 1, 1988 and another \$5 increase effective January 1, 1989.
- Motion: Approved a letter writing campaign by the Water Authority and its member agencies to elected representatives to encourage the provision of \$24 million for Colorado River Salinity Pollution Control Activity.
- Motion: Approved Water Authority and member agency support for Colorado River Basin States requests to the Federal Government for maintaining weather modification research and the Atmospheric Water Resources Management Program of the Bureau of Reclamation for a total funding of \$4 million.
- Motion: Approved Water Authority support for Federal Government funding of \$650,000 for the operation and maintenance of the National Weather Service Colorado River Flood Warning System.

BOARD OF DIRECTORS

- Motion: Adjourned the May 12, 1988 Board meeting to May 19, 1988 to avoid conflict with the ACWA Conference.
- May 19, 1988**
- Action: Chairman of the Board announced the appointment of the Nominating Committee which included: Directors Parker, Chairman; Anderson, Hennigar, Leach, and Starkey.
- Motion: Added an item to the Board agenda regarding the appointment of Assistant General Manager positions.
- Motion: Approved the addition of three new personnel classifications: Water Resource Specialist III, Water Resource II, and Education Program Manager.
- Motion: Approved the Water Authority Water Reclamation Technical Assistance Program.
- Motion: Authorized the General Manager to retain a professional firm to prepare a comprehensive economic feasibility assessment of the CCBA Process.
- Motion: Approved, in concept, the Drought '88 Conservation Goals and Objectives, the Drought '88 CWA Press Conference Campaign Kick-Off, and Resolution 88-18 with respect to the California drought.
- Motion: Approved the agreement for legal services with General Counsel Engstrand.
- Motion: Authorized the General Manager to execute an agreement for engineering services with Linden R. Burzell for the Pipeline 5 Extension.
- Motion: Denied request of Dr. William Zaayer for variance of easement conditions without prejudice and with the understanding that he may make another request upon the establishment of an encroachment policy by the Water Authority.
- Motion: Denied request of Mr. Joseph Conlin for permission to complete construction of a block retaining wall in the Authority's easement without prejudice and instructing the General Manager to take no action to remove the wall until the establishment of an encroachment policy by the Water Authority.

SAN DIEGO COUNTY WATER AUTHORITY

- Motion: Approved changes to the Administrative Code to reflect the separation of the General Manager and Chief Engineer position into two separate positions and establish two Assistant General Manager positions.
- Motion: Approved the following Assistant General Manager appointments: Shirley Jackson, Assistant General Manager – Administration; and Charles Rhodes, Assistant General Manager – Resource Planning and Development.
- Motion: Took a position of opposition on AB 3218.
- Motion: Approved the hiring of Orrick, Herrington and Sutcliffe as Water Authority Bond Counsel subject to negotiations by the General Manager for the terms of the agreement and the scope of the services to be rendered.

**June 9, 1988**

- Resolution: Extended appreciation to Margaret Rios.
- Action: The Nominating Committee announced the nominations for Board officers: Chairman – Dale Mason, Vice Chairman – Michael Madigan, and Secretary – Herbert Stickney.
- Motion: Approved a Joint Participation Agreement for Development and Utilization of Reclaimed Water between the Metropolitan Water District of Southern California, San Diego County Water Authority, and Fallbrook Sanitary District.
- Motion: Approved Technical Assistance Program funding for the Encina Basin Study and authorized the General Manager to enter into an agreement with each of the participating agencies and John S. Murk Engineers.
- Motion: Approved Technical Assistance Program funding for the Poway Reclamation Study and authorized the General Manager to enter into an agreement with the City of Poway.
- Resolution: Authority expressed intent to reimburse capital expenditures with tax exempt financing.
- Resolution: Approved Revision No. 1 to Work Order 11-55 appropriating an additional \$800,000 to remodel and furnish the building located at 3211 Fifth Avenue.

BOARD OF DIRECTORS

- Motion: Approved the Authority newsletter produced by Stoorza, Ziegaus, and Metzger.
- Motion: Approved a drought resolution to be sent to retail agencies for adoption.
- Motion: Approved the list of classified positions and salary ranges for Fiscal Year 1989 submitted by the General Manager.
- Motion: Took a position of support on AB 3180 with the provision that amendments, basically in the form of those proposed by Authority, be included.
- Resolution: Approved the 1988-89 Budget.

## EMPLOYEE RELATIONS

July 1, 1987 marked the beginning of a newly-created Personnel Department employing a personnel specialist. The Authority realized the need to centralize its personnel matters in dealing with employment, records and benefits. The first year included many significant events. The new personnel office was established at the Fred A. Heilbron Center in Escondido. Close communication between the two offices allowed many personnel-related problems to be handled on the spot, thus avoiding miscommunications, delays, and misunderstandings.

### Employment

Finding personnel to fill the many new and existing vacant positions became a major priority. The need to hire a permanent General Manager, Assistant General Manager, a Chief Engineer, establish a new Water Resources Department, and expand personnel in Operations and Maintenance, Engineering, Construction, Finance, and Public Information demanded an extensive recruitment program. As a result, 15 additional employees were added to the payroll during this period: 23 were employed in the San Diego office and 39 worked in Escondido's Operation Center. One employee retired, and two probationary employees were terminated.

### Special Activities

On August 13, 1987, notice was received that the Water Authority employees had affiliated with the Teamsters Local 911. Adoption of a Memorandum of Understanding (MOU) took place on December 17, 1987 allowing Teamsters Local 911 to negotiate on behalf of the employees of the bargaining unit for wages, hours, and conditions of employment based on the Meyers-Milias Brown Act. One of the conditions agreed upon was to employ a consultant to conduct a salary/classification survey with participation by both management and labor and to include wage levels and job descriptions. The study was conducted by Personnel Research Center of Irvine, California, and the final report was accepted and approved by the Board of Directors and employee representatives.

### Benefits

The Authority is a member of the Public Employees Retirement System of the State of California. Contributions to the system are made by the employee and the Authority. The plan is coordinated with Social Security. The Authority pays for employees' P.E.R.S. contribution except for the older employees who have chosen to continue making their own contributions. The basic formula provides for retirement at age 60 based upon 2 percent of the highest annual salary for each year of service. Social Security benefit will be received as well.

Other benefits the employees receive are a Blue Shield administered health plan, a Delta Dental Plan of California, a Vision Care Plan, a long-term disability plan, and a \$50,000 life insurance benefit.

The employees, through their Employees' Association, which is separate from the employees' union, organize a summer picnic, a Christmas party, and other occasional functions for the employees throughout the year.

The Administration Code provides for vacation leaves of 12 working days for the first five years of service and increases to 25 days of vacation after 25 years of service. The Authority recognizes 12 paid holidays each year. Sick leave is granted on the basis of 12 days per year of service and can be accumulated. The Administrative Code provides for partial payment of unused sick leave upon retirement and the conversion of sick leave, in excess of 60 days, to annual leave on a two-for-one basis. Employees may also choose to convert sick leave, in excess of 60 days, to cash in half value.

Every spring, in conjunction with preparation of the budget for the following fiscal year, a list of the classified positions to meet the needs of the Authority, along with the appropriate salary range, is recommended to the Board of Directors by the General Manager. After consideration of the staffing requirements within the framework of the budget, anticipated capital improvement projects, and the current changes in the cost of living index, the salary ranges are established by the Board.



*Employees' Association 1987 Christmas Party*

## WATER AUTHORITY COMPOSITION

### General

The San Diego County Water Authority consists of six cities, three water districts, two irrigation districts, ten municipal districts, one public utility district, one federal agency, one county water district, and the County of San Diego as an ex officio member. It was organized on June 9, 1944 under the County Water Authority Act of 1943. The Act was requested by San Diego City and County officials, prepared by the distinguished water attorney, Phil D. Swing, and introduced by Senator Ed Fletcher. The measure was approved by the Governor on May 17, 1943.

The original incorporators of the Water Authority were: the City of Chula Vista, City of Coronado, City of National City, City of Oceanside, City of San Diego, Fallbrook Public Utility District, Lakeside Irrigation District, La Mesa, Lemon Grove and Spring Valley Irrigation District, and Ramona Irrigation District.

Such an organization was needed for the prime purpose of importing Colorado River water to San Diego in order to augment local water supplies which were rapidly becoming inadequate.

### Area

The Authority encompasses 907,634 acres (1,418.2 square miles), a net increase of 346 acres during the fiscal year. Area changes, addition of member agencies, and percentage of area each member agency serves are contained in Table 3. The City of San Diego is the largest area with 210,282 acres; the smallest area is the City of Del Mar consisting of 1,159 acres.

Each calendar year the Authority is required by state law to file a Statement of Change of Boundary. The statement was filed with Metropolitan Water District, the San Diego County Assessor, and the State Board of Equalization on December 31, 1987.

The statement for calendar year 1987 contained two annexations which changed the Authority and MWD boundary in addition to annexations and detachments that affected the area of the Authority's member agencies.

The Statement of Change of Boundary is used by the County Assessor to determine the total assessed valuation within each member agency and the Authority for tax purposes.

**Population**

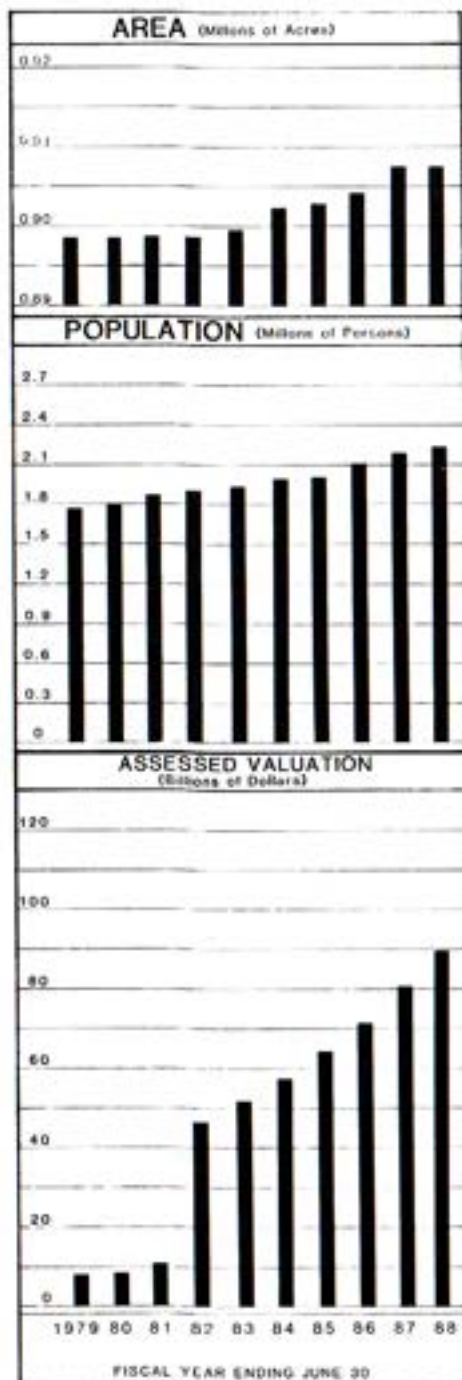
On June 30, 1987, the population of San Diego County was estimated to be 2,327,684 of which 97 percent live within the Authority service area. The average annual growth rate within the Authority service area for the period from 1946 to 1988 was 3.96 percent. The population within the Authority service area was estimated to be 2,253,276 on June 30, 1988, an increase of 72,216 or 3.3 percent from the June 30, 1987 estimate of 2,181,000. Population statistics are contained in Tables 2 and Table 3.

The City of San Diego, largest member agency of the Authority in area, leads the member agencies in population with 1,058,700 persons, approximately 47 percent of the Authority total. De Luz Heights Municipal Water District has the smallest population with 271 and the lowest density of 0.02 persons per acre. The highest population density within an agency is 9.12 persons per acre in the City of National City.

The average population density of the Authority increased during the fiscal year from 2.46 to 2.48 persons per acre or 1,589 persons per square mile.

**Assessed Valuation**

The assessed valuation of taxable property within the Authority, both secured and unsecured, and the Authority's debt service requirements provide the basis for the annual determination of the Authority tax rate by the Board of Directors. The number of directors and the number



of votes to which each member agency is entitled is determined by the total assessed valuation within each member agency. The valuations are determined by the San Diego County Assessor who collects these taxes for the Authority.

Total assessed valuation of taxable property within the Authority for 1987-88, according to the County Auditor's certification, was \$89,993,730,693, an increase of \$9,360,367,720 or 11.6 percent from the 1986-87 certified valuation of \$80,633,362,973.

The average assessed valuation of property within the Authority service area increased from \$88,873 per acre in 1986-87 to \$99,152 per acre in 1986-87. This increase was the result of higher value of secured and unsecured property in the Authority service area.

The assessed valuation for each member agency, the Authority, and San Diego County is contained in Table 5.

## WATER SUPPLY AND CONSUMPTION

### Source

The Metropolitan Water District of Southern California (MWD) is the sole source of supplemental water to the Authority and provides an average of 90 percent of its water. The member agencies of the Water Authority used approximately 27.5 percent of MWD's supply in 1987-88. The Authority has a preferential right to 11.23 percent of MWD's total supply but MWD has never invoked preferential rights as a basis for curtailment of water deliveries.

### MWD Facilities

Metropolitan Water District supplies a blend of Colorado River water and State Project water. Water from the Colorado River Aqueduct to the terminus at Lake Havasu is carried through the Colorado River Aqueduct to the terminus at Lake Mathews in Riverside County. Supplies for San Diego are diverted from the aqueduct near the west portal of the San Jacinto Tunnel into the First San Diego Aqueduct (Pipelines 1 and 2). A few miles west, the San Diego Canal receives water from the Casa Loma Canal. Pipelines 1 and 2 enter and traverse San Diego County without going through any other major facilities.

The State Water Project water is delivered to MWD at Lake Perris, terminus of the 444-mile California Aqueduct. From there, it flows through the Lakeview Pipeline to the San Diego Canal where it is blended with Colorado River water which then flows into Lake Skinner. A portion of the water from Lake Skinner flows directly into Pipelines 3 and 5 while another portion is processed through the Skinner Filtration Plant before entering Pipeline 4. By the end of June 1988, the blend in Lake Skinner was 49 percent Colorado River water and 51 percent State Water Project water.

Lake Skinner is the major storage facility for the San Diego Aqueduct with a maximum capacity of 44,000 acre-feet of storage. The maximum water elevation for storage is 1,479 feet above sea level. The Skinner Treatment Plant, located at the reservoir, has a treatment capacity of 340 million gallons per day (mgd). These facilities are located in Riverside County south of Winchester.

### Authority Facilities

The Authority takes delivery of water from MWD in the five pipelines of the San Diego Aqueducts approximately six miles south of the Riverside-San Diego County line.

San Vicente Reservoir, which is owned and operated by the City of San Diego, is the terminus of the First Aqueduct. The Fallbrook-Oceanside Branch originates from the First Aqueduct at Rainbow. The Authority operates and maintains approximately 12.5 miles of this branch from Rainbow to Morro Reservoir. The La Mesa-Sweetwater Branch extends from the First Aqueduct at Slaughterhouse Canyon through Lakeside and El Cajon to Sweetwater Reservoir. The two pipelines of the First Aqueduct share common tunnels and inverted siphons and are operated as a single unit.

The three pipelines of the Second Aqueduct (Pipelines 3, 4, and 5), although in common right of way for most of their length, do not share any facilities south of Lake Skinner and are operated separately. The treated water pipeline terminates in Lower Otay Reservoir. One untreated water pipeline ends at the City of San Diego's Alvarado Treatment Plant near Lake Murray. The terminus of Pipeline 5, the other untreated pipeline, is the crossover diversion structure at San Marcos. The Tri-Agencies Pipeline, a branch line that extends about 4.4 miles westerly from San Marcos, delivers treated water to service areas of Buena Vista Municipal Water District and the City of Oceanside at an elevation that previously would require pumping.

To maximize the flexibility of the system, several crossover connections have been constructed since 1965. One such facility is the pipeline from the Second Aqueduct at the diversion structure in Twin Oaks Valley to the First Aqueduct in Escondido. This connection permits the refilling of the First Aqueduct with untreated water after agencies to the north have used a portion of its capacity.

Just upstream of the Twin Oaks Diversion is an interconnection which permits the transfer of Pipeline 3 flows into Pipeline 4 and vice versa. Member agencies have also increased the flexibility of their operations by increasing the number of aqueduct pipelines to which they are connected.

Flows in the First Aqueduct are chlorinated at a station in Rainbow Pass just north of the Riverside-San Diego County line. Treated water is chlorinated during the treatment process at the Skinner Plant, and raw water in Pipeline 3 is chlorinated at the Rainbow Chlorination Station.

The design capabilities of the Authority pipelines at the point of delivery from the Metropolitan Water District are:

Pipelines 1 and 2 combined	196 cubic feet/second
Pipeline 3	250 cubic feet/second
Pipeline 4	380 cubic feet/second
Pipeline 5	450 cubic feet/second

One cubic foot equals 7.48 gallons. One cubic foot per second flowing twenty-four hours will produce nearly two acre feet. An acre foot contains approximately 326,000 gallons.

No storage facilities are owned or operated by the Authority. However, it does have the contractual right to store up to 40,000 acre feet in San Vicente Reservoir, the terminus of the First Aqueduct. An agreement with the City of San Diego, which owns the reservoir, provides for payment to the City of San Diego in the amount of \$2.20 per acre foot for the maximum amount of water in storage each year. In addition, the Authority pays the City of San Diego \$4.00 per acre foot for pumping water from storage into the City's system. The agreement also provides that the first water which may be lost over the spillway is that stored by the Authority. During the fiscal year, water was placed in storage at San Vicente Reservoir by the Authority for the account of member agencies. San Vicente storage statistics are shown in Table 4.

Another Authority-City of San Diego agreement permits storage up to 2,500 acre feet in Lower Otay Reservoir, terminus of Pipeline 3. Storage here is for operational purposes only. No storage is provided for member agencies. The City is paid \$1.00 per acre foot for the maximum storage in any twelve-month period subject to a minimum annual fee of \$1,000. The Authority also pays pumping charges which vary from \$1.50 to \$2.25 per acre foot depending on water elevation.

In July 1985, two hydroelectric plants were completed. The Miramar Plant has two turbine/generator units with a name plate generating capacity of 400 kilowatts per unit. The Alvarado Plant has two units with generator ratings of 1,050 kilowatts per unit.

Supervision and control of the San Diego Aqueduct system and the hydroelectric plants are conducted from the Fred A. Heilbron Operations Center in Escondido, where delivery requests from member agencies are received. Aqueduct flows and deliveries are monitored and controlled through a computer and telemetering system. Communications with operating and maintenance field staff and with MWD's East Valley Operations Section at Lake Skinner is by two-way radio.

#### **Deliveries and Rates**

The San Diego County Water Authority aqueducts received 552,841 acre feet from MWD during the fiscal year. Untreated water accounted for 375,249 acre feet, and the balance of 177,592 acre-feet of water was treated at the Skinner Treatment Plant in Riverside County. The total flow of 552,841 acre feet was 33,430 acre feet more than the previous fiscal year which represents a 6.4 percent increase. The lowest flow rate averaged 443 cubic feet per second (cfs) in December 1987. The highest average delivery of 999 cfs occurred during August 1987. The average for the entire year

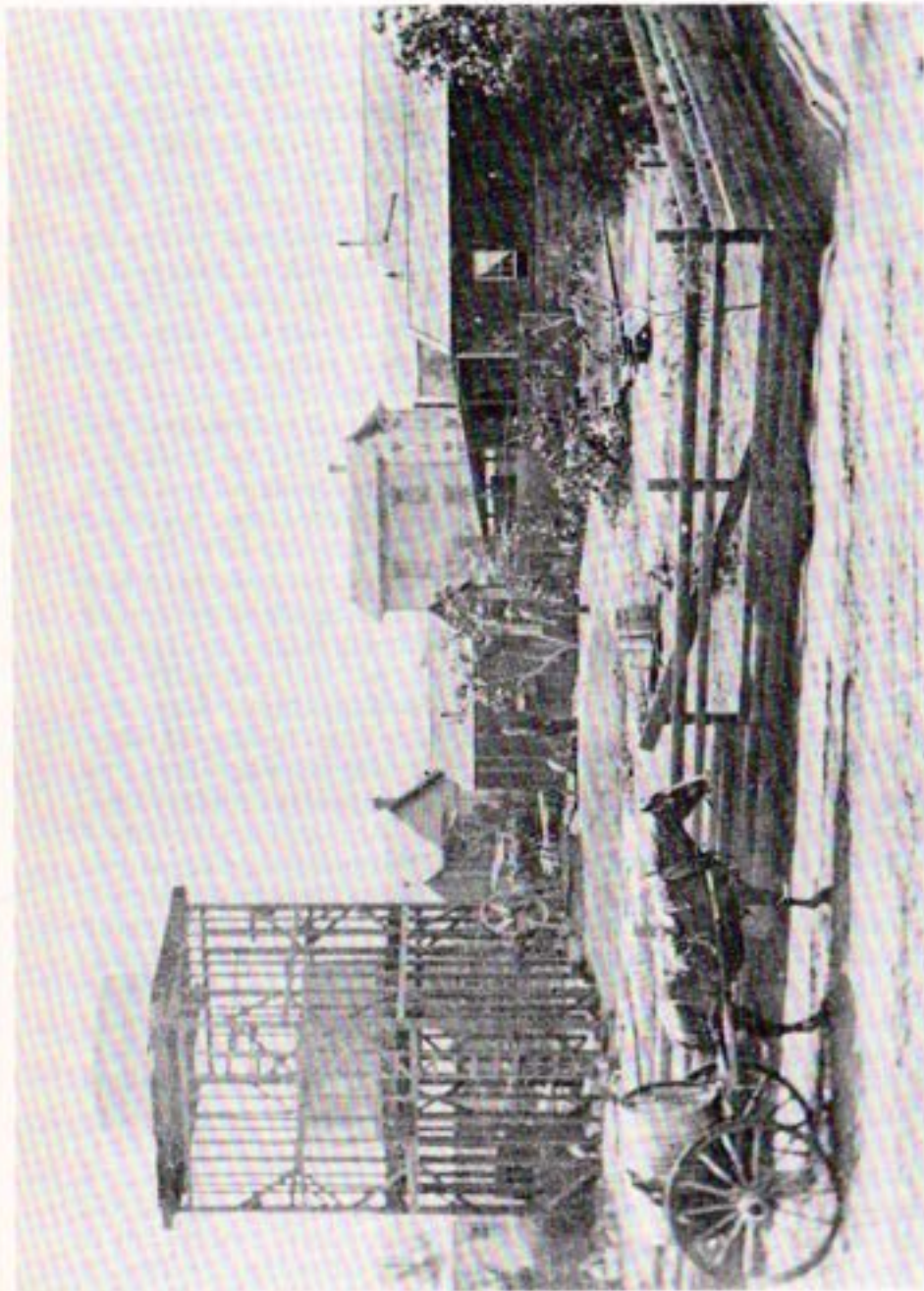
was 761 cfs. Water deliveries to member agencies and others during the fiscal year are shown in Table 8. Purchases by member agencies totaled 527,775 acre feet of which 439,617 acre feet was treated water from the Skinner plant and treatment plants owned by member agencies. Annual water sales to individual agencies for the eight-year period 1980-81 through 1987-88 and total water sales from 1947-1988 are shown on Table 7.

Capital costs for the First and Second Pipelines have been financed by the United States Government. The Third and Fourth Pipelines were financed by the sale of General Obligation Bonds. The debt service on this voter-approved debt is funded by an ad valorem tax on all property within the San Diego County Water Authority service area.

Construction of the Fifth Pipeline was financed through California First Bank under Section 8 of the Water Authority Act and accrued reserves from general purpose revenues, including property tax allocations from the County of San Diego, from the one percent general purpose levy. The tax revenues from assessed valuations of property within the Authority for fiscal year 1987-88, as determined by the County Assessor, was set at \$.004 per \$100 of assessed valuation for retirement of voter-approved bonded indebtedness.

The Metropolitan Water District generally announces water rates two years in advance. Since 1975 when water was \$58 an acre foot, water rates have been increased annually to \$197 an acre foot in fiscal year 1983-84. For the years 1984-85 and 1985-86, the rate remained the same at \$197 an acre foot due to the leveling off of inflation and the cost of energy for pumping. With a return to a higher demand for water because of lower rainfall and increased water sales, MWD decreased the water rate \$5 to \$192 per acre foot for the fiscal year 1985-86. The rate since 1986-87 has remained at \$197 per acre foot.

The MWD rate for untreated, non-interruptible water for municipal and industrial use was \$197 for 1987-88 to which was added the Authority's surcharge of \$15 per acre foot. Treatment charges by MWD at the Skinner Treatment Plant were \$33 per acre foot for the same period. Contracts between the Authority and some of its member agencies which have treatment plants provide for service by these plants. This treated water is then sold to agencies which do not have treatment facilities and with limited or not access to the filtered water pipelines. The commodity charge by the Authority for treatment of water for fiscal 1987-88 was \$40 per acre foot.

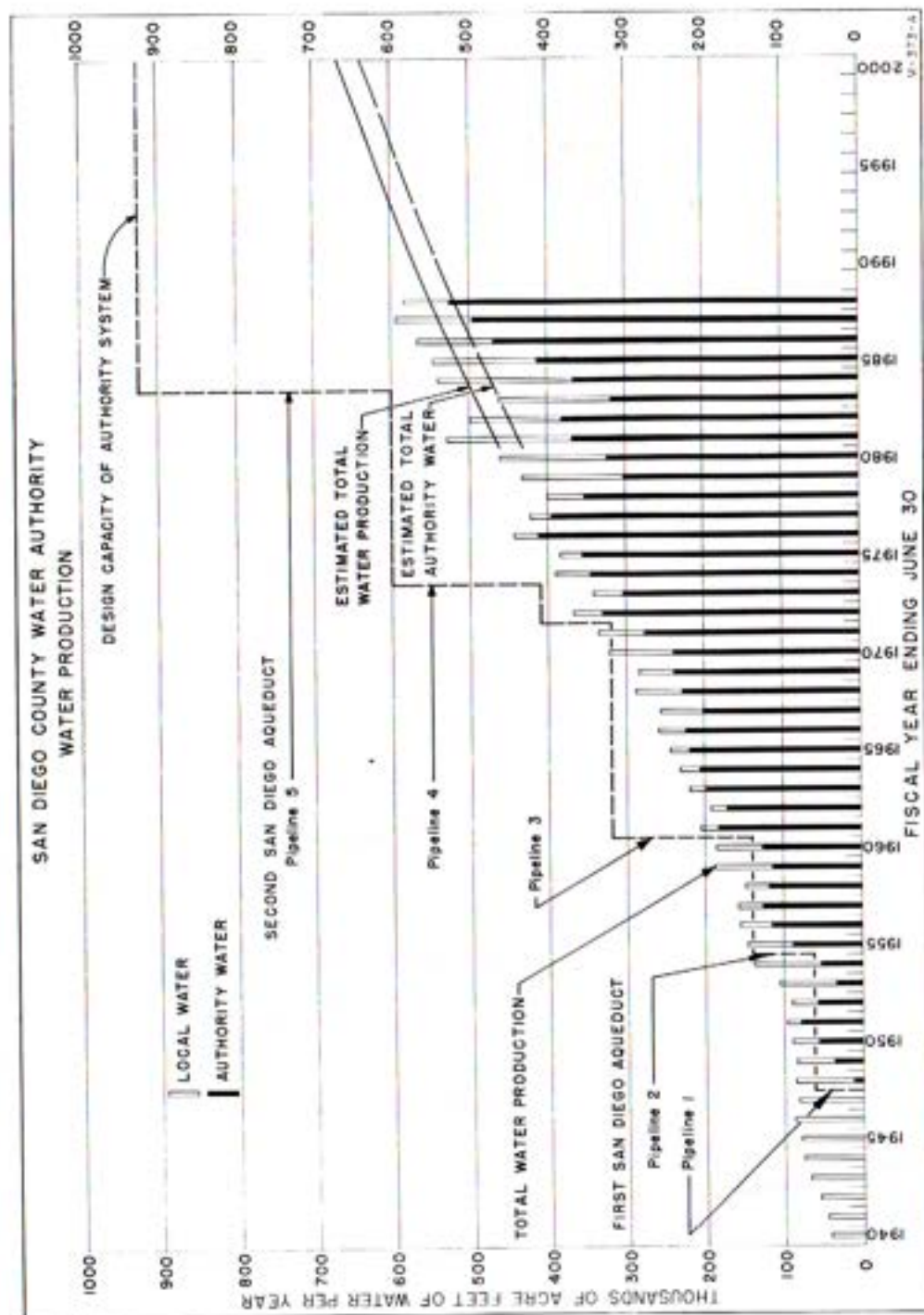


Water Works Project - Circa 1870  
 Front and "B" Street - City of San Diego  
 San Diego Historical Society - Tabor Collection

**SUMMARY OF UNTREATED WATER RATES**  
 (Dollars Per Acre Foot)

From	To	MWD Authority	Total	Agricultural Rebate	Resulting Agricultural Rate	Municipal and Industrial Interruptible Water Rate	
7/01/58	1/01/61	15.00	2.00	17.00	3.00	14.00	—
1/01/61	1/01/62	17.00	2.00	19.00	4.25	14.75	—
1/01/62	1/01/63	19.00	2.00	21.00	5.50	15.50	—
1/01/63	1/01/64	21.00	2.00	23.00	6.75	16.25	—
1/01/64	7/01/64	24.00	2.00	26.00	9.00	17.00	—
7/01/64	9/01/64	25.00	2.00	27.00	9.75	17.25	—
9/01/64	7/01/65	25.00	1.25	26.25	9.75	16.50	—
7/01/65	7/01/66	28.00	1.25	29.25	12.00	17.25	—
7/01/66	7/01/67	31.00	1.25	32.25	14.00	18.25	—
7/01/67	7/01/68	34.00	1.25	35.25	16.00	19.25	—
7/01/68	7/01/69	37.00	1.25	38.25	18.00	20.25	—
7/01/69	7/01/70	40.00	1.25	41.25	20.00	21.25	—
7/01/70	7/01/71	44.00	1.25	45.25	23.00	22.25	—
7/01/71	7/01/72	48.00	1.25	49.25	26.00	23.25	—
7/01/72	8/13/73	52.00	1.25	53.25	28.50	24.75	—
8/13/73	7/01/75	56.00	1.25	57.25	31.00	26.25	—
7/01/75	7/01/76	58.00	1.25	59.25	33.00	26.25	—
7/01/76	7/01/77	62.00	2.00	64.00	33.00	31.00	—
7/01/77	7/01/78	67.00	2.00	69.00	34.00	35.00	—
7/01/78	1/01/79	74.00	2.50	76.50	34.00	42.50	—
1/01/79	7/01/79	79.00	3.00	82.00	34.00	48.00	—
7/01/79	7/01/80	79.00	5.00	84.00	34.00	50.00	—
7/01/80	7/01/81	90.00	9.00	99.00	39.00	60.00	—
7/01/81	7/01/82	96.00	9.00	105.00	35.00	70.00	70.00
7/01/82	7/01/83	114.00	10.00	124.00	35.00	89.00	89.00
7/01/83	12/31/83	144.00	10.00	154.00	44.00	110.00	110.00
1/01/84	7/01/84	197.00	10.00	207.00	44.00	163.00	163.00
7/01/84	7/01/85	197.00	10.00	207.00	44.00	163.00	163.00
7/01/85	7/01/86	192.00	10.00	202.00	44.00	158.00	158.00
7/01/86	7/01/87	197.00	10.00	207.00	44.00	163.00	163.00
7/01/87	12/31/87	197.00	10.00	207.00	44.00	163.00	163.00
1/01/88	7/01/88	197.00	15.00	212.00	44.00	168.00	168.00
7/01/88	12/31/88	197.00	20.00	217.00	44.00	173.00	173.00
1/01/89	7/01/89	197.00	25.00	222.00	44.00	178.00	178.00

NOTE: The above summary of water rates shows prices for untreated Colorado River and State Project water: \$13.00/af for the period 7/01/76 to 7/01/77; \$17.00/af for the period 7/01/77 to 7/01/78; \$21.00/af for the period 7/01/78 to 7/01/79; \$25.00/af for the period 7/01/79 to 7/01/82; \$26.00 for period 7/1/82 to 7/1/83; \$28.00 for the period 7/1/83 to 7/1/84; \$32.00 for the period 7/1/84 to 7/1/86; and \$33.00 for the period 7/1/86 to 7/1/89 must be added to the above rates for treated water deliveries to the Authority from MWD.



As shown in the summary above, MWD now gives encouragement to better local control and management of water supplies through an interruptible water rate. To obtain the interruptible rebate, the Authority certifies the quantities of water in storage which qualify as interruptible water to MWD. Rebates are shared with member agencies in proportion to the interruptible water they have in storage. The total storage that qualifies for the municipal and industrial interruptible rate was 120,000 acre feet.

**Water Production of Member Agencies**

The term "water production" describes the quantity of water an agency obtains from all sources to meet its consumers' needs. It includes losses between the source and the consumer. These losses may result from pipeline breaks, evaporation from operating reservoirs, and metering discrepancies. Sources include impounding reservoirs, wells, and the Authority system.

Total water production from each of the 24 member agencies of the Authority is shown in Table 4. During 1986-87, the total water production was 591,819.7 acre feet. The water production for the current year 1987-88 is 580,152.7 acre feet which is a decrease of 11,667.0 acre feet or 2.0 percent. The highest monthly production occurred during August 1987 when 67,542.3 acre feet were used. This was less than the record high month of August 1986 when 72,930.3 acre feet were used. The lowest monthly production occurred during December 1987 when 31,215.7 acre feet were used. The Authority supplied a high of 92.7 percent of the water production during the month of September 1987 and 90.4 percent of the production for the fiscal year 1987-88.

Rainfall for 1987-88 was about normal as shown below:

Location	Rainfall	Percent of Normal
Lindbergh Field	13.18 inches	141%
Lake Cuyamaca	30.37 inches	80%
Lake Henshaw	27.12 inches	105%

Local and imported water stored in regional reservoirs increased from 292,906 acre feet on June 30, 1987, to 294,350 acre feet on June 30, 1988 which is an increase of 0.5 percent.

The City of San Diego maintains the most extensive system of impounding reservoirs in the Authority service area. This system produced 21,474.1 acre feet during the fiscal year, and out of this, the City of San Diego sold 5,264.0 acre feet to the California-American Water Company for delivery to Coronado and Imperial Beach. Helix Water District produced 5,066.1 acre feet from Lake Cuyamaca and its wells in the El Monte Basin. The Vista Irrigation District (part of the Bueno Colorado Municipal Water District) produced 7,103.0 acre feet from Lake Henshaw and the Warner Ranch wells. The City of Escondido produced 5,590.4 acre feet from the

Figure B. Water Production of Authority Member Agencies

Henshaw-Wolford system, and 2,108.7 acre feet were produced within Yuima Municipal Water District from the Pauma Valley wells. Sweetwater Authority produced 4,989.3 acre feet from the Sweetwater system and wells for use in National City and South Bay Irrigation District.

Eleven of the 24 member agencies are 100 percent dependent on imported water. The thirteen remaining agencies vary from 99.8 percent (Valley Center) to 40.6 percent (Yuima Municipal Water District) dependence on water from the Authority.

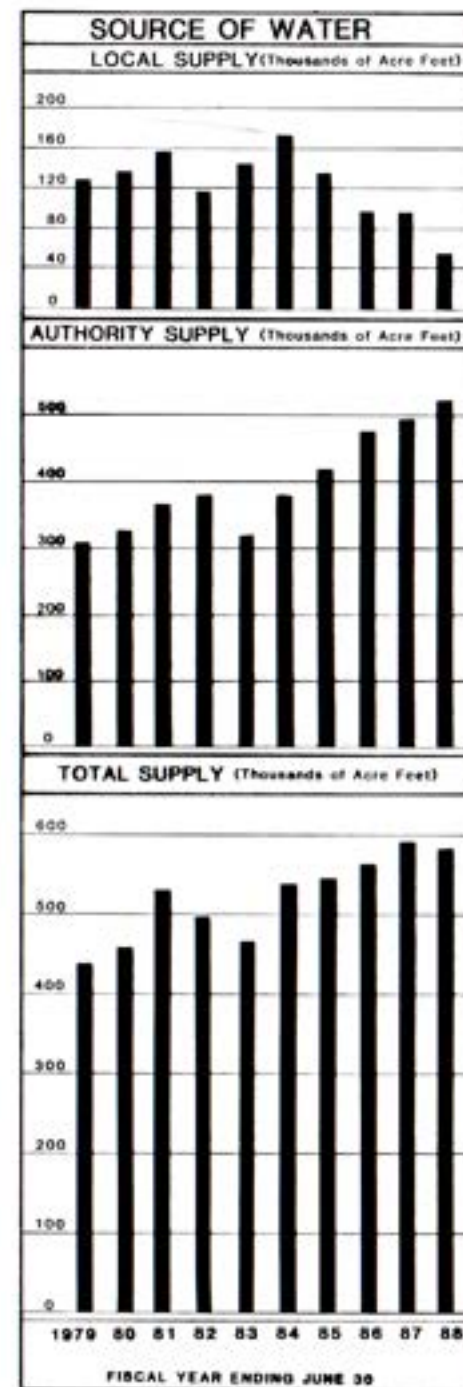
Water production per unit area is highest in the urbanized portions of the County. However, the per capita use of water is generally less in areas of greater population density such as Helix Water District, National City, and the City of San Diego. Water production per unit area in the less densely populated areas, such as Rainbow Municipal Water District, Valley Center Municipal Water District, and De Luz Heights Municipal Water District, is similar to more urbanized areas but per capita use is considerably higher.

Average daily per capita consumption of municipal and industrial water for fiscal year 1987-88 was 189 gallons per day. This is a decrease from the 192 gallons per capita per day of last year. It is estimated that the Authority serves approximately 49 percent of the geographical area within its boundaries.

The combined water production of Authority member agencies is shown in Figure B. The unshaded area indicates the proportion obtained from local sources compared with that supplied by the Authority. Present transmission facilities are adequate to meet water production demands until 1995.

**Water Quality**

The general quality of water entering the Authority system continues to improve. However, some variation in raw water turbidity still occurs due to seasonally high algae levels. This is serious only for users of Colorado River water which is not filtered prior to distribution. Turbidity at Miramar



Treatment Plant normally ranged from 0.6 to 11.2 Turbidity Units (TU).

Algae growth in Authority pipelines is controlled through a program of chlorination. The rate of chlorine applied during the year was 0.75 parts per million (ppm) to flows in Pipelines 1, 2, and 3 at the Rainbow Chlorination Station. This program has effectively controlled the residual algae from the Colorado River Aqueduct and provides continuous chlorination of untreated water in Pipeline 3 from Lake Skinner. Pipeline 5 is chlorinated periodically at Lake Skinner to control the algae inside the pipe. Treated water is delivered to the Authority from the Robert A. Skinner Treatment Plant where it is chlorinated and filtered.

Chemical constituents of the dissolved solids in the Colorado River water are shown in Table 10. The analyses are based on samples taken from the West Portal of San Jacinto Tunnel and treated by MWD. Total hardness ranged from a high of 280 milligrams per liter (mg/l) to a low of 263 mg/l. Water temperature varied from a high of 81°F (27°C) in August 1987 to a low of 50°F (10°C) reported in January 1988.

The chemical constituents of the dissolved solids of treated, blended water at Lake Skinner are shown in Table 11. Total hardness ranged from a high of 266 mg/l to a low of 204 mg/l. Water temperature ranged from a high of 77°F (25°C) recorded in August 1987 to a low of 50°F (10°C) in January 1988.

### Agricultural Water Use

Agricultural water use by member agencies of the Authority during 1987-88 was 102,422 acre feet which is 13,414 acre feet less than the previous year's use of 115,836 acre feet. The percentage of agricultural water to the total water production was 17.7 percent, a decrease from 19.6 percent in 1986-87. About 94 percent of water used for agricultural purposes is supplied by the Authority while only 90 percent of the total amount of water produced is from the Authority. This occurs because agencies with a high percentage of agricultural water have little or no local production. For example, Rainbow Municipal Water District uses approximately 82 percent of its water for agricultural purposes but it has no local production. On the other hand, the City of San Diego uses less than 1 percent of its water for agricultural purposes but its local production is 9.2 percent of its total water needs. A complete summary of agricultural water use is contained in Table 4.

### Water Treatment

The Robert A. Skinner Treatment Plant began operations in September 1976. Initial capacity of the facility was 150 million gallons per day (mgd). A 90 mgd expansion of the plant was completed and put into operation

in May 1979. This expansion, together with the 100 mgd Skinner No. 2 Plant completed in 1985-86, will provide treated water to 13 agencies within the Water Authority requiring treated water.

Member agencies of the Authority that own and operate treatment plants within the County are: The City of San Diego, the City of Escondido (joint ownership with Vista Irrigation District), San Dieguito Water District-Santa Fe Irrigation District (joint ownership), Helix Water District, City of Oceanside, City of Poway, Ramona Municipal Water District, and Sweetwater Authority (operating agency for South Bay Irrigation District and National City). The Authority purchases treated water from Helix and Poway to supply Otay Water District, Padre Dam Municipal Water District, and Ramona Municipal Water District. The cost of all treated water delivered by the Authority to its member agencies is the same regardless of the treatment source.

Several agencies on the First Aqueduct still use Colorado River water with dual chlorination as the only treatment provided. The Authority provides the first chlorine application in its pipelines, and the agencies are responsible for the second chlorination after delivery. The enlarged Skinner Treatment Plant and the Auld Valley pipeline connection to the First Aqueduct will provide treated, blended water in these pipelines in 1991. This treated water is disinfected by the relatively new chloramination method which introduces ammonia and chlorine into the water and prevents the formation of trihalomethanes (THM). The abrupt termination of a filtered water line at Escondido, without the benefit of a regulatory reservoir to take the pipeline surges, presents serious operating problems that will require modification of existing facilities.

### Allocation of Water to Member Agencies

The County Water Authority Act (Section 5.11) provides a preferential entitlement for the purchase of water by each of the Authority member agencies. This preferential right is established by the proportion of all payments by each agency to the Authority to meet capital costs including the annexation fees, taxes and that portion of water purchases related to capital expenditures.

Voluntary agreement between the member agencies has made it unnecessary to invoke these provisions when shortages have developed. When water and capacity are available, agencies are permitted to purchase without restriction. In addition, the California Water Code (Section 350 through 358) contains procedures which may be followed should water shortages occur.

The Authority's Administrative Code (Section 12.4 and 12.5) contains provisions for normal and abnormal water allocations in situations not deemed to be so serious that either of the above-mentioned provisions

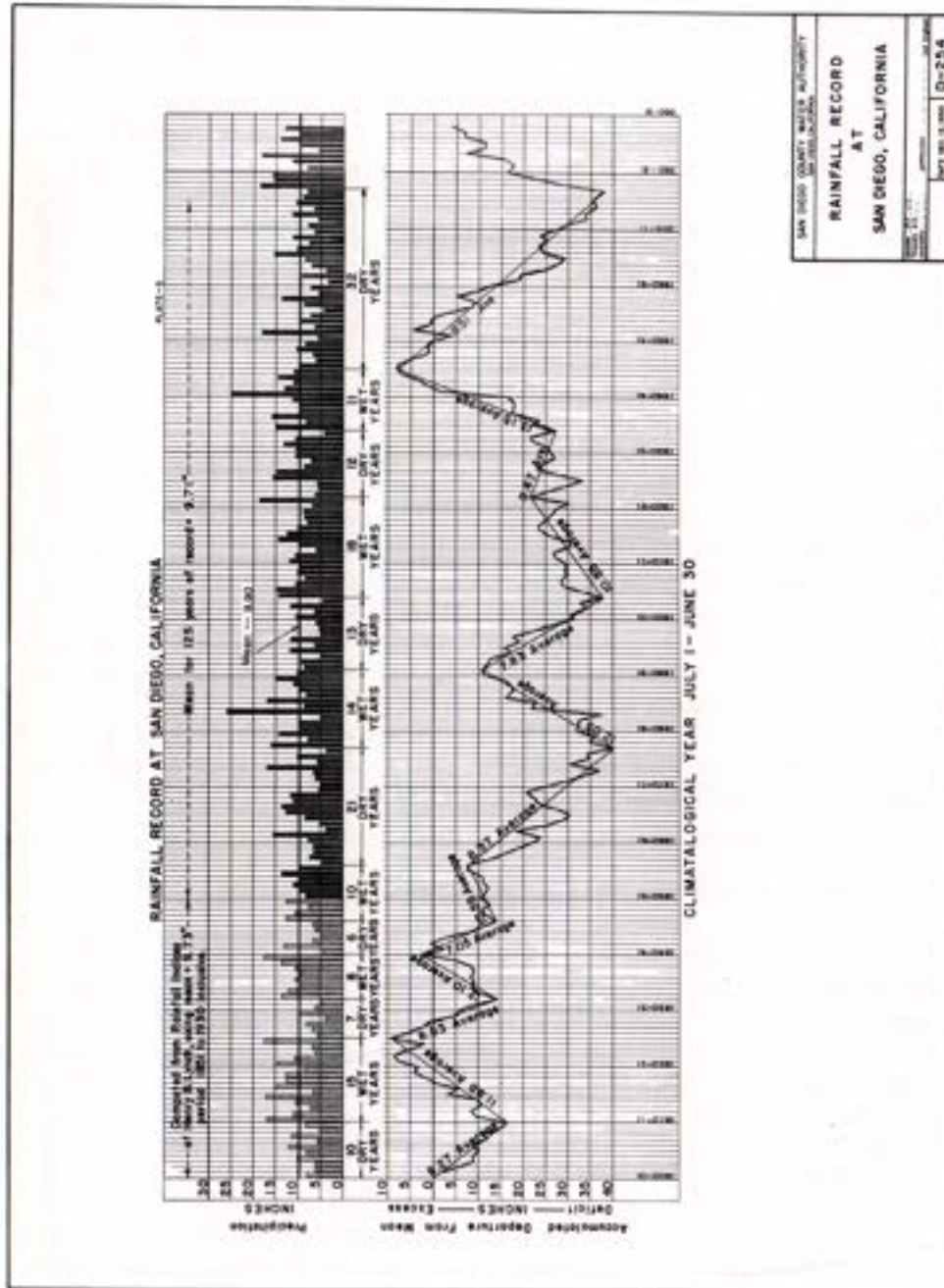


Figure C. Rainfall Record at San Diego California

need be invoked.

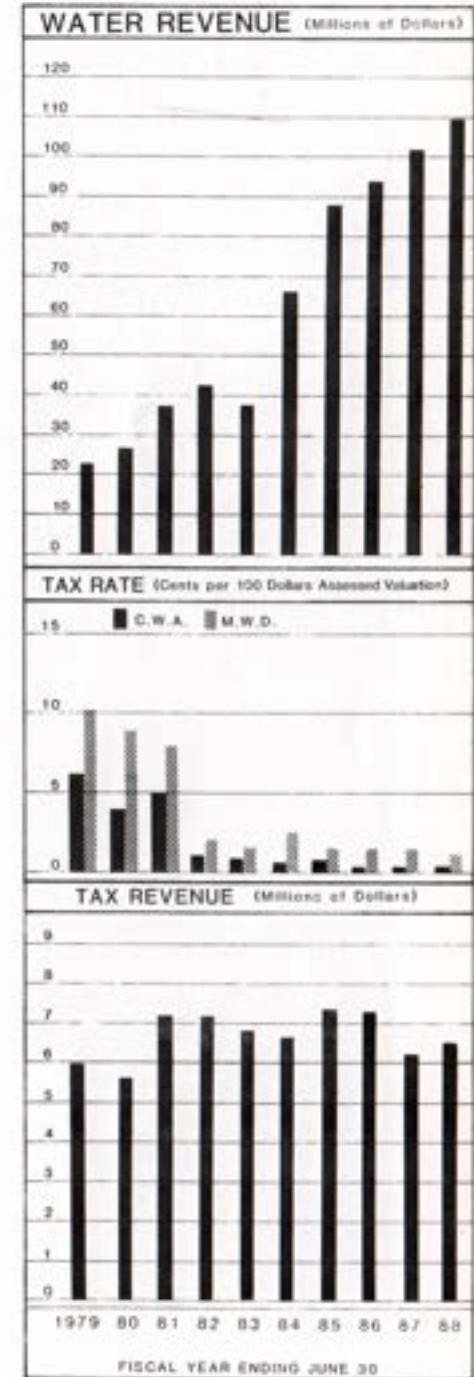
**Future Supplies**

It is the responsibility and the policy of the Authority to provide all the supplemental water required by its member agencies to meet the needs of their consumers. Nevertheless the Authority recognizes its responsibilities to encourage prudent conservation practices. It is also recognized that there are certain acts of nature against which there is no defense available within reasonable economic bounds.

Growth rates within the Authority's service area have indicated a continued population increase for the foreseeable future. The long lead time required for development of new water resources demands that constant attention be given to meeting future needs.

The Water Authority obtains all of the water it distributes from the Metropolitan Water District of Southern California which has two sources of supply: The Colorado River and the State Water Project. Population forecasts indicate that MWD's population will increase from the present 13 million to 16 million, and the Authority's population will increase from the present 2 million to 2.70 million by the year 2000.

The MWD Board has adopted a policy to provide additional water and/or facilities, as needed, to meet the demands of its member agencies. To fulfill that policy, MWD contracted with the State of California in 1960 for 1.5 million acre feet

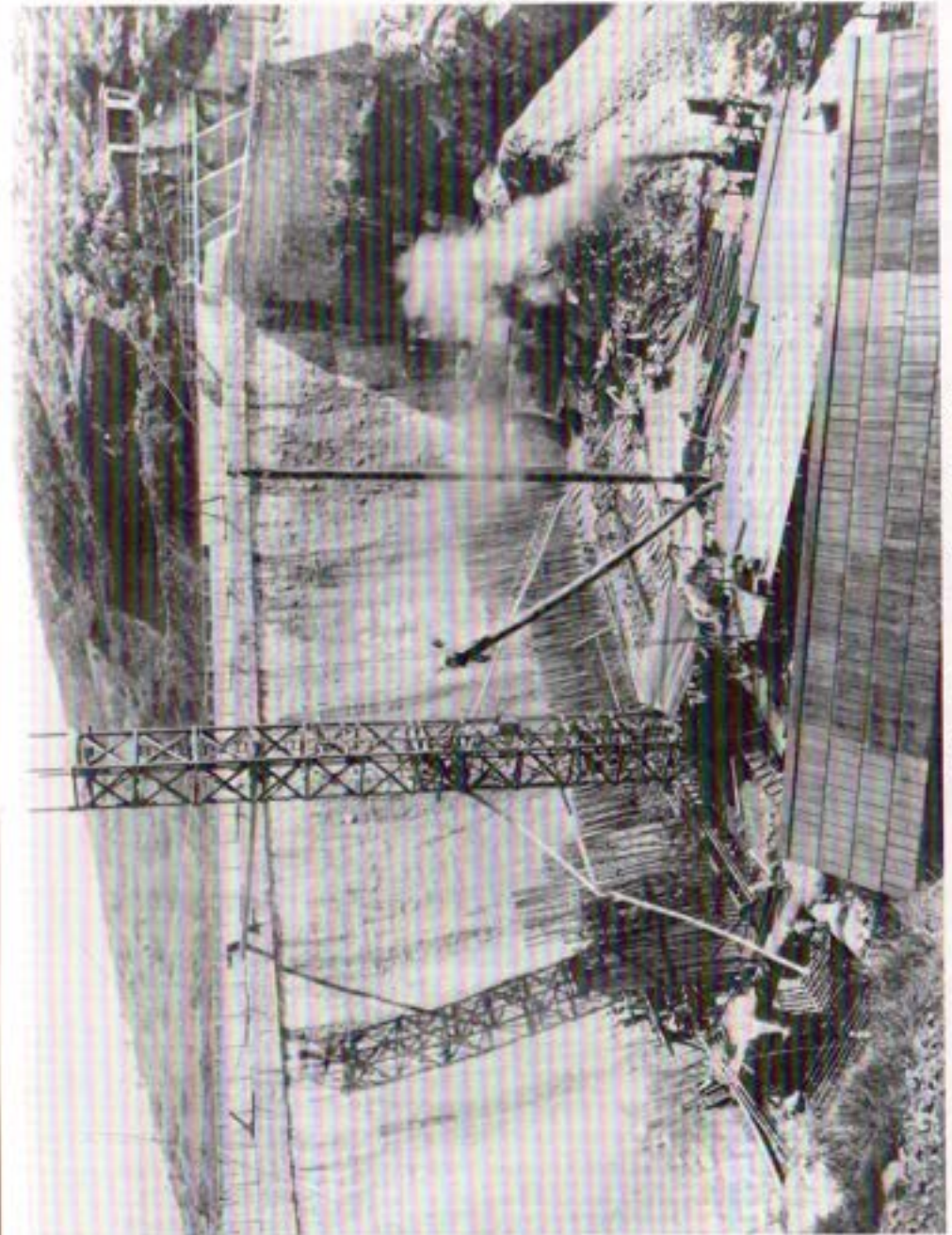


annually from the State Water Project. When faced with a loss of over half its annual Colorado River supply of 1,212,000 acre feet because of the U.S. Supreme Court's decision in *Arizona vs. California* in 1964, MWD amended its contract with the State to provide an additional 500,000 acre feet per year. Annexations and other changes have increased that MWD-State contract to 2,011,500 acre feet per year.

The California Aqueduct, a key water supply feature of the State Water Project, was completed in 1973. MWD takes delivery of State Project water at several points. Supplies destined for San Diego County are delivered to MWD at Lake Perris, terminus of the 444-mile aqueduct. Water then flows through Lakeview pipeline which parallels the Colorado River Aqueduct. Northern California water is mixed with Colorado River water at the existing turnout for the San Diego Canal. The blended water then flows south into Lake Skinner.

Additional water resources must be developed during the 1980's as a result of the failure of the voters to approve the completion of the State Water Project. The Authority, MWD, the State of California, various federal agencies, and many private organizations are presently conducting investigations of feasible alternate water sources. The Board of Directors of the San Diego County Water Authority supports local projects of member agencies such as the City of San Diego's Aquaculture Project.

Figure B shows the increase in water requirements within the Authority since 1940.



Raising Height of Sweetwater Dam - Circa 1911  
(Originally Constructed in 1888)  
San Diego Historical Society - Ticor Collection

## PUBLIC INFORMATION

Fiscal year 1987-88 was a year of transition for the Water Authority and its public information programs. The staff was increased by three, and the office's mission was being redefined.

The most pressing issue was the drought that plagued the State for a second year. The Water Authority, which supplies an average of 90 percent of the water to the San Diego region through its member agencies, launched a water conservation campaign with the ultimate goal of a 10 percent reduction in water use.

### Summer Conservation Campaign

The campaign was designed to explain where water comes from, identify the problems inherent in a drought, and to promote the wise use of water to help stretch available supplies.

Some of the artwork for the campaign for billboards and newspaper ads was provided free of charge by the Los Angeles Department of Water and Power. The production cost to the Water Authority and Metropolitan Water District was minimal.

The Water Authority's campaign consisted of radio commercials, newspapers and bus transit advertising, public service announcements, San Diego Stadium scoreboard, water tips, and a home show.

### California Water Awareness Week Campaign

The statewide campaign is designed to inform the public on how local agencies develop, treat, and deliver quality water to consumers at an affordable price.

The campaign was conducted during the week of October 19, 1987. Campaign activities included a press conference; an AIMS (Activities Integrating Mathematics and Science) workshop designed to provide K-6 grade teachers with water related background information; a speakers forum co-sponsored by the Sierra Club, Citizens Coordinate for Century III, Audubon Society, California Native Plant Society, and the League of Women Voters; water displays; resolutions; radio commercials; turf audits; and a public service announcement featuring Charger Quarterback Dan Fouts. The campaign ended with San Diego Crime Stoppers, Inc.'s "Light the Night Against Crime" 10K run/walk. To maintain the spirit of the crime theme, the Water Authority adopted the theme, "It's a Crime to Waste Water."

### Xeriscape

Xeriscape is the practice of water conservation through efficient landscaping. The Water Authority is committed to Xeriscaping as a means of conserving water while preserving San Diego's quality of life.

During the year, the Water Authority co-sponsored the San Diego Xeriscape '88 Conference, joined the National Xeriscape Council, changed the name of its permanent Low-Water-Use Demonstration Garden at the Del Mar Fairgrounds to Xeriscape Garden, and offered its member agencies a financial incentive to establish Xeriscape gardens in their respective service areas.

The Xeriscape Garden at Del Mar is used to present lectures, demonstrations, classes, and exhibits on water conservation to visitors at the Del Mar Fair.

### School Program

The Water Authority's School Program, established in 1975, offers a free classroom program to elementary schools, junior and senior high schools, colleges, universities, and adult education. During the fiscal year 1988, more than 24,000 students participated in the school program.

### Speakers Program

Guest speakers from the Water Authority addressed more than 3,600 members of community, professional, and service organizations during the year.

### Media Activity

Water quality, Bay-Delta Hearings, Pamo Project, the drought, and earthquakes created considerable media interest. Members of the Water Authority Board of Directors and staff participated in a number of live and taped interviews with local radio and TV. Several hundred column inches of newspaper copy were devoted to the Water Authority, its member agencies, water issues, or related topics, as well as public service announcements and editorials.

### Poster Contest

The Water Authority co-sponsored a water conservation poster contest in conjunction with Metropolitan Water District of Southern California

## SAN DIEGO COUNTY WATER AUTHORITY

during the year. The theme "Water Is Life" was selected as the poster contest theme. The contest was designed to actively involve fifth grade students who reside within the Water Authority service area about water education and important water issues.

Six judges, representing the arts, education, and the electronic media, judged over 130 posters. The following were selected the winners:

Grand Prize  
\$50 savings bond  
John Hornoff  
Monte Vista Elementary School  
Vista Unified School District

First Prize  
\$25 savings bond  
Simon Monks  
Lincoln Middle School  
Vista Imperial School District

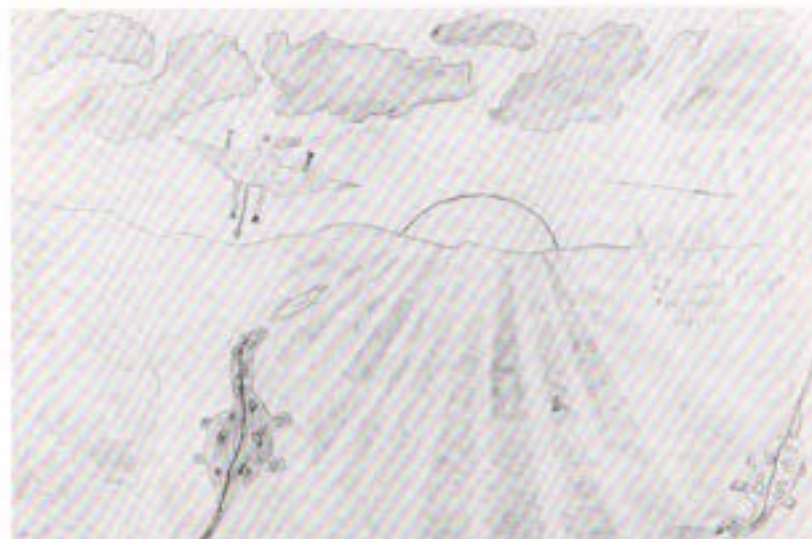
Second Prize  
Plaque  
Amy Fribon  
Flora Vista Elementary School  
Encinitas Union School District

Third Prize  
Plaque  
Tim Spinks  
Westwood Elementary School  
Poway Unified School District

Honorable Mention  
Plaque  
Aldous Brucelas  
Westwood Elementary School  
Poway Unified School District

The winners were honored by Joan Embrey, San Diego Zoological Society's Goodwill Ambassador, and Francesca Krauel, Water Authority Board Chairman, at a ceremony prior to a regular Board of Directors meeting.

## PUBLIC INFORMATION



*A Little Drop of Life.*

*Winning entries in the Water Conservation Contest sponsored by the San Diego County Water Authority for K-6 grade students in San Diego County.*



## OPERATIONS AND MAINTENANCE

### General

Operation and maintenance of the Water Authority's aqueduct facilities and equipment is directed by the Superintendent from the Fred A. Heilbron Operations Center, 610 W. Fifth Avenue, Escondido, California. As of June 30, 1988, the Authority has an operation and maintenance force of 29 employees who operate the aqueduct system and normally perform all maintenance and repair of the aqueducts, as well as construction and modification of metering and control buildings.

The Operator-Technician group has been separated into two sections with seven system operators and four system technicians. The maintenance force of 17 also includes a storekeeper, three shop mechanics and a three-man construction crew.

The Fred A. Heilbron Operations Center, composed of five major buildings, occupies one city block. The main building houses the aqueduct computerized telemetry control system and offices for operation, maintenance, technical service, construction personnel, and field engineering. A shop building has facilities for the repair and service of all Authority vehicles and heavy equipment, a small machine shop, meter shop, and equipment maintenance office. Materials, supplies, tools, and small equipment are stored in the warehouse which also provides security parking for equipment and contains the valve repair and carpentry shops. A training center building contains two classrooms equipped for waterworks technology training. An on-site resident increases security, night-time assistance to the aqueduct system operators, and reduces response time by having equipment ready for emergency response crews.

A dual radio system using four frequencies and two separate radio relay sites on Palomar Mountain connect the Authority base stations at the Operations Center in Escondido, the San Diego office, 25 mobile units, Metropolitan Water District's Robert A. Skinner Treatment Plant in Riverside County, all of the major San Diego County water purveyors, and all aqueduct water treatment plants. If either or both relay stations failed, they can be bypassed and radio units contacted directly. A touch tone call system can call up a specific interagency radio while others remain mute.

A standby generator supplies emergency power for the Fred A. Heilbron Operation Center's control room as well as the offices and shops.

### Operations

The Operations Center control room is staffed every day, including weekends and holidays from 7:30 a.m. to 4:00 p.m. During off-hours,

phone calls to the Authority are transferred to the home of the systems operator on duty who has a combination Authority and interagency mobile radio. A pager will notify the duty operator if a telephone contact cannot be made. In emergencies the duty operator is assisted by the Superintendent, Chief Operator and General Foreman who also have interagency radios at home for quick response and field coordination with other agencies.

Of the five pipelines presently serving the Authority, Nos. 1, 2, 3, and 5 carry untreated water. Three of the four raw water pipelines receive a continuous injection of chlorine from the Authority's Rainbow chlorine station. Chlorine is used to control algae and asiatic clams in the pipelines. This chlorine injection process also provides the first of a required dual chlorination for the First Aqueduct used by member agencies which deliver Colorado River water without full sedimentation and filtration treatment. Water in the treated water pipeline is disinfected with chloramines (chlorine and ammonia) by MWD at the Robert A. Skinner Treatment Plant.

The Authority serves as the agent for water districts in North County, served from the First Aqueduct, by measuring and reporting aqueduct water turbidity to meet daily monitoring requirements of the California Safe Drinking Water Act. The results of additional water quality sampling and measurement by Authority member agencies are collected for a more complete water quality record.

Charts of service connection meters are changed each week. Flow charts and meter readings are compared for inaccuracies. The calibration of each active meter is checked at least three times per year. Meter accuracy is also checked at the request of a member agency or if accuracy is questioned.

Flow into both the treated and raw water aqueducts is controlled locally or remotely by the Metropolitan Water District at the Robert A. Skinner Treatment Plant Operations Center. The plant operates round-the-clock to respond to requests for emergency flow changes. Normally, flow changes are made two times each day at designated hours in the morning and afternoon for the convenience of the treatment plant operations.

Most of the metered water deliveries in the aqueduct system are displayed and controlled on the Authority's operation center automatic computerized control system. The computer warns the day-time operator of problems by alarm displays and a synthesized voice, and the night-time duty operator by telephone. The night-time operator can also monitor and instruct the computer control system from home by telephone using special portable equipment. A security system prevents misuse by this or similar equipment.

The aqueduct system in San Diego County has no built-in operational storage. Therefore, all flow changes must be carefully coordinated to keep the system in balance to maintain the proper flow to the service connections at or near the end of the pipelines. The computer and an aqueduct flow status board show the amount of water available to meet the member agencies' needs. Each pipeline's current flow, requested flows, meter sizes,

maximum allowable capacity flows, critical pipeline flows, telemeter, and valve information are displayed on the status board, and computer terminals.

An aqueduct operations service van is equipped as a mobile emergency operations center to monitor radio, telephone, and certain telemeter functions.

Authority water is stored in several water agencies' reservoirs, principally in the City of San Diego's San Vicente Reservoir. Except in minor amounts, these water storage facilities cannot return stored water to the aqueduct for use elsewhere except in small amounts.

The Buena Colorado Water District, Helix Water District, and the City of San Diego have service connections which can be used to put small flows of treated water into the aqueduct when needed.

There are three pumps at the Authority's Miramar Pump Station available to pump high flows up to 140 cfs of treated water from the City of San Diego's Miramar Treatment Plant into the treated water aqueduct. Except for short periods of time, these flows are normally available only if additional untreated water can be delivered from the aqueduct to the plant because of limited storage capacity at Lake Miramar.

A fourth pump was replaced with piping so that the Authority's Miramar Pump station can also be used to deliver aqueduct treated water by reverse flow directly into the Miramar Treatment plant's clear well treated water storage bypassing the treatment plant.

Aqueduct flows during the year averaged a record 761 cfs with a high of 1152 on October 5, 1987, and a low of 282 cfs on December 18, 1987. The previous high year average was 1986-87 with 717 cfs. The First Aqueduct received 100 percent Colorado River Aqueduct water, the three pipelines of the Second Aqueduct averaged about 71 percent Colorado River Aqueduct water and 29 percent State Project water. State Project water monthly averages ranged between 14 percent and 51 percent.

In the last week of July, the growth of algae in the Metropolitan Water District's San Diego Canal restricted the flow from 1,100 to 850 cfs. With the application of copper sulfate to the canal at the rate of 1,000 pounds per week by MWD, the flow was gradually returning to normal.

Metropolitan Water District continues to use slug chlorination and dragging of the desert canals to maintain maximum capacity. Both operations sometimes caused excessive turbidity in the Authority's First Aqueduct.

In August the City of San Diego's Shepherd Canyon pipeline from the San Diego No. 1 aqueduct service connection failed. This failure forced several aqueduct operational changes. The break washed out the Authority's underground power and telephone conduits to San Diego No. 11 service connection, which took an extra week to return to service after the pipeline was back in operation. Flow settings had to be made manually at the station. The Miramar Filtration Plant had to serve a larger area, and the increased demand for raw water required the Authority's Miramar power plant to be

shut down and by-passed. The 400-horsepower pump at the Miramar Pumping Plant was shut down as the water available to the Authority from Miramar was reduced. Deliveries to the City of San Diego were increased at San Diego's service connections No. 12, No. 13 (Spring Valley), and No. 10 (Black Mountain). All of this took place during the hottest days in August and raised aqueduct flows to maximum capacity at many locations.

Other breaks on the City of San Diego's Shepherd Canyon pipeline on November 22, 1987 and January 17, 1988 washed out the Authority's underground power and telemetry lines a second time. On June 6, 1988, these same cables were cut again by a contractor. It took 10 days to replace 540 feet of conduit and cables. During these interim periods, each flow change required an additional trip to Camp Elliott.

In September 1987 and February 1988, a contractor cut the underground power and telemetry cables on the Tri-Agency Pipeline interrupting normal monitoring and control capabilities.

The Authority rented two portable chlorinators from MWD to chlorinate the eight-mile long Crossover Pipeline with 15,000 pounds of HTH dry chlorine compound solution. A residual was maintained at the Crossover Terminal Structure. It appeared that the chlorine helped clear this pipeline. A post-chlorination flow test indicated a flow of 227 cfs while the previous maximum flow was 208 cfs.

On October 13th, major brush fires in the North County caused power outages to some of the service connections for up to four days. The loss of ground cover was followed by rain, and on October 22nd, a mud slide destroyed the Yuima Water District office and section of pipeline. Yuima personnel were isolated but were able to contact the Authority through a pickup truck interagency radio. The Authority and several neighboring water agencies immediately offered to help Yuima return to full service.

A flow test was conducted on the Crossover Pipeline with Escondido No. 3 service connection at zero. The flow reached 198 cfs with Escondido No. 3 service connection taking 43 cfs. The First Aqueduct was receiving 184 cfs for a total of 227 cfs crossover flow.

On January 13, 1988, MWD experienced a computer failure which sent 80 cfs down the Fourth Pipeline which spilled over the Miramar vent.

On Sunday, January 17, 1988, the City of San Diego had experienced major pipeline breaks which nearly drained its Miramar clearwell. The Authority increased flows 75 to 180 cfs at San Diego's No. 5 service connection, 0 to 20 cfs at the No. 10 service connection, and 20 to 40 cfs at its No. 11 service connection. Three trips were necessary to San Diego's No. 11 service connection which could only be reached by a 4-wheel drive because of muddy roads.

The underground power and phone lines top the Shepherd Canyon station, which were damaged by San Diego crews, were not restored until January 25, 1988.

During the City of San Diego's problems, power was lost for four and

one-half hours at Escondido. Power at many remote stations and most telemeter-lines was also out. After a delayed start, the emergency generator got the computer and the Escondido telephones back on line. During the interim period, the telephone in the Training Center, which was operational, was used to maintain essential contact with MWD and others.

Early morning and late afternoon aqueduct flow changes were necessary at San Diego No. 11 service connection until the pipelines were repaired.

During the year, the Escondido Control Room was equipped with a glass and panel partition to protect operators from computer noise. The new partition improved operator comfort and lessened fatigue.

### Maintenance

The Authority maintenance yard is located at the Fred A. Heilbron Operations Center in Escondido where all maintenance and force account construction is based. The yard is located near the center of the aqueduct system. Satellite maintenance yards are located as far away as 60 miles. For outlying major construction projects, a field office may be established in an Authority office trailer, or in a large combination construction trailer with work benches and a locked storeroom.

Maintenance activities include service, repair, and maintenance of the Fred A. Heilbron Operations Center buildings, shops and yard; about 222 miles of major pipelines; 130 miles of rights-of-way; 109 miles of Authority roads; 69 buildings; meters and automatic control equipment; a large chlorine station; a pump station containing three pumps with motors from 400 to 1,000 horsepower; over 900 underground valve vaults; and two hydroelectric plants each with two turbines and generators. All control equipment is serviced and repaired in Authority shops or by specially-equipped service trucks.

Maintenance equipment includes two motor graders, a bulldozer, two skiploaders, a backhoe, one 25-ton and two 5-ton cranes, two forklifts, as well as dump trucks, truck tractors and equipment trailers, compressors, generators, welders, an eight inch dewatering pump, and other portable pumps. All pickups and most other trucks have mobile radios for efficiency and quick response.

A general foreman, three mechanics, a warehouse storekeeper, and a 12-person maintenance force normally provide all of the maintenance. They also construct new control and metering facilities, patrol the pipelines for encroachment and inspect for hazardous damage to pipelines or easements.

The vehicle shop is open two hours past normal working hours to perform minor repairs and servicing. The shop and warehouse are open during regular working hours.

The pipeline easements and patrol roads are normally checked every week by patrol vehicles. The pipelines are checked by foot patrol twice a year.

Technicians do all of the electrical and electronic installation including some electronic design fabrication and field testing and maintenance.

The Authority continued its policy of participating on a one share basis with local property owners in upgrading or paving aqueduct patrol roads.

The Authority is a member of the Underground Services Alert. This service notifies the Water Authority of any excavations within 500 feet of Authority pipelines. As a result of this service, the Authority has averaged about 10 calls per day. The cost of responding to these calls is small in comparison to the avoided damage to the Authority pipelines.

The Annual Engineering and Operation Director's Tour covered the Crossover and new pipeline alignment through San Marcos and the new Ramona pipeline and included the breaking out of a section of the 66-inch Crossover pipeline that was to be set at a lower depth.

### Force Construction

The San Marcos No. 5 service connection was completed and put into service.

Construction started on the new Olivenhain No. 3 service connection. By the end of the year the valve vault was complete and the floor of the control station had been poured.

The structures piping and painting for the new Otay No. 9 service connection which was started at the end of last year, have been completed and the equipment installation and electrical work has started.

### Other Construction

The City of Escondido began construction of its Harding Street Bridge which crosses its flood control channel and runs parallel to and over the Authority's First Aqueduct. The two pipelines of the First Aqueduct are straddled by concrete piles which were driven through holes drilled to below the inverts of the pipelines.

### Shutdowns

The southern end of the Third pipeline (treated water) was shut down south of Miramar on November 29th to remove a section of pipe and install a new section with 30-inch outlet and ball valve for the new Otay No. 9 service connection. The Authority crew was able to put the pipeline back in service on December 3, 1987 which was two days earlier than planned.

On January 11, 1988, the Skinner Plant and the treated water line were shut down for two and one-half days for the new Olivenhain No. 3 service

connection (24-inch service tap).

At approximately 3:00 a.m. on Friday, January 22, 1988, the 48-inch steel pipe section of the First pipeline of the First Aqueduct developed a 360 degree break at Station 682 + 6983 on the north side of Lake Hodges. The leak was on the bell end of one pipe section. About ten inches of pipe was removed and a ½ inch butt strap welded in place for repair. A concrete encasement was placed around the pipe. The pipe was refilled and put back into service on Tuesday, January 26, 1988.

On February 8, 1988, the La Mesa-Sweetwater pipeline was shut down to tie in the relocated 4,000 foot segment of the 30-inch pipeline on Jamacha Road for Caltrans, the existing pipe with no effective longitudinal reinforcing broke twice and required additional shut downs for repairs on February 9th and 10th. Otay Water District has a large number of domestic users dependent upon the near continuous operation of this pipeline. Both Olivenhain Water District and Otay Water District assisted the repair with either material or labor.

On February 23, 1988, the Sweetwater line was shut down because of a leak in the air/vacuum relief valve structure.

MWD shut down the Third Pipeline from February 28 to March 7, 1988. This shutdown did not inconvenience any water districts because the Fifth Pipeline, the other raw water pipeline, was still in service. The Third and Fifth Pipelines join together at the Crossover pipeline diversion structure. Only the City of Oceanside takes raw water north of this point and could be served by running the Fifth Pipeline water north from the Crossover in the Third Pipeline.

Between March 6 and March 10, 1988, the First Aqueduct was shut down to construct an interconnection between Pipelines 1 and 2 just south of the Crossover-First Aqueduct connection, and to provide a 24-inch outlet for the new Rincon No. 3 connection.

In March the Sweetwater line was shut down again to allow the contractor to replace an A.V. 90 degree elbow.

During the month of April, the Fallbrook-Oceanside pipeline was shut down to replace corroded pipe nipples at air valve structures and one valve.

The Fifth Pipeline was shut down for 24 hours late on June 22, 1988 for MWD to make temporary repairs of a leak caused when a jackhammer poked a hole in the pipe. A permanent repair will be made during a winter shutdown.

## DESIGN AND CONSTRUCTION

### General

The Authority continues to be involved in a number of construction projects throughout the county where its pipelines and pipeline easements are subject to the hazards and encroachments from adjacent development. Four major projects of the past year in this category would be:

1. Lowering of Crossover Pipeline at Reidy Creek in northern Escondido: Childers Company, a developer, lowered 260 feet of the 66-inch diameter Crossover Pipeline in April 1988 to allow for the construction of an improved Reidy Creek channel. Timing was critical on this project and all went smoothly. The project was totally funded by the developer.
2. Construction of Harding Street Bridge in Escondido: the First Aqueduct right-of-way through northern Escondido is Harding Street. The City of Escondido has now constructed a bridge over Escondido Creek which is parallel to the First Aqueduct. Friction piles had to be driven alongside and very near Pipelines 1 and 2. The pipelines were well protected during this construction. However, future maintenance and access will be more difficult.
3. La Mesa-Sweetwater Pipeline Relocation for Caltrans: Caltrans lowered a portion of Jamacha Road (State Highway 54) requiring the relocation of 1,200 feet of the 24-inch La Mesa-Sweetwater Pipeline. All costs for this relocation were borne by the Authority as the pipeline was built in 1948 in Caltrans' right-of-way.
4. La Mesa-Sweetwater Pipeline Relocation and Improvement for Home Capital: Home Capital subdivision development required replacing 3,400 feet of 24-inch pipeline with 30-inch pipeline near Jamacha Road and Fury Lane. The developer paid all costs associated with this project.

Construction was also initiated on three agency service connections in 1987-88.

1. Rincon No. 3 Service Connection: a 24-inch diameter/40 cfs connection north of Hubbard Hill in Escondido.
2. Olivenhain No. 3 Service Connection: a 24-inch diameter/20 cfs connection in the Paint Mountain area of Elfin Forest.



*Laying 262 feet of the 66-inch diameter crossover pipeline to accommodate improved flood control channel in the City of Escondido -- 1988*

3. Otay No. 9 Service Connection: a 30-inch diameter/60 cfs connection north of Otay Lakes Road. Additionally, L.H. Woods & Sons constructed a 36-inch cross tie between Pipeline 1 and 2 of the First Aqueduct below the Crossover Pipeline to allow for flow equalization after the introduction of filtered water into the First Aqueduct. The survey crew spent considerable time marking, locating, and protecting the Authority's aqueducts from encroachments throughout the county.

### **Pamo Project**

The Pamo project is envisioned as a 130,000 acre-foot emergency and dry year water storage reservoir featuring a 264-foot high roller compacted concrete dam and 21 miles of pipeline joining both Sutherland and Pamo Reservoirs to the First and Second Aqueducts. The design of the project was near completion at the end of the fiscal year.

The Corps of Engineers issued a Final Record of Decision on July 10, 1987 recommending a permit be issued for construction of Pamo Dam. On August 7, 1987, the Environmental Protection Agency (EPA) protested the issuance of the permit and requested additional studies. On October 19, 1987, the Corps of Engineers completed its review and again recommended permit issuance for Pamo. On November 2, 1987, the Corps of Engineers informed the EPA of its intent to issue a permit for Pamo. On November 25, 1987, the EPA formally notified the Corps of Engineers of its intent to halt the Pamo permit by invoking veto powers under Section 404(c) of the Clean Water Act.

The City of San Diego is the partner of the Authority in the Pamo project, and because of the controversy surrounding the project, the City hired an independent consultant in December 1987 to review the project goals, costs, alternatives, and mitigation efforts. That study is expected to be completed in the fall of 1988, and the project remains on hold until that report is received by the San Diego City Council.

### **Ramona Pipeline**

The design of the Ramona Pipeline is well underway by the firm of Camp, Dresser & McKee. This pipeline will supply treated water from the Second Aqueduct to three agencies: Ramona Municipal Water District, Olivenhain Municipal Water District, and the City of San Diego's Rancho Bernardo area. The pipeline is necessary to provide treated water service to Ramona because the City of Poway will no longer have surplus filtration plant capacity to serve Ramona.

The eight-mile pipeline will consist of four service connections which will serve the three agencies. The pipeline ranges in size from 57 inches

to 36 inches in diameter. Bids on the project are expected in the Fall of 1988 and construction will start in early 1989. Project completion is expected in early 1990.

### **Water Distribution Improvement Plan**

The Authority's Water Distribution Study was published in November 1987. This report delineated major construction projects necessary to enable the Authority's aqueduct system to meet the projected demands to the year 2010. Four Phase I projects and three Phase II projects were identified. The Phase I projects are planned for completion in 1992-93, and the Phase II projects are scheduled for completion about 1997-98.

The firm of Brian F. Mooney was hired to prepare a programmed Environmental Impact Report which would cover both Phase I and Phase II projects and address issues related to water supply, public disruption, growth inducement, and those issues significantly effecting the environment. Completion of this report, which would focus on the construction of the Phase I projects is expected by mid-1989.

### **Phase I Projects**

**Pipeline 5 Extension:** a nine-foot diameter pipeline in the Second Aqueduct alignment from the Crossover north of San Marcos to the Paint Mountain area of Elfin Forest. This eleven-mile project is being designed by the Linden R. Burzell firm and is expected to go to bid in late 1989.

**Pipeline 4B:** an eight-foot diameter pipeline along the Second Aqueduct alignment from north of Lake Miramar that passes through the community of Scripps Ranch to the Shepherd Canyon area east of Tierrasanta. The seven-mile project is being designed by the Boyle Engineering Corporation, Inc. Plans and specifications should be ready in 1990.

**Pipeline 4 Extension:** another segment of eight-foot diameter pipeline which generally follows the Second Aqueduct alignment between Mission Gorge and Sweetwater Reservoir. The eleven-mile project will be very difficult to construct inasmuch as it must traverse the densely-populated areas of La Mesa and Lemon Grove. Design of this section has been assigned to James M. Montgomery, Consulting Engineers, Inc. and is expected to go to bid in 1990.

**Project 2A:** a study of methods for insuring continued full water service to First Aqueduct agencies north of Escondido as demand in that area increases. This investigation compares the benefits of a new northerly

crossover pipeline with the transfer of several connections from the First Aqueduct to the Second Aqueduct. This transfer will provide more water to northeast member agencies. Although a new pipeline to this area may eventually be needed, these changes could possibly postpone the project for several years. This study is conducted by NBS/Lowery.

## WATER RECLAMATION

During fiscal year 1987-88, the San Diego County Water Authority's Board of Directors essentially doubled its previous water reuse objective by establishing an aggressive goal of reclaiming 100,000 acre-feet of water annually by the year 2010. This goal represents approximately 12 percent of the Water Authority's estimated total water demand for the year 2010 and represents a very ambitious reclamation effort.

To further this water reclamation program, the Water Authority has established and funded a Water Reclamation Department to serve as a focal point for the planning and development of alternative water sources. This department's responsibilities include:

- Development of comprehensive regional reclamation programs which will reach beyond the planning and service jurisdiction of individual reclamation agencies;
- Encourage policies which advocate the use of reclaimed water;
- Provide water reclamation entities with technical expertise relating to reclamation matters;
- Serve as the administrative agency in San Diego County for the Metropolitan Water District's Local Projects Program; and
- Provide financial support for alternative water resource development programs.

### Water Authority Reclamation Advisory Committee

The Water Authority Reclamation Advisory Committee (WARAC) was established in November 1987 to advise the Board of Directors on all water reclamation matters. It provides a vehicle for interjurisdictional coordination on all water and wastewater issues. WARAC is composed of representatives from water, wastewater regulatory agencies, and planning boards. Water Authority Board member Dale Mason served as Chairman of WARAC during fiscal year 1987-88.

Following up on a WARAC recommendation, the Board of Directors of the Water Authority established a Water Reclamation Technical Assistance Program which allows the Water Authority to share in the cost of water reclamation planning and development. Subsequently, funding from the Technical Assistance Program was authorized for the City of Poway and Encina Basin Reclamation Projects with a combined reuse potential of 18,000 acre feet per year.

### City of San Diego Reclamation Effort

The City of San Diego has been given an Environmental Protection Agency (EPA) mandate, under the Federal Clean Water Act of 1972, to upgrade its wastewater facilities to secondary sewage treatment standards. Water reclamation is expected to play a significant role in the City's efforts to comply with the EPA's secondary treatment mandate thereby reducing the City's dependence on imported water. Water Authority Directors John Leach and Mike Madigan were appointed by Mayor O'Connor to the Metro Sewer Task Force to assist the City of San Diego with its commitment to a major water reclamation effort.

### San Diego Water Reuse Study Completed

Through an agreement with the City and County of San Diego, the Water Authority completed a Water Reclamation Master Plan for the entire San Diego area. Twenty-six wastewater treatment facilities were identified as potential sources of reclaimed water. The most predominate uses for reclaimed water are landscape and agricultural irrigation. Several of the proposed projects are expected to combine the benefits of water reclamation and groundwater management to obtain the maximum yield from the resources available. Many successful water reclamation projects are already operating throughout the region. The fiscal year 1987-88 reclaimed water production within the Water Authority service area is summarized in the table shown below.

#### AVERAGE RECLAIMED WATER PRODUCTION

Fiscal Year 1987-1988

(Acre Feet)

Location	Treatment Facility	M&I	Ag.	G.W. Recharge	Total
Fallbrook PUD	Fallbrook SD Plant No. 1	75			75
Olivenhain MWD	Whispering Palms WPCF	100			100
Otay MWD	Jamacha WRP	101			101
Padre Dam MWD	Santee WRP	1,268			1,268
Pendleton	Pendleton	813		6,079	6,892
Ramona MWD	Santa Maria WPCF		583		583
Ramona MWD	San Vincente WRP		349		349
San Diego, City of	Wild Animal Park WRP	14			14
San Diego, City of	Aquaculture II	10			10
San Marcos CWD	Meadowlark WRP	11			11
Santa Fe WD	Fairbanks Ranch WPCF			112	112
Santa Fe WD	Rancho Santa Fe WPCF			224	224
Valley Center MWD	Lower Moosa Canyon WRP			280	280
Valley Center MWD	Skyline Ranch WPCF		39		39
<b>TOTAL:</b>		<b>2,392</b>	<b>971</b>	<b>6,695</b>	<b>10,058</b>

During fiscal year 1987-88, the Fallbrook Sanitary District began selling reclaimed water to Caltrans for the irrigation of landscape along Interstate 5 in Oceanside. Caltrans understands the importance and benefits obtained from irrigating with reclaimed water and will play a major role in the utilization of reclaimed water in San Diego County.



*Caltrans irrigating sections of Interstate 5 in the city of Oceanside. The reclaimed water was provided by Fallbrook Sanitary District.*

## LEGAL DEPARTMENT

Principal responsibility for legal advice and representation comes from the General Counsel. Other members of the firm, Jennings, Engstrand & Henrikson, provide assistance from time to time. Mr. Wallace R. Peck generally assists in all areas.

### Routine Matters

Two new members were appointed to the Board of Directors. Representing the City of San Diego, Ms. Christine Frahm replaced Mr. Larry Hirsch, and representing Buena Colorado MWD, Mr. William Taylor replaced Mr. Frank Tiesen. At the June meeting the Nominating Committee recommended selection of Director Mason as Chairman; Director Madigan, Vice-Chairman; and Director Stickney, Secretary.

Mr. Lester A. Snow was selected in November to become the fifth General Manager of the Authority (Burkholder, 1945-53; Holmgren, 1953-63; Burzell, 1963-84; Michaels, 1984-87). Acting General Manager Ralph R. Grahl ended his service in December and Mr. Snow commenced in January 1988.

The concurrent annexation of lands in the "Otay Valley-Palm Avenue" to the Water Authority and the Metropolitan Water District was processed and completed during the year. It consisted of 242.55 acres. Also, annexation by the City of San Diego of the "Meanley Property" resulted in automatic annexation to the Water Authority and MWD. It consisted of 101.74 acres.

Other routine matters included advice about Brown Act changes, disclosure statement requirements, changes in the Water Authority Administrative Code, minor ongoing litigation, and staff-related activities such as a Memorandum Of Understanding with the employees.

### Contractual Matters

The expanding scope and magnitude of Authority activities and necessities have increased contractually related documentation to keep pace. Contractual arrangements were finalized with EIR consultants, engineering and design consultants, and financial advisors. Minor capital improvement contracts were also made.

Contracts were made to purchase a new headquarters building at 3211 Fifth Avenue, and to engage architects, designers, and an improvement contractor for renovating and refurbishing the building. Also, a contract was made to sell the current office building to the American Lung Association with occupancy rights until renovation of the new headquarters

building is completed.

In addition, special legal services were arranged with Richard S. Whitmore as Employee Relations Consultant and with Orrick, Herrington and Sutcliffe for bond counsel services.

### Reclamation Actions

As part of the Authority's expanded activities, a new standing committee (Water Reclamation Committee) was created by adding sections 2.2(k) to the Administrative Code. The Water Authority Reclamation Advisory Committee (WARAC), an ad hoc advisory group, was organized to include entities involved in sewage treatment in order to interrelate reclamation plans and activities.

The Authority acquired the assets and obligations of a joint powers entity, the San Diego Region Water Reclamation Agency, and significant funding was provided for ongoing activities. These include grant and assistance contracts for studying and developing programs for potential water reclamation projects.

### MWD Matters

Independently, although in close cooperation with the Metropolitan Water District, the Authority presented evidence to the State Water Resources Control Board in connection with the Bay/Delta hearings. Mr. Peck, as legal counsel, coordinated the presentation. It is expected that as the hearings progress and preliminary decisions are circulated, that the Authority's involvement will become significantly increased.

Contacts were received from the Galloway group asserting a continued interest in securing Upper Basin rights to the Colorado River water for delivery to San Diego. However, there were no new meaningful developments.

Informal discussions were held regarding San Diego's continued frustration about the intolerable inconsistency between MWD's section 135 (preferential rights) and the Laguna Declaration (meet all supplemental needs of each member agency). However, no definitive program for resolution has been developed.

The Authority continued to monitor the faltering negotiations between MWD and the Imperial Irrigation District (IID) in their efforts to agree upon terms for the creation of conserved water in IID for use by MWD in its service area.

The Authority's six representatives (Harry Griffen, John Starkey, Mike Madigan, Francesca Krauel, Dale Mason, and John Hennigar) on MWD's Board of Directors are active in MWD's policy affairs and give regular monthly reports to the Authority's Board of Directors.

**Pamo Dam**

Repayment of all but \$8 million of the \$100 million Adjustable Convertible Extendable Securities (ACES) financing was completed. Opposition to the "404 permit" process of the Corps of Engineers from the EPA, Fish and Wildlife Service, and lay environmental groups continued. It was becoming more uncertain when or if a permit would result from the current proceedings.

**Legislation**

During the 1987-88 fiscal year, three legislative bills amending the county water act, which were sponsored by the Authority, became law:

A.B. 34 (Bradley) added section 6(f) to clearly define what constitutes a quorum of the Board of Directors necessary for the transaction of business (and also for compliance with the Brown Act).

S.B. 1294 (Bergeson) added section 8(c) to allow a second contract of indebtedness where the first is repaid because of failure to obtain necessary governmental permits if the first contract was made pursuant to section 8(b). Section 8(b) increases the amount of indebtedness that the Authority can issue under section 8 (one-tenth of one percent of assessed valuation) by the amount authorized by voters under the 1941 Revenue Bond Law.

A.B. 2928 (Frazee) added section 5.2 to the County Water Authority Act. It authorizes establishment of standby charges not to exceed \$10 per acre or per parcel. It also provides procedures including a public hearing for fixing any such charges.

**Government Relations**

The 1988 legislative session was fairly quiet for water interests. The major water focus for the Legislature was on the drought. Senator Ruben Ayala sponsored legislation to assist the state and local agencies on managing the drought. This measure was supported by the Authority.

Assemblyman Robert Frazee authored a bill specifically for the Authority which granted the Authority the ability to levy a standby charge on all property within its service area. The need for this measure came about after the Water Authority received its capital financing program for upgrading and expanding the current system.

**FINANCIAL REPORT**

For the fiscal year ending June 30, 1988, total Water Authority income was \$117,683,000. Total disbursements during the year were \$107,720,000. At the fiscal year end, the Treasurer was accountable for funds and investments totaling \$24,206,000.

The Director of Finance, Henry G. Lozano, also acts as the San Diego County Water Authority Treasurer and is responsible for all funds not immediately required for the conduct of business. Funds are invested under Board of Directors policy in interest bearing time deposits and in savings accounts.

A monthly report is presented to the Board of Directors that shows monthly activity consistent with investment policy. The report outlines investments by amount, type, rate, institution, number of days invested, and maturity date. As part of the monthly report to the Board of Directors, each investment during the month is listed showing the referenced information together with the list of institutions bidding for the funds and the rates quoted.

The Water Authority Administrative Code requires the Treasurer to report a summary of financial transactions monthly and for each fiscal year-end. For fiscal year 1987-88, the Statement of Earnings is as follows:

**STATEMENT OF EARNINGS (Dollars in Thousands)**

Income was as follows:	1986	1987	1988
Water Sales	\$ 94,010	\$102,007	\$109,529
Taxes	7,373	6,667	6,341
Interest on investments	2,116	1,571	1,586
Miscellaneous	39	897	—
Hydroelectric sales (net)	418	352	227
<b>Total income</b>	<b>\$103,956</b>	<b>\$111,494</b>	<b>\$117,683</b>

SAN DIEGO COUNTY WATER AUTHORITY

Disbursements were as follows:	1986	1987	1988
Water purchases	\$ 89,031	\$ 95,937	\$101,762
Operation and maintenance	2,780	2,974	3,833
Interest expense	3,032	2,394	2,125
In lieu		4,500	
<b>Total Disbursements</b>	<b>\$ 94,843</b>	<b>\$105,805</b>	<b>\$167,720</b>
<b>Net earnings before depreciation</b>	<b>\$ 9,113</b>	<b>\$ 5,689</b>	<b>\$ 9,963</b>

As of June 30, 1987 and 1988, the Treasurer's cash accountability was as follows:

Demand deposits	\$ 27	\$ 53	\$ 32
Time deposits	25,860	21,060	22,768
Bond proceeds (in escrow)	93,902	95,462	1,406
<b>Total deposits</b>	<b>\$119,789</b>	<b>\$116,575</b>	<b>\$ 24,206</b>

SAN DIEGO COUNTY WATER AUTHORITY

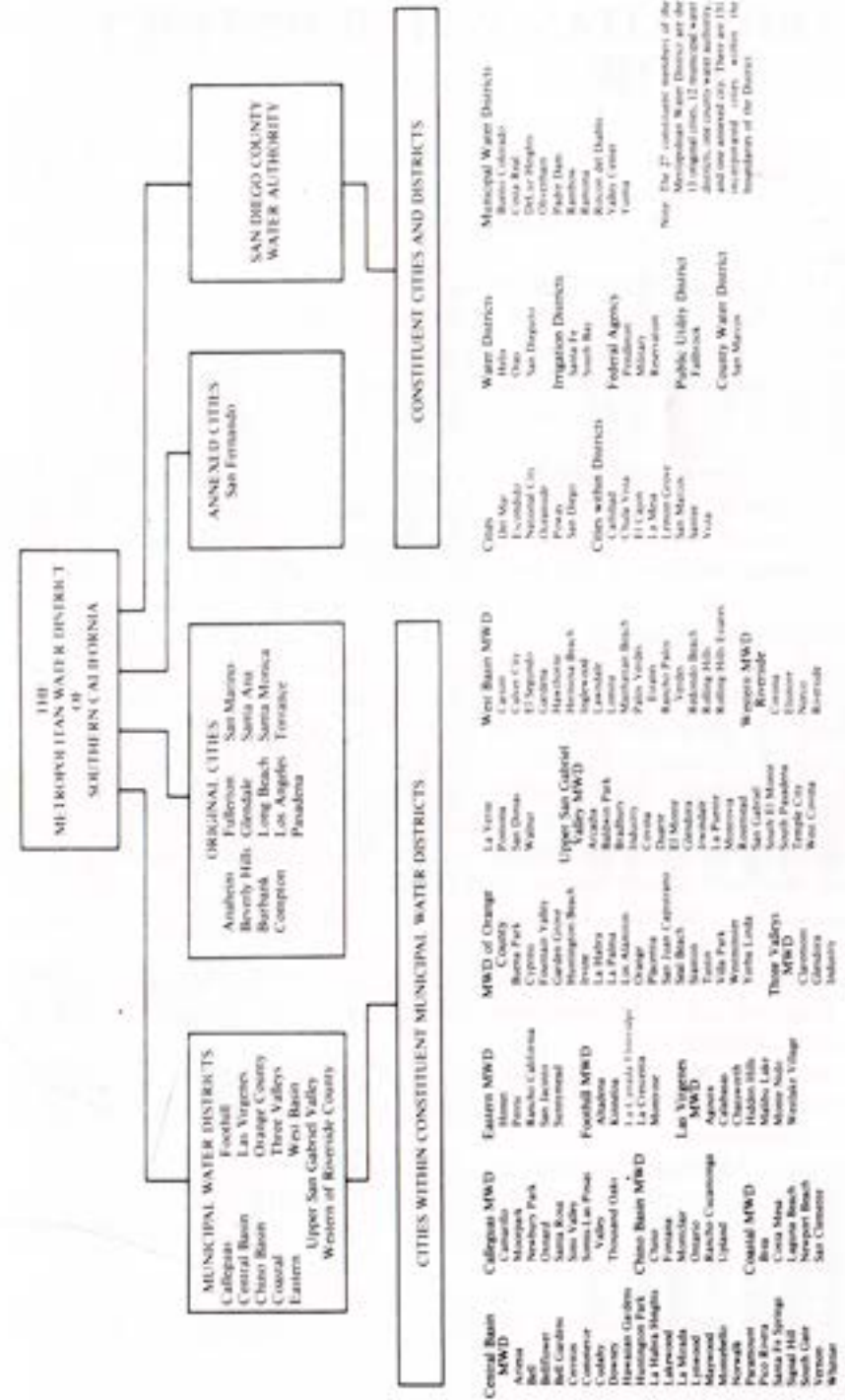


Figure D. Composition of The Metropolitan Water District of Southern California

## METROPOLITAN WATER DISTRICT MEMBERSHIP

Due to the close relationship between the Metropolitan Water District of Southern California (MWD) and the San Diego Water Authority, readers of this report are given the following brief description of MWD's organization and operations.

The Metropolitan Water District was approved by the State Legislature in 1927. Early the following year, MWD was organized. The original act provided for membership by cities. An amendment passed by the Legislature permitted annexation of water districts, and MWD's membership now includes 13 original cities, one city added in 1971, 12 municipal water districts, and the San Diego County Water Authority.

The Authority joined MWD on December 17, 1946, one of the 27 member agencies of the District. The two agencies have been working closely together since their association began. The MWD Act and the County Water Authority Act are very similar. Under each act, policy is established by a board of directors which represents the member agencies. Each director is appointed by the chief executive officer of the agency represented with approval from its legislative body. Under present MWD policy, each member agency is entitled to a minimum of one director. An additional representative may be appointed for each full three percent of the total MWD assessed valuation which lies within the member agency's boundaries. These district member agencies are listed in Figure D.

The Water Authority has six representatives on the Metropolitan Board of Directors, all of whom are members of the Water Authority Board. Harry Griffen, who has served on the MWD Board for twenty-five years, is a member of the Executive Committee, the Finance and Insurance Committee, and the Water Problems Committee.

John F. Hennigar, who was appointed on October 9, 1986, is a member of the Engineering and Operations Committee and the Organization and Personnel Committee.

Francesca M. Krauel, who has been a MWD Director for four years, is a member of the Finance and Insurance Committee and the Legal and Claims Committee.

Michael D. Madigan, who has served on the MWD Board for six years, is an ex officio member of the Executive Committee, Chairman of the Land Committee, and a member of the Engineering and Operations Committee.

Dale Mason, who was appointed on December 19, 1986, is a member of the Finance and Insurance Committee and the Organization and Personnel Committee.

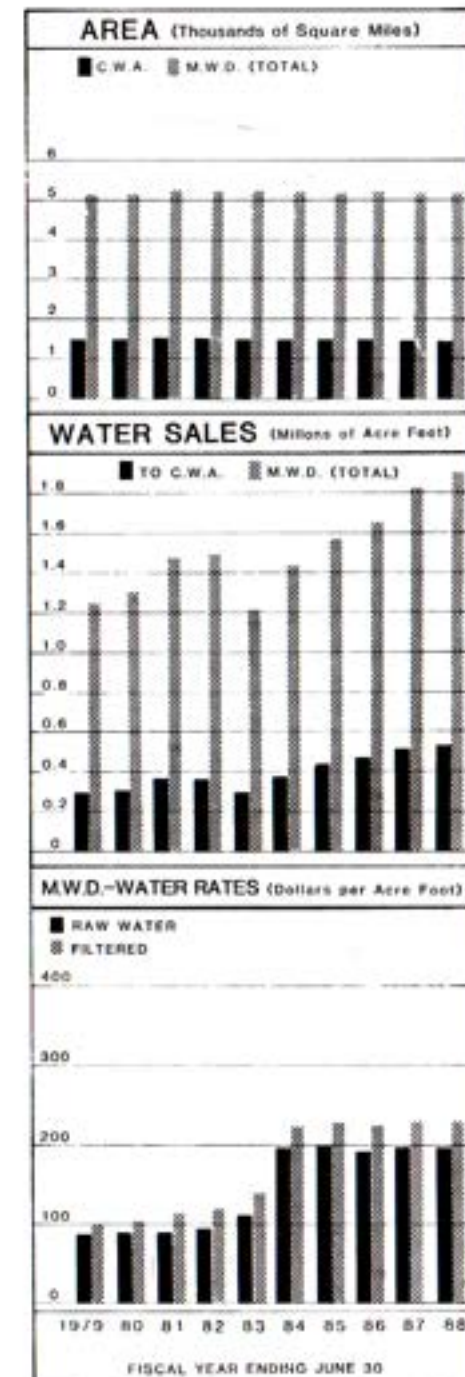
John P. Starkey, who has been a member of the Board for eight years,

is an ex officio member of the Executive Committee, Chairman of the Finance and Insurance Committee, and a member of the Land Committee and the Water Problems Committee.

As of August 1987, the Authority representatives had a total of 8,751 votes out of 55,017 or 16.0 percent of the total voting strength of MWD. The delegation of each member agency is entitled to cast one vote for each \$10 million or major fraction thereof of assessed valuation within the agency's boundaries.

The Metropolitan Water District's service area is shown in Figure E. About 14.5 million people living within those portions of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties are served by MWD. There are 139 incorporated cities within the District. MWD's service area contains 5,136.42 square miles which is an increase of 1.37 square miles during the fiscal year. Of this, 1,418.2 square miles, or 27.6 percent, lie within the Authority's boundaries.

Total assessed value of taxable property lying within the boundaries of Metropolitan Water District was \$564,692,806,207. Assessed value is determined by the assessors of the counties served for use in levying 1987-88 taxes. These valuations were increased \$59,272,142,528, or 11.7 percent, above the previous year's valuation of \$505,419,663,679. An amount of \$9,360,367,720, or 15.8 percent of this increase, occurred within the Authority's boundaries. Assessed valuation within the Authority is 15.9 percent of the MWD total.



## SAN DIEGO COUNTY WATER AUTHORITY

The assessed valuation of MWD established for 1988-1989 is \$596,900,358,958 which includes \$91,992,977,704 for the Authority's valuation.

### Water Sales

MWD delivered 1,926,702 acre-feet of water during fiscal year 1987-88. Delivery to the Authority of 529,930 acre feet represented 27.5 percent of MWD's total deliveries.

MWD has five filtration plants in operation. The Skinner Filtration Plant, with a capacity of 340 mgd, serves a portion of the treated water requirement of the Authority.

The other plants operated by MWD, none of which can serve the Authority, are: F.E. Weymouth Memorial Filtration Plant in La Verne; Robert B. Diemer Filtration Plant near Yorba Linda; Joseph Jensen Filtration Plant at Granada Hills; and the Henry J. Mills Filtration Plant near Riverside. The Jensen Plant can only receive water from the West Branch of the California Aqueduct.

### Tax Rate

MWD set its tax rate at .0112 percent of assessed valuation for the 1987-88 fiscal year. When the Authority annexed to MWD in 1946, the tax rate was 50 cents per \$100 assessed valuation. The tax rate for each year since 1930 is shown in Table 12. The total MWD tax levy during the 1987-88 fiscal year, including regular and special taxes, was approximately \$70,425,111 of which \$10,753,056, or 15.3 percent, was levied against property within the Authority. The estimated tax level for the 1987-88 fiscal year is \$74,604,738 for MWD as a whole and includes \$10,520,531 for the Authority's service area.



Figure E.

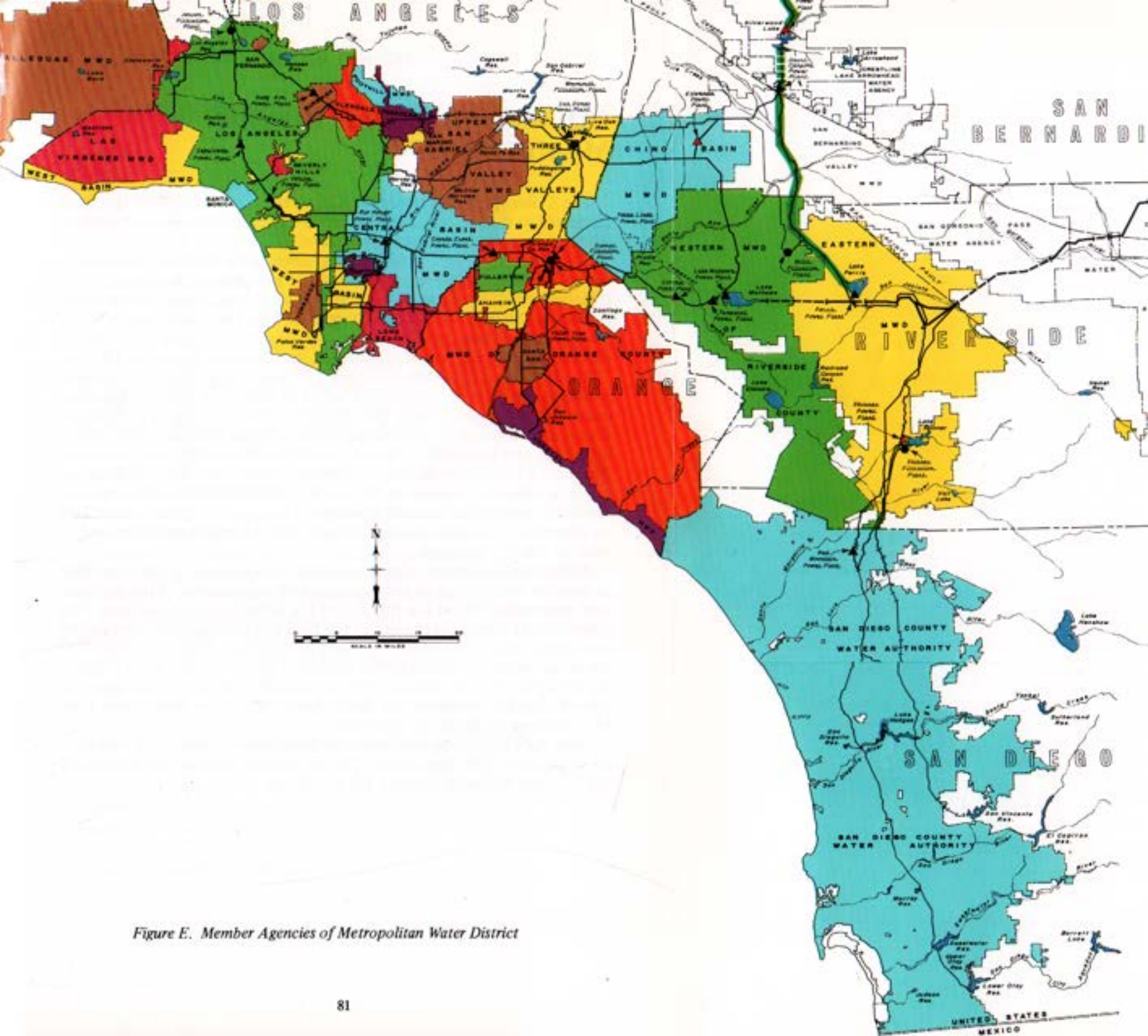


Figure E. Member Agencies of Metropolitan Water District

## COLORADO RIVER BOARD MEMBERSHIP

The Colorado River Board of California is an agency of the State dedicated to the protection of California rights and interests in Colorado River system water and power resources.

The Board members were originally selected by the Governor from a list of persons submitted by each of the six agencies having rights to Colorado River resources. The six agencies are: San Diego County Water Authority, Metropolitan Water District of Southern California, City of Los Angeles Department of Water and Power, Coachella Valley Water District, Palo Verde Irrigation District, and Imperial Irrigation District.

The Board was reorganized in April 1977 and enlarged from six to eleven members pursuant to legislation enacted in 1976. The five new members consist of two State officers, the Director of the Department of Fish and Game, and the Director of the Department of Water Resources as ex officio members; and three public Board members appointed by the Governor. The Board elects from among its members, other than the two State officers, a Chairman who is ex officio the Colorado River Commissioner. Under the revised statutes, the Governor is to appoint both a member and an alternate member to the Board from a list of nominees designated by each of the six agencies.

Additional legislation, effective in 1985, was enacted in 1983 and 1984 to improve the method of appointment and replacement of the six agencies' representatives on the Board and the selection of a Chairman. The legislation also reduced the size of the Board to ten members, eliminating one public member. The member and the alternate representing each of the six agencies are chosen by the Governor from two lists, each containing not less than three persons, that are submitted by each of the agencies. John P. Starkey represents the Water Authority on the Board, and John M. Cranston serves as his alternate.

Once fully funded by the State, the Board now receives only one-third of its support from that source. The six agencies provide the balance of the required financial support for the Board.

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Table 1  
STATISTICAL SUMMARY

	1986-87	1987-88	Percent Change
<b>GROWTH OF AREA</b>			
Number of Agencies	24	24	-0-
Total Area - Acres	907,288	907,634	-0-
Population	2,181,000	2,253,216	+ 3.3
Assessed Valuation	80,633,362,973	89,993,730,693	+ 11.6
<b>OPERATIONS</b>			
Water Imported by Authority-af	519,411	552,841	+ 6.4
Water Production of Agencies-af	591,820*	580,153	- 2.0
Local Water Used-af	97,459	55,798	- 42.7
Authority Water Used-af	494,361*	524,355	+ 6.1
Miles of Pipeline	222	222	-0-
Miles of Patrol Roads Maintained	105	105	-0-
Number of Service Connections	77	77	-0-
<b>FINANCIAL</b>			
Revenues:			
Water Revenue	102,007,000	109,529,000	+ 7.4
Other Revenue	2,907,000	1,813,000	- 37.6
Taxes	5,813,000	6,341,000	+ 9.1
Expenditures:			
Operations and Maintenance	2,974,000	3,833,000	+ 28.9
Purchase of Water	95,937,000	101,762,000	+ 6.1
Payments on Outstanding Debt	4,885,000	97,999,000	+ 1,906.1
In Lieu Settlement	3,646,000	-	-
Interest Expense	2,394,000	2,125,000	- 11.2
Total Investment in Plant:			
Total Fixed Assets	133,479,000	137,474,000	+ 3.0
Long-Term Debt	143,209,000	45,210,000	- 68.4

\*Does not include Pendleton Military Reservation

TABLES

Table 2  
POPULATION GROWTH - COUNTY AND AUTHORITY AREA  
1910 to 1988  
(Includes Resident Military Personnel)

Year (as of April 1)	COUNTY		AUTHORITY		Percent of County Population in Authority
	Total Population (1)	Annual Growth	Total Population	Annual Growth	
1910.....	61,665				
1920.....	112,248	5,058			
1930.....	209,659	9,741			
1940.....	289,348	7,969			
1946.....(3)	502,804	26,746	(3) 440,659	2,807	88
1950.....	556,808	42,478	(2) 451,886	50,083	81
1955.....(4)	769,200	52,762	(2) 702,300	50,820	91
1960.....	1,033,010	32,198	(2) 956,400	38,720	93
1965.....(4)	1,194,000	23,360	(5) 1,150,000	21,000	96
1970.....	1,310,800	49,850	(5) 1,255,000	54,500	96
1975.....(6)	1,560,038	49,632	(5) 1,527,520	54,027	98
1980.....	1,808,200	91,800	(5) 1,797,655	66,635	99
1981.....(7)	1,900,000	44,000	(5) 1,864,290	25,075	98
1982.....(7)	1,944,000*	42,035	(5) 1,889,365	45,222	97
1983.....(7)	1,986,035	54,853	(5) 1,934,587	71,652	97
1984.....(7)	2,040,888	42,471	(5) 2,006,239	40,761	98
1985.....(7)	2,083,359	82,810	(5) 2,047,000	58,500	97
1986.....(7)	2,166,169	74,490	(5) 2,105,500	75,000	97
1987.....(7)	2,240,659	87,025	(5) 2,181,000	72,216	97
1988.....(7)	2,327,684		(5) 2,253,216		97

- (1) County population from U.S. Census Bureau Reports.
- (2) Authority population based on U.S. Census Bureau Reports.
- (3) Based on Special Census, U.S. Census Bureau, exclusive of emergency military personnel due to World War II.
- (4) Estimated by the San Diego Chamber of Commerce.
- (5) Estimated by Authority member agencies.
- (6) Population by Special Census.
- (7) Population estimates by Department of Planning and Land Use, San Diego County.
- \* Corrected estimate by Integrated Planning Office, San Diego County.

SAN DIEGO COUNTY WATER AUTHORITY

Table 3  
AREA—AUTHORITY MEMBER AGENCIES

	Areas Within Authority			Percent of Total Authority Area 6/30/88
	As of 6/30/87 (acres)	Changes During Year (acres)	As of 6/30/88 (acres)	
Bueno Colorado M.W.D. ....(2)	19,825	-1	19,824	2.18
Costa Real M.W.D. ....(3)	20,369	0	20,369	2.24
Del Mar, City of .....	1,159	0	1,159	0.13
De Luz Heights M.W.D. ....	11,789	0	11,789	1.30
Escondido, City of ....(12)	21,215	105	21,320	2.35
Fallbrook P.U.D. ....	16,174	23	16,197	1.78
Helix Water District ....(4)	31,278	0	31,278	3.45
National City, City of .....	5,573	0	5,573	0.61
Oceanside, City of .....	25,698	0	25,698	2.83
Olivenhain M.W.D. ....(5)	30,822	-1	30,821	3.40
Otay M.W.D. ....(6)	62,779	243	63,022	6.94
Padre Dam M.W.D. ....(8)	54,503	0	54,503	6.00
Pendleton Military Res. ....	134,625	0	134,625	14.83
Poway, City of .....	23,214	0	23,214	2.56
Rainbow M.W.D. ....(10)	47,261	-22	47,239	5.20
Ramona M.W.D. ....	46,524	0	46,524	5.13
Rincon del Diablo M.W.D. ....(7)	10,614	-42	10,572	1.16
San Diego, City of .....	210,180	102	210,282	23.17
San Dieguito W.D. ....	5,639	1	5,640	0.62
San Marcos C.W.D. ....(15)	28,488	-44	28,444	3.13
Santa Fe I.D. ....	10,173	0	10,173	1.12
South Bay I.D. ....(9)	15,569	0	15,569	1.72
Valley Center M.W.D. ....(11)	61,004	-18	60,986	6.72
Yuima M.W.D. ....	12,813	0	12,813	1.41
<b>Total Authority Area</b>	<b>907,288</b>	<b>346</b>	<b>907,634</b>	<b>100.00</b>
<b>San Diego County</b>	<b>2,725,100</b>	<b>0</b>	<b>2,725,100</b>	

- (1) Includes San Marcos C.W.D. which became a member agency of Authority on February 25, 1980.
- (2) Does not include 2,806 acres overlapping in City of Oceanside, and 37 acres overlapping in City of Escondido.
- (3) Does not include 34 acres overlapping in City of Oceanside.
- (4) Does not include 3 acres overlapping in City of San Diego.
- (5) Does not include 25 acres overlapping in City of San Diego.
- (6) Does not include 4,682 acres overlapping in City of San Diego.
- (7) Does not include 16,136 acres overlapping in City of Escondido and 39 acres overlapping in City of San Diego.
- (8) Does not include 12 acres overlapping in City of San Diego.
- (9) Does not include 297 acres overlapping in City of San Diego and 718 acres overlapping in National City.

TABLES

Table 3 (continued)  
POPULATION—AUTHORITY MEMBER AGENCIES AND COUNTY  
(Includes Resident Military Personnel)

Population—U.S. Census					Density of Population 1988	
1970 (13)	1980 (13)	Decade Increase 1970-80 Percent	1988 Estimate (14)	Annual Increase 1987-88 Percent	Per Acre	Per Sq. Mile
39,000 (1)	51,000	31	67,599	8.29	3.41	2,182
15,500	31,500	103	49,000	4.26	2.41	1,540
3,900	5,040	29	5,120	1.51	4.42	2,827
150	225	50	271	0.74	0.02	15
36,000	64,100	78	94,915	6.04	4.45	2,849
12,000	18,700	56	22,337	4.18	1.38	883
163,000	203,500	25	223,337	0.92	7.14	4,570
39,000	47,200	21	50,800	0.30	9.12	5,834
40,700	77,800	91	107,884	6.84	4.20	2,687
2,000	23,000	1,050	40,300	3.87	1.31	837
19,400	51,600	166	80,259	5.76	1.27	815
46,000	89,000	93	99,297	3.16	1.82	1,166
—	33,150	—	48,000	0.00	0.36	228
14,000	33,620*	140	40,300	1.79	1.74	1,111
4,200	7,800	86	10,946	3.85	0.23	148
6,800	16,000	135	29,500	7.27	0.63	406
18,900	13,800	-27	24,047	6.07	2.27	1,456
675,800	849,600	26	1,058,700	3.13	5.03	3,222
21,800	30,900	42	32,968	6.29	5.85	3,741
—	24,200	—	30,346	1.25	1.07	683
8,600	14,700	71	17,040	2.12	1.68	1,072
80,000	99,200	24	105,200	0.77	6.76	4,324
7,000	10,200*	46	13,230	4.17	0.22	139
1,250	1,820	46	1,820	-1.62	0.14	91
<b>1,255,000</b>	<b>1,797,655*</b>	<b>43</b>	<b>2,253,216</b>	<b>3.31</b>	<b>2.48</b>	<b>1,589</b>
<b>1,310,800</b>	<b>1,808,200</b>	<b>38</b>	<b>2,327,684</b>	<b>3.88</b>	<b>0.85</b>	<b>547</b>

- (10) Does not include 701 acres overlapping in City of Oceanside.
- (11) Does not include 1,177 acres overlapping in City of Escondido.
- (12) Includes 1,177 acres overlapping in Valley Center M.W.D., 410 acres overlapping in San Marcos C.W.D., 37 acres overlapping in Bueno Colorado M.W.D., and 16,136 acres overlapping in Rincon Del Diablo M.W.D.
- (13) Population in agencies other than cities was furnished by agencies.
- (14) Estimate by agencies.
- (15) Does not include 410 acres overlapping in City of Escondido.

\* Corrected figures per agencies.

SAN DIEGO COUNTY WATER AUTHORITY

Table 4  
 WATER PRODUCTION, AGRICULTURAL USE, AND AUTHORITY STORAGE  
 FISCAL YEAR 1987-88  
 (Compilation of data furnished by member agencies)

Member Agencies	SOURCE OF WATER (3)				Total Water Production Ac. Ft.	Gross Area (2) Acres	Estimated Area Served by Water System Acres	Gross Area Served by Water System Percent	POOLED STORAGE IN RESERVOIR		Total Quantity in Storage 6/30/88 Ac. Ft.
	Local Supply		Authority Supply						WATER WITHDRAWN FISCAL YEAR		
	Amount Ac. Ft.	Percent	Amount Ac. Ft.	Percent					By Evaporation Ac. Ft.	By Spill Ac. Ft.	
Bueno Colorado M.W.D.	7,103.0	37.8	11,677.8	62.2	18,780.8	19,824	16,313	82.3	0.0	0.0	0.0
Costa Real M.W.D.	0.0	0.0	15,146.3	100.0	15,146.3	20,369	18,000	88.4	95.2	0.0	1,606.0
Del Mar, City of	0.0	0.0	1,481.2	100.0	1,481.2	1,159	1,082	93.4	0.0	0.0	0.0
De Luz Heights M.W.D.	0.0	0.0	2,459.4	100.0	2,459.4	11,789	2,740	23.2	0.0	0.0	0.0
Escondido, City of	5,590.4	22.5	19,280.6	77.5	24,871.0	21,320	18,512	86.8	0.0	0.0	0.0
Fallbrook P.U.D.	0.0	0.0	11,765.7	100.0	11,765.7	16,197	11,110	68.6	95.2	0.0	1,606.0
Helix W.D.	5,066.1	12.1	36,796.4	87.9	41,862.5	31,278	30,204	96.6	0.0	0.0	0.0
National City, City of	2,373.7	34.2	4,566.1	65.8	6,939.8	5,573	5,073	91.0	0.0	0.0	0.0
Oceanside, City of	0.0	0.0	25,889.2	100.0	25,889.2	25,698	16,837	65.5	190.6	0.0	3,211.9
Olivenhain M.W.D.	0.0	0.0	10,754.8	100.0	10,754.8	30,821	14,750	47.9	31.8	0.0	535.3
Otay W.D.	0.0	0.0	17,245.6	100.0	17,245.6	63,022	33,705	53.5	95.2	0.0	1,606.0
Padre Dam M.W.D.	0.0	0.0	18,120.7	100.0	18,120.7	54,503	35,344	64.8	127.0	0.0	2,141.3
Pendleton Military Res.	-	-	117.9	-	117.9	134,625	N.A.	-	-	-	-
Poway, City of	95.5	0.8	11,505.5	99.2	11,601.0	23,214	8,942	38.5	0.0	0.0	0.0
Rainbow M.W.D.	0.0	0.0	28,389.5	100.0	28,389.5	47,239	17,551	37.2	31.8	0.0	535.3
Ramona M.W.D.	46.5	0.5	9,526.6	99.5	9,573.1	46,524	11,415	24.5	127.0	0.0	2,141.3
Rincon del Diablo M.W.D.	0.0	0.0	7,189.3	100.0	7,189.3	10,572	7,941	75.1	38.1	0.0	642.4
San Diego, City of (1)	21,474.1	9.2	213,124.2	90.8	234,598.3	210,282	112,043	53.3	0.0	0.0	0.0
San Dieguito W.D.	3,824.1	46.6	4,380.7	53.4	8,204.8	5,640	5,460	96.8	0.0	0.0	0.0
San Marcos C.W.D.	0.0	0.0	11,385.4	100.0	11,385.4	28,444	21,500	75.6	31.8	0.0	535.3
Santa Fe I.D.	5,416.5	47.4	6,019.0	52.6	11,435.5	10,175	10,175	100.0	0.0	0.0	0.0
South Bay I.D.	2,615.6	14.1	15,948.4	85.9	18,564.0	15,569	11,777	75.6	0.0	0.0	0.0
Valley Center M.W.D.	83.2	0.2	40,140.8	99.8	40,224.0	60,986	37,270	61.1	31.8	0.0	535.3
Yuima M.W.D.	2,108.7	59.4	1,444.2	40.6	3,552.9	12,813	4,000	31.2	6.4	0.0	107.0
Total and Average	55,797.4	9.6	524,355.3	90.4	580,152.7	907,636	451,744	49.8	901.9	0.0	15,203.1

- (1) Includes production by City of San Diego for areas outside City (not in Authority).
  - (2) Does not include overlapping areas as shown in Table 1.
  - (3) Figures include losses from transmission and distribution system but not from reservoirs.
- N.A. - Not Applicable

Estimated Area Served by Water System Acres	Gross Area Served by Water System Percent	Water Production Per Acre Served Ac.Ft./Ac./Yr.	Estimated Population	Water Production Per Capita Ac. Ft./Cap./Yr.	WATER USED FOR AGRICULTURAL PURPOSES					Percent of Agricultural Water to Total Production	MEMBER AGENCIES' POOLED STORAGE IN SAN VICENTE RESERVOIR						
					From Local Supply		From Authority		Total Ac. Ft.		Total Quantity in Storage 6/30/87 Ac. Ft.	Placed into Storage During Fiscal Year Ac. Ft.	STORED WATER WITHDRAWN DURING FISCAL YEAR			Total Quantity in Storage 6/30/88 Ac. Ft.	
					Ac. Ft.	Percent	Ac. Ft.	Percent					By Delivery Ac. Ft.	By Evaporation Ac. Ft.	By Spill Ac. Ft.		
16,313	82.3	1.15	67,599	0.28	904.4	33.1	1,829.1	66.9	2,733.5	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18,000	88.4	0.84	49,000	0.31	0.0	0.0	1,900.6	100.0	1,900.6	12.5	1,577.1	124.1	0.0	95.2	0.0	1,606.0	0.0
1,082	93.4	1.37	5,120	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2,740	23.2	0.90	271	9.08	0.0	0.0	2,384.5	100.0	2,384.5	97.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18,512	86.8	1.34	94,915	0.26	1,682.3	28.4	4,248.4	71.6	5,930.7	23.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11,110	68.6	1.06	22,337	0.53	0.0	0.0	6,608.0	100.0	6,608.0	56.2	1,577.1	124.1	0.0	95.2	0.0	1,606.0	0.0
30,204	96.6	1.39	223,337	0.19	67.3	12.8	458.7	87.2	526.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5,073	91.0	1.37	50,800	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16,837	65.5	1.54	107,884	0.24	0.0	0.0	3,714.3	100.0	3,714.3	14.3	3,154.2	248.3	0.0	190.6	0.0	3,211.9	0.0
14,750	47.9	0.73	40,300	0.27	0.0	0.0	1,269.0	100.0	1,269.0	11.8	525.7	41.4	0.0	31.8	0.0	535.3	0.0
33,705	53.5	0.51	80,259	0.21	0.0	0.0	805.9	100.0	805.9	4.7	1,577.1	124.1	0.0	95.2	0.0	1,606.0	0.0
35,344	64.8	0.51	99,297	0.18	0.0	0.0	1,292.0	100.0	1,292.0	7.1	2,102.8	165.5	0.0	127.0	0.0	2,141.3	0.0
N.A.	-	-	48,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8,942	38.5	1.30	40,300	0.29	7.0	0.8	894.6	99.2	901.6	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17,551	37.2	1.62	10,946	2.59	0.0	0.0	23,213.2	100.0	3,213.2	81.8	525.7	41.4	0.0	31.8	0.0	535.3	0.0
11,415	24.5	0.84	29,500	0.32	0.0	0.0	4,297.1	100.0	4,297.2	44.9	2,102.8	165.5	0.0	127.0	0.0	2,141.3	0.0
7,941	75.1	0.91	24,047	0.30	0.5	0.1	989.8	99.9	990.3	13.8	630.8	49.7	0.0	38.1	0.0	642.4	0.0
112,043	53.3	2.09	1,058,700	0.22	0.0	0.0	1,304.4	100.0	1,304.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5,460	96.8	1.50	32,968	0.25	671.1	45.2	812.6	54.8	1,483.7	18.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21,500	75.6	0.53	30,346	0.38	0.0	0.0	2,969.2	100.0	2,969.2	26.1	525.7	41.4	0.0	31.8	0.0	535.3	0.0
10,175	100.0	1.12	17,040	0.67	672.6	42.3	918.9	57.7	1,591.5	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11,777	75.6	1.58	105,200	0.18	5.2	17.2	25.1	82.8	30.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37,270	61.1	1.08	13,230	3.04	72.1	0.2	34,950.2	99.8	35,022.3	87.1	525.7	41.4	0.0	31.8	0.0	535.3	0.0
4,000	31.2	0.89	1,820	1.95	2,049.6	59.3	1,404.3	40.7	3,453.9	97.2	105.1	8.3	0.0	6.4	0.0	107.0	0.0
451,744	49.8	1.28	2,253,216	0.26	6,132.1	6.0	96,289.9	94.0	102,422.0	17.7	14,929.8	1,175.2	0.0	901.9	0.0	15,203.1	0.0

Table 5  
 ASSESSED VALUATION AND TAX COLLECTIONS  
 FISCAL YEAR 1987-88

Member Agencies	ASSESSED VALUATION – SECURED AND UNSECURED				Area 6/30/88  Acres	1987-88 Valuation Per Acre	Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/88	Tax Collections
	1986-87*	1987-88*	1986-87 to 1987-88 Percent Change	1988-89*						
	Total	Total		Total						
Bueno Colorado M.W.D.	\$ 2,787,271,024	\$ 3,253,711,801	+ 16.7	\$ 3,727,447,729	19,824	\$ 164,130	\$ 3,715,612.96	\$ 341,043.71	\$ 29,640.23	\$ 4,027,016.44
Costa Real M.W.D.	2,928,817,724	3,397,838,824	+ 16.0	3,570,926,600	20,369	166,814	3,782,484.33	341,313.65	24,574.82	4,099,223.16
Del Mar, City of	370,575,006	422,473,436	+ 14.0	459,717,402	1,159	364,515	747,969.46	60,378.50	4,357.46	803,717.50
De Luz Heights M.W.D.	50,071,254	52,318,440	+ 4.5	49,684,360	11,789	4,438	81,569.15	5,042.36	822.75	85,788.76
Escondido, City of	1,956,578,606	2,239,556,361	+ 14.5	2,345,425,433	21,320	105,045	3,038,909.92	222,847.97	14,697.54	3,247,060.35
Fallbrook P.U.D.	707,671,331	771,474,608	+ 9.0	825,387,469	16,197	47,631	1,219,731.91	97,332.42	7,727.41	1,309,336.92
Helix W.D.	6,048,402,835	6,510,134,509	+ 7.6	6,723,213,945	31,278	208,138	12,635,070.40	797,893.50	54,293.53	13,378,670.37
National City, City of	789,058,820	840,535,388	+ 6.5	844,611,323	5,573	150,823	2,005,257.40	103,881.63	5,814.31	2,103,324.72
Oceanside, City of	2,659,068,957	2,995,736,395	+ 12.7	3,320,798,760	25,698	116,575	3,887,489.10	290,134.75	25,437.21	4,152,186.64
Olivenhain M.W.D.	2,003,261,107	2,304,160,023	+ 15.0	2,611,724,064	30,821	74,759	1,884,557.05	190,270.90	16,149.89	2,058,678.06
Otay W.D.	2,391,288,987	3,005,019,934	+ 25.7	3,342,911,362	63,022	47,682	2,955,862.74	265,633.33	36,544.54	3,184,951.53
Padre Dam M.W.D.	2,606,259,901	2,846,520,109	+ 9.2	2,967,420,228	54,503	52,227	3,778,763.69	271,546.09	23,431.64	4,026,878.14
Pendleton Military Res.	3,410,610,730	3,544,561,657	+ 3.9	121,243,037	134,625	26,329	2,199,259.05	(78,905.74)	359.84	2,119,993.47
Poway, City of	1,387,724,029	1,568,466,256	+ 13.0	1,767,715,363	23,214	67,566	1,885,016.69	138,783.56	10,643.98	2,013,156.27
Rainbow M.W.D.	801,355,346	869,176,746	+ 8.5	915,125,159	47,239	18,400	1,329,983.67	106,543.12	9,077.02	1,427,449.77
Ramona M.W.D.	772,833,531	854,101,215	+ 10.5	918,488,265	46,524	18,358	1,145,876.45	175,102.48	9,024.63	1,311,954.30
Rincon del Diablo M.W.D.	1,420,181,493	1,695,226,774	+ 19.4	1,920,611,220	10,572	160,351	2,042,636.90	146,650.69	13,380.39	2,175,907.20
San Diego, City of (1)	38,899,063,923	43,216,944,091	+ 11.1	45,487,581,636	210,282	205,519	62,522,796.39	(42,686,012.20)	66,812.67	19,769,971.52
San Dieguito W.D.	1,294,764,141	1,455,906,129	+ 12.4	1,592,691,450	5,640	258,139	2,047,778.08	174,080.04	12,752.21	2,209,105.91
San Marcos C.W.D.	1,453,812,585	1,690,573,443	+ 16.3	1,873,856,784	28,444	59,435	1,922,386.63	191,872.47	14,390.88	2,099,868.22
Santa Fe I.D.	1,803,819,133	1,972,270,275	+ 9.3	2,151,067,655	10,173	193,873	2,471,216.33	283,208.17	17,969.12	2,736,455.38
South Bay I.D.	3,129,097,013	3,429,610,248	+ 9.6	3,345,781,253	15,569	220,285	6,711,849.30	(25,038.07)	22,433.30	6,664,377.93
Valley Center M.W.D.	845,871,899	936,505,241	+ 10.7	987,686,833	60,986	15,356	1,340,995.65	94,249.94	10,826.04	1,424,419.55
Yuima M.W.D.	115,903,598	120,908,790	+ 4.3	121,860,374	12,813	9,436	276,950.16	15,727.80	1,141.56	291,536.40
Total Authority	\$ 80,633,362,973	\$ 89,993,730,693	+ 11.6	\$ 91,992,977,704	907,634	\$ 99,152	\$ 125,629,750.41	(\$38,476,418.93)	\$432,302.97	\$86,721,028.51
San Diego County (1)	\$ 85,143,527,702	\$ 93,255,887,031	+ 9.5	\$ 103,108,087,158	2,725,100	\$ 37,836				

(1) Excluding 1,454,000 acres of non-taxable land in San Diego County.

\*Market value as determined by County Assessor.

Table 5  
 ASSESSED VALUATION AND TAX COLLECTIONS  
 FISCAL YEAR 1987-88

77-88 Assessment Per Acre	Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/88	Tax Collections	Interest & Penalties	Receipts in Lieu of Taxes	Miscellaneous Tax	Net Total Collections	Amount Paid for Service Connections to 6/30/88	Total Amount Paid by Each Member Agency to 6/30/88
14,130	\$ 3,715,612.96	\$ 341,043.71	\$ 29,640.23	\$ 4,027,016.44	\$ 28,877.03	\$ 10,802.62	\$ 123.67	\$ 4,066,819.76	\$ 207,438.59	\$ 4,274,258.35
6,814	3,782,484.33	341,313.65	24,574.82	4,099,223.16	27,826.95	33,275.49	10.70	4,160,336.30	7,931.07	4,168,267.37
14,515	747,969.46	60,378.50	4,357.46	803,717.50	5,943.44	530.63	1.05	810,192.62	0.00	810,192.62
4,438	81,569.15	5,042.36	822.75	85,788.76	838.40	1,000.00	0.00	87,627.16	0.00	87,627.16
15,045	3,038,909.92	222,847.97	14,697.54	3,247,060.35	18,356.23	28.80	28.84	3,265,474.22	9,253.62	3,274,727.84
17,631	1,219,731.91	97,332.42	7,727.41	1,309,336.92	7,589.42	3,420.09	43.10	1,320,389.53	67,773.04	1,388,162.57
18,138	12,635,070.40	797,893.50	54,293.53	13,378,670.37	55,319.05	4,930.57	783.52	13,439,703.51	28,905.90	13,468,609.41
10,823	2,005,257.40	103,881.63	5,814.31	2,103,324.72	7,000.19	6,828.33	96.07	2,117,249.31	0.00	2,117,249.31
6,575	3,887,489.10	290,134.75	25,437.21	4,152,186.64	24,099.93	2,601.17	100.46	4,178,988.20	126,369.19	4,305,357.39
14,759	1,884,557.05	190,270.90	16,149.89	2,058,678.06	17,622.95	1,250.00	0.00	2,077,551.01	89,024.26	2,166,575.27
17,682	2,955,862.74	265,633.33	36,544.54	3,184,951.53	20,318.19	4,455.25	45.44	3,209,770.41	208,573.58	3,418,343.99
12,227	3,778,763.69	271,546.09	23,431.64	4,026,878.14	30,222.18	3,003.17	131.84	4,060,235.33	45,244.19	4,105,479.52
16,329	2,199,259.05	(78,905.74)	359.84	2,119,993.47	0.00	0.00	0.00	2,119,993.47	0.00	2,119,993.47
17,566	1,885,016.69	138,783.56	10,643.98	2,013,156.27	17,464.28	15.02	8.94	2,030,644.51	103,875.15	2,134,519.66
18,400	1,329,983.67	106,543.12	9,077.02	1,427,449.77	17,039.01	23,679.97	0.72	1,468,169.47	193,484.23	1,661,653.70
18,358	1,145,876.45	175,102.48	9,024.63	1,311,954.30	12,404.01	5,400.02	58.79	1,329,817.12	3,378.93	1,333,196.05
10,351	2,042,636.90	146,650.69	13,380.39	2,175,907.20	14,472.66	58,800.96	1.36	2,249,182.18	14,527.34	2,263,709.52
15,519	62,522,796.39	-(42,686,012.20)	66,812.67	19,769,971.52	58,111.23	45,429,760.00	2,466.79	65,260,309.54	610,595.45	65,870,904.99
18,139	2,047,778.08	174,080.04	12,752.21	2,209,105.91	10,838.46	5,426.06	131.25	2,225,501.68	47,205.63	2,272,707.31
19,435	1,922,386.63	191,872.47	14,390.88	2,099,868.22	9,156.57	0.00	0.00	2,109,024.79	14,769.25	2,123,794.04
13,873	2,471,216.33	283,208.17	17,969.12	2,736,455.38	13,983.71	2,892.80	1,914.29	2,755,246.18	58,787.21	2,814,033.39
10,285	6,711,849.30	(25,038.07)	22,433.30	6,664,377.93	20,539.69	629,977.08	143.26	7,315,037.96	0.00	7,315,037.96
15,356	1,340,995.65	94,249.94	10,826.04	1,424,419.55	15,063.72	1,011.39	26.31	1,440,520.97	162,554.79	1,603,075.76
9,436	276,950.16	15,727.80	1,141.56	291,536.40	1,596.96	1,500.00	0.00	294,633.36	28,424.47	323,057.83
19,152	\$ 125,629,750.41	(\$38,476,418.93)	\$432,302.97	\$86,721,028.51	\$434,684.26	\$46,230,589.42	\$6,116.40	\$133,392,418.59	\$2,028,115.89	\$135,420,534.48
17,836										

WATER PRODUCTION WITHIN AUTHORITY AGENCIES - FISCAL YEAR 1977-78 TO 1987-88

Table 6

(All Figures in Acre Feet)

Member Agencies	From Local and Authority Supplies										
	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Bueno Colorado M.W.D.	13,263	14,554	15,038	17,565	15,446	14,720	18,351	16,988	17,584	17,928	18,781
Costa Real M.W.D.	10,010	11,135	12,554	13,385	12,749	11,879	12,895	12,880	13,686	14,644	15,146
Del Mar, City of	921	1,096	999	1,075	1,045	1,055	1,235	1,097	1,107	1,456	1,481
De Luz Heights M.W.D.	612	990	1,339	1,757	1,794	1,792	2,531	2,373	2,586	3,186	2,459
Escondido, City of	19,001	20,500	22,113	26,052	22,534	20,269	24,214	23,281	23,712	24,913	24,871
Fallbrook P.U.D.	11,128	11,667	12,174	14,698	12,386	10,156	12,600	11,606	12,270	12,346	11,766
Helix W.D.	32,882	36,256	37,676	41,613	39,284	36,519	41,081	40,579	42,056	42,201	41,863
National City & South Bay I.D.	20,021	21,628	21,519	23,222	23,209	23,252	25,593	26,092	26,854	26,115	25,504
Oceanside, City of	15,851	18,310	19,602	22,408	21,769	19,846	22,583	24,114	24,190	25,164	25,889
Oliventhain M.W.D.	4,358	4,714	5,313	6,437	5,856	6,027	7,741	8,233	9,490	9,739	10,755
Oray W.D.	11,846	11,270	11,852	13,612	12,943	11,952	13,551	13,830	15,126	16,337	17,246
Padre Dam M.W.D.	11,799	12,812	13,718	15,572	14,908	14,102	16,992	17,027	17,966	18,319	18,121
Pendleton Military Res.	-	-	-	-	-	-	-	-	-	-	-
Poway, City of	6,553	6,948	8,240	9,027	7,873	7,547	9,215	9,320	10,061	10,822	11,601
Rainbow M.W.D.	22,529	24,709	26,943	34,111	28,630	25,354	31,374	29,297	29,887	29,822	28,389
Ramona M.W.D.	5,531	6,269	6,583	9,065	8,873	8,679	10,871	9,609	10,307	10,219	9,573
Rincon del Diablo M.W.D.	3,926	4,483	4,789	5,763	5,256	4,374	6,001	6,039	6,383	6,859	7,189
San Diego, City of	-	-	-	-	-	-	-	-	-	-	-
Inside City	155,226	164,934	175,668	191,713	192,626	182,873	203,642	216,289	221,873	228,796	229,334
Outside City (Not in Authority)	6,023	6,866	4,480	6,964	5,657	3,723	6,149	4,492	5,611	5,247	5,264
San Diegoito W.D.	6,452	7,170	7,342	8,056	7,668	7,298	7,670	7,956	7,904	8,300	8,205
San Marcos C.W.D.	5,562	6,559	6,800	8,420	8,233	7,847	9,654	10,090	10,932	11,161	11,385
Santa Fe I.D.	7,254	7,735	10,252	9,368	8,792	7,728	10,617	11,195	11,074	11,266	11,436
Valley Center M.W.D.	26,738	29,417	33,568	44,687	38,358	32,583	42,367	39,435	41,419	43,791	40,224
Yuma M.W.D.	3,335	2,987	2,978	3,891	3,498	2,782	3,335	3,392	3,523	3,710	3,553
Total	400,821	433,009	461,540	528,461	499,387	462,357	540,262	545,214	565,601	582,341	580,035

TABLES

Table 7  
WATER SALES - FISCAL YEARS 1947 TO 1988  
(All Figures Rounded to the Nearest Whole Acre Foot)

Member Agencies	(1)	1947-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	Total
Bueno Colorado M.W.D.	.....	168,942	6,594	9,652	2,753	3,463	5,827	4,473	5,119	11,678	218,501
Costa Real M.W.D.	.....	180,072	13,308	12,749	11,879	12,895	12,829	13,677	14,671	15,157	287,237
Del Mar, City of	.....	13,051	1,076	1,045	1,055	1,235	1,097	1,107	1,456	1,481	22,603
De Luz Heights M.W.D.	.....	3,650	1,627	1,794	1,792	2,531	2,354	2,586	3,186	2,458	21,978
Escondido, City of	.....	166,160	12,880	15,969	8,342	14,624	14,082	14,284	18,320	20,381	285,042
Fallbrook P.U.D.	.....	288,149	14,698	12,363	10,168	12,600	11,600	12,322	13,555	11,622	387,077
Helix W.D.	.....	654,477	24,413	29,377	22,898	24,779	36,507	37,972	39,732	37,267	907,622
National City & South Bay I.D.	.....	365,217	143	315	132	4,863	20,817	16,384	20,514	20,514	428,472
Oceanside, City of	.....	243,116	22,362	21,726	19,821	22,583	24,114	24,190	25,164	25,889	428,965
Oliventhain M.W.D.	.....	42,786	6,413	5,739	7,860	8,233	9,739	9,485	9,739	10,742	106,731
Oray W.D.	.....	174,568	13,629	12,943	11,952	13,542	13,830	15,125	16,337	17,246	289,172
Padre Dam M.W.D.	.....	159,042	15,572	14,908	14,102	16,992	17,027	17,966	18,319	18,121	292,049
Pendleton Military Res.	.....	293	617	715	1,376	1,694	1,542	95	118	6,541	6,541
Poway, City of	.....	107,184	9,269	8,351	6,841	9,005	9,313	9,821	10,724	11,548	182,056
Rainbow M.W.D.	.....	369,320	33,940	28,630	25,426	31,374	29,160	29,211	30,323	28,240	605,624
Ramona M.W.D.	.....	52,920	8,258	8,541	8,092	10,392	8,688	9,723	9,526	9,526	126,083
Rincon del Diablo M.W.D.	.....	134,283	5,763	5,256	4,374	6,001	6,019	6,183	6,858	7,188	182,145
San Diego, City of	.....	3,098,060	119,890	155,743	90,841	114,473	170,344	183,903	197,965	215,460	4,346,659
San Diegoito W.D.	.....	85,561	5,711	4,373	4,009	4,250	3,291	3,227	3,937	4,281	119,210
San Marcos C.W.D.	.....	74,735	8,465	8,154	7,847	9,654	10,135	10,941	11,145	11,380	152,456
Santa Fe I.D.	.....	91,332	6,630	5,278	4,426	5,895	4,488	4,668	5,268	6,019	136,004
Valley Center M.W.D.	.....	313,052	44,046	39,091	32,583	42,247	38,953	41,055	43,511	39,937	633,475
Yuma M.W.D.	.....	32,457	2,054	2,205	1,403	1,331	1,885	1,924	1,911	1,442	46,614
Total Sales to Agencies	.....	6,820,427	377,378	404,317	297,806	369,779	436,201	474,955	503,678	527,775	10,212,316
Total Sales to Others	.....	55,851	658	0	0	0	0	0	0	0	56,509
Total to Authority Storage	.....	334,181	0	14,560	9,100	452	645	13,158	15,849	3,722	391,667
Total to Metropolitan Storage	.....	(298,831)	(2,000)	0	(7,383)	0	0	0	(116)	0	(308,330)
Total from Metropolitan Storage	.....	120,929	0	0	0	0	0	230	0	28,899	150,058
Total from Metropolitan Storage	.....	(116,908)	0	0	0	0	0	(219)	0	(7,555)	(124,682)
Total Flow in Authority System	.....	6,915,649	376,036	418,877	299,523	370,231	436,846	488,124	519,411	552,841	10,377,538
Average Rate of Flow (c.f.s.)	.....	522.2	558.5	411.3	509.4	602.5	656.0	695.7	727.0	727.0	727.0
To Agencies and Others	.....	0.0	20.1	12.6	0.6	0.9	18.2	21.9	5.1	5.1	5.1
To Authority Storage	.....	(2.8)	0.0	(10.2)	0.0	0.0	0.0	(0.2)	0.0	0.0	0.0
To Metropolitan Storage	.....	0.0	0.0	0.0	0.0	0.0	0.3	0.0	39.8	0.0	39.8
From Metropolitan Storage	.....	0.0	0.0	0.0	0.0	0.0	(0.3)	0.0	(10.4)	0.0	(10.4)
Flow in Authority System	.....	519.4	578.6	413.7	510.0	603.4	674.2	717.4	761.5	761.5	761.5

(1) Operation of the First Aqueduct was formally initiated on November 24, 1947. For sales in intervening year, see previous reports.

SAN DIEGO COUNTY WATER AUTHORITY

Table 8  
SALES OF IMPORTED WATER - FISCAL YEAR 1987-88  
(All Figures in Acre Feet except as noted)

Member Agencies	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total 6 Months 1987
Bueno Colorado M.W.D. ....	1,495.7	1,592.2	1,502.0	1,225.6	983.2	974.8	7,773.5
Costa Real M.W.D. ....	1,687.9	1,828.0	1,624.2	1,149.4	858.5	753.1	7,901.1
Del Mar, City of .....	158.7	188.5	117.3	62.4	58.4	60.9	646.2
De Luz Heights M.W.D. ....	347.1	389.8	364.2	195.7	63.4	58.9	1,419.1
Escondido, City of .....	1,842.8	2,721.3	2,582.2	1,005.1	156.2	689.4	8,997.0
Fallbrook P.U.D. ....	1,363.8	1,788.0	1,203.4	809.4	326.0	281.6	5,772.2
Helix W.D. ....	3,717.9	3,784.9	3,460.6	3,136.3	2,485.4	2,504.2	19,089.3
National City & South Bay I.D.	2,503.1	2,560.4	2,255.8	2,389.6	1,010.8	722.4	11,442.1
Oceanside, City of .....	2,677.7	2,791.0	2,511.1	1,950.7	1,472.2	1,465.6	12,868.3
Olivenhain M.W.D. ....	1,211.5	1,298.9	1,112.8	758.6	506.0	456.6	5,344.4
Oray W.D. ....	1,909.2	1,967.1	1,721.1	1,336.2	935.3	913.5	8,782.4
Padre Dam M.W.D. ....	2,159.2	2,190.5	1,874.9	1,438.0	932.6	952.9	9,548.1
Pendleton Military Res. ....	10.9	11.0	11.5	10.6	8.7	7.6	60.3
Poway, City of .....	1,383.3	1,356.1	693.2	1,400.2	617.9	364.2	5,814.9
Rainbow M.W.D. ....	3,428.3	4,246.9	3,525.9	1,957.9	616.6	723.4	14,499.0
Ramona M.W.D. ....	1,235.0	1,353.5	1,227.5	787.9	386.5	349.5	5,339.9
Rincon del Diablo M.W.D. ....	837.5	902.3	821.2	501.6	320.8	305.9	3,689.3
San Diego, City of .....	22,647.6	22,241.8	20,387.7	15,755.3	13,118.0	13,227.4	107,377.8
San Dieguito W.D. ....	512.2	520.5	500.9	449.2	343.0	171.6	2,497.4
San Marcos C.W.D. ....	1,286.5	1,272.9	1,197.5	894.1	536.8	518.0	5,615.8
Santa Fe I.D. ....	815.5	822.5	787.4	568.8	327.3	152.0	3,473.5
Valley Center M.W.D. ....	5,324.3	6,078.5	5,678.1	2,798.1	947.0	1,188.0	22,014.0
Yuima M.W.D. ....	204.2	239.0	217.6	135.6	33.1	46.8	876.3
<b>Total Sales to Agencies .....</b>	<b>58,759.9</b>	<b>62,145.6</b>	<b>55,378.1</b>	<b>40,626.3</b>	<b>27,043.7</b>	<b>26,888.3</b>	<b>270,841.9</b>
Total to Authority Storage ....	472.1	0.0	0.0	500.0	0.0	0.0	972.1
Total from Authority Storage .	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total to Metropolitan Storage .	0.0	0.0	0.0	0.0	0.0	602.8	602.8
Total from Metropolitan Storage	(795.8)	(1,020.5)	(752.1)	(1,788.9)	0.0	0.0	(4,357.3)
<b>Total Flow in Authority System</b>	<b>58,436.2</b>	<b>61,125.1</b>	<b>54,626.0</b>	<b>39,337.4</b>	<b>27,043.7</b>	<b>27,491.1</b>	<b>268,059.5</b>
<b>Total Evaporation Losses from</b> <b>Storage in San Vicente .....</b>	<b>300.3</b>	<b>289.5</b>	<b>253.5</b>	<b>176.8</b>	<b>81.5</b>	<b>56.5</b>	<b>1,158.1</b>
<b>Total Evaporation</b> <b>M.W.D./C.W.A. from</b> <b>Pre-Delivered Storage</b> <b>Program in El Capitan,</b> <b>Henshaw, and Sweetwater</b> <b>Reservoirs .....</b>	<b>111.6</b>	<b>100.0</b>	<b>53.8</b>	<b>32.7</b>	<b>0.0</b>	<b>1.4</b>	<b>299.5</b>
<b>Rate of Flow</b> <b>To Agencies .....</b>	<b>955.6</b>	<b>1,010.7</b>	<b>930.7</b>	<b>660.7</b>	<b>454.5</b>	<b>437.3</b>	<b>742.1</b>
To Authority Storage .....	7.7	0.0	0.0	8.1	0.0	0.0	2.7
From Authority Storage ....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
To Metropolitan Storage ....	0.0	0.0	0.0	0.0	0.0	9.8	1.7
From Metropolitan Storage .	(12.9)	(16.6)	(12.2)	(29.1)	0.0	0.0	(11.9)
In Authority System .....	950.4	994.1	918.5	639.7	454.5	447.1	734.6

TABLES

Table 8  
(Continued)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Total 6 Months 1988	Fiscal Year Total	Fiscal Year C.F.S.
0.0	0.0	0.0	0.0	1,869.7	2,034.6	3,904.3	11,677.8	16.1
698.9	906.6	1,300.0	1,152.7	1,529.0	1,668.6	7,255.8	15,156.9	20.9
74.1	103.9	137.1	143.2	186.2	190.5	835.0	1,481.2	2.0
41.2	103.4	198.2	157.2	239.4	299.9	1,039.3	2,458.4	3.4
1,119.0	1,704.7	1,691.9	1,856.1	2,198.9	2,813.0	11,383.6	20,380.6	28.1
169.1	390.0	1,224.5	1,258.1	1,410.3	1,397.3	5,849.3	11,621.5	16.0
2,325.8	2,616.3	2,749.7	3,668.4	2,783.5	4,034.3	18,178.0	37,267.3	51.3
1,617.5	1,142.0	1,869.1	1,294.7	1,688.1	1,461.0	9,072.4	20,514.5	28.3
1,467.6	1,670.7	2,438.2	1,891.0	2,664.3	2,889.1	13,020.9	25,889.2	35.7
473.2	654.1	895.6	825.8	1,160.7	1,388.5	5,397.9	10,742.3	14.8
934.7	1,062.9	1,431.5	1,326.6	1,735.8	1,971.7	8,463.2	17,245.6	23.8
919.1	1,062.8	1,448.1	1,376.6	1,753.3	2,012.7	8,572.6	18,120.7	25.0
8.0	6.7	6.0	8.0	13.5	15.4	57.6	117.9	0.2
547.7	805.0	863.8	1,006.2	1,159.2	1,350.7	5,732.6	11,547.5	15.9
644.3	1,667.6	2,921.8	2,108.1	2,808.4	3,590.3	13,740.5	28,239.5	38.9
332.7	534.9	726.3	623.4	870.6	1,098.8	4,186.7	9,526.6	13.1
303.4	432.5	610.9	560.9	740.3	851.0	3,499.0	7,188.3	9.9
14,248.9	15,567.0	17,305.6	17,207.4	20,925.1	22,807.9	108,061.9	215,439.7	296.6
109.2	234.4	325.2	253.3	453.1	508.1	1,883.3	4,380.7	6.0
543.8	778.1	1,032.1	925.7	1,210.3	1,274.6	5,764.6	11,380.4	15.7
95.4	264.6	396.7	306.4	659.4	823.0	2,545.5	6,019.0	8.3
901.8	2,078.9	3,235.9	2,445.2	4,226.2	5,035.2	17,923.2	39,937.2	55.0
27.2	68.2	108.6	78.5	111.3	172.0	565.8	1,442.1	2.0
<b>27,602.6</b>	<b>33,855.3</b>	<b>42,916.8</b>	<b>40,473.5</b>	<b>52,396.6</b>	<b>59,688.2</b>	<b>256,933.0</b>	<b>527,774.9</b>	<b>727.0</b>
0.0	0.0	0.0	0.0	2,750.0	0.0	2,750.0	3,722.1	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5,771.2	6,904.8	7,543.7	8,076.3	0.0	0.0	28,296.0	28,898.8	
0.0	0.0	0.0	0.0	(375.3)	(2,822.5)	(3,197.8)	(7,555.1)	
<b>33,373.8</b>	<b>40,760.1</b>	<b>50,460.5</b>	<b>48,549.8</b>	<b>54,771.3</b>	<b>56,865.7</b>	<b>284,781.2</b>	<b>552,840.7</b>	
66.4	105.0	182.0	156.5	224.5	265.1	999.5	2,157.6	
19.6	80.3	270.4	304.7	535.8	552.9	1,763.7	2,063.2	
448.9	588.6	698.0	680.2	852.1	1,003.1	711.7	727.0	
0.0	0.0	0.0	0.0	44.7	0.0	7.6	5.1	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
93.9	120.0	122.7	135.7	0.0	0.0	78.4	39.8	
0.0	0.0	0.0	0.0	(6.1)	(47.4)	(8.9)	(10.4)	
<b>542.8</b>	<b>708.6</b>	<b>820.7</b>	<b>815.9</b>	<b>890.7</b>	<b>955.7</b>	<b>788.8</b>	<b>761.5</b>	

SAN DIEGO COUNTY WATER AUTHORITY

Table 9  
ASSESSED VALUATIONS AND TAX RATES  
Fiscal Years 1945-46 to 1987-88

Fiscal Year	Secured Property	Public Utilities	Unsecured Property	Total	Tax Rate per \$100	
					Secured	Unsecured
1945-46	\$ 212,082,975	\$ 28,253,700	\$ 29,960,130	\$ 270,296,805	0.04	—
1946-47	208,715,150 (1)	29,433,450	30,665,910	268,814,510	0.04	0.04
1947-48	233,579,990	32,740,680	40,977,850	307,298,520 (2)	0.14	0.04
1948-49	254,227,570	37,482,020	47,177,300	338,886,890	0.14	0.14
1949-50	290,351,875	42,429,140	45,743,200	378,524,215	0.10	0.14
1950-51	306,104,930	43,595,730	44,717,740	394,418,400	0.10	0.10
1951-52	344,620,030	48,452,940	50,904,035	443,977,005	0.10	0.10
1952-53	382,948,860	53,208,220	63,996,330	500,153,410	0.12	0.10
1953-54	490,709,350	63,092,050	69,147,150	622,948,550	0.10	0.12
1954-55	546,272,880	69,243,550	79,629,790	695,146,220	0.10	0.10
1955-56	627,062,960	87,485,390	79,936,450	794,484,800	0.09	0.10
1956-57	680,824,400	101,224,260	97,950,800	879,999,460	0.09	0.09
1957-58	761,088,330	111,351,890	128,785,440	1,001,025,660	0.09	0.09
1958-59	865,283,080	128,479,290	128,124,720	1,121,887,090	0.10	0.09
1959-60	979,491,050	145,317,290	134,846,730	1,259,655,070	0.11	0.10
1960-61	1,116,723,830	165,666,720	159,954,740	1,442,345,290	0.11	0.11
1961-62	1,220,810,650	191,276,650	155,149,890	1,567,237,190	0.11	0.11
1962-63	1,272,506,330	201,245,370	154,989,440	1,628,741,140	0.11	0.11
1963-64	1,340,197,170	209,793,780	159,714,930	1,709,705,880	0.11	0.11
1964-65	1,423,375,590	213,352,470	151,686,520	1,788,414,580	0.11	0.11
1965-66	1,511,967,750	212,605,040	155,417,220	1,879,990,010	0.11	0.11
1966-67	1,567,290,460	212,223,550	147,740,730	1,927,254,740	0.11	0.11
1967-68	1,735,209,870	209,136,160	178,641,120	2,122,987,150	0.10	0.11
1968-69	1,876,936,060	208,018,700	197,139,600	2,282,094,360	0.09	0.10
1969-70	2,063,618,582	210,839,100	237,951,409	2,512,409,091	0.09	0.09
1970-71	2,348,151,943	216,378,300	276,932,717	2,841,462,960	0.09	0.09
1971-72	2,755,734,087	231,191,301	306,608,099	3,275,533,487	0.10	0.09
1972-73	3,061,010,163	225,224,650	347,857,938	3,634,092,751	0.11	0.10
1973-74	3,481,734,238	239,346,070	393,300,174	4,114,380,482	0.11	0.11
1974-75	4,075,823,685	249,562,970	450,374,627	4,775,761,282	0.11	0.11
1975-76	4,629,303,071	283,136,410	503,493,823	5,415,933,304	0.11	0.11
1976-77	5,230,851,497	311,553,680	545,425,038	6,087,830,215	0.11	0.11
1977-78	6,121,864,014	376,899,840	607,393,849	7,106,157,703	0.11	0.11
1978-79	6,272,490,327	554,099,470	707,294,537	7,533,884,334	0.06	0.11
1979-80	7,624,459,863	660,454,810	837,758,367	9,122,673,040	0.04	0.06
1980-81	9,163,752,692	731,869,180	483,834,623	10,379,456,495	0.05	0.04
1981-82 (4)	41,739,646,912	3,457,486,860	1,692,548,096	46,889,681,868	0.01	0.0125
1982-83	46,670,563,147	4,136,538,170	1,971,803,569	52,778,924,886	0.00817	0.01
1983-84	50,057,533,413	5,275,693,400	2,190,834,774	57,524,061,587	0.004605	0.00817
1984-85	55,587,979,549	5,666,443,560	2,577,402,391	63,831,825,500	0.007090	0.004605
1985-86	62,444,546,244	6,086,772,100	2,856,824,972	71,388,143,316	0.005310	0.007090
1986-87	70,584,788,216	7,095,945,340	2,952,629,417	80,633,362,973	0.00461	0.005310
1987-88	78,866,134,523	7,466,884,810	3,660,711,360	89,993,730,693	0.004	0.00461

(1) City of Coronado secured assessed valuations not included in this or subsequent tax levies by the Authority, having withdrawn from the Authority prior to 1946-47.  
 (2) City of Coronado not included in this or subsequent total valuation.  
 (3) Gross Tax Levy; Includes State Grant for Business Inventory, Homeowners Exemption, and allocation of the 1% assessment from the County of San Diego.  
 (4) Assessed valuation changed to full market value as determined by County Assessor.

TABLES

Table 9  
(Continued)  
TAX LEVIES AND TAX COLLECTIONS BY FISCAL YEAR  
(Includes in Lieu of Taxes)  
Fiscal Years 1945-46 to 1987-88

Tax Levy (3)	Collection of Current Years' Taxes During Fiscal Year	Percentage of Levy Collected During Fiscal Year	Adjustments to Prior Years' Levies	Collection of Prior Years' Taxes During Fiscal Year	Total Tax Collections	Accumulated Delinquent Taxes	Ratio
							Accumulated Delinquent Taxes to Tax Levy
\$ 96,131	\$ 94,656	98.47	—	—	\$ 94,656	\$ 1,474	1.53
107,808	105,753	98.09	—	1,090	106,844	2,439	2.26
389,591	381,563	97.94	—	1,882	383,445	8,585	2.20
474,520	459,504	96.84	—	5,916	465,420	17,685	3.73
401,112	392,732	97.91	329	13,342	406,074	13,052	3.25
397,970	390,274	98.07	373	8,217	398,492	12,904	3.24
450,405	441,242	97.97	978	7,699	448,941	15,346	3.40
594,603	585,417	98.46	(1,140)	12,567	597,985	10,824	1.82
652,335	640,239	98.15	4,213	9,942	650,181	17,191	2.62
709,678	695,200	97.96	1,295	12,638	707,838	20,326	2.86
803,375	788,734	97.41	(2,099)	12,140	800,874	20,726	2.59
874,774	861,461	98.48	576	13,056	874,517	21,560	2.46
985,006	946,445	96.08	958	12,890	959,335	28,189	2.92
1,178,885	1,157,265	98.17	—	13,347	1,170,613	36,462	3.09
1,436,270	1,408,277	98.05	(5,274)	16,647	1,424,925	42,533	2.97
1,624,733	1,586,169	97.63	(8,720)	21,501	1,607,671	50,874	3.15
1,763,785	1,718,575	97.44	(2,276)	31,477	1,750,053	62,330	3.54
1,816,449	1,775,932	97.77	(3,688)	38,134	1,814,066	61,023	3.37
1,910,019	1,862,973	97.54	(268)	36,825	1,899,799	70,975	3.72
2,000,067	1,948,853	97.44	(6,588)	42,596	1,991,450	73,003	3.66
2,101,023	2,033,032	96.76	2,303	44,784	2,077,816	98,714	4.69
2,154,994	2,090,637	97.01	(7,164)	54,333	2,144,970	101,573	4.73
2,175,276	2,129,596	97.92	(303)	64,473	2,194,470	82,078	3.77
2,110,913	2,103,601	99.65	—	55,253	2,158,854	34,136	1.62
2,182,274	2,149,330	98.49	91,680	24,018	2,204,127	103,963	4.52
2,450,123	2,408,899	98.32	38,500	104,032	2,512,932	79,655	3.25
3,084,869	3,058,713	99.15	27,045	32,926	3,091,639	99,930	3.24
3,790,191	3,743,715	98.77	494	45,314	3,789,029	101,586	2.68
4,004,024	3,941,152	98.43	4,891	43,846	3,984,999	125,502	3.13
4,673,400	4,597,610	98.37	(4,573)	42,611	4,640,222	154,107	2.32
5,336,375	5,223,483	97.88	(17,845)	76,632	5,300,115	172,522	3.23
6,012,954	5,928,085	98.59	34,543	109,718	6,037,803	182,216	3.03
7,111,999	7,083,080	99.59	(6,021)	87,193	7,170,273	117,921	1.66
5,956,033	5,802,438	97.42	—	134,444	5,936,882	137,027	2.30
5,549,222	5,420,190	97.67	(105,757)	137,072	5,557,262	23,275	0.42
7,164,231	7,076,598	97.78	181,346	137,782	7,214,380	154,472	2.16
6,690,619	6,634,619	99.16	73,743	228,215	7,114,393	213,847	3.69
6,588,403	6,460,324	98.06	(47,042)	178,479	6,638,803	205,073	3.11
7,239,670	7,039,608	97.24	176,805	283,045	7,322,653	298,895	4.13
7,181,483	7,092,760	98.76	40,938	158,696	7,251,456	269,860	3.76
6,269,310	6,053,170	96.55	53,304	166,944	6,220,114	372,360	5.94
6,309,666	6,057,897	96.01	95,635	462,995	6,520,892	251,769	3.99

SAN DIEGO COUNTY WATER AUTHORITY

Table 10  
 SAN JACINTO TUNNEL WEST PORTAL  
 CHEMICAL CHARACTERISTICS OF NATURAL COLORADO RIVER WATER  
 Year Ending June 30, 1988  
 Samples Taken at Entrance to San Diego Aqueduct by M.W.D.  
 and Analysis by District Laboratory

Month	Total Hardness as mg/l CaCO <sub>3</sub>	Alkalinity as mg/l CaCO <sub>3</sub> Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					*F	*C
July	266	133	24.5	8.35	79	26
August	268	128	25.0	8.40	81	27
September	265	127	25.0	8.36	72	22
October	263	126	24.5	8.35	73	23
November	267	127	25.5	8.36	72	22
December	270	130	25.5	8.25	61	16
January	270	128	25.5	8.25	50	10
February	273	129	25.0	8.30	55	13
March	273	131	24.5	8.09	57	14
April	280	131	25.0	8.39	66	19
May	277	133	26.0	8.40	64	18
June	277	131	26.0	8.43	73	23

ANALYSIS - YEAR ENDING JUNE 30, 1988  
 (mg/l Except PH, Conductivity, and Temperature)

Constituents	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO <sub>2</sub> )	9.1	10.4	8.8
Calcium	(Ca)	67	71	65
Magnesium	(Mg)	25.2	26.0	24.5
Sodium	(Na)	74	77	72
Potassium	(K)	4.0	4.1	3.8
Carbonate	(CO <sub>3</sub> )	1	1	0
Bicarbonate	(HCO <sub>3</sub> )	154	162	151
Sulfate	(SO <sub>4</sub> )	215	219	208
Chloride	(Cl)	57	61	55
Nitrate	(NO <sub>3</sub> )	0.77	1.05	0.45
Fluoride	(F)	0.31	0.37	0.28
Boron	(B)	0.08	0.1	ND
Total Dissolved Solids		532	545	521
Hardness as CaCO <sub>3</sub> - Total		271	280	263
Alkalinity - Total		130	133	126
Free Carbon Dioxide	(CO <sub>2</sub> )	1.3	2.2	1.0
Hydrogen Ion Concentration	(PH)	8.33	8.43	8.09
Electrical Conductivity EC x 10 <sup>6</sup> @ 25°C		769	841	703
Temperature °C		19	27	10

TABLES

Table 11  
 CHEMICAL CHARACTER OF BLENDED TREATED WATER  
 AT LAKE SKINNER  
 Year Ending June 30, 1988  
 Samples Taken by M.W.D. and Analyzed by District Laboratory

Month	Total Hardness as mg/l CaCO <sub>3</sub>	Alkalinity as mg/l CaCO <sub>3</sub> Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					*F	*C
July	211	106	21.5	8.32	75	24
August	211	111	21.0	8.32	77	25
September	211	110	21.0	8.33	75	24
October	214	109	21.0	8.32	72	22
November	230	115	22.5	8.27	66	19
December	251	122	24.0	8.31	57	14
January	261	126	24.5	8.37	50	10
February	266	127	24.5	8.41	54	12
March	247	121	23.0	8.45	57	14
April	213	111	22.0	8.43	63	17
May	218	113	22.0	8.46	66	19
June	204	109	21.0	8.33	72	22

ANALYSIS - YEAR ENDING JUNE 30, 1988  
 (mg/l Except PH, Conductivity, and Temperature)

Constituents	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO <sub>2</sub> )	10.0	11.3	9.3
Calcium	(Ca)	55	66	49
Magnesium	(Mg)	22.5	24.5	21
Sodium	(Na)	71	75	64
Potassium	(K)	3.8	3.9	3.5
Carbonate	(CO <sub>3</sub> )	2	5	0
Bicarbonate	(HCO <sub>3</sub> )	136	149	127
Sulfate	(SO <sub>4</sub> )	168	212	141
Chloride	(Cl)	68	80	60
Nitrate	(NO <sub>3</sub> )	0.55	1.15	0.1
Fluoride	(F)	0.25	0.29	0.2
Boron	(B)	0.12	0.11	ND
Total Dissolved Solids		469	529	431
Hardness as CaCO <sub>3</sub> - Total		228	266	211
Alkalinity - Total		115	127	106
Free Carbon Dioxide	(CO <sub>2</sub> )	1.0	1.3	0.8
Hydrogen Ion Concentration	(PH)	8.36	8.45	8.27
Electrical Conductivity EC x 10 <sup>6</sup> @ 25°C		769	841	703
Temperature °C		19	25	10

SAN DIEGO COUNTY WATER AUTHORITY

Table 12  
ASSESSED VALUATIONS AND TAX RATES OF THE  
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Fiscal Year	Area (acres)	Assessed Valuation Total (1)	Tax Rate	
			Per \$100 Secured	Per \$100 Unsecured
1929-30	-	\$ 2,439,836,920	0.04	0.00
1930-31	-	2,431,684,250	.03	.04
1931-32	-	2,382,184,445	.03	.03
1932-33	-	1,936,051,180	.04	.03
1933-34	-	1,654,403,890	.04	.04
1934-35	-	1,587,147,565	.10	.04
1935-36	-	1,783,531,020	.20	.10
1936-37	-	1,789,160,685	.37	.20
1937-38	-	1,827,765,725	.40	.37
1938-39	-	1,896,966,235	.40	.40
1939-40	-	1,910,152,190	.42	.40
1940-41	389,588	1,841,248,450	.49	.42
1941-42	399,875	1,900,599,934	.48	.49
1942-43	400,614	2,001,924,735	.48	.48
1943-44	401,190	2,005,496,430	.48	.48
1944-45	401,536	2,109,192,795	.48	.48
1945-46	402,779	2,159,731,425	.50	.48
1946-47	501,425	2,413,186,570	.48	.50
1947-48	546,573	3,443,212,822 (2)	.35	.48
1948-49	578,368	3,883,081,225	.34	.35
1949-50	585,184	4,181,812,855	.34	.34
1950-51	721,850	4,281,519,725	.31	.34
1951-52	995,130	4,674,664,040	.30	.31
1952-53	1,120,448	5,372,498,515	.28	.30
1953-54	1,368,038	6,015,691,980	.25	.28
1954-55	1,793,651	6,548,392,114	.23	.25
1955-56	1,876,256	8,514,868,335	.21	.23
1956-57	1,932,205	9,674,000,560	.19	.21
1957-58	2,046,189	11,235,906,510	.18	.19
1958-59	2,128,333	12,070,838,070	.18	.18
1959-60	2,171,290	12,714,205,470	.17	.18
1960-61	2,544,960	13,737,971,925	.16	.17
1961-62	2,647,014	14,803,202,587	.15	.16
1962-63	2,797,946	15,699,681,030	.14	.15
1963-64	2,825,306	17,261,412,395	.14	.14
1964-65	2,882,144	17,757,246,740	.14	.14
1965-66	2,890,266	19,143,157,788	.14	.14
1966-67	2,901,421	20,979,150,165	.14	.14
1967-68	3,061,885	22,732,157,500	.14	.14
1968-69	3,067,896	24,016,568,274	.16	.14
1969-70	3,072,058	25,572,510,561	.17	.16
1970-71	3,075,616	27,605,064,302	.17	.17
1971-72	3,093,303	29,023,413,462	.17	.17
1972-73	3,126,803	31,001,520,641	.15	.17
1973-74	3,127,680	32,838,476,378	.14	.15
1974-75	3,129,664	35,941,961,265	.14	.14
1975-76	3,132,012	39,585,365,754	.13	.14
1976-77	3,132,800	45,695,542,697	.12	.13
1977-78	3,267,533	51,268,796,300	.12	.12
1978-79	3,268,337	53,571,470,118	.10	.12
1979-80	3,270,880	64,119,383,253	.09	.10
1980-81	3,272,679	69,390,300,019	.079	.09
1981-82	3,273,339	114,726,854,882 (3)	.0198%(3)	.0198%(3)
1982-83	3,277,011	353,335,259,307	.0166%	.0198%
1983-84	3,280,294	379,788,761,242	.0237%	.0166%
1984-85	3,280,954	419,859,047,899	.0156%	.0237%
1985-86	3,282,745	458,782,059,816	.0164%	.0156%
1986-87	3,286,400	505,419,663,679	.0148%	.0164%
1987-88	3,287,309	564,692,806,207	.0112%	.0148%
1988-89	-	596,900,358,958	.0110%	.0112%

(1) Includes secured, unsecured, and public utility valuations.  
 (2) First year in which Authority assessed valuation was included in District's assessed valuation.  
 (3) Effective FY 1981-82, assessed valuation reported at 100% of full value, and tax rates levied in percentage of full assessed value.

TABLES

Table 13  
METROPOLITAN WATER DISTRICT ANNEXATION CHARGES  
AND BALANCES ON AUTHORITY AREAS

Member Agencies	Date of Annexation	Amount of Annexation Charge	Remaining Balance 6-30-88
<b>Annexation Charges Outstanding</b>			
Del Mar, City of	11-23-62	\$ 611,250	\$ 101,778
De Luz M.W.D.	6-28-67	2,002,000	3,299,662*
No. 1 Annexation of 1969	10-15-69	312,000	585,589*
Fallbrook P.U.D.			
No. 2 Annexation of 1958	11-24-58	50,400	1,670
Fallbrook Community Air Park	12-22-69	59,800	93,161*
Helix W.D.			
Helix-Watson Ranch Annexation	2-20-59	8,730	560
Helix-Sunny Slope Hts. Annexation	9-17-59	38,250	2,530
Olivenhain M.W.D.	7-25-60	83,880	7,121
No. 1 Annexation of 1965	2-11-65	512,520	136,465
No. 4 Annexation of 1967	11-13-67	74,000	56,689
Otay W.D.	10-26-56	273,000	0
No. 3 Annexation of 1960	10-20-60	95,100	9,418
Padre Dam M.W.D. (not including Lakeside I.D.)			
(Formerly Rio San Diego M.W.D.)	6-7-56	373,980	0
No. 2 Annexation of 1959	11-6-59	109,110	7,234
No. 3 Annexation of 1960	10-17-60	289,890	28,873
No. 4 Annexation of 1970	8-3-70	164,000	108,754
Poway M.W.D.			
No. 1 Annexation of 1959	9-21-59	27,150	1,800
Rainbow M.W.D.			
No. 1 Annexation of 1959	5-12-59	24,300	1,596
No. 3 Annexation of 1967	12-6-67	1,728,000	3,330,740*
No. 5 Annexation of 1973	11-22-73	13,200	10,336
Ramona M.W.D.	8-27-57	339,000	0
No. 1 Annexation of 1959	5-29-59	42,330	2,818
No. 2 Annexation of 1961	9-22-61	15,480	2,049
No. 3 Annexation of 1963	9-20-63	10,560	2,103
No. 4 Annexation of 1967	11-27-67	480,600	511,317
No. 5 Annexation of 1972	5-17-72	732,000	610,361
Rincon del Diablo M.W.D.			
No. 4 Annexation of 1972	11-2-72	19,200	26,557*
San Diego W.D.			
No. 1 Annexation of 1959	9-15-59	71,820	4,648
No. 2 Annexation of 1972	12-8-72	107,000	150,858*
Valley Center M.W.D.	5-9-55	205,680	0
No. 1 Annexation of 1960	12-12-60	23,700	2,364
No. 2 Annexation of 1967	11-29-67	22,000	26,563
No. 3 Annexation of 1967	11-30-67	502,000	611,706
Yuima M.W.D.	12-16-63	749,490	149,828
No. 1 Annexation of 1967	11-21-67	72,200	43,717
No. 2 Annexation of 1969	11-24-69	14,400	12,235
Pendleton Military Res.-Nuclear			
Generating Plant	12-16-77	2,405,229**	1,942,733
<b>Total</b>		<b>\$16,077,099</b>	<b>\$11,883,883</b>
Annexation charges received from other annexed areas not listed above having no remaining balance		\$22,715,328	

\*Annual interest charge on outstanding balance is greater than tax levy based on maximum MWD tax rate of .1875% of assessed valuation (formerly 75¢/\$100 of A.V.).

\*\*Principal only.

SAN DIEGO COUNTY WATER AUTHORITY

Table 14  
WATER SALES BY METROPOLITAN WATER DISTRICT  
Fiscal Years 1941-42 to 1987-88

Year	To Member Municipalities						Total
	Natural Water		Treated Water		Total to Agencies	To Others	
	Acre Feet	Percent	Acre Feet	Percent	Acre Feet	Acre Feet	
1941-42	0	0	9,372.6	100	9,372.6	70.7	9,443.3
1942-43	0	0	14,457.8	100	14,457.8	2,626.4	17,084.2
1943-44	0	0	15,874.9	100	15,874.9	3,301.8	19,176.7
1944-45	0	0	30,591.3	100	30,591.3	1,715.7	32,307.0
1945-46	0	0	46,685.8	100	46,685.8	1,264.2	47,950.0
1946-47	0	0	59,861.8	100	59,861.8	524.0	60,385.8
1947-48	41,093.5	36	71,995.4	64	113,088.9	116.8	113,255.7
1948-49	71,642.6	49	73,237.1	51	144,879.7	128.4	145,008.1
1949-50	69,308.0	49	72,936.0	51	142,244.0	23,171.6	165,415.6
1950-51	75,000.9	54	63,493.1	46	138,494.0	26,978.6	165,472.6
1951-52	66,674.3	44	84,616.1	56	151,290.4	42,464.2	193,754.6
1952-53	30,845.3	24	99,589.6	76	130,434.9	31,682.4	162,117.3
1953-54	120,773.0	51	115,550.6	49	236,323.6	7,820.7	244,144.3
1954-55	192,544.7	59	134,923.3	41	327,468.0	58,184.5	385,652.5
1955-56	190,337.2	53	169,506.4	47	359,843.6	45,562.9	405,406.5
1956-57	286,059.1	60	191,110.7	40	477,169.8	66,074.1	543,243.9
1957-58	266,024.1	57	197,900.0	43	463,955.1	75,612.8	539,567.9
1958-59	244,354.2	46	282,248.1	54	526,602.3	74,107.1	600,709.4
1959-60	425,019.0	58	304,874.8	42	729,893.8	3,523.2	733,417.0
1960-61	594,521.1	64	335,207.2	36	929,728.3	4,099.4	933,827.7
1961-62	608,811.0	66	312,975.9	34	921,786.9	3,676.9	925,463.8
1962-63	668,881.8	66	348,092.6	34	1,016,974.4	3,677.0	1,020,651.4
1963-64	671,853.4	63	388,553.9	37	1,060,407.3	3,776.7	1,064,184.0
1964-65	645,577.3	58	471,042.0	42	1,116,619.3	5,035.3	1,121,654.6
1965-66	550,630.8	52	503,424.9	48	1,054,055.7	4,821.8	1,058,877.5
1966-67	523,141.2	50	531,659.7	50	1,054,800.9	4,513.0	1,059,313.9
1967-68	514,248.1	48	557,730.9	52	1,071,979.0	4,934.9	1,076,913.9
1968-69	455,174.3	43	599,237.7	57	1,054,412.0	2,232.4	1,056,644.4
1969-70	482,256.9	41	692,846.4	59	1,165,103.3	650.0	1,165,753.3
1970-71	520,983.9	46	612,511.6	54	1,133,495.5	150.3	1,133,645.8
1971-72	590,336.9	47	656,635.9	53	1,246,992.8	549.6	1,247,542.4
1972-73	569,290.7	48	606,120.4	52	1,175,411.1	4.3	1,175,415.4
1973-74*	655,058.0	52	593,180.0	48	1,248,238.0	955.0	1,249,193.0
1974-75*	721,970.0	54	607,013.0	46	1,328,983.0	653.0	1,329,636.0
1975-76*	735,100.0	53	653,154.0	47	1,388,254.0	994.0	1,389,248.0
1976-77*	560,124.0	40	829,773.0	60	1,389,897.0	569.0	1,390,466.0
1977-78*	508,036.0	40	757,270.0	60	1,265,306.0	22,019.0	1,287,325.0
1978-79*	434,455.0	35	777,173.0	65	1,211,628.0	24,256.0	1,235,884.0
1979-80	438,414.0	34	843,800.0	66	1,282,214.0	2,620.0	1,284,834.0
1980-81	487,833.0	33	975,177.0	67	1,463,010.0	588.0	1,463,598.0
1981-82	562,650.0	37	940,660.0	63	1,503,310.0	989.0	1,504,299.0
1982-83	314,190.0	26	912,172.0	74	1,226,362.0	207.0	1,226,569.0
1983-84	364,608.5	26	1,062,123.5	74	1,426,732.0	1,210.0	1,427,942.0
1984-85	455,061.0	29	1,119,443.0	71	1,574,806.0 **	934.0	1,575,740.0
1985-86	500,955.0	30	1,143,826.0	70	1,646,851.0 **	346.0	1,647,197.0
1986-87	568,812.9	31	1,252,783.6	69	1,825,921.5 **	1,508.0	1,827,429.5
1987-88	598,722.0	31	1,322,484.0	69	1,926,702.0 **	675.0	1,927,377.0

\*Revised

\*\*Includes deliveries of reclaimed water to Las Virgenes, Coastal MWD, Long Beach, and MWD of Orange Co.

TABLES

Table 15  
WATER PRODUCTION - METROPOLITAN WATER DISTRICT CONSTITUENT AREAS  
Figures Furnished by Metropolitan Water District

M.W.D. Member Agencies	1986-1987 Fiscal Year			1987-1988 Fiscal Year			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Local Water Supply	M.W.D. Water Supply	Total Water Use	Local Water Supply	M.W.D. Water Supply	Total Water Use											
	(2)+(3)	(5)+(6)	(7)-(14)	(8)-(14)	(9)-(13)	(10)-(13)											
Anaheim	51,902	20,693	72,595	43,839	25,212	69,051	(4.88)	4,519	21.84								
Beverly Hills	0	14,791	14,791	0	14,506	14,506	(1.93)	(285)	(1.93)								
Butte	614	23,108	23,722	802	22,872	23,674	(0.20)	(236)	(1.02)								
Calleguas M.W.D.	29,626	95,547	125,173	26,549	96,324	122,873	(2.30)	(1.84)	0.81								
Central Basin M.W.D.	116,629	147,508	264,137	127,862	134,901	262,763	(1.37)	(12,607)	(8.55)								
Chino Basin M.W.D.	165,798	33,958	199,756	156,049	36,025	192,074	(7.68)	2,067	6.09								
Coastal M.W.D.	4,671	45,046	49,717	5,907	42,860	48,767	(1.91)	(2,186)	(4.85)								
Compton	6,229	4,299	10,528	6,690	3,942	10,632	104	(357)	(8.30)								
Eastern M.W.D.	84,646	30,775	115,421	87,927	31,877	119,804	8,383	5,102	16.58								
Foothill M.W.D.	6,419	10,672	17,091	6,284	10,461	16,745	(346)	(211)	(1.98)								
Fullerton	21,095	13,830	34,925	17,310	16,362	33,672	(1,253)	2,532	18.31								
Glendale	9,379	21,996	31,375	4,274	26,812	31,086	(289)	1,975	21.89								
Las Virgenes	2,071	17,889	19,960	3,113	19,564	20,677	6.19	1,975	11.23								
Long Beach	30,477	48,560	79,037	29,975	48,783	78,758	(279)	223	0.46								
Los Angeles	580,672	125,176	705,848	538,792	148,262	687,054	(18,794)	23,086	18.44								
M.W.D. of Orange County	162,000	239,076	401,076	150,701	274,955	425,656	24,580	35,879	15.01								
Pasadena	16,401	23,006	39,407	13,164	25,074	38,238	(1,169)	2,068	8.99								
San Diego C.W.A.	93,978	520,892	614,870	53,896	529,930	583,826	(31,044)	9,038	1.74								
San Fernando	3,224	854	4,078	2,136	2,006	4,142	64	1,152	134.89								
San Marino	12,205	1,037	13,242	12,931	599	13,530	288	(438)	(42.24)								
Santa Ana	33,999	15,021	49,020	33,896	15,832	49,728	708	811	5.40								
Santa Monica	7,478	11,886	19,364	7,128	11,015	18,143	(1,221)	(6.31)	(7.33)								
Three Valleys M.W.D.	62,294	58,378	120,672	57,206	66,000	123,206	2,534	7,622	13.06								
Torrance	8,823	20,570	29,393	8,843	20,334	29,177	(416)	(436)	(2.12)								
Upper San Gabriel Valley M.W.D.	154,030	35,432	189,462	141,102	50,889	191,991	2,529	15,457	43.62								
West Basin M.W.D.	7,751	185,713	193,464	3,256	191,936	195,192	1,728	6,223	3.35								
Western M.W.D. of Riverside Co.	183,542	60,510	244,052	181,386	55,569	236,955	(7,097)	(4,941)	(8.17)								
Totals	1,835,953	1,825,923	3,661,876	1,719,218	1,926,702	3,645,920	(35,956)	100,779	5.52								

**SAN DIEGO COUNTY WATER AUTHORITY**  
Financial Statements and Schedule  
June 30, 1988 and 1987  
(With Independent Auditor's Report)

## SAN DIEGO COUNTY WATER AUTHORITY

## Balance Sheet

(Dollar amounts in thousands)

June 30, 1988 and 1987

The Board of Directors  
San Diego County Water Authority

I have examined the balance sheet of the San Diego County Water Authority as of June 30, 1988 and 1987 and the related statements of earnings and changes in equity, and cash flows for the years then ended. My examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as I considered necessary in the circumstances.

In my opinion, the June 30, 1988 and 1987 financial statements referred to above present fairly the financial position of the San Diego County Water Authority at June 30, 1988 and 1987 and the results of its operations and its cash flows for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.



Lois A. Brozey, CPA

San Diego, California

September 2, 1988

	<u>1988</u>	<u>1987</u>
<u>Assets</u>		
<u>Current assets</u>		
Cash and certificates of deposit (note 2)	\$ 24,206	\$116,575
Accounts and taxes receivable	13,799	13,884
Inventory of water in storage	6,291	6,956
Other current assets	<u>316</u>	<u>805</u>
Total current assets	44,612	138,220
<u>Property, plant and equipment</u>		
Property, plant and equipment	156,549	156,076
Construction work in progress (note 3)	8,440	3,020
	164,989	159,096
Less accumulated depreciation	<u>27,515</u>	<u>25,617</u>
	137,474	133,479
<u>Other assets (notes 4 and 7)</u>		
	<u>2,192</u>	<u>2,910</u>
Total assets	<u>184,278</u>	<u>274,609</u>
<u>Liabilities and Equity</u>		
<u>Current liabilities</u>		
Current portion of long-term debt	6,600	97,999
Accounts payable	24,110	24,776
Other current liabilities	<u>1,551</u>	<u>1,586</u>
Total current liabilities	32,261	124,361
<u>Long-term debt (note 4)</u>	38,610	45,210
<u>Other liabilities (note 7)</u>	984	774
<u>Equity</u>		
Contributions in aid of construction	2,141	2,014
Retained earnings	<u>110,282</u>	<u>102,250</u>
	112,423	104,264
Total liabilities and equity	<u>\$184,278</u>	<u>\$274,609</u>

See accompanying notes to financial statements

## SAN DIEGO COUNTY WATER AUTHORITY

Statement of Earnings and  
Changes in Equity

(Dollar amounts in thousands)

Years ended June 30, 1988 and 1987

	1988	1987
<u>Operating revenue</u>		
Water sales	\$109,529	\$102,007
Cost of water sold	<u>101,762</u>	<u>95,937</u>
Margin from water sales	7,767	6,070
Net revenues - hydroelectric sales	<u>227</u>	<u>352</u>
Total operating revenue	<u>7,994</u>	<u>6,422</u>
<u>Operating expenses</u>		
Water treatment	146	113
Systems operations	409	348
Maintenance of structures and plant	873	829
Automotive and shop expense	56	71
Administrative and general salaries	1,100	878
General expense and supplies	1,249	735
Depreciation	<u>1,931</u>	<u>1,930</u>
Total operating expenses	<u>5,764</u>	<u>4,904</u>
Earnings from operations	2,230	1,518
<u>Nonoperating income (expense)</u>		
Property taxes	3,871	4,006
In-lieu fees	2,470	2,661
In-lieu settlement (note 5)	-	(4,500)
Annexation fees	-	984
Interest expense, net of interest capitalized of \$1,242 in 1988 and \$4,562 in 1987	<u>(2,125)</u>	<u>(2,394)</u>
Interest income, net of interest capitalized of \$595 in 1988 and \$5,869 in 1987	1,586	1,571
Other	<u>-</u>	<u>(87)</u>
Net earnings	8,032	3,759
Retained earnings - beginning of period	102,250	98,697
Transfers	<u>-</u>	<u>(206)</u>
Retained earnings - end of period	<u>\$110,282</u>	<u>\$102,250</u>

See accompanying notes to financial statements

## SAN DIEGO COUNTY WATER AUTHORITY

## Statement of Cash Flows

(Dollar amounts in thousands)

Years ended June 30, 1988 and 1987

	1988	1987
<u>Cash flows from operating activities</u>		
Cash received from water sales	\$109,728	\$100,744
Cash paid for water purchases	(101,835)	(98,595)
Other operating expense	(3,708)	(1,723)
Tax revenues and fees	6,454	6,580
In-lieu settlement	-	(4,500)
Interest income	2,073	3,086
Interest expense	<u>(2,179)</u>	<u>(2,430)</u>
Net cash provided by operating activities	<u>10,533</u>	<u>3,162</u>
<u>Cash flows from financing activities</u>		
Contributions from member agencies	127	206
Repayment of long-term debt	<u>(97,802)</u>	<u>(4,688)</u>
Net cash used in financing activities	<u>(97,675)</u>	<u>(4,482)</u>
<u>Cash flows from investing activities</u>		
Purchase of property plant and equipment	<u>(5,227)</u>	<u>(214)</u>
Net decrease in cash	<u>\$ (92,369)</u>	<u>\$ (1,534)</u>
<u>Reconciliation of net earnings to net cash provided by operating activities</u>		
Net earnings	\$ 8,032	\$ 3,759
Depreciation expense	1,931	1,930
Amortization	32	34
Decrease (increase) in current assets		
Receivables	85	(1,702)
Interest receivable	487	1,516
Inventories	667	(2,926)
Increase (decrease) in current liabilities		
Accounts payable	(666)	271
Accrued expenses	<u>(35)</u>	<u>280</u>
Net cash provided by operating activities	<u>\$ 10,533</u>	<u>\$ 3,162</u>

See accompanying notes to financial statements

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(1) Reporting Entity and Summary of Significant Accounting Policies

(a) Reporting Entity

The San Diego County Water Authority (the Authority) was organized on June 9, 1944 under the County Water Authority Act (the Act). The Authority's primary purpose is to provide a supplemental supply of imported water to its member agencies for domestic, municipal and agricultural uses. Historically, the Authority, as a member of the Metropolitan Water District of Southern California (MWD), has purchased from MWD all the water it has needed to meet the demands of member agencies. There are 24 member agencies of the Authority consisting of six cities, three water districts, two irrigation districts, ten municipal water districts, one public utility district, one federal agency and one county water district. Each member agency is represented on the Authority's Board of Directors by at least one person. In addition, each member agency is entitled to one additional representative for each full five percent of total assessed valuation contained within its boundaries.

(b) Principals of Presentation

The accompanying financial statements reflect the combined balances of the various accounts (funds) of the Authority using the accrual basis of accounting. The Authority operates as an enterprise fund although three funds are used for its internal accounting system, a capital outlay fund, a debt servicing fund and an operating fund.

(c) Taxing Authority

The Authority is expressly empowered under the Act to levy taxes on all taxable property within its boundaries for the purpose of carrying on its operations and paying its obligations subject to certain limitations in its Act, the Revenue and Taxation Code, and the California Constitution. The Authority levies taxes to meet its general obligation bond debt servicing and its portion of the payment obligation under its contract with the U.S. Government.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(1) Reporting entity and Summary of Significant Accounting Policies

(d) Inventories of Water in Storage

Inventories of water in storage are stated at cost using the first-in, first-out method.

(e) Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Depreciation is computed on the straight line method over the estimated lives of the assets, which range from 100 years for pipelines to 5 years for automobiles and 1 - 4 years for other equipment.

(f) Contributions in Aid of Construction

Amounts received from member agencies for construction of service connections or other facilities are shown in the accompanying balance sheets as an equity account. Contributed service connections or other facilities are recorded as Authority assets and are depreciated in accordance with established policy for similar capital assets.

(g) Capitalized Interest

The Authority capitalizes interest expense associated with financing for self-constructed assets. This occurs during the time period for construction and is viewed as a financing cost associated with the acquisition of the assets. If the proceeds from tax-exempt borrowings produce interest income during the construction period, the result is viewed as cost recovery and this income is recorded as a reduction of financing costs for self-constructed assets.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(2) Cash and Certificates of Deposit

Cash and certificates of deposit are detailed:

	<u>1988</u>	<u>1987</u>
Cash in checking and savings, insured by the Federal Deposit Insurance Corporation	\$ 32	\$ 53
Certificates of deposit, uncollateralized	22,768	21,060
Bank of America trust fund	<u>1,406</u>	<u>95,462</u>
	<u>\$ 24,206</u>	<u>\$116,575</u>

Although the Authority's checking and savings accounts are protected by federal deposit insurance, this system is inadequate for larger deposits such as certificates of deposit acquired from various financial institutions. Public agencies such as the Authority must rely on pooled collateral arrangements to limit risk. State statutes determine how these pools function.

On behalf of the public agencies banking with it, each financial institution must maintain a pool of assets pledged as security for the entire group's deposits at that institution. The pooled security market value must equal or exceed 110% of the group's deposits at all times. Since the collateral is not specifically assigned to individual depositors, the Authority's certificates of deposit are considered uncollateralized.

A loan agreement requires that the Authority maintain a contingency reserve balance for the life of the loan. These restricted funds are held in trust by Bank of America. The trust agreement determines the minimum funding level. A minimum restriction of \$1.3 million and \$10.6 million existed at June 30, 1988 and 1987. This restriction requirement decreases as the debt level is reduced but cannot decrease below \$800 thousand until the final retirement.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(3) Construction Work in Progress

The Authority incurs certain costs which are identified as work in progress until such time as the asset is placed in service. Construction work in progress is detailed:

	<u>1988</u>	<u>1987</u>
Pamo Reservoir Project	\$4,137	\$2,544
Administrative office building	2,695	-
Other waterworks projects	<u>1,608</u>	<u>476</u>
	<u>\$8,440</u>	<u>\$3,020</u>

During October 1985, the Authority applied for a permit to construct the Pamo Reservoir Project. The issuance of this permit has been delayed due to various environmental and technical obstacles. On August 16, 1988 the Authority requested the U.S. Army Corps of Engineers to suspend the application for the permit. The project is being held in abeyance pending completion of a county wide water storage plan. The viability of the project depends upon future events and circumstances.

The Authority acquired an office building at 3211 Fifth Avenue, San Diego, California which will become the new administrative offices of the Authority. Work in progress has been charged for the \$2,651 thousand purchase price plus modification costs to date.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(4) Long-Term Debt

	<u>Interest rate</u>	<u>1988</u>	<u>1987</u>
General obligation bonds:			
Waterworks bonds, 1957, maturing February 1, 1989-1994	1 1/2-6%	\$ 10,405	\$ 12,220
Waterworks bonds, 1966, maturing October 1, 1988-2004	4.5%-5.5%	19,310	20,125
Total general obligation bonds		<u>29,715</u>	<u>32,345</u>
U.S. Government contract maturing 1988-1995, second pipeline:			
Authority's share	2.6%	1,163	1,335
Metropolitan Water District's share	2.6%	1,332	1,529
Total U.S. Government contract		<u>2,495</u>	<u>2,864</u>
Note payable to bank, maturing June 25, 1988	7.1%	-	2,000
Contract note payable, maturing May 1, 1988-1990	9.25%-10%	5,000	6,000
Contract notes payable, maturing November 1, 1988-1999	Variable	8,000	100,000
Total long-term debt		45,210	143,209
Less current installments of long-term debt		<u>6,600</u>	<u>97,999</u>
Long-term debt, excluding current installments		<u>\$ 38,610</u>	<u>\$ 45,210</u>

The Metropolitan Water District's share of U.S. Government contract, \$1,332 thousand and \$1,529 thousand at June 30, 1988 and 1987, is also recorded as due from Metropolitan Water District. Allocations of the current and long-term portions of this receivable have been made. An amount of \$197 thousand at 1988 and 1987 is included in current assets.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(4) Long-Term Debt (continued)

Maturities of long-term debt are summarized:

<u>June 30,</u>	
1989	\$ 6,600
1990	5,719
1991	3,835
1992	4,039
1993	4,150
1994-1995	4,372
1996-2000	10,330
2001-2004	<u>6,165</u>
	<u>\$45,210</u>

(5) In-lieu Tax Settlement

Member agencies of the Authority may elect to pay amounts from other sources instead of the tax levy. The City of San Diego has made this in-lieu election each year since 1969.

The Authority and the City reviewed the legal restrictions and computational practices for determining the amount of these payments. As a result of this review, it was determined that excess payments had been made by the City since the adoption of California Constitution Article XIII A, July 1, 1978 - June 30, 1987. The agencies agreed to a settlement which retroactively revised the computation for the prior years.

The terms of the settlement required the Authority to reimburse the City \$4.5 million. This payment is included in operations for the fiscal year ended June 30, 1987.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(6) Defined Benefit Pension Plan

(a) Plan Description

The Authority is a member of the California Public Employees' Retirement System (PERS), an agent multiple-employer pension system, which provides a contributory defined benefit plan for all permanent employees of the Authority. Benefits fully vest on reaching five years of service. Employees who retire at or after age 60 with five years of credited service are entitled to a retirement benefit payable monthly for life. An employee's monthly service benefit is determined by computing the product: years of credited service multiplied by two percent multiplied by final-average monthly compensation. Final-average monthly compensation is the employee's average monthly salary during the last year of credited service, or the last three years whichever is greater. Vested employees may retire at or after age 50 and receive reduced retirement benefits. PERS also provides death and disability benefits. These benefit provisions and all other requirements are established by state statute. On behalf of its employees, the Authority pays the employees' required contribution. This amount is based upon a payroll contribution rate of 7%. The Authority is required to contribute the remaining amounts necessary to fund PERS, using the actuarial basis specified by statute.

(b) Funding Status and Progress

The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases and step-rate benefits, estimated to be payable in the future as a result of employee service to date. The measure is intended (1) to help users assess the funding status of PERS on a going-concern basis, (2) to assess progress made in accumulating sufficient assets to pay benefits when due, and (3) to make comparisons among employers. The measure is the actuarial present value of credited projected benefits. It is independent of the funding method used to determine contributions to PERS.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(6) Defined Benefit Pension Plan

(b) Funding Status and Progress (continued)

The pension benefit obligation was computed as part of an actuarial valuation performed as of June 30, 1987 but it incorporates all PERS amendments adopted through June 30, 1988. Significant actuarial assumptions used in the valuation include (1) a rate of return on the investment of present and future assets of 8.5% a year compounded annually, (2) projected salary increases attributable to inflation of 5% a year compounded annually, (3) additional projected salary increases of 2% a year, attributable to seniority/merit and (4) no postretirement benefit increases.

The total unfunded pension benefit obligation applicable to the Authority's employees was \$1,184 thousand at June 30, 1987 detailed:

Retirees and beneficiaries	
Currently receiving benefits and terminated employees not yet receiving benefits	\$1,936
Current employees	
Accumulated employee contributions including allocated investment earnings	1,317
Employer-financed vested	2,678
Employer-financed nonvested	65
Total pension benefit obligation	5,996
Net assets available for benefits, at cost (market value is \$6,024)	4,812
Unfunded pension benefit obligation	\$1,184

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

(6) Defined Benefit Pension Plan

(c) Actuarially Determined Contribution Requirements and Contributions Made

PERS uses the entry-age normal method which is a projected benefit cost method. This method takes into account those benefits that are expected to be earned in the future as well as those already accrued. According to this cost method, the normal cost for an employee is the level amount which would fund the projected benefit if it were paid annually from date of employment until retirement. PERS uses a modification of the entry-age method in which the Authority's total normal cost is expressed as a level percentage of payroll. This same method is used to amortize any unfunded actuarial liabilities. The amortization period of the unfunded actuarial liability ends by the year 2000.

The significant actuarial assumptions used to compute the actuarially determined contribution requirement are the same as those used to compute the pension benefit obligation, as described in (b). The total pension cost was \$349 thousand in 1988 and \$340 thousand in 1987 based on payroll contribution rates of 14.258% and 16.445%. Of these rates, 7.045% and 8.745% are attributable to amortizing the unfunded actuarial liability.

(d) Trend Information

Trend information gives an indication of the progress made in accumulating sufficient assets to pay benefits when due. Systemwide ten-year trend information may be found in the California Public Employees Retirement System Annual Reports. For the year ended June 30, 1987, net available assets were sufficient to fund 80.3% of the pension benefit obligation. The unfunded pension benefit obligation represented 290% of the annual June 30, 1987 payroll for employees covered by PERS. The Authority's contributions to PERS, all made in accordance with actuarially determined requirements, were 14.258%, 16.445%, and 18.822% of annual covered payroll for the years ended June 30, 1988, 1987 and 1986.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(7) Deferred Compensation Plan

For the benefit of its employees, the Authority has adopted and administers a deferred compensation plan in accordance with Section 457 of the Internal Revenue Code. Generally, all eligible employees may defer receipt of a portion of their salary until future years. Once deferred, the compensation is not available to employees until termination, retirement, death or unforeseeable emergency and the employees' liability for income taxes is similarly deferred until the funds are withdrawn.

All amounts of compensation deferred under the plan, all assets purchased with these amounts and all income attributable to these amounts or assets (until paid or made available to the employee or other beneficiary) are solely the property of the Authority, subject to the claims of the Authority's general creditors. Participant's rights to deferred amounts under the plan are equal to those of the general creditors of the Authority. It is the opinion of the Authority's General Counsel that the Authority has no liability for losses under the plan but does have the duty of care that would be required of an ordinary prudent investor. The Authority believes that it is highly unlikely that it will use the assets to satisfy the claims of general creditors in the future.

Deferred amounts under the plan are invested by the Authority and are principally invested in time deposits. At June 30, 1988 and 1987 such assets totalled \$984 thousand and \$774 thousand. The assets and corresponding liabilities are included on the balance sheet in other assets and other liabilities.

(8) Commitments and Contingencies

As a condition of three outstanding contract loans, the Authority is required to maintain a minimum level of operational earnings. Exclusive of the tax revenue and debt servicing costs associated with voter-approved general obligation bonds and other voter-approved debt, net revenue, as defined by the contracts, must equal or exceed 120% of all other debt servicing costs (principal and interest). This condition has been met.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

(Dollar amounts in thousands)

June 30, 1988 and 1987

(8) Commitments and Contingencies (continued)

The Authority is contingently liable under an irrevocable letter of credit issued by Golden Sanka Bank which secures payment of two contract notes. Under the terms of an associated trust agreement, these contracts also require the Authority to maintain a minimum level of restricted funds at Bank of America. Refer to note 2.