



CALIFORNIA **URBAN WATER** AGENCIES
ANNUAL REPORT OF ACTIVITIES
FOR 1995

California Urban Water Agencies

Annual Report of Activities for 1995

I. Summary

The California Urban Water Agencies (CUWA) is a non-profit corporation formed in 1990 with a mission to provide a forum for combining the expertise and resources of its member agencies to study and promote the need for a reliable, high quality water supply for the state's current and future urban water needs. The organization is headquartered in Sacramento, California from where its various research and water management studies and efforts are coordinated with its eleven member agencies who directly and indirectly serve over two-thirds of the state's population. Resources of the member agencies are pooled to study technical water management issues of common interest and to develop common understanding and consensus in the urban community regarding solutions to meet California's water resource needs. CUWA also provides management services under contract to the California Urban Water Conservation Council. Efforts in 1995 focused on completion of studies regarding drought impacts, customer willingness to pay for conservation actions, water treatment strategies to bromate formation in drinking water, analysis of the Central Valley Improvement Act environmental review process, and technical studies which support resolving questions regarding management of the Sacramento-San Joaquin Bay-Delta Estuary. CUWA also led an effort of its member agencies and agricultural agencies in coordinating participation in the first phase of the CALFED Bay-Delta Program, a joint state-federal partnership developing a long-term solution to Bay-Delta problems as recognized in the 1994 Bay-Delta Accord.

Mission and Goals¹

Mission:

Provide a forum for combining the expertise and resources of its member agencies to study and promote the need for a reliable, high-quality water supply for the state's current and future urban water needs.

Goals:

- 1) *California Water Management - Serve as a leading forum to develop and promote a unified urban viewpoint for the management of California's water supplies.*
- 2) *Bay Delta - Provide a leading forum for developing consensus-based resolutions to technical and water management issues affecting the Bay-Delta, consistent with the 1994 December Bay-Delta Accord.*

¹As Adopted by the Board of Representatives, September 21, 1995

- 3) *Drinking Water Quality - Pursue and promote technical investigations and policies to advance treatment technology and protect drinking water quality at the source.*
- 4) *Reliability and Shortage Management - Promote the societal value of a reliable urban water supply and document the impact of shortages.*
- 5) *Water Management Options - Develop information on the viability of emerging water management technology and applications.*
- 6) *Conservation - Assist the California Urban Water Conservation Council in development and use of best management practices for urban water conservation*

II. Membership, Officers and Staff

CUWA Members

CUWA is comprised of eleven member agencies representing a geographic balance of the state's major urban areas serving two-thirds of California's 32 million population, and more than three-fourths of the state's \$800 billion economy. The members are urban water agencies whose leaders are engaged in regional and statewide water policy issues. Each member agency is represented on the CUWA Board by a representative who is the chief executive of the member agency. CUWA's Board meets bi-monthly. CUWA's members are:

1. **Alameda County Water District**
Representative: James D. Beard, General Manager

Alameda County Water District (ACWD) serves a population of 290,000. Its normal water supply is 55 percent from State Water Project, 30 percent from the San Francisco Water Department and 15 percent from local sources.

2. **Contra Costa Water District**
Representative: Walter J. Bishop, General Manager

Contra Costa Water District (CCWD) serves a population of 200,000 with treated water through 56,000 retail service connections, and another 200,000 people through 700 connections for delivering untreated water for wholesale service. CCWD's major supply is from the federal Central Valley Project (CVP).

3. **East Bay Municipal Utility District**
Representative: Dennis M. Diemer, Interim General Manager (August-December 1995) Jorge Carrasco (January - August 1995)

East Bay Municipal Utility District (EBMUD) provides water and sewer services to a population of 1.2 million in the east San Francisco Bay region. It gets its normal water supply from its own Mokelumne River reservoirs in the Sierra Nevada.

4. **City of Los Angeles Department of Water and Power**
Representative: James F. Wickser, Assistant General Manager

Los Angeles Department of Water and Power (LADWP) serves a population of almost 3.6 million. Its normal water supply is 58 percent from the Owens Valley and Mono Basin through the Los Angeles Aqueduct, 17 percent from local groundwater, and 25 percent from the Metropolitan Water District of Southern California.

5. **Metropolitan Water District of Southern California**
Representative: John Wodraska, General Manager

The Metropolitan Water District of Southern California (MWDSC) is a wholesale water agency supplying water to 17 million consumers through 27 member public agencies. MWDSC's two sources of supply are the Colorado River and the State Water Project (SWP). The percentage of supplies from these sources varies from year-to-year. The Colorado River Aqueduct has a maximum annual delivery capacity of about 1.2 million acre-feet. The MWDSC contract for SWP water calls for a maximum of about 2.1 million acre-feet but maximum annual SWP delivery so far has been about 1.5 million acre-feet. MWDSC deliveries are about two-thirds of the total water deliveries by its member agencies.

6. **Municipal Water District of Orange County**
Representative: Stanley E. Sprague, General Manager

Municipal Water District of Orange County (MWDOC) provides supplemental supplies of imported water on a wholesale basis to 1.5 million people through 27 retail water purveyors. MWDOC is a member agency of Metropolitan Water District of Southern California from which it purchases water that comes from the Colorado River and State Water Project aqueducts.

7. Orange County Water District
Representative: William Mills Jr., General Manager

Orange County Water District (OCWD) is a groundwater management agency, managing 75 percent of the water needs of 2 million people whose homes overlie the groundwater basin in the majority of Orange County. With normal hydrology, groundwater provides 75 percent to 80 percent of the area's total water use. Much of this water is obtained from the largest river within Southern California, the Santa Ana River. The remainder is made up of imported water plus reclaimed water from an aggressive recycling program.

8. San Diego County Water Authority
Representative: John Lockwood, General Manager

San Diego County Water Authority (SDCWA) provides 90 percent of the water needs of its service area. All of the SDCWA's water is purchased from the Metropolitan Water District of Southern California. SDCWA is a wholesale provider which serves a population of 2.6 million people in most of San Diego County through a network of 23 member agencies.

9. Santa Clara Valley Water District
Representative: Stan Williams, General Manager

Santa Clara Valley Water District (SCVWD) is a wholesale water provider that serves a population of 1.5 million people through 12 major retail water suppliers. In addition to local surface water and groundwater sources, the SCVWD receives imported water from a combination of the State Water Project, the federal Central Valley Project, and Hetch Hetchy.

10. City of San Diego Water Utilities Department
Representative: Pete Silva, Deputy Director

San Diego Water Utilities Department (SDWUD) supplies water retail to 1.1 million city residents, and wholesale water to around 90,000 customers. Each day the SDWUD delivers an average of 200 million gallons of treated water to city residents. With an average rainfall of less than 10 inches a year, SDWUD purchases more than 80 percent of its total water needs from the SDCWA.

11. San Francisco Public Utilities Commission
Representative: Anson Moran, General Manager

The San Francisco Water Department (SFWD) supplies retail water to 750,000 residents, and wholesale water to a population of about 1.6 million. SFWD's normal water supply is made up of 85 percent from the Hetch Hetchy reservoirs and 15 percent from local sources.

CUWA Officers

CUWA officers are elected to two year terms. 1995 officers were: Anson Moran, Chair; James Wickser, Vice-Chair; and Walter Bishop, Secretary and Treasurer.

CUWA Staff

Byron M. Buck is CUWA's Executive Director, succeeding Lyle N. Hoag CUWA's first Executive Director who retired in May of 1995. Cynthia Gelatt is the CUWA Administrative Assistant. Denise Phelps Administrative Assistant to the California Urban Water Conservation Council provides financial management services to CUWA in a part-time employee sharing relationship with the California Urban Water Conservation Council. CUWA's offices are at 455 Capitol Mall Suite 705, Sacramento 95814.

III. Summary of 1995 Program and Activities

Work Program and Mode of Operation

CUWA's activities are guided by its mission and a set of strategic goals. Annual program budgets array planned activities related to each goal. CUWA's mode of operation is to form project teams made up of key member agency staff with expertise in the area of study. Work plans are developed for each team effort defining the activity to be accomplished and the efforts to be undertaken. Where contract technical services are required, these teams are formally organized into Project Advisory Committees (PAC), chaired by a key member agency staff member. The Executive Director sits as an ex-officio member of these committees which report to the Board of Representatives for overall guidance. Activities during 1995 are summarized below under each Strategic Goal heading.

California Water Management

CUWA member agency staff and the Executive Director actively participated in the following cooperative work groups made up of water interests, state and federal officials and private interest groups. These groups are primarily focused on issues surrounding the resolution of water management related to the Sacramento - San Joaquin Bay-Delta. These groups and their purposes are summarized below.

CUWA

1. Central Valley Project Program Environmental Impacts Statement Project.
Purpose: This formal CUWA PAC oversees a consultant (EDAW, Inc.) which provides staff support and analysis of the US Bureau of Reclamation's Program EIS for implementation of the CVPIA. CUWA's interest is to see that the law is faithfully and logically implemented so that the benefits of the legislation are realized. In 1995 development of implementation alternatives was evaluated, and CUWA met and corresponded with the Burec numerous times to assess and advise on their progress. CUWA also led the development of a water industry consensus document recommending broadly supported near term actions to be included in the U.S. Fish and Wildlife Service's Anadromous Fish Restoration Plan.

CUWA/AG Groups²

1. CUWA/AG Policy Group
Purpose: To provide policy guidance to the CUWA/AG Legal and Technical Committees and to develop consensus on strategy related to Bay-Delta and other statewide water issues of common interest. In 1995 this group guided the efforts in the Stakeholders process and in development of joint comments before the State Water Resources Control Board related to adoption of the 1995 Water Quality Control Plan.
2. CUWA/AG Legal/Technical Committee
Purpose: A working committee which develops joint technical and legal work products on matters as directed by the Policy Group. This group developed the technical information and drafted comments and testimony before the State Water Resources Control Board related to the adoption of the 1995 Water Quality Control Plan.

² CUWA/AG is an informal collection of agricultural agencies (San Luis Delta Mendota Water Authority, Kern County Water Agency, Tulare Lake Basin Water Storage District and Westlands Water District) and CUWA agencies who work on issues of concern where there is common community of interests.

3. **Sacramento Water Rights Negotiations**
 Purpose: To represent CUWA/AG in the negotiations for purchase of water from Sacramento Valley interests to provide a negotiated settlement for the SWRCB water rights decision implementing the May 1995 Water Quality Control Plan. Negotiations in 1995 have pursued various strategies of identifying and purchasing various sized blocks of water under different hydrologic conditions and providing well infrastructure to allow for conjunctive use actions which could allow surface flows to be used to meet outflow needs. Negotiations are continuing into 1996.

4. **San Joaquin Water Rights Negotiations**
 Purpose: To represent CUWA/AG in the negotiations for purchase of water from San Joaquin tributary water rights holders to provide a negotiated settlement for the SWRCB water rights decision implementing the May 1995 Water Quality Control Plan a draft set of settlement principles was developed to allow for partial implementation and review of the Vernalis flow objective within the Water Quality Control Plan. Negotiations continue into 1996.

5. **Water Rights Negotiations Technical Support Team**
 Purpose: To provide technical support to the Sacramento and San Joaquin Water Rights negotiations teams.

6. **CUWA/AG CALFED Process Group**
 Purpose: To coordinate comments of CUWA/AG members within the formal CALFED process. This group was active in reviewing CALFED workshop material and in jointly participating in CALFED workshops and the development of comment letters to CALFED commenting on the workshops and CALFED progress.

7. **Ecosystem Restoration Study Group**
 Purpose: To develop biological and ecosystem science based rationale and documentation for the composition of alternative proposals to 'fix' the Bay-Delta. This group completed a literature review of the utility of ecosystem restoration activities and their potential application in the Bay-Delta. This group's members coordinated with other Stakeholder teams.

Bay-Delta Process Stakeholders

1. **Stakeholders - full group**
 Purpose: To develop consensus on a set of alternatives to be evaluated in the CALFED process. This group discussed approaches to alternative development and directed the work of subcommittees toward development of consensus alternatives to offer into the

CALFED Bay-Delta Program.

2. **Ecosystem/Alternatives Development Team**
Purpose: A subcommittee developing ecosystem/water supply alternatives for the CALFED process. The group developed white papers evaluating six different physical options for addressing Delta issues.
3. **Finance Team**
Purpose: A subcommittee developing financing alternatives for ecosystem/water supply alternatives developed by the Ecosystem/Alternatives Development team. This group developed a white paper on potential finance options for Delta solutions.
4. **Legal Institutional Team**
Purpose: A subcommittee of Stakeholders developing legal and institutional framework options to support execution of a CALFED alternative. In late 1995 this group began drafting a white paper outlining legal and institutional framework options which could be adapted to a variety of Delta physical solutions.

CALFED Related

1. **California Water Clearinghouse**
Purpose: To coordinate factual consistency of water agency public affairs documents and programs related to the CALFED process. In 1995 this group developed a generic information brochure for water agencies on the CALFED Bay-Delta program and the issues at hand in the process. The group continues to develop additional coordinated public information materials.
2. **CUWA BDAC Support Team**
Purpose: Selected CUWA staff provide technical analysis and support to Bay Delta Advisory Commission members representing the urban sector. In 1995 this group developed information on urban demand management programs, salinity control information and analysis of agricultural land retirement issues.

Groups Involved in Implementation of the Bay-Delta Accord

1. **Category III Steering Committee**
Purpose: To direct prioritization of Category III funds; recommend a long term structure for resolving Category III issues. In 1995 the group agreed on a first phase

of funding of about \$4.4 million for six category III projects. The group also developed and discussed issue papers outlining options for long term implementation of Category III projects.

2. **Operations Group**

Purpose: To provide CVP and SWP project operations coordination under the terms of the 1994 Bay-Delta Accord. In addition to tending to its duties to coordinate operations of the projects under the terms of the Accord, the group developed issue papers further defining the scope and operating mode of the group.

3. **Stakeholder Advisors to Operations Group ("Noname" Group)**

Purpose: an advisory committee to the Operations Group to providing 'stakeholder' input to the Operations Group in making operational decisions affecting the environment and water supply. As envisioned in the Accord, this group of stakeholders periodically advised the Operations group in its operations of the projects in ways to optimize water project's yield and natural resources protections.

Other

1. **Chinook Salmon Status Review Group**

Purpose: A group chaired by ACWA with members including the Central Valley Project Water Users Association, CUWA, SWC, DWR, and NCWA to oversee development of a species status review report on Chinook salmon to provide the members information upon which to participate in the potential listing process for the Chinook. This group has commissioned a consultant study of the status of the Chinook to allow for its member agencies to participate in management decisions for the Chinook in a more informed way. The study is expected to be complete in early 1996.

Bay-Delta

CUWA's primary research effort and major portion of its budget is related to providing scientific information to inform management decisions surrounding the Bay-Delta estuary. In Phase I of the CUWA Bay-Delta Project during 1994, CUWA critiqued the EPA proposed standards and recommended the "sliding scale" revision to X2. The CUWA alternative provided an equivalent level of biological protection at less water cost and provided a plan of action on non-flow measures affecting the ecosystem (Category III measures). CUWA's continuing efforts in this area are focused on implementation of the Water Quality Control Plan objectives, patterned after the CUWA alternative, and at explaining the source of variability in ecosystem health not attributable to outflow. CUWA's Bay-Delta Program is overseen by a steering committee of top staff experts in Bay-Delta

matters and is managed by a contract program manager, Elaine Archibald of Archibald and Wallberg Consultants. 1995 program areas and summary accomplishments are noted below.

1. **Triennial Review Project**

Purpose: To develop a strategy and supporting technical information to support the triennial review of Bay-Delta water quality standards. Two technical efforts are ongoing: one, an effort to develop a more accurate model of salmon smolt escapement to aid in understanding the conditions under which these fish move through the Delta, and two, a joint project with ACWA evaluating the status of chinook salmon. CUWA intends to work with regulatory agencies, environmental interests and agricultural water interests to develop a plan for conducting the 1998 Triennial Standards Review. These projects will continue into 1996.

2. **IEP Monitoring Program Project**

Purpose: Provide coordinated CUWA input in conjunction with CUWA/AG on redesign of the Interagency Ecological Studies Program in order to address unresolved questions raised as a result of the Bay-Delta Accord and to address relevant scientific factors affecting the Bay-Delta environment. CUWA member agency staff and consultants participated on IEP project teams to offer support and advice on proper targets and execution of IEP studies. As a result of this input, the IEP group has established a toxics investigation group to evaluate influence of pesticides and other toxicants in the estuary and is developing a quality assurance/quality control program. Additional integration of CUWA personnel and coordination between IEP and CUWA research projects is expected in 1996.

3. **Category III Factors Project**

Purpose: Develop scientific information on the importance of non-flow factors which affect the Bay-Delta environment. In 1996 a draft report compiling all recent know data on pesticide toxicity in tributaries to and within the Delta was produced. This report confirmed that levels of pesticides toxic to aquatic microorganisms and algae are present throughout the Sacramento and San Joaquin Rivers and the Delta. Some levels are high enough to cause acute toxicity to fish, especially juveniles and larvae. CUWA will be developing additional research correlating toxicity and species abundance trends in 1996 as well as pursuing regulatory action to control discharges.

4. **Implementation of Standards Project**

Purpose: To develop an allocation methodology to present to the State Board for consideration in the water rights phase of the Water Quality Control Plan implementation. In 1995 a draft CUWA allocation methodology was developed to share the water cost of the standards among a broad group of water users.

As part of this development, a consultant study analyzing total depletions within the watershed was commissioned. Finalization of this study and further development of the approach will follow in 1996.

5. Ecosystem Management Project

Purpose: To develop a common concept of ecosystem management in the Bay-Delta and apply it in the CALFED process. In cooperation with the CALFED Bay-Delta Program, CUWA sponsored a one-day workshop bringing together interested agency staff, academics, water agency staff and environmental interests to begin developing a dialog on the concept of ecosystem management in the context of the Bay-Delta. A report summarizing the concepts expressed and providing recommendations on further development of this concept by CALFED was produced and forwarded to CALFED. A follow-on workshop defining ecosystem restoration terms sponsored by the Natural Heritage Institute was co-sponsored by CUWA.

6. Data Management Project

Purpose: To develop an integrated data management system for use by CUWA agencies to access and archive technical information related to the Bay-Delta. This project, staffed by the Metropolitan Water District, began in the latter half of 1995. With the help of a consultant, research toward developing a database design began. Interviews were held with a variety of agencies who are repositories of basic data on the Delta.

Drinking Water Quality

During 1995, CUWA continued its tradition of facilitating the investigation of drinking water quality issues important to its members and specific to California and use of Delta waters. Two studies were completed in 1995 and two other projects are ongoing. Drinking water quality issues, particularly source control, are becoming more topical as California grows and areas upstream of the Delta develop and use water resources. Upstream effluent impacts, especially increasing salinity in Delta tributary waters and regulatory efforts to control its sources, loom as issues which will occupy the organization's attention in coming years.

Strategies for Removing Bromate from Drinking Water

Purpose: Evaluation of options for reducing formation and removing bromate after formation by disinfection by various methods in conventional surface water treatment plants utilizing ozone disinfection. As a result of the 1986 Safe Drinking Water Act, water agencies must meet stricter standards for a class of contaminants known as disinfection by products. One such byproduct is bromate ion (BrO_3), which is

formed when water is disinfected with oxidants such as ozone. Bromate is a specific problem of concern to agencies taking water from the Delta due to high bromide concentrations during periods of seawater intrusion. This study evaluated reducing bromate formation by pH control, and three methods of bromate reduction after formation: ferrous iron reduction, activated carbon surface reduction, and ultraviolet irradiation. High intensity ultraviolet irradiation was found to be the most effective method for bromate destruction.

Strategies to Control Bromide and Bromate

Purpose: As a follow-up to the above study, this project is designed to develop feasible strategies for the control of bromate through: 1) the removal of bromide prior to disinfection; 2) control of bromate formation by pretreatment and during disinfection and; 3) removal of bromate after formation. This study is being conducted by five CUWA member agencies coordinated by the University of Colorado and funded in part by a research grant from the American Water Works Association. Participating CUWA members are contributing in-kind services which will be reimbursed by the University of Colorado through CUWA. CUWA is acting as a contract and coordinating agent with no funding contribution. The testing phase of this project was completed in 1995 and a final report on results is expected in 1996.

Drinking Water Quality in Delta Tributaries

Purpose: Evaluate source loadings of key drinking water contaminants to the Sacramento-San Joaquin Delta tributaries and determine if there are contaminant source control measures which, if implemented, would improve drinking water quality in the Delta tributaries and at the Delta pumping plants. Sources of disinfection by-product precursors, microbiological contaminants, nutrients, arsenic, total dissolved solids and pesticides were reviewed. Sources of these contaminants were found to be diffuse in most cases and data available did not lend itself to identification of specific generation sites and resulting control strategies in most cases. A cumulation of non-point sources is responsible for most of the contaminant sources to the Delta. This study has raised the need for better data gathering and the general focus on non-point source control. Its findings were reviewed with the Department of Water Resources Municipal Water Quality Investigations Group and assessed as part of its work plan efforts for 1995 and 1996. Additionally, this work has helped CUWA focus its attention on pesticide issues and on control of existing and proposed total dissolved solid sources (see MacMillan-Bloedel below).

Proposed West Sacramento Wastewater Treatment Plant - MacMillan Bloedel Wastepaper Recycling Plant.

Purpose: To coordinate CUWA agency efforts at reviewing and assuring adequate

mitigation is provided for the subject project. The City of West Sacramento is proposing an expansion of its wastewater treatment plant which discharges to the Sacramento River. This project is designed to meet the expanding needs for treatment within the City and provide for treatment of effluent from a large wastepaper recycling plant proposed by MacMillan Bloedel, Ltd. The wastepaper plant would include large concentrations of dissolved organic carbon, total dissolved solids, arsenic, mercury and temperature impacts. CUWA agencies have concerns with the impact on the biological environment and recovery of the Bay-Delta Estuary, anadromous fishes and the impact upon maintenance of salinity objectives in the Delta. This project has been estimated to have a potential to require up to 30,000 acre feet of dilution flows to mitigate TDS loadings during certain periods. The proponents did not take responsibility for full mitigation of these impacts. CUWA agencies commented extensively on the Draft EIR in 1995 and as a result, numerous meetings were held by the City, CUWA and MacMillan-Bloedel. CUWA has requested MacMillan provide a discharge to the City's treatment plant at a TDS level no higher than average ambient conditions in the River as well as address TOC, arsenic, mercury and temperature impacts. At the close of 1995, CUWA was awaiting a response from the City and MacMillan and no Final EIR had been released.

Reliability and Shortage Management

In 1995 CUWA continued its history of developing understanding of the value of a reliable urban water supply and information needed to plan these needs. Two studies were active in this category.

Assessment of the Economic Impacts of the California Drought on Urban Areas.
Purpose: Identify the economic impacts of the 1986-1991 California drought in urban areas, the economic benefits of water supplied to urban areas and benefits which occurred due to the 1991 Drought Water Bank. This project began in 1993 and evolved from its initial scope as additional research questions were raised. In 1995 an interim report entitled "The Effect of Urban Water Supply Reductions During the 1987-1992 California Drought" was produced detailing responses of municipal and industrial customers to the drought based upon surveys conducted in 1993. Results indicated most severe effects were felt in 1991. Strategies used by agencies to cope and realized savings were analyzed. With a National Science Foundation grant, Rand Inc., the project contractor, pursued an economic and statistical modeling analysis of the drought based upon data from Alameda County Water District. This "consumer surplus analysis" is expected to produce additional new data quantifying customer costs during the drought. These efforts were completed in 1995 and following internal Rand peer review, a final report is expected in 1996.

Survey of Residential Conservation Attitudes.

Purpose: To study how much urban residential water users are willing to pay for water-saving devices. This study was completed in 1995 and a report entitled "Willingness to Pay for Household Water Saving Technology in Two California Service Areas" was produced. This study used a willingness to pay survey of over 600 residential customers of the Los Angeles Department of Water and Power and the East Bay Municipal Utility District. This survey which had a very high response rate for surveys of this type (over 70 percent) has produced numerous findings of use in design of conservation programs for urban water agencies. Findings were consistent between the two regions studied. The study noted considerable market penetration of water saving devices and the effectiveness of rebate-type programs in eliciting customer response. Significant data on the response rates relative to rebate amounts was produced with the report noting that there was substantial response even at low rebate levels. Also notable was the lack of large effect in installation of water saving technology from the level of water rate increases expected to occur in the medium term.

Water Management Options

No studies in under this goal were conducted in 1995.

Conservation

CUWCC Support - CUWA continued to provide management support to the California Urban Water Conservation Council in 1995. Denise Phelps was hired as the new Administrative Assistant for the Council. In addition to performing its BMP reporting function, the Council prepared documentation on conservation rate structures and methodology for cost-effectiveness analysis of individual best management practices. An independent evaluation of the Council was performed and a formalized strategic planning process for the Council will be executed in 1996. Final efforts at formally separating the Council from CUWA as an independent corporation were completed in 1995 with the signing of the management services agreement between the Council and CUWA.

CUWA Water Conservation Advisory Committee - CUWA has a standing water conservation advisory committee made up of conservation professionals employed by the member agencies. This committee advises the Board on conservation issues. In 1995 the committee was active in evaluating a white paper produced by the CUWCC outlining options for the future of the CUWCC as it relates to the CALFED Bay-Delta process. The committee reported to the Board that pressure is being applied by environmental interests for more

uniform implementation of BMPs. The CALFED process will address conservation and demand management issues in its solutions and the committee recommended to the Board that additional efforts are needed in BMP application, measurement and reporting but that the current CUWCC structure must be maintained and a top-down regulatory approach avoided. The Board responded by commissioning the Demand Management Advisory Committee to produce technical documentation of CUWA agency's efforts in conservation and provide detailed input to CALFED on how conservation and demand management should be addressed in the CALFED process. This committee's work will be nested in CUWA's Bay-Delta program in 1996.

IV. Financial Summary

California Urban Water Agencies 1995 Summary Income and Expense³

Income

Dues	550,000
Special Assessments	445,000
Miscellaneous	<u>49,947</u>
	\$1,044,947

Expenses

Salaries and Benefits	237,741
General Office	124,970
Special Projects - General	139,001
Special Projects - Bay Delta	<u>320,630</u>
	\$ 822,342

³ Does not include in-kind or direct expenses of CUWA agencies participating in CUWA affairs.

V. CUWA Annotated Bibliography of Published Technical Reports by Topic Area

Bay-Delta

1. *The Delta*. B.J. Miller, Ph.D., Consulting Engineer. May 1993.

This report is an overview of the Delta and was produced as a comprehensive but readable, uncomplicated but accurate primer on Delta issues.

Drinking Water Quality

2. *Water Quality Changes In Conveyance and Storage--A Study of Water Quality Changes in the State Water Project*. Alex Horne Associates. Commins Consulting. March 1994.

This study of water quality changes in conveyance and storage within the California State Water Project was begun during the 1987-92 drought. It is an effort to learn as much as possible about the changes in water quality characteristics of drinking water as water moves from the Sacramento-San Joaquin Delta southward to the areas of urban use.

3. *Study of Drinking Water Quality in Delta Tributaries*. Brown and Caldwell. May 1995.

This study is intended to fill the gap in our knowledge of drinking water quality problems in waters upstream of the Delta in its major tributary streams. It identifies relative contribution of contaminants by type and source region.

4. *Removal of Bromate from Ozonated Drinking Water*. University of Colorado. November 1995.

This study evaluates promising options applicable to conventional surface water treatment plants contemplating the use of ozone at various points of application.

Reliability and Shortage Management

5. *CUWA Survey of 1991 Drought Management Measures*. June 1991.

This report presents the results of a survey conducted in May of 1991 of the emergency drought actions taken by the agencies that supply water to California's population centers--its largest cities. This survey did not include conservation measures already in place, therefore it does not describe all the intensified efforts

undertaken in response to the drought of the previous four years. It is limited to reporting the measures that were adopted to deal with urban water demands in the summer and fall of 1991 in the fifth year of the drought.

6. *Cost of Industrial Water Shortages.* Spectrum Economics, Inc. November 1991.

This report researches the issue of economic impacts of water shortages on the industrial sector. This analysis is based on the most extensive set of data ever collected on industrial water use, water conservation, and shortage impacts on industry. This project includes the major manufacturing sectors within the areas served by CUWA member agencies. It excludes commercial activities, institutional sectors, services industries and the landscape industry.

7. *Using Farm Programs to Promote Water Management Goals.* BioSystems Analysis, Inc. March 1993.

This report researches interactions between federal agricultural policy and irrigation water use and the implications for water supply and water quality planning.

8. *The Value of Water Supply Reliability: Results of a Contingent Valuation Survey of Residential Customers.* Barakat & Chamberlin, Inc. August 1994.

This contingent valuation survey was conducted to study residential water shortage economic losses. It is the most comprehensive and informative survey of its type to date conducted in the urban water supply industry. This report details results of the survey and shows what California residents are willing to pay per household on their water bills to avoid the kinds of water shortages they or their regional neighbors have incurred in recent memory.

Water Management Options

9. *Desalination For Urban Water Supply.* Boyle Engineering Corporation. July 1991.

This study was commissioned by CUWA to examine the range of factors involved in considering seawater desalination for urban use. It provides an overview of desalination as an additional water supply option; advantages and disadvantages are both presented.

Conservation

10. *Evaluating Urban Water Conservation Programs: A Procedures Manual.* Planning and Management Consultants, Ltd. February 1992.

This report is a state-of-the-art procedures manual on the evaluation of urban water conservation programs which is intended to fill the technical gap between the science of design and evaluation of water conservation programs and the interest and need for these programs. The manual is necessarily technical and is intended to be used by experienced professionals.

11. *CUWA Survey of 1992 Demand Management Measures.* May 1992.

This survey provides an update of the 1991 survey of Drought Management Measures by CUWA. It presents the results of a survey conducted in May 1992 of the water demand management measures taken in the summer of 1992 by CUWA member agencies and provides CUWA member agencies with up-to-date information on what the other member agencies were doing.

12. *Ultra-Low Flush Toilets in Commercial Installations.* A & N Technical Services, Inc. W.L. Corpening & Associates. February 1994.

This report addresses concerns about the use of ULF toilets in commercial, industrial and institutional settings. A survey was conducted of non-residential ULF toilet installations and problems, and from this information set forth: (1) a description of the problems found; (2) a clear enunciation of the technical questions which need to be answered; and (3) a suggested research approach which can resolve this major problem in U.S. water conservation practice.

13. *A Guide To: Customer Incentives For Water Conservation.* Barakat & Chamberlin, Inc. February 1994.

This report provides solid information on a variety of water conservation incentive programs to help water agencies design and evaluate programs on a more rational, thoughtful basis.

14. *Long-Term Water Conservation and Shortage Management Practices; Planning That Included Demand Hardening.* Tabors Caramanis and Associates. June 1994.

This guide examines demand hardening. It helps water agencies understand what demand hardening is, measure the amount of such demand hardening, identify, analyze and manage the interactions of long-term conservation programs with shortage demand management measures, and incorporate the interactions of long term conservation and shortage demand management measures into a water agency's planning for new water resources.

15. *Contingent Valuation of Residential Water Conservation*. University of California, Los Angeles. December 1995.

This survey examines how much urban residential water users are willing to pay for particular water-saving technological fixes, and how that willingness to pay varies with water availability and the consequences of that availability. It also researches the value to residential water users of behavioral change as a function of the consequences of water shortages.

16. *Annotated Bibliography of Water Conservation*. Planning and Management Consultants, Inc. February 1996.

This bibliography provides a comprehensive and insightful review of the developments in water demand management that have occurred over the past ten years. This project comprises three products: (1) annotated bibliography of conversations programs, Volume I; (2) topical listing of relevant bibliographic references, Volume II; and (3) monograph on the state of demand management, Volume III.