BULLETIN 132-95 NOVEMBER 1996

Management of the California State Water Project



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AGREEMENT

PETE WILSON, *Governor* STATE OF CALIFORNIA

DOUGLAS P. WHEELER, *Secretary for Resources* THE RESOURCES AGENCY

DAVID N. KENNEDY, *Director* DEPARTMENT OF WATER RESOURCES

Bulletin 132-95 • November 1996

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State of California
The Resources Agency
Department of Water Resources

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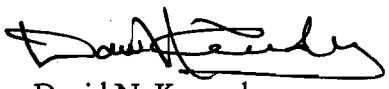
Foreword

Beginning in 1963, the Bulletin 132 series, *Management of the California State Water Project*, has reported annually on State Water Project operations and water deliveries, and analyzed project costs and financing. The series also discusses water supply planning, power operations, and events that affect management of the State Water Project. Bulletin 132-95 continues the assignment with the following thirty-third annual report. Appendix B to the bulletin contains data and computations used to determine the State Water Project contractors' Statement of Charges for 1996.

This year's report includes events that occurred during the calendar year 1994, the fiscal year beginning July 1, 1994, and the water year beginning October 1, 1993. A notable addition to this report is the memorial to former Governor Edmund G. Brown, Sr., and former Director William E. Warne. The memorial recounts their special roles in the history of the State Water Project.

This year's cover refers to two agreements that should have significant impacts on the administration of the State Water Project for years to come--The Monterey Agreement and the Bay-Delta Accord. A discussion of these milestone documents can be found in Chapter 1.

Finally, the Department's water education efforts have been highlighted in Chapter 16, the newest addition to the Bulletin.



David N. Kennedy
Director

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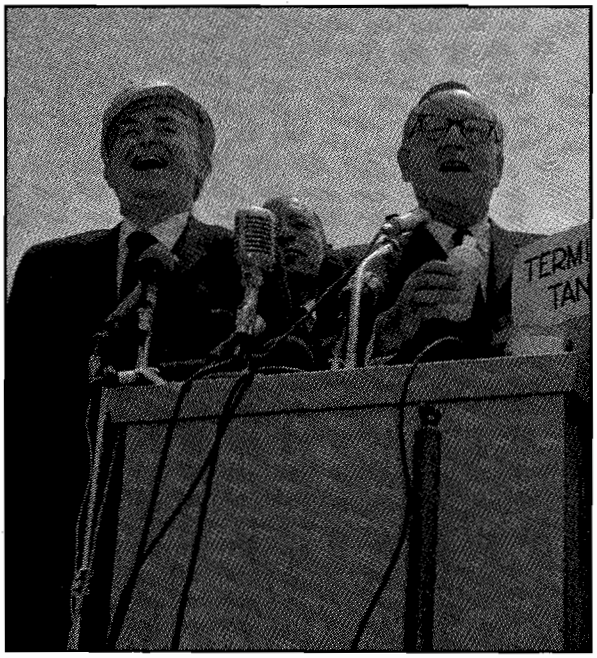
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In Memory

Within a month in early 1996, California lost two of the major participants in the early development of the SWP. Former Governor **Edmund G. Brown, Sr.**, 90, passed away on February 16, followed by former Director of Water Resources, **William E. Warne**, 90, on March 9. These men provided decisive leadership during critical junctures in the history of the SWP.

For much of this century, the attributes of the present day SWP—flood control facilities in the north, reliable water supplies for the south, agricultural development in central California, State control of State resources—existed simply as elusive goals. Attempts at implementing these ideas met with partial success with the construction of the Central Valley Project. However, these facilities, financed by the federal government, were operated to meet federal service area needs and did not extend into all areas of need. With his 1950 appointment as State Engineer, A.D. Edmonston initiated a systematic effort to revive earlier plans for a statewide water project. Unfortunately, legislative action on these plans fell victim to disagreements among the many diverse interests characteristic of California water politics. No political figure or organization was able to surmount the political risks associated with breaking this legislative deadlock. It was during this period, in his role as the State Attorney General, that "Pat" Brown developed insights that would prove invaluable to the future of a statewide water project.

Governor Brown won office in 1958 with a self-described agenda of ". . . new blood, new ideas and new ways of dealing with old problems." By nature, Governor Brown was outgoing, friendly, optimistic, conscientious, and determined. He immediately led a charge to break the legislative deadlock. He later remarked he "begged, pleaded, urged, and cajoled" to unite a divided Legislature on the water project issue. The result was legislative authorization of the SWP financing methodology known as the Burns-Porter Act. However, unless the voters of the State ratified the Act with its $1.75 billion in general obligation bonds to finance the SWP, the dream of a statewide water project would not be realized. Approval was far from certain given the enormous cost and the regional differences in water policy between Northern and Southern Californians. Convinced that the SWP was good for the State as a whole, Governor Brown used his enormous powers of persuasion to bring both factions closer together. He traveled the State tirelessly to garner support for passage of the measure. When the voters of the State were called on to approve the financing measure in 1960, the measure passed by a narrow margin.



Governor Brown and Director Warne at dedication of Santa Clara Terminal Tank Facility of the South Bay Aqueduct on July 1, 1965

Governor Brown's administration went on to many successes during its tenure. Besides the SWP, over 1,000 miles of freeway and 11 new university campuses were built. Governor Brown also led efforts to outlaw racial discrimination in jobs, create a health care system for the poor, and establish a consumer-protection agency. The Los Angeles Times has said, "No other chief executive left as lasting a mark on this state's infrastructure as the affable visionary everyone knew simply as Pat Brown."

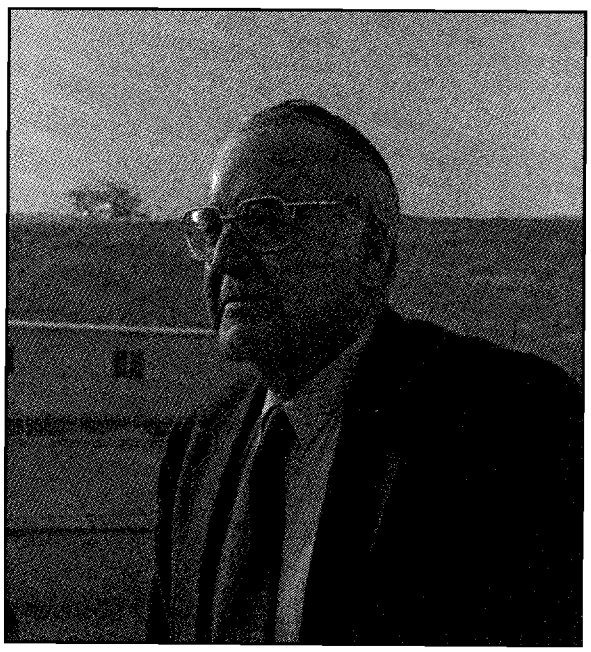
Governor Brown's own assessment was that the SWP was his administration's most important achievement. Even as the SWP stands as a technological wonder of the engineering world, Governor Brown's triumph over the political challenges of a statewide water project deserves special recognition.

Voter approval of the Burns-Porter Act allowed little time for celebration. Indeed, Governor Brown realized that the job was far from done. Any missteps in starting-up the SWP could easily undermine the thin margin of political support. The potential for disaster was very real. The untried Department of Water Resources, less than 5 years old, would be spending an amount of money almost equal to the State's entire annual budget. It would have to negotiate innovative water delivery contracts and design and build water facilities unprecedented in size and scale. Governor Brown's appointment to lead the Department and construct the SWP would be crucial.

Showing no hesitation, Governor Brown selected William E. Warne to serve as the second Director of the Department and guide the SWP through its early construction years. Knowledgeable opponents of the SWP had to admit, "Bill Warne can get the project built if anyone can." Fortunately, he would be able to build upon the groundwork laid by his predecessor, Harvey Banks, who was instrumental in the start-up of the newly created Department. Director Warne served concurrently as the first Administrator of the Resources Agency, a role he would later relinquish to concentrate on the Department and the SWP.

Director Warne brought with him an extensive background in public service administration. At the State level, he served as Director of the Department of Fish and Game and Director of the Department of Food and Agriculture. His federal career included appointments as Assistant Secretary of the Department of Interior and Assistant Commissioner of the U.S. Bureau of Reclamation. Director Warne's expertise had also been called upon in assignments to Korea, Iran, and Brazil. Just as important, for the success of the SWP, was Director Warne's enthusiasm for his DWR appointment as displayed by his declaration, ". . . exactly the assignment I wanted!"

The new Director had to get his department moving quickly before excessive delays eroded the hard won support for the SWP. He immediately instituted a nation-wide recruitment



Governor Edmund G. (Pat) Brown—1905-1996

program that would eventually increase employee ranks from 2,200 to 4,500. Engineers, lawyers, secretaries, accountants, and technicians answered the call. They worked at a feverish pace to complete the project. In Bulletin 132-63 (the inaugural edition of this series), Director Warne was able to report, ". . . it is my pleasure to advise that work is proceeding on schedule and in accordance with the plans." During much of 1965, construction spending approached about $1 million a day. Record after record would fall to this ambitious group: the nation's highest earth-fill dam; the nation's largest underground power plant; and the world's highest single-lift pumping plant.

By the time Director Warne left the Department in 1967, Oroville Dam was almost complete, the Tehachapi Crossing was ready to start, and water deliveries had begun to the Santa Clara Valley and Alameda County. The SWP was later honored by a national civil engineering society for its contribution to the well-being of people and communities; the resourcefulness in planning and solving design problems; the pioneering use of materials and methods; and its innovations in construction, in unusual aspects, and in esthetic values.

In 1982, the Department memorialized Governor Brown and Director Warne by renaming SWP facilities in their honor. On September 17 of that year, the Pyramid Powerplant in Southern California became officially known as the William E. Warne Powerplant. Three months later on December 11, the California Aqueduct was renamed the Governor Edmund G. Brown California Aqueduct. Both ceremonies were well attended by influential water policy makers and stakeholders, past and present, and interested citizens. The common denominator of the attendees was an appreciation of the accomplishments engineered by these men during their respective terms in office.

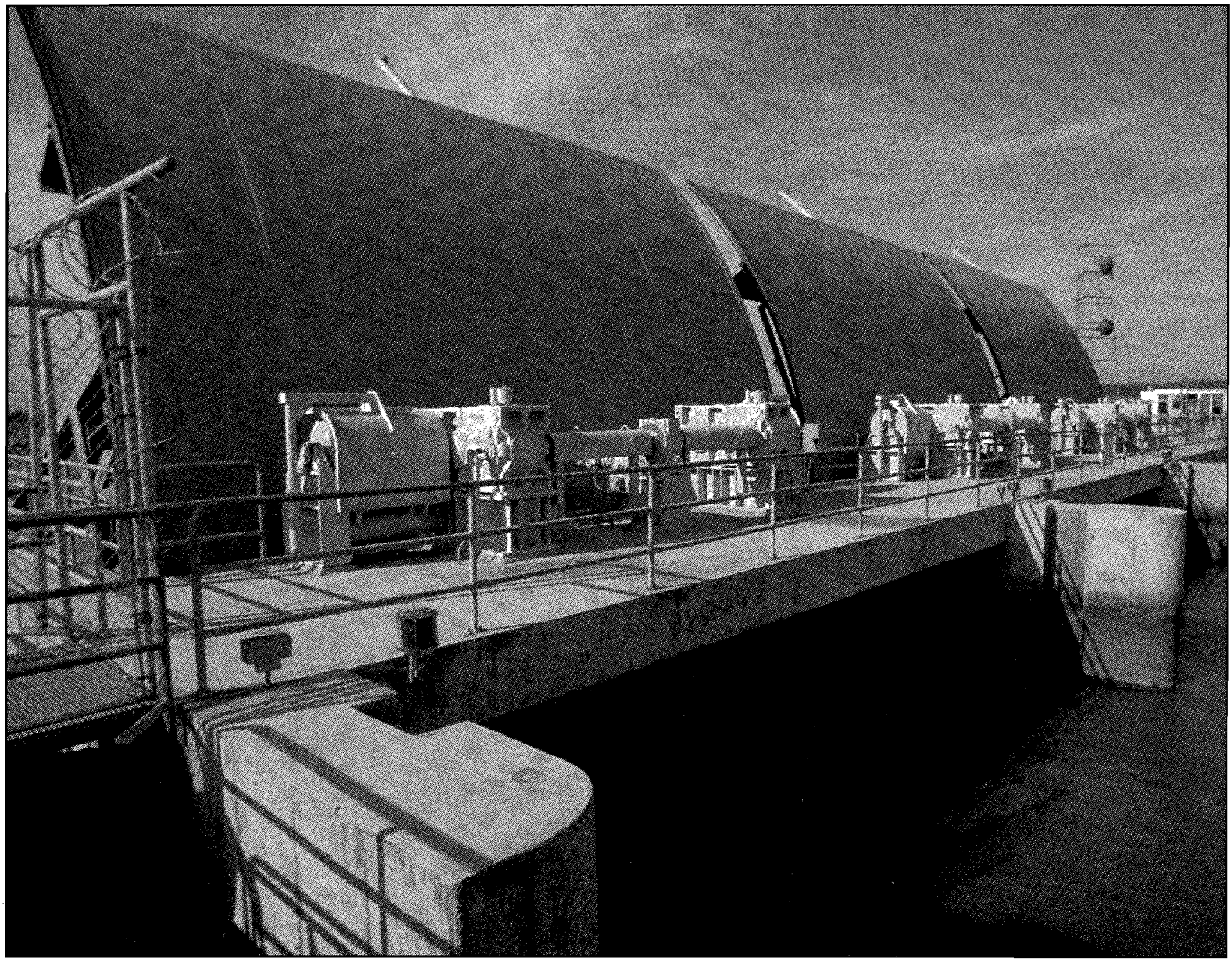


Director William E. Warne—1905-1996

The State Water Project, as currently constructed, provides up to 3 million acre-feet of water each year for homes, industry, agriculture, recreation, and the environment. About two/thirds of California's thirsty population relies to some extent on the SWP. The effects of the recent 7-year drought were mitigated by SWP deliveries. SWP water turned the west side of the San Joaquin Valley into prime agricultural land when sheep ranching gave way to acres of highly marketable produce, fruits, vineyards, orchards, and other crops. Without the efforts of Pat Brown and William Warne in support of the SWP, it is doubtful that Californians would be enjoying these benefits. Truly, they were the right men at the right time.

Introduction

The State Water Project



Salinity gates at Suisun Marsh

California is a land of contrast, with climate and geography ranging from desert to alpine to subtropical. In an average year, some areas in California may receive as little as 2 inches of rain while other areas receive 100 inches or more.

People have settled in all areas of the state, regardless of the amount of rainfall those areas receive. Consequently, California has long been faced with the problem of how best to conserve, control, and deliver water. For example, remains of aqueducts, canals, and dams still may be found near some of California's missions. And in the early twentieth century, several cities—San Francisco and Los Angeles, for example—built aqueducts to bring water from the Sierra Nevada.

In 1951, after many years of discussion and study, the Legislature authorized the construction of a water storage and supply system to capture and store runoff in Northern California and deliver it to areas of need in Northern and Southern California, the San Francisco Bay Area, and the San Joaquin Valley. Eight years later the legislature passed the Burns-Porter Act, which provided the mechanism for obtaining funds necessary to construct the initial facilities. In 1960, California voters approved an issue of $1.75 billion general obligation bonds, as authorized in the act, thereby obtaining funds to build the State Water Project.

Today the SWP, managed by the Department of Water Resources, is the largest state-built, multipurpose water project in the country. Approximately 19 million of California's 32 million residents receive at least part of their water from the SWP, and SWP water is used to irrigate approximately 600,000 acres of farmland. Also, the SWP was designed and built to control floods, generate power, and provide recreational opportunities as well as enhance habitats for fish and wildlife.

Water Delivery Facilities

The State Water Project depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. Although initial transportation facilities were essentially completed in 1973, other facilities have been constructed since then, and still others are under construction or are scheduled to be built as needed (Figure I-1). The SWP facilities now comprise 28 dams and reservoirs, 22 pumping and generating plants, and (with completion of the Coastal Branch Phase II in 1996) nearly 660 miles of aqueducts.

Facilities were designed and built to meet a buildup in demands for water through 1990; these demands were projected to be about 4.0 million acre-feet. Actual demand, however, has not developed as projected, owing to circumstances such as slower than projected population growth, changes in local use, local water conservation programs, and conjunctive use programs. The most SWP entitlement water delivered to date was about 2.8 million acre-feet in 1989.

Project Design

The water delivered by the State Water Project conservation and transportation facilities originates from rainfall and snowmelt runoff in northern and central California watersheds, where most of the state's precipitation occurs. Agencies or districts in the Upper Feather River, North Bay, South Bay, San Joaquin Valley, Central Coastal, and Southern California areas receive water from the SWP.

Three small reservoirs—Lake Davis, Frenchman Lake, and Antelope Lake—are the



Fig. I-1. Names and Locations of Primary Water Delivery Facilities, Current and Projected

northernmost SWP facilities. Situated on Feather River tributaries in Plumas County, these lakes, which are used primarily for recreation, also provide water to the city of Portola and to local agencies that have water rights agreements with the Department.

Downstream from the three lakes that begin the SWP is Lake Oroville, the keystone of the SWP. Lake Oroville conserves water from the branches and forks of the Feather River. Created by Oroville Dam, the tallest and one of the largest earthfill dams in the United States, Lake Oroville is the project's largest storage facility, with a capacity of about 3.5 million acre-feet. (An acre-foot consists of about 326,000 gallons.)

Releases from Lake Oroville flow down the Feather River to the Sacramento River, which drains the northern portion of California's great Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta--738,000 acres of land interlaced with channels that receive runoff from 40 percent of the State's land area. The SWP, along with the federal Central Valley Project and local agencies, diverts water from the Delta.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano Counties through the North Bay Aqueduct, completed in 1988. Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. The Harvey O. Banks Delta Pumping Plant lifts water from Clifton Court Forebay into Bethany Reservoir, and from Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct. Through the South Bay Aqueduct water is supplied to Alameda and Santa Clara Counties. The South Bay Aqueduct provided initial deliveries in 1962 and has been fully operational since 1965.

Most of the water from Bethany Reservoir, however, flows into the Governor Edmund G. Brown California Aqueduct. This 444-mile-long aqueduct conveys water to the primarily agricultural lands of the San Joaquin Valley and to the primarily urban regions of Southern California.

The California Aqueduct winds along the west side of the San Joaquin Valley, transporting water to O'Neill Forebay, William R. Gianelli Pumping-Generating Plant, and San Luis Reservoir, which are jointly owned by the Department and the U.S. Bureau of Reclamation, which operates the Central Valley Project. San Luis Reservoir has a storage capacity of more than 2 million acre-feet; the Department's share of gross storage in the reservoir is about 1,062,000 acre-feet.

SWP water not stored in San Luis Reservoir continues to flow south through the San Luis Canal, a portion of the California Aqueduct jointly owned by the Department and the USBR.

As the water flows through the San Joaquin Valley, it is raised over 1,000 feet by four pumping plants—Dos Amigos, Buena Vista, John R. Teerink Wheeler Ridge, and Ira J. Chrisman Wind Gap—before reaching the foot of the Tehachapi Mountains.

In the San Joaquin Valley near Kettleman City, the existing Coastal Branch Aqueduct stub serves agricultural areas west of the California Aqueduct. This branch is now being extended to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties. The extended Coastal Branch is scheduled to be completed in late 1996.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, where about two/thirds of California's population lives. However, before that water can be delivered, it must first cross the Tehachapi Mountains. Pumps at A.D. Edmonston Pumping Plant, situated at the foot of the mountains, raise the water 1,926 feet—the highest single lift of any pumping plant in the world. Then the water enters 8.5 miles of tunnels and siphons as it flows into the Antelope Valley, where the California Aqueduct divides into two branches, the East Branch and the West Branch.

The East Branch of the California Aqueduct carries water through the Antelope Valley into Silverwood Lake in the San Bernardino Mountains. From Silverwood Lake, the water flows through the San Bernardino Tunnel into the Devil Canyon Powerplant. The water continues down the East Branch to Lake Perris, the southernmost SWP reservoir, which is also the project's most popular destination for recreationists.

Water in the West Branch of the California Aqueduct flows through the William E. Warne Powerplant into Pyramid Lake in Los Angeles County. From there it flows through the Angeles Tunnel and Castaic Powerplant into Castaic Lake, terminus of the West Branch.

The energy needed to operate the SWP comes from a variety of its own hydroelectric and coal-fired generation plants and power purchased from other utilities. The project's eight hydroelectric power plants, including three pumping-generating plants together with its coal-fired plant, produce enough electricity in a normal year to supply about two/thirds of the project's needed power.

Tables I-1 through I-5 present statistical information about the SWP's primary reservoirs and ground water storage facilities, primary dams, pumping plants, power plants, and aqueducts. Additional information regarding operation of the plants under full development can be found in Chapter 11.

Additional Construction

The initial facilities of the SWP were designed and constructed to meet projected demands through about 1990. Additional SWP facilities were tentatively scheduled to meet increased demands beyond that date. It was also anticipated that population growth in delivery service areas and in the areas of water supply origin would influence the final schedule for the additional SWP facilities. Because of increased costs, unrealized population growth, and increased non-SWP demands for limited water supplies, the construction schedule for additional facilities has been delayed.

In response to changes in water management policy, the Department continues to reassess plans for the additional facilities to incorporate increased environmental safeguards while also increasing the SWP delivery yield. Developing those plans involves the time-consuming process of finding technically suitable sites and satisfying the many complex environmental procedures, laws, and regulations.

In the late 1980s and early 1990s, the Department began planning the offstream storage complex Los Banos Grandes in Merced County and the Red Bank Project in Shasta and Tehama counties. The Department also developed alternative methods of storing water, including the Kern Water Bank, a conjunctive-use ground water storage facility. Initial planning for these projects was completed. However, environmental concerns about the Sacramento-San Joaquin Delta and their effects on water management, along with concerns about how best to transfer water across the Delta, suspended additional planning for Los Banos Grandes until those concerns have been addressed. Recognizing those constraints and concerns, the Department is developing a new planning strategy to manage water effectively and construct new facilities as needed.

The Department and SWP contractors transferred the Kern Fan Element to a group of agricultural contractors to wrap up Kern Water Bank program activities. The transfer was part of the Monterey Agreement announced in December 1994. The transfer simplifies implementation of the Kern Fan Element and should resolve disputes over allocation of shortages in dry years.

In the meantime the Department continues to plan, design, and construct transportation and power-producing facilities for the SWP. Mojave Siphon Powerplant, which is now under construction, is scheduled for com-

TABLE I-1
Physical Characteristics of Primary Reservoirs and Storage Facilities

Facility	Gross Capacity (Acre-Feet)	Surface Area (Acres)	Shoreline (Miles)
Antelope Lake	22,600	930	15
Frenchman Lake	55,500	1,580	21
Lake Davis	84,400	4,030	32
Lake Oroville	3,537,600	15,800	167
Thermalito Forebay	11,700	630	10
Thermalito Afterbay	57,000	4,300	26
Thermalito Diversion Pool	13,400	320	10
Clifton Court Forebay	31,300	2,180	8
Bethany Reservoir	5,100	180	6
Lake Del Valle	77,100	1,060	16
San Luis Reservoir	2,027,800	12,520	65
SWP storage, 1,062,183 AF			
O'Neill Forebay	56,400	2,700	12
SWP storage, 29,500 AF			
Los Banos Grandes (future facility)	1,728,000	12,870	
Los Banos Reservoir	34,600	620	12
Kern Water Bank Fan Element	1,000,000		
Pyramid Lake	171,200	1,300	21
Elderberry Forebay	33,000	500	7
Castaic Lake	324,000	2,240	29
Silverwood Lake	75,000	980	13
Lake Perris	131,000	2,320	10
Quail Lake	7,600	240	3

pletion in 1996. The enlarged Devil Canyon Powerplant and the new Devil Canyon Powerplant Second Afterbay will become operational in 1995. In addition, the second phase of the Coastal Branch of the California Aqueduct is currently under construction. Upon completion, the Coastal Branch will have the capacity to transport about 50,000 acre-feet annually to San Luis Obispo and Santa Barbara counties.

Methods of Financing

Project facilities have been constructed with four general types of financing: general obligation bonds and tideland oil revenues (under the Burns-Porter Act, approved by voters in 1960), revenue bonds, and capital resources. Repayment of these funds and the operations, maintenance, power, and replacement costs associated with water supply are paid by the 29 agencies or districts that have long-term contracts with the Department for SWP water; those costs are repaid as they are incurred.

The contracts initially provided for a combined maximum annual entitlement of 4,230,000 acre-feet of water supply. As a result of contract amendments in the 1980s, the current combined maximum annual entitlement totals 4,217,786 acre-feet. The contracts are in effect until 2035.

Long-Term Contracting Agencies

From 1963 through 1967, a total of 32 agencies or districts signed long-term water supply contracts with the Department. However, in 1965 the city of West Covina was annexed to the Metropolitan Water District of Southern California, and in 1981 Hacienda Water District was assigned to Tulare Lake

TABLE I-2

Physical Characteristics of Primary Dams

Facility	Crest Elevation (Feet)	Structural Height (Feet)	Crest Length (Feet)	Structural Volume (in thousand cubic yards)
Antelope	5,025	120	1,320	380
Frenchman	5,607	139	720	537
Grizzly Valley	5,785	132	800	253
Oroville	922	770	6,920	80,000
Thermalito Diversion	233	143	1,300	154
Thermalito Forebay	231	91	15,900	1,840
Thermalito Afterbay	142	39	42,000	5,020
Clifton Court Forebay	14	30	36,500	2,440
Bethany	250	121	3,940	1,400
Del Valle	773	235	880	4,150
Sisk	554	385	18,600	77,645
O'Neill	233	88	14,350	3,000
Los Banos Detention	284	167	1,370	2,100
Pyramid	2,606	400	1,090	6,000
Elderberry Forebay	1,550	200	1,990	6,000
Castaic Lake	1,535	425	4,900	46,000
Cedar Springs	3,378	249	2,230	7,600
Perris	1,600	128	11,600	20,000
Quail Lake	3,320	45	6,600	———

TABLE I-3

Pumping Plant Characteristics

Facility	Number of Units	Normal Static Head (ft)	Total Flow at Design Head (cfs)	Total Motor Rating (hp)
Thermalito	3 (p-g)	85-101	9,120	120,000
E. Hyatt	3 (p-g)	410-660	5,610	519,000
Barker Slough	9	95-120	228	4,800
Cordelia	11	104-439	138	5,600
H. O. Banks Delta	11	236-252	10,668	333,000
South Bay	9	566	330	27,800
Del Valle	4	0-38	120	1,000
W. R. Gianelli	8 (p-g)	99-327	11,000	504,000
Dos Amigos	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,000
Badger Hill	6	151	454	11,800
Devil's Den (under construction)	6	515	150	10,500
Bluestone (under construction)	6	482	150	10,500
Polonio Pass (under construction)	6	524	150	10,500
Buena Vista	10	205	5,405	144,500
J.R. Teerink Wheeler Ridge	9	233	5,445	150,000
I. J. Chrisman Wind Gap	9	518	4,995	330,000
A. D. Edmonston	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	539-546	2,575	203,200

TABLE I-4
Power Plant Characteristics, by Type of Facility

Type and Facility	Number of Units	Normal Static Head (ft)	Total Flow at Design Head (cfs)	Total Generator Rating (kw)
Hydro				
Thermalito Diversion Dam	1	63–77	615	3,000
Thermalito	4 (3 p-g)	85–101	16,900	115,000
E. Hyatt	6 (3 p-g)	410–675	16,950	644,250
W. R. Gianelli	8 p-g	99–327	16,960	424,000
SWP share			222,100	
Alamo	1	115-141	1,740	17,000
W. E. Warne	2	719–739	1,564	74,300
Mojave Siphon (under construction)	3	95-146	2,880	32,400
Devil Canyon	4	1,406	2,811	280,000
Thermal				
Reid Gardner, Unit 4	1 (a			245,000
SWP share				169,500

a) Life of the plant is expected to extend through 2013.

TABLE I-5
Total Miles of Aqueducts

Facility	Channel and Reservoir	Canal	Pipeline	Tunnel	Total
North Bay Aqueduct	0.0	0.0	27.4	0.0	27.4
South Bay Aqueduct	0.0	8.4	32.9	1.6	42.9
Subtotal	0.0	8.4	60.3	1.6	70.3
California Aqueduct, Main Line Delta to O'Neill Forebay	1.4	67.0	0.0	0.0	68.4
O'Neill Forebay to Kettleman City	2.2	103.5	0.0	0.0	105.7
Kettleman City to Edmonston Pumping Plant	0.0	120.9	0.0	0.0	120.9
A.D. Edmonston Pumping Plant to Tehachapi Afterbay	0.0	0.2	2.5	7.9	10.6
Tehachapi Afterbay to Lake Perris	2.9	93.4	38.3	3.8	138.4
Subtotal	6.5	385.0	40.8	11.7	444.0
California Aqueduct Branches					
West Branch	9.2	9.1	6.4	7.2	31.9
Coastal Branch (under construction)	0.0	14.8 (a	98.3	2.7	115.8
Subtotal	9.2	23.9	104.7	9.9	147.7
Total	**15.7**	**417.3**	**205.8**	**23.2**	**662.0**

a) Existing

1992, Castaic Lake Water Agency assumed all rights and obligations granted to Devil's Den Water District according to its long-term supply contract. The remaining 29 agencies or districts that now have long-term contracts with the Department are listed in Figure I-2 and Table I-6.

Figure I-2 shows the location of each contracting agency or district and lists the first year of SWP delivery service for each. Table I-6 presents information about each contracting agency.

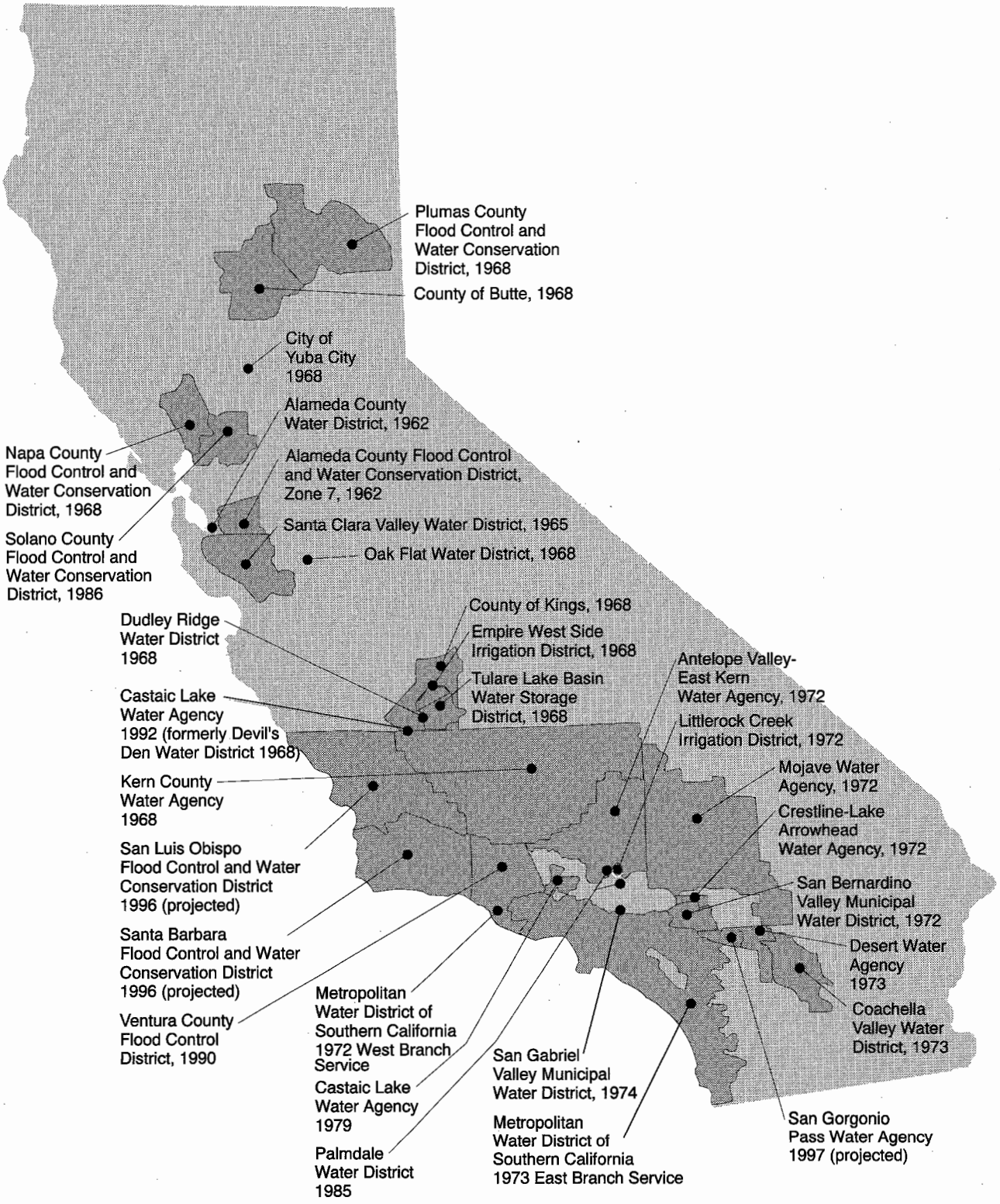


Fig. I-2. Names and Locations of, and First Year of Service to, Long-Term Contracting Agencies, June 30, 1995

TABLE I-6

Long-Term Water Supply Contracting Agencies, by Area

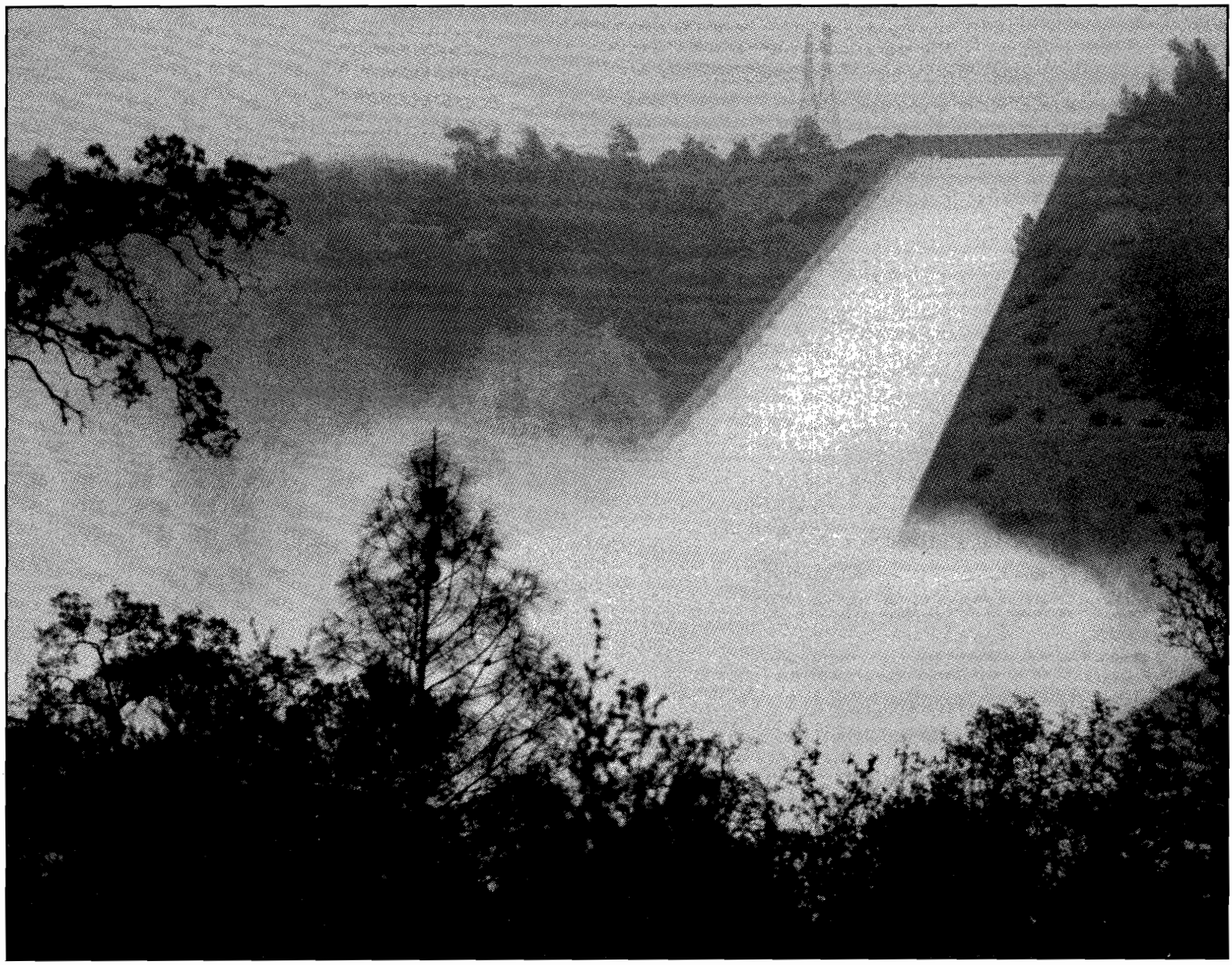
Contracting Agency	Cumulative Deliveries through December 31, 1994 (Acre-Feet)(a	Maximum Annual Entitlement (Acre-Feet)	Payments through December 31, 1994 (Dollars)	Gross Area as of July 1, 1995 (Acres)	Assessed Valuation 1995-96 (Dollars) (b	Estimated Population July 1, 1995
Upper Feather River Area						
City of Yuba City	4,474	9,600	1,088,072	5,107	1,126,662,000	34,350
County of Butte	7,424	27,500	395,431	1,069,000	6,239,500,000	172,600
Plumas County Flood Control and Water Conservation District	9,573	2,700	796,244	1,676,056	1,973,575,825	21,200
Subtotal	*21,471*	*39,800*	*2,279,747*	*2,750,163*	*9,339,737,825*	*228,150*
North Bay Area						
Napa County Flood Control and Water Conservation District	152,840	25,000	28,381,962	508,000	9,157,442,311	120,604
Solano County Water Agency	165,291	42,000	31,697,203	537,600	18,344,679,797	377,560
Subtotal	*318,131*	*67,000*	*60,061,165*	*1,045,600*	*27,502,122,108*	*498,164*
South Bay Area						
Alameda County Flood Control and Water Conservation District, Zone 7	556,729	46,000	41,473,108	272,000	7,009,487,000	161,600
Alameda County Water District	635,671	42,000	46,339,291	64,640	19,428,055,000	286,317
Santa Clara Valley Water District	2,486,926	100,000	152,954,271	833,000	94,500,000,000	1,585,000
Subtotal	*3,679,326*	*188,000*	*240,766,670*	*1,169,640*	*120,937,542,000*	*2,032,917*
San Joaquin Valley Area						
County of Kings	59,822	4,000	2,028,935	893,300	3,517,953,648	114,191
Dudley Ridge Water District	1,311,146	57,700	33,358,696	29,970	-- (e	50
Empire West Side Irrigation District	85,376	3,000	1,860,202	7,400	-- (e	50
Kern County Water Agency	19,730,481	1,153,400	763,090,479	5,161,000	30,540,999,000	612,300
Oak Flat Water District	135,219	5,700	2,699,052	4,000	-- (e	50
Tulare Lake Basin Water Storage District	2,664,529	118,500	65,074,652	189,200	-- (e	50
Subtotal	*24,317,420*	*1,342,300*	*868,112,016*	*6,284,870*	*34,058,952,648*	*726,691*
Central Coastal Area						
San Luis Obispo County Flood Control and Water Conservation District	0	25,000	14,748,278	2,131,300	14,109,987,000	212,074
Santa Barbara County Flood Control and Water Conservation District	1,240	45,486	28,651,029	1,775,296	23,203,211,423	396,900
Subtotal	*1,240*	*70,486*	*43,399,307*	*3,906,596*	*37,313,198,423*	*608,974*
Southern California Area						
Antelope Valley-East Kern Water Agency	808,731	138,400	170,079,326	1,525,029	12,378,500,000	230,000
Castaic Lake Water Agency(d	543,893	54,200	79,457,561	133,700	10,872,299,000	150,250
Coachella Valley Water District	295,970	23,100	70,992,934	637,600	11,132,616,000	200,000
Crestline-Lake Arrowhead Water Agency	28,806	5,800	11,266,813	55,100	1,500,527,807	25,000
Desert Water Agency	475,084	38,100	98,275,887	208,800	4,295,287,000	82,000
Littlerock Creek Irrigation District	11,829	2,300	3,067,903	43,300	85,052,000	2,900
Metropolitan Water District of Southern California	14,079,815	2,011,500	3,712,271,848	3,289,593 (f	671,699,559,000 (f	14,500,000 (f
Mojave Water Agency	119,380	50,800	73,089,063	3,160,400	13,264,223	340,000
Palmdale Water District	53,548	17,300	22,343,586	73,900	1,956,651,000	90,000
San Bernardino Valley Municipal Water District	280,443	102,600	190,105,568	210,000	14,131,900,000	540,000
San Gabriel Valley Municipal Water District	165,428	28,800	58,438,387	17,335	7,724,348,817	191,000
San Gorgonio Pass Water Agency	0	17,300	27,892,844	140,600	1,238,913,000	44,600
Ventura County Flood Control District	5,824	20,000	22,389,881	308,252	21,957,265,429	457,000
Subtotal	*16,537,904*	*2,510,200*	*4,539,671,601*	*9,803,609*	*758,986,183,276*	*16,778,950*
Total, State Water Project	44,875,492	4,217,786	5,754,290,506	24,778,000 (g	895,727,000,000 (g	20,250,000 (g
Net Total, SWP Service Area				23,790,839 (h	867,200,194,280 (h	18,840,929 (h
Total, State of California				100,314,000	1,863,390,349,000	32,140,000
Percentage, Net SWP of Total California				24	47	59

a) All water delivered to long-term SWP contractors, including current and deferred entitlement, surplus, unscheduled, emergency relief, exchange, and non-SWP water delivered through SWP facilities to Napa County Flood Control and Water Conservation District.
b) Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100 percent of full value for the 1981-82 fiscal year and fiscal years thereafter.
c) Total for all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.
d) District includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.
e) Assessed valuation not available on an agency area breakdown.
f) Total for MWDSC, including Calleguas Municipal Water District, which is common to MWDSC and Ventura County Flood Control District.
g) Includes duplicate values. Some areas that are within two or more agencies are included in each agency's total.
h) Excludes duplicate values where agencies have overlapping boundaries.

Part I
The Year in Review

Chapter 1

Summary of Significant Events



Lake Oroville Spillway

Bulletin 132, *Management of the California State Water Project*, an annual publication, reports activities of the Department of Water Resources in planning, constructing, operating, financing, and managing the State Water Project.

This issue, Bulletin 132-95, continues a 33-year tradition of discussing significant SWP events as well as reporting on issues that affect SWP management and operations. Bulletin 132-95 reports on the 1993-94 water year, the 1994 calendar year, and the 1994-95 fiscal year. The combination covers the period from October 1, 1993, to July 1, 1995. The reporting period for Bulletin 132-95 was a busy time for the SWP, marked by important projects and changes.

Again in 1994, the Department faced the challenge of delivering water to long-term contractors in a year of extremely dry hydrological conditions. (For information on hydrological measurements for the 1992-1994 water years, see Figure 1-1.) Construction associated with Phase II of the Coastal Branch of the California Aqueduct also presented numerous challenges to overcome. During this same period, the Department increased efforts to safeguard the Sacramento-San Joaquin Delta as a water supply and as habitat for endangered species.

State, federal, and local officials recognized the increasing urgency of cooperating to improve management of the Sacramento-San Joaquin Delta. These events culminated in drafting two historic documents—the Monterey Principles and the Bay-Delta Accord.

Monterey "Agreement"

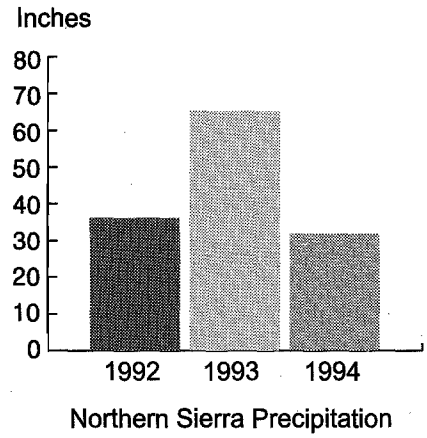
The Monterey Agreement is the name given to the understanding reached in Monterey, California, among the Department and the SWP contractors to address fundamental contract issues by amending the long-term water supply contracts. This understanding produced a set of guidelines, known as the Monterey Principles, to amend the contracts to resolve some long-standing concerns of SWP contractors and provide more flexibility in administering those contracts. Those amendments will significantly revise the complex SWP contracts, written more than 30 years ago. Despite careful crafting, the contracts could not easily accommodate the shifts in water policy and management that occurred since their execution.

Background

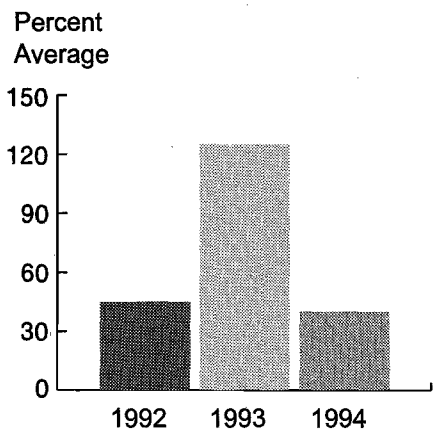
The development of the Monterey Agreement began as a search for an answer to a single—but critical—problem in managing the SWP: how to allocate the water supply equitably during times of shortage. The problem had been a longstanding challenge, dating back to January 20, 1960, when the *Contracting Principles for Water Service Contracts*, was published. Article 18 of the ensuing water supply contracts addressed this question.

While Article 18 provisions covered several situations in which SWP water supply shortages might occur, Article 18(a) eventually became the most significant provision for allocating SWP water in times of insufficient water supply. Article 18(a) provides that for "shortages due to drought or other temporary cause," water supply for agricultural contractors "shall be reduced by a percentage not to exceed fifty percent (50%) in any one year or a total of one hundred percent (100%) in a series of seven consecutive years" before any cut is made in municipal and industrial water supplies. Any necessary further reductions in deliveries are apportioned among all the contractors regardless of the use.

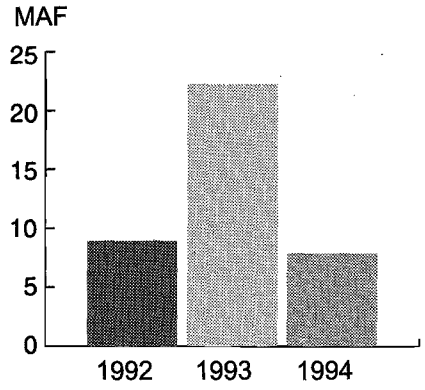
Because the available water supply was severely reduced during the 1987 to 1992 drought, the Department made cuts in agricul-



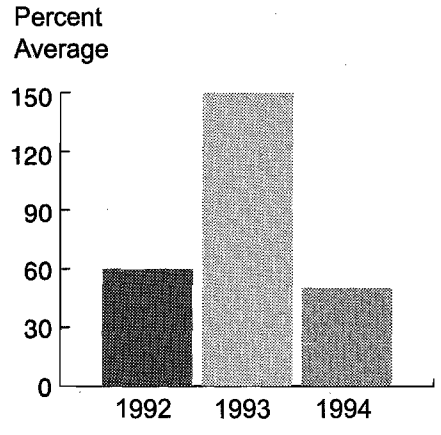
Northern Sierra Precipitation



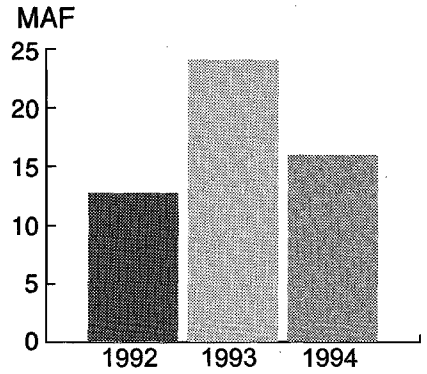
Statewide Runoff



Sacramento River Unimpaired Runoff



April 1 Snowpack Water Content



155 Major Statewide Reservoir Storage

Fig. 1-1. Key Hydrological Measurements, 1992-1994 Water Years

tural allocations under Article 18(a). Agricultural contractors argued that such cuts were inequitable and were brought about as much by undeveloped project yield as by temporary hydrological conditions. They felt they were bearing an unfair share of the burden of water shortages.

The urban contractors' views about Article 18 and SWP operations differed significantly from those of agricultural contractors. With the Department pursuing its mandate to allocate SWP water supply equitably and solve a critical problem in water supply allocation, a long series of discussions and negotiations began among the Department and SWP contractors.

Finding a solution became increasingly urgent as drought conditions persisted. Some contractors began to experience financial hardships that could ultimately impact the financial stability of the SWP. During the course of negotiations, legislators and other concerned parties began to focus on the reliability of the SWP water supply and financial integrity.

Negotiations

With the discussions threatening to spill over into the legislative and judicial arenas, the water supply contractors and the Department took unprecedented steps in fall 1994. They hired a mediator, set a December 1 deadline for reaching an agreement, and initiated a full-time effort during October and November to solve the water allocation problem.

Soon after discussions began, the parties determined that the water allocation problem was far too complex to be effectively approached as a single-issue problem. Article 18 negotiations grew into an omnibus revision of the SWP long-term contracts and their administration—an endeavor to update management of the SWP. The feeling was that amended contracts would allow increased flexibility for the long-term contractors and make the SWP and the Department more responsive to changing water supplies and needs.

Because the SWP has yet to be fully developed, administration of the contracts encounters unanticipated difficulties. The parties recognized the necessity of amending the water supply contracts to meet contractors' unforeseen needs. The parties also determined that the contracts had not been designed to address such contingencies. Only through major contract modifications could the problems be adequately addressed.

Development of Principles

After 2 months of full-time effort from the Department and contractor representatives, the Monterey Agreement took shape and was released to the public on December 16, 1994, in the form of 14 principles (see sidebar). These principles fell into three general categories that matched the following goals of the negotiations:

Goal 1—Increase reliability of existing water supplies. The agreement calls for the Department to adopt new rules to allocate water and allow contractors to turn back allocated water and also create an annual pool for water sales.

Goal 2—Provide stronger financial management. The agreement satisfies this goal by creating a general capital operating fund—consistent with utility practices—and redirecting contractor revenues to rate payments and other programs after California Water Fund repayment. This revenue redirection would allow creation of a trust fund for agricultural contractors to stabilize payments in water-short years.

Goal 3—Increase water management flexibility, providing more tools to local water agencies to maximize existing facilities. To accomplish this goal, the Department would:

- transfer control of the Kern Water Bank property to the agricultural contractors,

State Water Project "Monterey Agreement"

1. **Water Allocations.** Allocations are based on entitlement.
2. **Water Allocations When Requests Exceed Available Supply.** Initial agricultural deficiency is eliminated; Article 18(b) [permanent shortage provision] is eliminated.
3. **Kern Water Bank.** Kern Fan Element property is transferred to agricultural contractors; agricultural contractors permanently retire 45,000 acre-feet of entitlement.
4. **Permanent Sales of Entitlement.** Agricultural contractors commit to allow up to 130,000 acre-feet of entitlement to be sold to urban contractors, on a willing buyer-willing seller basis.
5. **Restructuring to Ensure Financial Integrity of the SWP.** Contractor payments in excess of SWP financial obligations are returned to the contractors as follows: money for agricultural contractors is put into a trust fund for rate management; money for urban contractors is distributed directly to them.
6. **Terminal Reservoirs-Points of Delivery.** The contractors paying for the terminal reservoirs gain increased control/management of those reservoirs.
7. **Interruptible Water Service Program.** Current categories of surplus, wet weather, and Article 12(d) [shortage make-up provision] water are replaced by a single category of interruptible water, which is allocated based on entitlement and delivered at the melded SWP power rate.
8. **Non-Project Water Transport.** Contractors have the right to transport non-Project water in SWP facilities, at the melded SWP power rate.
9. **Water Storage Outside Service Area.** Rules for carryover in SWP conservation facilities are expanded; there are no limits on ground water storage of SWP water outside a contractor's service area.
10. **Turn-Back Water Pool Sales.** An annual turn-back pool is created under which water allocated but not needed by a contractor may be sold to interested contractors and/or DWR at a percentage of the Delta Water Rate, or to noncontractors.
11. **Conforming Contract Amendments.** SWP contracts are to be amended to conform to these principles.
12. **Project Improvements.** DWR reaffirms its obligation to complete the SWP.
13. **Integrated Package.** The principles come as a package—a contractor can participate in all or none of the provisions.
14. **No Precedent.** If the amendments are not entered into, the parties agree not to use these principles in court proceedings.

- provide for permanent sales of water among contractors,
- provide more flexibility in using certain reservoirs for local use,
- implement a simpler program for interruptible water supplies,
- provide new rules for transportation of non-SWP water to contractors, and
- provide new rules for storing water outside a contractor's service area.

As part of this agreement, 45,000 acre-feet of annual entitlement belonging to two agricultural contractors will be retired. In addition, voluntary entitlement transfers of about 130,000 acre-feet from agricultural to urban users will likely proceed.

Benefits of Agreement

The Monterey Agreement is designed to benefit all parties involved in its development. The principles of the agreement will increase contractors' certainty over water allocation and facilities use. The agreement also provides measures to allow individual contractors to increase their own water supply reliability through:

- water transfers,
- water banking,
- storage outside service areas,
- transport of nonproject water,
- permanent sales of water among contractors,
- annual turn-back programs,

- use of Kern Water Bank property by agricultural contractors for water banking, and
- access by urban water contractors to Kern Water Bank use.

The agreement provides rules for water allocation, water delivery, and contract management. It provides greater financial stability for agricultural and urban contractors alike. Most importantly, the agreement also avoids potential litigation over decades-long contract disputes.

Implementation

The parties are in the process of implementing this historic agreement, working toward adoption of water supply contract amendments and negotiating a separate agreement to transfer Kern Water Bank property to agricultural contractors. To comply with the California Environmental Quality Act, a programmatic environmental impact report will be issued. In the future, other agreements will be negotiated to transfer water from willing sellers to willing buyers—an action made possible by the agreement.

The guidelines set in place by this agreement allow more flexibility and water management benefits to participating contractors. Implementation of these guidelines is evidence of a partnership spirit among the agricultural and urban contractors and the Department.

Bay-Delta Accord

With assistance from urban, agricultural, and environmental interests, and other stakeholders concerned with Bay-Delta issues, State and federal agencies developed the Bay Delta Accord. The Accord grew out of Governor Wilson's 1992 policy to "fix the Delta." This led to the events that shaped the State-Federal Framework Agreement, signed in June 1994, and the Bay-Delta Accord signed December 15, 1994.

The June 1994 Framework Agreement called for a cooperative, coordinated process to solve long-term water quality and ecosystem problems in the Bay-Delta Estuary. The Agreement's signers—now known collectively as CALFED—are responsible for (1) setting water quality standards,(2) coordinating operations in the Bay-Delta, and (3) developing long-term solutions to fish and wildlife issues, water supply reliability, flood control, and water quality problems in the Bay-Delta Estuary. The Bay-Delta Accord fulfilled the first two promises of the Framework Agreement. Formally known as the *Principles for Agreement on Bay-Delta Standards Between the State and Federal Governments*, the Bay-Delta Accord supplemented and built on the Framework Agreement. It was released concurrently with the SWRCB draft *Water Quality Control Plan for the Bay-Delta.* That document reflected the principles on which the Bay-Delta Accord was based. The Accord set forth strategies and procedures for addressing three major issues of concern and conflict in the Delta:

1) The Accord and the SWRCB Water Quality Control Plan establish standards and project operating constraints for protecting fish and wildlife in the Delta, as well as urban and agricultural uses.
2) The Accord broadens the operations coordination group established by the Framework Agreement to include participation by the stakeholders. Also, it sets

The Delta

The 738,000-acre Delta, interlaced with hundreds of miles of waterways, receives runoff from 40 percent of the State's land area, including runoff and flood flows from the water basins of the Sacramento, San Joaquin, Mokelumne, and Consumnes rivers. As part of an interconnected estuary system that includes Suisun Marsh and San Francisco Bay, the Delta supports hundreds of species of fish, wildlife, and plants. The Delta also serves as part of an important water transport system, which includes the SWP, that delivers water to over 20 million Californians.

forth specific objectives for the coordination group, known as CALFED OPS.

3) The Accord also gives added definition to the CALFED Bay-Delta Program (the long-term process to fix the Delta). The Delta stakeholders organized themselves to provide timely contributions to this planning process.

The Bay-Delta Accord also will benefit the SWP as it protects valuable Delta resources. Specifically, the Accord reduces uncertainty for SWP managers and contractors by:

- establishing Bay-Delta water supplies and SWP/CVP operations for at least 3 years,
- setting the stage for the SWRCB to adopt Bay-Delta water quality standards and an implementation program for these standards in the Sacramento and San Joaquin river basins that meet the requirements of State and federal laws,
- enabling a long-term process to find a solution to the Bay-Delta management problem to be built on the foundation provided by the SWRCB water quality standards,
- securing State-federal partnership on administering the Endangered Species Act for the Bay-Delta,
- fostering cooperative management of the SWP and CVP, and
- improving project coordination to protect the Delta and its resources.

Bay-Delta Accord implementation requires that the SWP and CVP each surrender a specified amount of their Delta water supplies—up to a combined 1.1 million acre-feet in a critically dry year, roughly a 20-percent reduction—to protect Delta resources. However, knowing in advance how much water they will lose reduces uncertainty and enables SWP and CVP water users to plan for the loss.

Also reducing uncertainty for water users is the promise that, during the 3-year term of the agreement, any additional Endangered Species Act listing will not result in diminished water supplies—barring unforeseen circumstances. In other words, instead of focusing on listing individual species, the agreement provides for an integrated ecosystem approach to management of the Bay-Delta. The CALFED OPS group will be instrumental in finding innovative ways to protect fish if unforeseen circumstances occur, without impairing seasonal water supply allocations.

Implementation of the CALFED Bay-Delta Program to formulate the permanent solution for the Delta is proceeding.

In May 1995, the SWRCB issued a final *Water Quality Control Plan* and submitted it to EPA for approval under the Clean Water Act. SWRCB is holding water rights workshops and hearings to allocate responsibility for providing the water supplies needed to meet the standards set forth in that *Water Quality Control Plan*. Delta water users are negotiating with upstream diverters to develop a mutually satisfactory strategy for safeguarding Delta water supplies.

Drought Watch

The importance of cooperation and creative problem solving was highlighted in 1994 with the recurrence of dry hydrologic conditions reminiscent of the 6-year drought that ended in February 1993. In fact, the 1993-94 water year proved to be the fourth driest year since official record-keeping began in 1906. With below-average precipitation and runoff, the water year was classified as critically dry under SWRCB Decision 1485 criteria, and the Department declared the State to be under a *drought watch*, which lasted throughout the calendar year.

Above-average reservoir storage carried over from the previous water year lessened the impact of the dry conditions that prevailed during 1994. However, with cities and farms again facing the problems of reduced water supply, the Department reenforced some innovative water management techniques that helped Californians survive the

TABLE 1-1

Water Delivered, by Category, 1962 through 1994

	Water Delivered (Acre-feet)								
	Entitlement Water (a			Other Water Deliveries					
				Surplus and Unscheduled					
Year	Municipal and Industrial (1)	Agricultural (2)	Total (3)	Industrial (4)	Agricultural (5)	Other Water (b (6)	Feather River Diversions (c (7)	Recreation Water (8)	Total Deliveries (9)
1962	--	--	--	--	--	18,289	--	--	18,289
1963	--	--	--	--	--	22,456	--	--	22,456
1964	--	--	--	--	--	32,507	--	--	32,507
1965	--	--	--	--	--	44,105	--	--	44,105
1966	--	--	--	--	--	67,928	--	--	67,928
1967	5,747	5,791	11,538	0	0	53,605	--	--	65,143
1968	46,472	125,237	171,709	10,000	111,534	14,777	866,926	--	1,174,946
1969	34,434	158,586	193,020	0	72,397	18,829	794,374	--	1,078,620
1970	47,996	185,997	233,993	0	133,024	38,080	759,759	--	1,164,856
1971	85,286	272,054	357,340	2,400	293,619	44,119	778,362	8	1,475,848
1972	181,066	430,735	611,801	22,205	401,759	66,638	817,398	6,489	1,926,290
1973	293,824	400,564	694,388	3,161	293,255	42,511	800,743	1,155	1,835,213
1974	418,521	455,556	874,077	4,753	412,923	46,224	911,613	2,118	2,251,708
1975	641,621	582,369	1,223,990	21,043	601,859	63,793	862,218	3,377	2,776,280
1976	818,588	554,414	1,373,002	32,488	547,622	115,217	946,440	1,745	3,016,514
1977	280,919	293,236	574,155	0	0	389,065	581,994	1,111	1,546,325
1978	742,385	710,314	1,452,699	3,566	13,348	121,225	786,517	1,691	2,379,046
1979	690,659	969,237	1,659,896	66,081	582,308	187,630	882,549	1,766	3,380,230
1980	730,545	799,204	1,529,749	19,722	384,835	46,459	875,045	2,131	2,857,941
1981	1,057,273	852,289	1,909,562	12,000	896,428	279,161	838,557	4,688	3,940,396
1982	928,721	821,303	1,750,024	0	215,873	154,882	776,330	4,646	2,901,755
1983	483,499	701,370	1,184,869	0	13,019	181,453	602,905	7,849	1,990,095
1984	725,925	862,694	1,588,619	3,663	259,254	381,024	832,332	7,040	3,071,932
1985	992,538	1,002,915	1,995,453	9,638	298,034	404,842	870,008	4,033	3,582,008
1986	998,611	997,025	1,995,636	2,595	34,025	193,606	791,737	3,865	3,021,464
1987	1,096,368	1,033,718	2,130,086	6,949	107,958	377,592	831,947	7,672	3,462,204
1988	1,316,820	1,068,302	2,385,122	0	0	507,076	794,834	4,889	3,691,921
1989	1,602,454	1,251,293	2,853,747	0	0	474,559	822,276	8,135	4,158,717
1990	1,876,072	706,079	2,582,151	0	90	424,697	868,219	9,262	3,884,419
1991	536,672	12,444	549,116	3,521	0	551,048	565,395	4,879	1,673,959
1992	961,394	509,805	1,471,199	1,156	0	145,044	613,978	2,605	2,233,982
1993	1,064,729	1,250,369	2,315,098	0	0	254,991	822,589	2,609	3,395,287
1994	1,181,743	680,233	1,861,976	0	0	236,739	874,018	8,200	2,980,933
1995	--	--	0	--	--	--	--	--	--
Total	19,840,882	17,693,133	37,534,015	224,941	5,673,164	6,000,171	21,569,063	101,963	71,103,317

a) Includes amounts of deliveries of carry-over entitlement water and advance entitlement water.
b) Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP water contractors.
c) Includes amounts of water diverted according to various water rights agreements.

recent prolonged drought. Water transfers and water banking again became important means of providing needed water supplies.

To assist SWP contractors, the Department initiated a short-term water purchase program. That program, developed in cooperation with several long-term contractors, also provided a framework for a long-term program. To further assist SWP contractors and others in need of additional water supply, the Director of the Department of Water Resources reactivated the Drought Water Bank on June 10, 1994.

The Department modeled the 1994 water bank after the successful 1991 and 1992 drought water banks. Using expertise gained from operating the earlier water banks, water managers made the 1994 water bank an effective tool for meeting water supply needs during a critically dry, drought-watch year. As in past years, implementation of the 1994 water bank depended on close coordination with the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, California Department of Fish and Game, State Water Resources Control Board, and local water districts and counties.

The first deliveries from the 1994 programs began in August, with deliveries made through SWP and CVP facilities. In 1994, more than 173,000 acre-feet of water were delivered to cities and farms throughout the State. About 115,000 acre-feet were delivered from the water bank and 58,000 acre-feet delivered from the short-term water purchase program. Alameda County Flood Control and Water Conservation District Zone 7, Mojave Water Agency, and the Metropolitan Water District of Southern California bought water from the short-term program but not from the water bank. Several SWP long-term contractors purchased water from both the water bank and the short-term program. Those contractors included: Kern County Water Agency, Tulare Lake Basin Water Storage District, Santa Clara Valley Water District, and Oak Flat Water District. (For a summary of all water delivered from 1962-1994, by category, see Table 1-1.)

The Department developed plans to reactivate the water bank in 1995 if necessary. However, strong winter storms in January 1995 provided three times the average precipitation, and, in late January 1995, the drought watch ended. By that time, reservoir storage statewide had risen to 105 percent of normal. Also in January 1995, SWP announced that contractors would receive full deliveries—up to a total of 3.2 million acre-feet–for 1995. These events will be discussed in more detail in Bulletin 132-96, which will include the 1994-1995 water year.

Coastal Branch Phase II

To meet additional water supply needs in California's central coastal area, the Department is constructing Phase II of the Coastal Branch of the California Aqueduct. Phase II will deliver water to San Luis Obispo and Santa Barbara counties. The Department faces numerous environmental and technical challenges in planning, designing, and constructing the Phase II facilities. The project has become an ongoing example of cooperative problem solving.

One innovation in constructing Phase II is the agreement between the Department and the Central Coast Water Authority. That agreement creates a cooperative effort between CCWA and the Department in constructing Reaches 5B and 6, the last 28 miles of the pipeline. Involvement of CCWA will enable the Department to meet the 1996 operational date and planned budget for the project. Also, in response to local requests, the Department eliminated four major facilities initially planned for the project: San Luis Obispo Powerplant, Tank Site 3, Tank Site 4, and Casmalia Hills Pumping Plant.

Cooperation and creative problem solving have also been the keys to meeting the environmental challenges presented by con-

struction. Measures necessary to obtain the numerous environmental permits and approvals required the Department to design and construct a project that avoids or minimizes detrimental impacts on the environment. These measures include protecting stream crossings; safeguarding native ecological communities, including 22 sensitive plant species and the habitat of several threatened or endangered species such as the San Joaquin kit fox and the blunt-nosed leopard lizard; and training all personnel. Everyone working on the project is trained to understand and comply with environmental guidelines. In fact, Phase II of the Coastal Branch has been subject to the most careful environmental monitoring ever undertaken for any facility the Department has constructed.

California Water Plan Update

The need for cooperative problem solving is underscored by findings reported in Bulletin 160-93, the legislatively mandated *California Water Plan Update* released November 14, 1994. The result of a detailed research effort on California's future water needs, Bulletin 160-93 was developed with extensive public comment and assistance from an advisory committee representing urban, agricultural, and environmental interests. The plan calls for a wide range of short-term and long-term actions to ensure that the State's water supply will reliably meet future demands.

Although the plan asserts that more study will be needed for water managers to determine how best to meet those demands, it also reaffirms the importance of refining water management strategies that the Department developed and practices. This means creating and implementing such innovative water management strategies as water transfers, water banks, and conjunctive use programs. However, those techniques alone cannot satisfy projected water needs. Even with extensive water conservation, additional facilities will be needed by 2020 to reliably meet demands. Development of those additional facilities will depend on finding a long-term solution to Delta problems—a solution built on close cooperation among the many agencies, organizations, and individuals with interests in Delta issues and concerns about California's water supply.

Part II
State Water Project Management

Chapter 2

Future Storage and Delivery Capabilities



Tank 1 Site Treated Water Tank, Coastal Branch

Significant Events

- In early 1994, the Department began construction of Phase II of the Coastal Branch of the California Aqueduct. Construction is expected to cost about $400 million and will include 100 miles of buried pipe, three pumping plants and three water-storage facilities. Construction is scheduled to be completed in late 1996.

To meet the water deliveries specified in water service contracts, the Department of Water Resources will need to construct additional storage and delivery facilities as part of the State Water Project. In planning and developing those facilities, however, the Department often faces two significant challenges: 1) finding technically suitable projects; and 2) satisfying many complex environmental procedures, laws, and regulations.

Because meeting contractual water delivery commitments remains a priority with the Department, two planning programs were initiated to lay the groundwork for developing additional SWP water supplies: the SWP Planning Strategy and the Service Area Impact Study. The SWP Planning Strategy will help the Department determine the best means to develop and implement a SWP water supply plan for at least the next 30 years. The Service Area Impact Study will update a 1985 study and provide information to help planners, SWP contractors, and other SWP water recipients satisfy environmental requirements for new water development projects.

SWP Planning Strategy

Because of the significantly increasing need for additional water supplies for the SWP, along with the impacts of new constraints on Delta exports, the Department initiated efforts in 1994 to formulate a new planning strategy for the SWP Future Water Supply Program. The Department held initial meetings with all interested SWP contractors to discuss regional water management issues, requirements for SWP supply reliability, and strategies for implementing new demand reduction and supply development projects.

The SWP Planning Strategy must address many critical issues, including changing regulatory laws and processes, financial mechanisms, individual SWP contractor participation and nonparticipation (opt-in/opt-out), local project guidelines, Delta constraints, and area-of-origin needs. In addition, the planning strategy needs to examine both traditional and nontraditional measures for SWP demand reduction and water supply development. Many nontraditional measures would allow increases in SWP water supply reliability to occur in a timely manner independent of the Delta and its various current regulatory constraints. Possible nontraditional water supply development measures include land retirement, water reclamation, and water transfers. These, along with traditional measures such as conjunctive use, ground water banking, and south-of-the-Delta off-stream reservoirs, will be evaluated during this scoping process.

The end product of the SWP planning strategy will be a detailed plan comprising water demand reduction and supply enhancement programs and their implementation schedules. The plan would specify how the SWP will meet interim (10-year planning horizon) and long-term (year 2020 and beyond) demands of SWP service areas according to service-area-specific ranges of desired reliability. The plan would be updated periodically in response to changes in current and forecasted water use, sources and costs of SWP water, and water development technology.

Service Area Impact Study

In 1985, the Division of Planning completed the initial Service Area Impact Study, an examination of the socioeconomic and environmental effects of increasing State Water Project deliveries to the service areas. The Service Area Impact Study was conducted to provide a consistent method of measuring the impacts of future water supply projects in the SWP service areas as part of the process of

Environmental Policy Acts

The National Environmental Policy Act (Title 42 United States Code sections 4321-4370 [1970]) and the California Environmental Quality Act (California Public Resources Code sections 21000-21177 [1970]) compel governmental agencies to document and consider environmental consequences of their actions in their decision-making process. NEPA states that it is the goal of the federal government to use all practicable means consistent with other considerations of national policy to protect and enhance the quality of the environment. All federal agencies must prepare an environmental impact statement, including a discussion of mitigation measures and alternatives, for actions significantly affecting environmental quality.

The California Environmental Quality Act is patterned after NEPA. According to CEQA, agencies are required to (1) disclose, through an environmental impact report, the significant effects proposed projects would have on the environment; and (2) search for ways to reduce or avoid environmental damage.

CEQA applies only to projects directly undertaken, funded, or approved by state or local agencies. NEPA applies to projects directly undertaken, funded, or approved by federal agencies. The Department conducts many projects in cooperation with federal agencies. In those cases both CEQA and NEPA must be followed.

NEPA requires that mitigation measures and alternatives be disclosed to the public in the EIS, but it does not generally require federal agencies to adopt such mitigation measures or alternatives. CEQA, on the other hand, does impose substantive duties on all California governmental agencies approving projects with significant environmental impacts to adopt alternatives or mitigation measures that they find to be feasible to substantially lessen these impacts, unless there are overriding reasons why they cannot. When a project is subject to both CEQA and NEPA, both laws encourage the agencies to cooperate in planning the project and preparing joint environmental documents.

Through the environmental review process, citizens can learn about those significant effects and, if the project is approved, the reasons for approving the project. The review process requires agencies to:

- describe the proposed project;
- identify the lead and cooperating agencies involved in the project;
- determine the scope of study with public and governmental agency participation;
- prepare and distribute a draft EIS or EIR;
- respond to comments received on the draft;
- prepare the final EIS or EIR;
- make findings and adopt feasible alternatives or mitigation measures to avoid significant effects, if applicable;
- adopt a monitoring plan to ensure mitigation measures are viable; and
- prepare and file applications for permits required to implement the project if the project is approved.

The scoping phase, which occurs early in the review process, is particularly important because it enables governmental agencies to identify issues and topics to be considered when preparing the report. Information gathered in the scoping phase helps agencies identify and evaluate reasonable alternatives; identify potential environmental impacts of the project; determine data and information needed; develop a work schedule; and allocate resources for preparing and distributing the draft environmental document for public review and comment.

NEPA requires a lead agency to involve the public during scoping, while CEQA does not. CEQA does not preclude public involvement at this stage, however, so generally members of the public may raise issues during the scoping phase and not just after the draft environmental document is prepared. Thus, the CEQA process leads to changes in projects through the development, consideration, and adoption of alternatives or enforceable mitigation measures to avoid or reduce any potential significant adverse effects on the environment.

complying with the California Environmental Quality Act. The information developed from the study was incorporated into several environmental impact reports prepared by the Department.

Since the initial study was completed, the socioeconomic and environmental data inventories in the service areas have become outdated, and environmental compliance has become more complex. As a consequence of these changes, the State Water Project Planning Branch began a Service Area Impact Study in late spring 1994 to update and reevaluate the effects of developing and distributing additional State Water Project supplies within the service areas.

Study Update

The Service Area Impact Study will reexamine the effects of developing and distributing additional water supplies within the SWP service areas. Because of the increased complexity of complying with the Endangered Species Act, the study will focus on habitat for threatened and endangered wildlife and plants, particularly the potential for growth to affect this habitat in the service areas. By providing this information, the study will assist SWP contractors and other recipients of SWP water, such as local-level decision makers and agencies, in identifying measures and conditions that ensure ESA compliance. Since the exact location of future urban and/or agricultural development within the SWP service areas is unknown, the local project proponents may need to prepare additional environmental documents that tier from the project-specific EIRs prepared by the Department.

In addition to identifying where sensitive environmental impacts from development may occur, the Division of Planning will work with the SWP contractors and local, State, and federal agencies to develop consensus concerning impact evaluation and mitigation response.

A Service Area Impact Study status report, *Procedures for Estimating the Environmental Impacts of Increasing Water Deliveries to the State Water Project Service Areas*, was prepared to identify the methodology to be used for the study. This status report, which also summarized the pertinent data collected to date, was distributed to appropriate environmental resource planning agencies and SWP contractors in June 1995.

The study will be conducted in four stages. Stage 1 consists of the preparation of an environmental baseline for the six SWP service areas (Feather River, North Bay, South Bay, San Joaquin, Central Coast, and Southern California). Stage 2 of the analysis will examine the relationship between water supplies and regional growth, and the estimation of the potential SWP-related growth and associated changes. Stage 3 will consist of the environmental impact analysis. Stage 4 will identify potential mitigation measures that could be adopted and implemented by local agencies that have the decision-making authority relative to these issues.

It is anticipated that a report summarizing the results of the first two stages of the updated Service Area Impact Study will be distributed in a Phase One memorandum report for review in April 1996. The study will be updated biannually, allowing the Department to better track future development in the service areas. Study results will be presented in memorandum reports.

Coastal Branch Delivery Facilities

The Coastal Branch of the California Aqueduct is being constructed in two phases. The first phase was completed in the late 1960s and delivers water for agricultural use to contractors in northwestern Kern County. The Phase I facilities include two pumping plants and a 14.8-mile coastal stub canal ex-

tending from Avenal Gap to the vicinity of Devil's Den in northwestern Kern County. Berrenda Mesa Water District, a member of Kern County Water Agency, receives water through the Phase I facilities. The second phase is under construction and will deliver water for municipal and industrial use to Santa Barbara County Flood Control and Water Conservation District and San Luis Obispo County Flood Control and Water Conservation District.

Phase II Facilities

In October 1986, SBCFCWCD and SLOCFCWCD requested that the Department conduct the planning and environmental studies needed to complete Coastal Branch Phase II. The final EIR was released in May 1991; the Notice of Determination and summary of findings were issued in July 1992.

SBCFCWCD and SLOCFCWCD were notified, as required in paragraph 45(d) of the water supply contracts, that the Department would start final design on Phase II in June 1992. The two districts notified the Department of their requests for entitlement water. SLOCFCWCD requested 4,830 acre-feet per year; SBCFCWCD requested 42,486 acre-feet per year.

Phase II Construction

The Phase II project is currently divided into six construction reaches. In early 1994, the Department began acquiring rights-of-way, and obtaining additional permits necessary to construct the project and began construction of the first two reaches and final design. Four addenda and one supplement to the final EIR were prepared to document changes in the project. With mitigation, the project will result in no long-term significant environmental impacts. All significant impacts are short-term and associated with construction (traffic, noise, and air quality). There was a legal challenge to the adequacy of the supplement. There have been several settlement meetings to work toward resolving the challenge.

Construction of Phase II of the Coastal Branch requires laying 100 miles of buried pipe from the existing Phase I terminus near Devil's Den to the site of Tank 5 on Vandenberg Air Force Base. Other facilities to be constructed include Devil's Den, Bluestone, and Polonio Pass Pumping Plants, and three water-storage facilities. The three tank facilities will be used to provide hydraulic stability and control in operating the project. A regional water treatment plant owned and operated by the local water purveyors (Central Coast Water Authority) is being constructed at the Tank Site 1 at Polonio Pass. The Department entered into a joint powers agreement with the Central Coast Water Authority to assist with construction of Reaches 5B and 6.

Development of the project has been divided into 27 construction contracts. Five contracts were awarded in late 1993, 13 in 1994, and 5 by mid-1995. Construction is scheduled to be completed in late 1996.

Los Banos Grandes

A key component of the Department's plans to meet California's growing water needs is through water banking. Water banking moves water from the Delta during periods of high flows in the winter into storage facilities located south of the Delta for later release during dry periods.

Water banking south of the Delta offers considerable benefits to SWP contractors and other users. Water banking helps to:

- improve the reliability of the SWP water supply;
- reduce demands for water exported through the Delta in the spring and summer; and
- benefit Delta fisheries by providing the Department with the option of pumping from the Delta when impacts on fisheries are least significant.

The Department designed the Los Banos Grandes facilities to be a primary south-of-the-Delta water bank. A major purpose of the facilities would be to reduce the frequency and magnitude of projected water shortages by increasing the dependability of the existing water supplies available to SWP contractors. Improving the reliability of SWP supplies will reduce the likelihood of long-term water shortages that could otherwise occur more frequently as demand increases.

In addition to improving the reliability of the SWP water supply, Los Banos Grandes would benefit Delta fisheries by providing the Department with additional flexibility to operate existing and planned delivery systems and by allowing a shift in Delta pumping to months when the effects of diversions on fisheries are least significant.

Investigations and Status

A feasibility report and draft environmental impact report for the proposed Los Banos Grandes project were completed in December 1990. The final environmental impact report and statement were scheduled to be completed in 1993, and construction of facilities was to begin in mid-1995. However, since the 1990 reports were released, new constraints on Delta exports have affected the feasibility of the proposed project. The U.S. Fish and Wildlife Service and National Marine Fisheries Service mandated measures to protect the delta smelt and winter-run chinook salmon. These two Delta fish species are listed under the federal Endangered Species Act. The State Water Resources Control Board and the federal Environmental Protection Agency proposed new flow and water quality standards for the Delta. These actions significantly reduce the amounts of Delta flows anticipated to be available for diversion and storage in the proposed Los Banos Grandes facilities.

In June 1994, a State-federal framework agreement was reached that calls for a cooperative and coordinated process to solve long-term water quality and ecosystem problems in the Bay-Delta Estuary. The agreement's signers—known collectively as CALFED—became responsible for setting water quality standards and developing long-term solutions to fish and wildlife issues, water supply reliability, flood control, and water quality problems in the Bay-Delta Estuary. In December 1994, CALFED signed the "Principles for Agreement on Bay-Delta Standards Between the State and Federal Governments." Concurrently, the SWRCB released a draft Water Quality Control Plan for the Bay-Delta that reflects these principles. The SWRCB issued a final plan in May 1995 and submitted it to EPA for approval under the Clean Water Act. Work will proceed through the CALFED Bay-Delta Program on formulating a permanent solution for the Delta.

The Department will reassess the feasibility of constructing the Los Banos Grandes facilities or an alternative south-of-the-Delta

Endangered Species Act

In planning, constructing, and operating the SWP, the Department must consider the effects its actions will have on organisms—plants, birds, reptiles, fish, and mammals—listed as threatened or endangered according to the Federal Endangered Species Act (Title 16, United States Code sections 1531-1544 [1973]) and the California Endangered Species Act (California Fish and Game Code sections 2050-2098 [1984]). An endangered species is one in danger of extinction in all or a significant portion of its range; a threatened species is one likely to become endangered.

These acts are designed to protect threatened and endangered species by:

- listing endangered and threatened species;
- ensuring federal and State agencies adopt measures to protect the species during the design, construction, and operation of the project and in taking other forms of agency action; and
- prohibiting the taking of endangered species.

One important aspect of the acts is preserving habitat critical to the survival of the threatened or endangered species.

off-stream reservoir once a Delta solution is identified. The optimum size and location of the facilities will be reevaluated, taking into consideration future Delta water export restrictions, changes in environmental regulations and permit processes, and the needs and financial capabilities of the SWP contractors. The reevaluation analyses of a south-of-the-Delta off-stream reservoir will be integrated into the ongoing SWP future water supply planning strategy studies.

In the meantime, limited work will continue on gathering and updating information on alternative south-of-the-Delta off-stream reservoir sites, preserving the viability of environmental data collected at the Los Banos Grandes site, and evaluating mitigation techniques for potential project impacts. These studies include a reconnaissance study of engineering and environmental considerations of alternative south-of-the-Delta off-stream reservoir sites; periodic field surveys for threatened and endangered species; continued investigations under the Sycamore Pilot Program, developed by the Department to evaluate survival parameters for sycamore trees in the reservoir area; and testing potential mitigationmeasures for impacts to the San Joaquin kit fox.

Kern Water Bank

The Kern Water Bank is broadly defined to include all opportunities to recharge SWP water in Kern County. The purpose of the Kern Water Bank is to store water available from the Delta during wet periods for use during dry periods. During wet periods, the Department would convey surplus water directly to recharge ponds or to local water districts for use in lieu of their pumping from ground water storage. In dry periods, water would be extracted from storage. In some cases, the extracted water would be directly conveyed to the California Aqueduct to supplement SWP water supply: in other cases, it would be used by local districts in exchange for an equivalent amount of their SWP entitlement water. Their entitlement would then be added to the amount of SWP water available for delivery to other SWP contractors.

The proposed Kern Water Bank program consists of eight separate projects or elements. One element, the Kern Fan Element, would be constructed on lands owned by the Department. The other seven elements, referred to as local elements, would be implemented in various existing water districts in Kern County. Together, the eight local elements could store as much as 3 million acre-feet of water and provide about 400,000 acre-feet of additional water in dry and critically-dry years.

As a result of the endangered species issues in the Delta and subsequent restrictions on diversions from the Delta to downstream facilities, the water supply for new facilities downstream of Banks Pumping Plant has become uncertain. Consequently, design activities for the Kern Fan Element and all planning activities for the other local elements were discontinued in spring 1993. Once an adequate water supply was determined to be available, planning for implementation of the local elements was to be reevaulated and possibly resumed.

Recent program emphasis has been directed toward maintaining the Kern Fan Element property and existing extraction facilities, monitoring ground water levels and water quality, coordinating with local planning efforts, and reevaluating the Kern Fan Element in consideration of water supply uncertainties.

The principles of the Monterey Agreement, including the agreement to transfer the KFE to a group of agricultural contractors, were released to the public in December 1994. Since that time, efforts have focused on documentation of the Kern Fan Element reevaluation, documentation of the ground water modeling program, continuation of land management activities, support of the property transfer activities, and preparation of a wrap-up report for the Kern Water Bank program

activities. The ground water model reports are complete. The reevaluation report and wrap-up are expected to be completed in 1996. The Kern Water Bank program will not be funded after fiscal year 1995/96. Future consideration of the local elements will be included in a program that encompasses all opportunities for conjunctive use in the San Joaquin Valley.

Information for this chapter was provided by the Division of Planning.

Chapter 3

Water Supply Development



Measuring snowpack off US highway 50

Significant Events

- The Department increased the flexibility of SWP water supply options during dry years through innovative programs such as the 1994 Drought Water Bank, water transfers, and short-term water purchases.

To meet State Water Project contractors' increasing need for water, the Department of Water Resources investigates and implements plans to augment the SWP water supply. The plans include:

- developing programs to transfer water, either through programs such as the Drought Water Bank or through transfers between SWP long-term contractors and/or other agencies, including the Central Valley Project contractors;
- establishing conjunctive use programs; and
- using SWP funds to develop local water supply.

Water Transfers

Before 1991 most water transfers in California were conducted on a limited basis. SWP facilities were used to transfer water (1) for SWP long-term contractors and (2) to other agencies in California—most notably to CVP contractors.

However, in February 1991, after four drought years and three winter months of meager precipitation, California began its first large-scale water transfer program when the Governor established the 1991 Drought Water Bank. As the drought continued into 1992, he established the 1992 Water Bank in March based on the successful 1991 program. Both Water Banks were administered by the Department; SWP facilities were used, when necessary, to transfer the water.

In 1993, with a plentiful water supply, no water bank was established. To facilitate future drought water banks, however, the Department issued a final program environmental impact report in November 1993. The EIR outlines the framework for future water bank operations under specified drought conditions.

Based on its experience in managing the 1991 and 1992 Water Banks, the Department also published *Water Transfers in California: Translating Concept into Reality*. Released in November 1993, this report presents an overview of issues involved in water transfers and provides guidance for individuals and agencies interested in implementing a water transfer. Recognizing that water transfers will undoubtedly play a major role in California's future, the publication discusses lessons learned and challenges that remain for water managers and others concerned with water transfers.

The following sections briefly describe water transfer activities. Specific information is noted in Chapter 10.

Drought Water Banks

The 1991 and 1992 Drought Water Banks were successful in arranging water transfers to meet critical agricultural, urban, and fish and wildlife needs on a short-term basis.

Following a wet 1993 when a water bank was not activated, a dry 1993-1994 winter along with severe water export restrictions in the Delta resulted in major cutbacks in 1994 water deliveries to SWP and CVP contractors. In June 1994, Director Kennedy announced the activation of a 1994 Drought Water Bank. Water Bank activities were immediately initiated which resulted in the acquisition and transfer of enough water to meet all 1994 critical needs.

Four SWP long-term water contractors and eight non-SWP contractors benefitted from this program. A total of 115,083 acre-feet of water, mainly for agricultural use, was conveyed in 1994 with 103,908 acre-feet conveyed through SWP facilities. Deliveries to SWP contractors totaled 27,468 acre-feet.

Short-Term Water Purchases

Increasing interest is being expressed in water transfers as a water management tool for alleviating short-term shortages as well as for augmenting long-term supplies. During 1994, and in parallel with the 1994 Drought Water

Bank, the Department executed agreements with six SWP contractors for the acquisition and delivery of water under a short-term water purchase program. A total of 58,400 acre-feet was delivered to SWP contractors in 1994 under the program. The Department continues to explore possibilities of purchasing water via short-term transfers. During 1994 the Department began drafting a program environmental impact report for SWP short-term water purchases outside the scope of a Drought Water Bank program.

State Water Project Transfers

The Department through the State Water Project Analysis Office, arranges for the temporary transfers of water through SWP facilities for SWP long-term contractors as well as for other agencies. Those transfers are usually in the form of (1) water loans or entitlement water transfers between long-term SWP contractors, and (2) transfers of nonproject water to non-SWP and SWP agencies. Most temporary water transfers have to be approved by the State Water Resources Control Board in accordance with sections 1725 through 1728 of the *California Water Code.*

Conjunctive Water Use

As a water management tool, conjunctive use of surface water and ground water can provide important benefits:

- Conjunctive use is a "win win" situation for the agencies involved. Agencies work together for their own benefit as well as to benefit each other by making the most efficient use of available water supplies. By combining resources, agencies can develop projects and solve problems beyond their individual capabilities.
- Conjunctive use is a relatively low-cost method of storing water in times of above-average supply to use during dry periods. Conjunctive use offers a way to stretch the water supply, both locally and statewide. For example, agencies with subsurface storage space can capture flood flows at times when surface storage is limited.
- Conjunctive use increases the flexibility of the overall water management system, improves efficiency, and assists in developing creative solutions to problems not contemplated during project development.

The Department has actively promoted conjunctive use as a water management tool since the 1960s and has operated its own groundwater demonstration programs in past years. In 1992, the Department expanded its conjunctive use program to investigate the potential for planned conjunctive use of surface water and ground water in the Sacramento Valley to contribute to both local and State Water Project supplies.

Sacramento Valley

The Department adopted a three-part approach to evaluating the conjunctive use potential of the Sacramento Valley. Work completed this year focused on the latter two components. This approach consists of:

- evaluating hydrogeologic conditions, water supply, facilities, legal and institutional relationships, and existing operations;
- working with local agencies to establish cooperative relationships needed to resolve legal and institutional concerns and develop cooperative problem-solving approaches; and
- conducting prefeasibility investigations and develop demonstration programs to allow incremental expansion as conditions permit.

The Department is conducting several investigations to determine the potential for conjunctive water use in the Sacramento Valley and is also working to develop demonstration programs as conditions permit. These projects would develop water to augment the SWP water supply in dry years.

Yolo County. The Department completed a cooperative prefeasibility investigation in eastern Yolo County for a proposed project to recharge ground water basins during wet periods for extraction during dry periods. This operation would add about 30,000 acre-feet to the SWP supply for delivery in dry years. Attempts to negotiate a demonstration program agreement with the principal local participant were unsuccessful. The Department continues its monitoring programs while evaluating options for reformulating the project. It is also continuing to work with the Water Resources Association of Yolo County to assure local acceptance and to coordinate planning efforts for water supply projects in the study area.

American River Basin. The Department completed the prefeasibility investigation in the American River Basin area of Sutter, Placer, and Sacramento counties. This investigation contemplates the development of 45,000 acre-feet of dry-year water supply for the SWP by managing ground water and surface water. During dry periods, ground water would be substituted for a portion of the surface water normally used in the area; during wet periods, ground water would be recharged by *in lieu* means using additional surface water imported to the area. A feasibility analysis begun in 1995 expands the project scope to include regional projects being considered by the Placer and Yuba County Water Agencies.

M&T Chico Ranch. Work continued on the Phase II investigation at the M&T Chico Ranch in Butte County. Efforts focused on evaluating the hydrogeology of the ranch, developing a water level monitoring network, reviewing water rights, identifying recharge options, and developing project designs. This study will be completed in 1996.

Butte Basin. The 1987-92 drought resulted in substantial increases in ground water use in the Butte Basin. Monitoring the basin response identified a significant resiliency that makes the basin very suitable for conjunctive operation. The Department, in cooperation with local districts, formulated an approach to evaluating the conjunctive use potential of part of the basin and providing data needed to improve understanding. However, these studies were delayed by resumption of Drought Water Bank activities in 1994 and the ongoing controversy over the effects of these activities. Concurrently, the Department continues to work with the Butte Basin Water Users Association and its members to coordinate its activities with the Association's efforts to develop management programs for the basin.

Local Agency Concerns. The Department continues to work with local agencies and other interested parties to address their concerns about additional use of ground water, water transfers, and to inform them about the potential for conjunctive use as an element of overall resource development. Local agencies continue to develop ground water management programs and are trying to assert increased local control over water supply development and use. However, the difficulty of resolving conflicting local interests has slowed adoption of programs. Therefore, the prospects of local groundwater management programs for conjunctive use remain uncertain.

Stanislaus River Basin and Calaveras River Water Use Program

In 1986, two water districts in San Joaquin County, Stockton East Water District and Central San Joaquin Water Conservation District, presented a proposal to the Department and USBR for releasing CVP water from New Melones Dam in exchange for financing diversion and conveyance facilities. Specifically, the districts proposed to release 155,000 acre-feet of CVP contracted water (106,000 acre-feet of interim water and 49,000 acre-feet of firm water) into the Stanislaus River in dry years to possibly increase SWP and CVP yield. In exchange, the SWP and CVP would finance surface water facilities in the Stanislaus River basin to allow the districts to divert and store their CVP contract water

during wet years. During dry years the districts would revert to ground water use.

In 1988, in response to the proposal, the Department, U.S. Bureau of Reclamation, and local water agencies agreed to investigate the future demands for water in the study area and the most efficient means of meeting those demands. The Department and USBR prepared a work plan for that investigation and a memorandum of understanding was signed by the Department of Water Resources, USBR, Department of Fish and Game, Stockton East Water District, Central San Joaquin Water Conservation District, Calaveras County, Calaveras County Water District, Tuolumne County, Tuolumne Regional Water District, Stanislaus County, San Joaquin County, Lathrop County Water District, South Delta Water Agency, and the cities of Escalon, Ripon, Manteca, and Stockton.

Two irrigation districts, Oakdale Irrigation District and South San Joaquin Irrigation District, with water rights to Stanislaus River water, decided not to sign the memorandum of understanding, but instead to monitor and contribute information to the study when necessary.

Alternatives to Meet Demands. As part of the study process, the Department and USBR would develop and analyze alternatives to determine the one that best:

- preserves and protects water resources for long-term use in areas of origin;
- meets current and projected local agricultural and municipal and industrial water needs in the study area;
- provides increased instream flows for fishery and wildlife in the Stanislaus and San Joaquin rivers;
- improves water quality in the Stanislaus River, San Joaquin River, and southern Delta channels; and
- increases the yield of the CVP and SWP and assists in meeting Delta outflow requirements.

In 1991, Stockton East Water District and Central San Joaquin Water Conservation District decided to begin constructing a portion of the diversion and conveyance facilities necessary to import CVP water to their service areas before a conjunctive use agreement was implemented. A 3.5-mile diversion tunnel and 8.5 miles of canal were financed and constructed by the two districts to divert 155,000 acre-feet of interim and firm water supplies from the Stanislaus River, via Shirley Creek, into Farmington Reservoir, a U.S. Army Corps of Engineers flood control reservoir.

The tunnel and canal conveyance facilities were completed in summer 1993. However, provisions of the Central Valley Project Improvement Act, passed in 1992, required annual releases of 800,000 acre-feet of water from CVP reservoirs to flow through the Delta for environmental needs. In 1993, 200,000 acre-feet of this CVPIA requirement was to come from New Melones, which resulted in a lack of water supply for SEWD and CSJWCD to divert. Although a court order now prevents implementation of CVPIA flow requirements for the Stanislaus River until CVPIA environmental documentation is complete, the availability of water for diversion by SEWD and CSJWCD remains uncertain.

Current Status. In March 1995, the Department withdrew participation in the Stanislaus River Basin and Calaveras River Water Use Program based on the impact of new proposed Delta Standards on the water supply potential of the program. In May 1995, these new Delta standards were issued by the State Water Resources Control Board and submitted to EPA for approval under the Clean Water Act. These standards have a potential to increase the demands on New Melones Reservoir to meet water quality and pulse flow requirements. USBR traditionally relies on New Melones to meet Delta and San Joaquin River requirements below the confluence with the Stanislaus River. Due to these increasing demands on the Stanislaus River, it appears unlikely that sufficient interim CVP water supplies will be available

to support the SEWD and CSJWCD conjunctive use proposal.

Three environmental studies for the DEIS/EIR were in progress when the Department withdrew from the program: a Habitat Evaluation Procedure study along the Stanislaus River, a survey of threatened and endangered animal species, and a survey for sensitive vegetation species. Summaries of the completed portions of the environmental studies as well as descriptions of other work completed by the Department on this program will be included in a departmental Stanislaus River Basin and Calaveras River Water Use Program wrap-up report. The wrap-up report will be published in December 1995.

Local Water Supply Projects

Local projects to augment water supply may be financed with SWP funds and become units of the SWP if the Department determines that the projects are structurally, economically, financially, and contractually feasible as well as environmentally acceptable. SWP water contractors benefit from increased water supplies or reduced demands resulting from the projects.

Should construction costs of the local project exceed available SWP funds, local participation in financing the construction will be required. In addition, SWP funding will not exceed the actual construction costs and the local project will not become a unit of the SWP until all participants sign an agreement.

For a project to be financed by the SWP, the Department must be assured that:

- appropriate water supply contracts would be amended;
- yield developed by a local project as a unit of the SWP would become part of the SWP yield, whether for the life of the project or for an interim period; and
- the local project would not adversely affect the costs of water deliveries to nonparticipating SWP contractors.

Central Valley Project Improvement Act of 1992

The Central Valley Project Improvement Act (PL 102-575; 106 Stat. 4706) made protection, restoration, and enhancement of fish and wildlife a major purpose of the CVP. Because it requires specific water supply actions, the CVPIA directly affects the joint activities of the CVP and SWP. The act indirectly influences SWP operations by addressing several Delta environmental issues.

The CVPIA is designed to (1) protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins; (2) address impacts of CVP on fish, wildlife, and associated habitats; (3) improve operational flexibility of the CVP; (4) encourage expanded use of voluntary water transfers and water conservation; (5) contribute to efforts to protect the Sacramento-San Joaquin Delta and estuary; and (6) achieve a reasonable balance among competing demands for CVP water, including fish and wildlife, agricultural, municipal, and power uses.

In addition to imposing further limitations on new and renewed CVP contracts and encouraging voluntary transfers of CVP water, the CVPIA requires the implementation of a program to ensure that by 2002, natural production of anadromous fish will be sustainable at population levels twice the average sustained from 1967 to 1991. The CVPIA also requires the dedication and management of an additional 800,000 acre-feet of CVP yield for fish-and-wildlife purposes.

The CVPIA also specifies measures to restore fish and wildlife and their habitat. Several measures, including installing a structural temperature control device at Shasta Dam, constructing specified Delta barriers, and acquiring supplemental wildlife refuge water, require cost sharing by the State of California.

The USBR is establishing guidelines and procedures to implement the CVPIA requirements. The Department is working closely with USBR as these programs develop to manage any effects on SWP operations and minimize adverse impacts to threatened and endangered species.

The Department conducts a feasibility study of local projects only when conceptual and reconnaissance reports support the project and SWP water contractors agree that the project is advantageous.

At this time, no local projects are being considered by the Department.

Information for this chapter was provided by the State Water Projects Analysis Office and the Division of Planning.

Chapter 4

Delta Resources



Twitchell Island

Significant Events

- Two agreements signed in 1994 by Federal and State resource managers advanced the water policy goal set forth by the Governor in 1992 to "fix the Delta." The June 1994 Framework Agreement called for a cooperative, coordinated process to solve long-term water quality and ecosystem problems in the Bay-Delta Estuary. The December 1994 Bay Delta Accord fulfilled the promise of the Framework Agreement by setting forth strategies and procedures for addressing major issues of concern in the Delta.
- The State Water Resources Control Board released a draft Water Quality Control plan designed to work in conjunction with the Accord to establish standards and project operating constraints for protecting Delta fish and wildlife.

Over the past 40 years, various federal and State agencies, including the Department of Water Resources, have participated in developing and implementing several programs designed to preserve the Delta both as a unique environmental resource and as one of California's major water supply sources.

Many of those programs involve:

- improving the water supply reliability to the SWP and other Delta water users;
- defining water rights;
- determining the levels of salinity needed to protect fish and wildlife habitat; and
- devising methods to control flooding, protect fish and wildlife, and provide for recreational activities.

Delta Water Management Programs

To manage water in the Sacramento-San Joaquin Delta, the Department of Water Resources developed planning programs for three distinct areas of the Delta: the south Delta, north Delta, and west Delta (Figure 4-1). Work on those planning programs continues under the guidelines contained in the Governor's 1992 water policy. As part of the policy to "fix the Delta," the Governor directed that interim actions in the south Delta be implemented and long-term solutions be investigated and evaluated by the Bay-Delta Oversight Council. The December 15, 1994, agreement between the federal and State government set up a new Bay-Delta Advisory Council. The new council was chartered under the Federal Advisory Committee Act. It will provide input to CALFED, which is made up of the State and federal resource managers for the Bay-Delta who signed the December 15, 1994, agreement. BDAC consists of 31 citizen-advisors selected from California agricultural, environmental, urban, business, fishing, and other interests who have a stake in finding long-term solutions to the Bay-Delta problems.

In keeping with the Governor's policy, the Department's Delta planning programs emphasize short-term interim solutions to improve conditions in the Delta.

In addition, the December 15, 1994, agreement included a mutually agreeable water quality plan for the next 3 years, coordination of federal and State water operations, and a jointly managed process to evaluate and produce environmental documentation for long-term solutions for the Bay-Delta Estuary.

Interim South Delta Program

To be consistent with the Governor's water policy, the Interim South Delta Program calls for facilities in the south Delta that can be constructed quickly to improve Delta water conditions while a long-term solution is developed.

The Interim South Delta Program is designed to improve hydraulic conditions in the south Delta and water levels and circulation in south Delta channels for local agricultural diversions. Improved hydraulic conditions will increase operational flexibility to divert water into Clifton Court Forebay and improve reliability of scheduled diversions at Banks Pumping Plant.

Proposals. The environmental review process currently in progress includes a preferred alternative with proposals by the Department and the U.S. Bureau of Reclamation to:

- construct up to three flow-control structures in south Delta channels to improve local water levels and circulation;
- construct an additional flow-control structure to improve water quality and fish migration in the San Joaquin River;

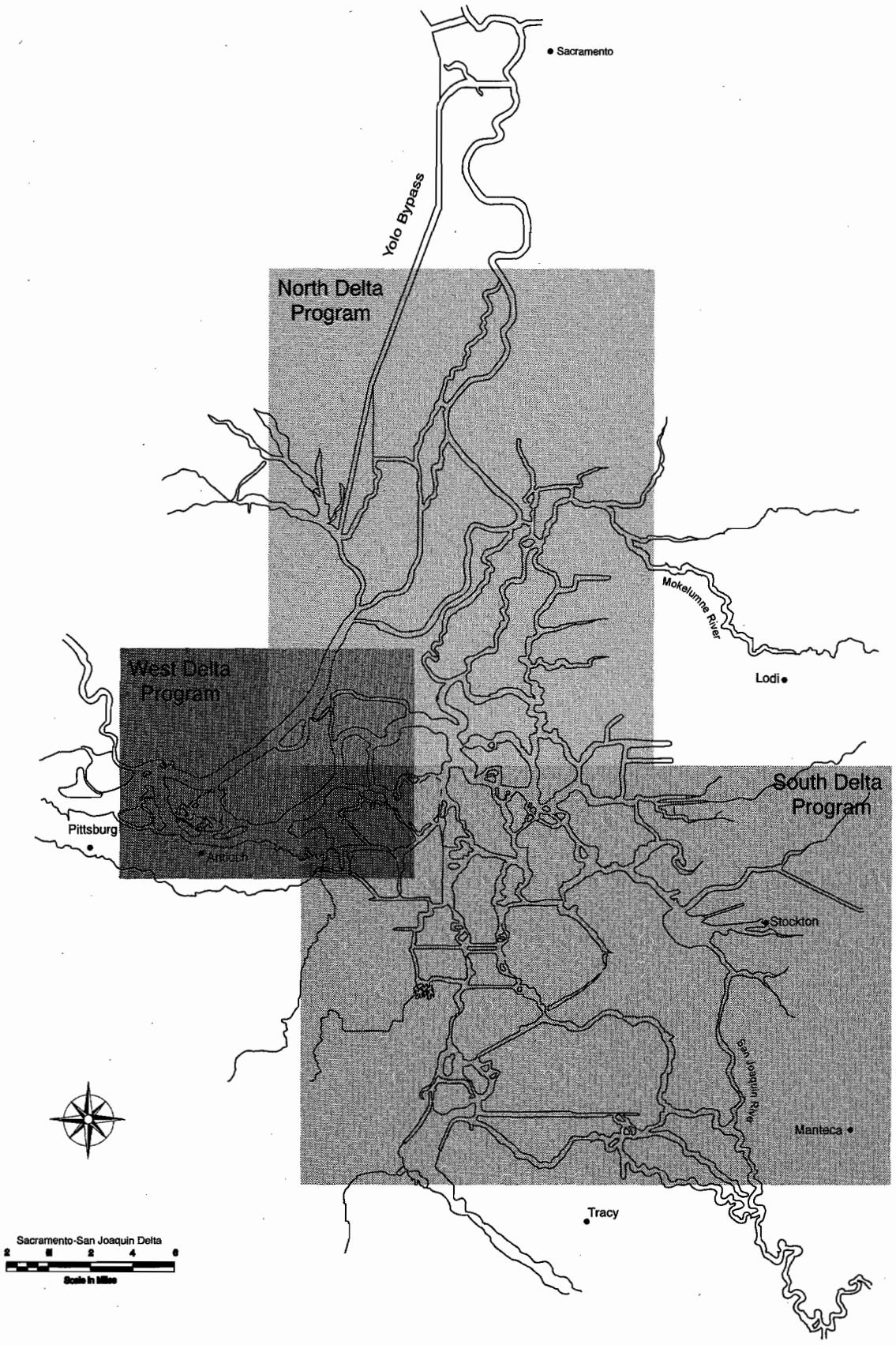


Fig 4-1. Boundaries of North, West, and South Delta Water Management Programs

- dredge approximately 5 miles of existing south Delta channels to improve conveyance and circulation and provide fish protection on the San Joaquin River;
- construct an additional intake to Clifton Court Forebay north of the existing intake; and
- obtain a permit from the U.S. Army Corps of Engineers to increase diversions into Clifton Court Forebay.

The proposal for increasing diversions into Clifton Court Forebay would allow Harvey O. Banks Delta Pumping Plant to pump up to its maximum design capacity of about 10,300 cubic feet per second with fewer restrictions while reducing fish losses. It would improve reliability of the water supply and operational flexibility. In addition, the proposal to construct flow-control structures in south Delta channels would allow the Department and USBR to meet the obligations of a pending contract with South Delta Water Agency to improve conditions for local agricultural diversions. The improved flow patterns should also benefit salmon migrations in the San Joaquin River.

To minimize losses of wildlife habitat related to the Interim South Delta Program, the preferred alternative no longer specifies an enlarged Clifton Court Forebay. Also, the Department and USBR signed an agreement with the Department of Fish and Game to negotiate fishery mitigation.

Environmental Review Process. A draft environmental impact report/statement for the South Delta Water Management Program was released in June 1990; the extended public review period ended September 30, 1991. The Department and USBR decided to issue a completely new draft EIR/EIS for the ISDP. The draft is expected to be released for public review and comment during 1996; the final EIR/EIS is planned to be completed in early 1997. Once the final EIR/EIS is completed, a Notice of Determination will be filed. State and federal regulatory agencies may then act on permits required to construct and operate the proposed facilities.

The key permit required will be issued by the U.S. Army Corps of Engineers according to Section 404 of the Federal Water Pollution Control Act (Clean Water Act) for dredging operations and Section 10 of the Rivers and Harbors Act for navigation. Approval for the permit must be coordinated with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Environmental Protection Agency.

Interim North Delta Program

The objectives of the Interim North Delta Program, which evolved from the former North Delta Program, are to:

- alleviate flooding in the north Delta and protect the towns of Thornton and Walnut Grove;
- reduce reverse flow in the lower San Joaquin River;
- improve water quality;
- reduce project impacts on fisheries; and
- increase flexibility of the SWP for water transfers and improve reliability of its water supply.

The program is also designed to enhance wildlife habitat and recreational opportunities. Interim actions under consideration include:

- increasing the hydraulic capacity of the Mokelumne River channels by dredging;
- improving levees by creating waterside berms and adding material to landside slopes;
- creating levee setbacks;
- enlarging the Delta Cross Channel gate structure;
- providing a new screened diversion from the Sacramento River near Hood into the Mokelumne River system; and
- testing and implementing various fish protective measures such as screens and fish guidance systems.

West Delta Program

The objective of the West Delta Program is to implement a different land-use management program to control subsidence and soil erosion on Sherman and Twitchell islands and also provide diverse habitat for wildlife and waterfowl.

Implementing such a program, designed to stabilize the soil by replacing current agricultural cultivation with land-use management practices, will significantly reduce subsidence by minimizing oxidation and erosion of the peat soils on the islands.

Altering land-use practices could result in the following benefits:

- increased flood control, including protection for highways and utilities;
- additional protection of water quality in the Delta;
- increased reliability of the SWP water supply;
- additional opportunities for recreation in the Delta;
- reduced fish losses;
- improved water quality;
- increased wetlands and wildlife habitats; and
- increased terrestrial biodiversity.

The Department also contracted with a consultant to develop a preliminary wildlife management plan for the two islands. The plan is designed to benefit species of wildlife that occupy wetland, upland, and riparian habitats and to provide recreational opportunities for hunting and viewing. In addition, property acquired and habitat developed through the Department's efforts will be available as mitigation for impacts associated with ongoing Delta water management programs.

Establishing wetland and wildlife habitats on the two islands is consistent with national and State policies to enhance and expand wetlands.

Clean Water Act

Section 404 of the Federal Water Pollution Control Act (Title 33, United States Code Section 1344 [1977]), also known as the Clean Water Act, requires that a permit be obtained from the U.S. Army Corps of Engineers for any activity that results in discharge of dredged material or placement of fill material in the waters of the United States. Section 404 has been broadly interpreted by the federal courts to include structures or fills introduced into waters of the United States, including wetlands as well as all interstate waters and waters within a state that may be used for interstate or foreign commerce.

Section 402 of the Clean Water Act established a permit system known as the National Pollutant Discharge Elimination System to regulate point sources of discharges in navigable waters of the United States. The Porter-Cologne Water Quality Control Act is California's comprehensive water quality control law and is a complete regulatory program designed to protect water quality and beneficial uses of the State's water. In 1972, the Porter-Cologne Act was amended to give California the authority and ability to operate the NPDES permits program. These laws require regional water quality plans to be adopted and implemented by issuing waste discharge requirements to each discharger of waste that could impact the waters of the State.

Special Flood Control Program

As a result of the Delta Flood Protection Act passed by the California Legislature in March 1988, $12 million is to be appropriated each year until January 1, 1999, to develop two programs to prevent flooding in the Delta–the Delta Levee Maintenance Subventions Program and the Special Flood Control Program. Under the Special Flood Control Program, the Department has initiated or participated in a number of activities that will protect towns and islands in the Delta and help to safeguard the SWP water supply as well.

Protection of Towns and Western Delta Islands. The Special Flood Control Program includes a mandate to protect the towns of Walnut Grove and Thornton and the eight islands of

the western Delta–Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell, and Webb. Those eight islands require protection because they support urban areas, including public facilities; provide large areas of diverse, valuable habitat; and are critical to the protection of water quality in the Delta. Because fresh and salt waters mix nearby, flooding any of those islands would allow saline water to intrude farther into the Delta.

In July 1989, the Legislature approved the flood control plan for Thornton and Walnut Grove. Immediate improvements to levees were recommended along with several long-term improvements to levees, channels, and facilities. Implementation of the plan to protect Thornton began in 1990.

Since 1990, a financial study of local cost-sharing possibilities was completed and a cost-sharing agreement signed between the Department and Reclamation District 348, where Thornton is located. The final design of the interim facilities identified in the flood control plan was completed in September 1992. The design was specifically crafted to protect as much of the existing on-levee habitat as possible. Unavoidable loss of habitat will be mitigated by developing replacement habitat on nearby property owned by the Department.

Although construction of the Thornton project was scheduled to begin in spring 1993, funding reductions resulting from the State's ongoing financial crisis caused a delay. After receiving full funding for the Special Projects program in 1993-94, final easements were obtained and relocations and mitigation planning were completed. Construction began in July 1994, but was delayed most of 1995 due to high flows in the Mokelumne River. Completion is expected in fall 1996.

In addition to the Thornton levee improvements, the Flood Control Plan recommended improvements to the patrol road on the crown of the Walnut Grove local levee. That work was completed during 1993.

A long-term plan, *Actions and Priorities, Delta Flood Protection Act, Eight Western Delta Islands,* was approved in May 1990 by the California Water Commission as the second step in implementing the flood control program.

That long-term plan is being used by the Department to determine how to best use appropriations to protect the eight western Delta islands. Those protections include:

- rehabilitating threatened levees;
- documenting levee encroachments on Bethel Island and Hotchkiss Tract;
- investigating subsidence;
- coordinating efforts for rehabilitating levees through the use of imported dredged material;
- verifying elevations in the Delta through the use of Global Positioning System equipment, which is used in conjunction with U.S. Navy navigational satellites; and
- upgrading levees to the standards included in Bulletin 192-82, *Delta Levees Investigation* published by the Department in December 1982.

Delta Levee Maintenance Subventions Program. Rehabilitating the threatened levee sites provides short-term protection for the western Delta until long-term improvements can be made. To date, more than $29 million has been spent at locations on Hotchkiss, Holland, Webb tracts and Sherman, Twitchell, Bethel, Jersey, and Bradford islands and the towns of Thornton and Walnut Grove. The costs of rehabilitation are divided between the State and local agencies; those agencies may pay up to 25 percent of the costs. The actual amounts to be paid were determined in an ability-to-pay study completed in May 1992 for each island.

Encroachment Documentation. Structures encroaching on levees conceal seepage, boils, rodent burrows, cracks, and other potential causes of levee failures. In addition, those structures restrict access to sections of the levees needing improvements or repairs. In August 1989, the Department documented

130 encroachments on Bethel Island and Hotchkiss Tract.

The first-phase encroachment study was completed in March 1990. This phase covered landside levee encroachments and resulted in a report documenting the location and extent of each encroachment. The second phase covers waterside encroachments. Hotchkiss fieldwork for the second-phase work is finished. A report covering Hotchkiss Tract was published in February 1995.

Subsidence Investigations. Subsidence of peat soils is an important concern throughout the Delta. As the ground surface on an island subsides, the geometry of the levee changes; the levee is then less likely to withstand the pressure of the water. Flooding is likely to occur if the levees are not enlarged correspondingly.

The Legislature recognized that problem and, with the Delta Flood Protection Act, requested the Department to monitor subsidence and study its causes. Accordingly, the Department contributed $900,000 to the U.S. Geological Survey to help fund a subsidence investigation in the Delta.

After reviewing preliminary data provided by USGS, the Department concluded that:

- land management practices substantially influence subsidence rates;
- permanent shallow flooding can stop the microbial subsidence processes;
- cultivation practices that raise soil temperature and lower the water table dramatically increase oxidation of the peat soils; and
- conversion of highly organic peat soils to carbon dioxide gas appears to be the primary cause of subsidence.

Future studies are designed to better quantify the range of subsidence rates and identify land management practices that will minimize subsidence and maximize wildlife habitat.

Upland Relocation of Dredged Material. As local sources of fill material for levee repair are depleted, new economical sources must be located. The Department, in coordination with the U.S. Army Corps of Engineers, local Reclamation Districts, and the Central Valley Regional Water Quality Control Board, implemented three pilot projects to demonstrate the viability of relocating material from the San Francisco Bay area.

The first project, on Sherman Island, Reclamation District 341, used about 1,600 cubic yards of sediment dredged from Suisun Bay as part of a 2,500-cubic-yard experimental berm. The berm was built on the toe of a levee reach along the San Joaquin River. As a condition of allowing the import of dredged sediment from the San Francisco Bay area to Sherman Island for levee rehabilitation, the Central Valley Regional Water Quality Control Board required an extensive program of soil and water monitoring. The testing program began in late 1990, immediately after the berm was constructed. The program continued for 2 years and ended with the board's approval in late 1992. No soil or water quality problems were found.

The second project, on Twitchell Island, Reclamation District 1601, transported about 50,000 cubic yards of sediment to the island. The sediment was dredged from Suisun Bay, transported from the Corps storage site on Simmons Island, and used as part of a major rehabilitation of the San Joaquin River levee on Twitchell Island. The dredged sediment was used with the permission of the CVRWQCB, which required–as a condition for its approval–that a water quality monitoring program be undertaken on Twitchell Island. This program was implemented in late 1992; as of June 30, 1995, no adverse salinity impacts had been measured.

A third project, the Jersey Island Demonstration Project, consisted of levee-stabilizing berms using about 65,000 cubic yards of sediment dredged from navigation channels in Suisun Bay and New York Slough. The project entailed extensive cooperation and planning among the Department, the Corps, Reclama-

tion District 830 on Jersey Island, and DFG. In addition, the CVRWQCB required a very extensive and expensive monitoring and testing program as part of the waste discharge permit issued for the project. This project was completed in December 1994. The monitoring and reporting required by the CVRWQCB have not identified any adverse impacts to date.

Levee Upgrades. The Department is upgrading the levees according to standards contained in Bulletin 192-82, *Delta Levees Investigation.* According to those standards, the agricultural levees must be raised to provide 1.5 feet of freeboard for a 300-year flood and widened to increase both landside and waterside stability.

To encourage levee upgrading, the Department uses available special project funds when other sources of funds are not available.

To augment its flood control actions, the Department is implementing long-term plans to provide higher levels of protection for all eight islands included in the Special Flood Control Program. The preparation and implementation of those plans was approved by the California Water Commission in May 1990. The programs resulting from those plans will be funded by yearly appropriations as provided for in the Delta Flood Protection Act. The long-term improvements for Webb and Holland tracts were completed in 1989-91. The long-term levee improvement program for Twitchell Island was completed in 1993. A long-term levee improvement program for Sherman Island is scheduled to begin in summer 1995.

In August 1991, the Corps, the Reclamation Board, and the Department signed a feasibility cost-sharing agreement for a special study of the Sacramento-San Joaquin Delta.

Updating an earlier 1982 study, the 1991 special study provides for investigating solutions for Delta flood protection, salinity intrusion, recreation, and navigation. In accordance with the Water Resources Development Act of 1986 and the federal policy of incurring no net loss of wetlands, the 1991 study includes environmental and wildlife habitat restoration measures. The study will also consider the Department's management plans for water supply and flood control when developing alternatives for a comprehensive Delta plan.

The special study is divided into two phases. Phase one began in September 1991 and ended in March 1993. The phase one report, called the Initial Report, describes problems, possible solutions, and opportunities to improve and/or provide flood protection, fish and wildlife habitat, water quality, recreation, and navigation. The Initial Report included a plan that identifies existing and future land uses in years 2000, 2020, and 2040. The report also included a discussion on developing a comprehensive plan–primarily for flood control, navigation, and environmental restoration.

Phase II of the special study is expected to emphasize coordination and development of reuse of dredged sediment for Delta levees. Emphasis will be on integration of ongoing activities of the Corps and the Department to achieve a time and cost saving by scheduling projects that can complement each other.

Necessary maintenance dredging of navigation channels could implement a demonstration reuse project on the Twitchell Island-Three Mile Slough levee. Such a project would be a most effective demonstration to CALFED participants, as well as the long-term management strategy program, of the feasibility of dredge reuse in the Delta and the ability of the Corps to integrate programs for best public benefit.

In addition, a joint program is planned to investigate other reuse opportunities as well as technical studies of sediment traps, water quality effects of sediment reuse, subsidence control, and habitat restoration. These studies will demonstrate the value of sediment reuse and the large part it can play in maintaining the momentum that seems to be building to-

ward solutions to Delta problems, particularly flood control.

Delta Water Rights Management

Several agencies in the western Delta claim rights to usable water in the Delta. To manage those water rights and resolve issues associated with them, the Department negotiated water rights management contracts with some of the agencies concerned. Those agencies serve agricultural as well as municipal and industrial users of Delta water.

Delta Agricultural Water Users

In 1974, the Delta Water Agency was replaced by six Delta agricultural water agencies: North Delta Water Agency, South Delta Water Agency, Central Delta Water Agency, East Contra Costa Irrigation District, Contra Costa County Water Agency, and Byron-Bethany Irrigation District. Two of those agencies–North Delta Water Agency and East Contra Costa Irrigation District–signed water rights management contracts with the Department in 1981.[1] The Department also negotiated contracts or is requesting negotiations with other agencies to provide for water level, circulation, and quality needs in certain areas.

In September 1990, the Department completed negotiations for a long-term contract with the SDWA and USBR. The three agencies are now working to obtain approvals from control agencies to sign the contract, which includes provisions to address SDWA's concerns about the quality of water entering SDWA through the San Joaquin River system.

South Delta Water Agency Contract. According to provisions of the proposed SDWA contract, the parties agree to proceed with the design, construction, and operation of certain barrier facilities in the channels of the south Delta. The facilities resolve those portions of the lawsuit that SDWA filed in 1982 regarding the alleged effects of export pumping by the SWP or the Central Valley Project or both on water levels, quality, and circulation in the south Delta.

At this time, the Department has conducted public meetings, negotiations, and environmental and engineering studies to test barriers in south Delta channels. The test involves:

- reducing or eliminating adverse water levels,
- improving hydraulic circulation,
- reviewing alternative timing patterns for the barriers,
- monitoring fish and vegetation,
- evaluating and reviewing computer model calibration,
- developing comprehensive environmental information, and
- defining potential effects on vegetation and fisheries.

Four temporary rock barriers are being tested at:

- Old River at Head, in Old River where it splits off from the San Joaquin River;
- Old River near Tracy, in Old River one-half mile east of the Tracy Pumping Plant intake and about 8 miles northwest of the City of Tracy;
- Middle River, just south of the confluence of Middle River, Trapper Slough, and North Canal; and
- Grant Line Canal, 420 feet east of Tracy Boulevard Bridge.

The Old River Barrier near the San Joaquin River directs San Joaquin River water that would otherwise flow into Old River down the San Joaquin River toward the central Delta. This additional flow in the San Joaquin River guides fish to the ocean in the spring and improves dissolved oxygen levels for upstream salmon spawning in the fall. At

[1] The Department also periodically conducts informational meetings with Central Delta Water Agency and is requesting to begin negotiations on contracts designed to meet the needs of that agency.

South Delta Water Agency v. United States, et al.

In 1982, the South Delta Water Agency filed suit in Federal District Court for the Eastern District of California against the United States, the Department of the Interior, the U.S. Bureau of Reclamation, and the Department.

This case involves the effects of operations by the Central Valley Project (operated by the USBR) and the State Water Project on the SDWA service area, and the effect of the Department of Interior's designation of the boundaries of the New Melones Reservoir service area as not including the SDWA service area. In its suit, SDWA asked for declaratory and injunctive relief, which, if granted, would have restricted certain Delta operations.

The United States and the SDWA settled the agency's motion for preliminary injunction to prevent the United States from signing contracts for New Melones water. The motion was settled by parties agreeing to a stipulation that any contracts entered into by the United States are subject to any superior rights in the southern Delta that are determined in this litigation.

In October 1986, the USBR, the Department, and the SDWA signed a framework agreement to settle the lawsuit. The parties agreed to work together to develop mutually acceptable, long-term solutions and to stay all actions in the litigation while negotiating a settlement.

In August 1990, a draft contract for settlement of the lawsuit was completed. The proposed settlement contract includes provisions for constructing, operating, and maintaining temporary (and later permanent) rock barriers in south Delta channels to improve water levels and circulation. In addition, according to the contract, USBR will take interim actions to improve the quality and quantity of water that flows into the south Delta from the San Joaquin River.

The SDWA held an election in September 1991 at which the voters approved the signing of the contract. USBR is in the process of obtaining authorization to sign the contract.

The Department has proceeded with designing, constructing, and operating the temporary barrier facilities as part of the five-year testing program included in the proposed contract. USBR and the Department will share equally the costs associated with the barrier facilities. According to the contract, those costs are limited to $40 million for both the temporary and permanent barriers.

the other barriers, culverts with flap gates and a notch in the barriers increase upstream flows, thus improving water levels and circulation.

The Old River at Head barrier has been installed in the fall since 1963 and intermittently in the spring since 1992, the Old River near Tracy barrier has been installed since 1991, and the Middle River barrier has been installed since 1987. The Grant Line Canal barrier is scheduled to be installed in 1996.

In addition to providing for barrier facilities, the proposed contract defines amounts of certain interim releases from New Melones Reservoir and other related actions to be taken by USBR. Those measures will provide a temporary solution to the portion of the 1982 litigation concerning San Joaquin River flows and water quality as measured at Vernalis.

A more permanent settlement of issues concerning the quantity and quality of water entering SDWA boundaries from the south through the San Joaquin River System will take the form of an amendment to the proposed contract. The proposed contract includes the framework for USBR and SDWA use in negotiating an amendment.

The South Delta Water Agency held an election in September 1991 and voted overwhelmingly (97 percent) to approve the contract. However, Congressional authorization is needed for USBR to sign the contract. USBR is seeking authorization under the recently enacted Central Valley Project Improvement Act.

Western Delta Industrial Water Users

Some industries near the cities of Antioch and Pittsburg in the western Delta use offshore water in their manufacturing process.

When offshore water quality falls below the industries' requirements, a substitute supply is provided through the Contra Costa Canal.

According to terms of a contract executed in 1987, the Department makes payments to the operator of a mill located in the western Delta, Fibreboard Corporation and its successors (now Gaylord Container Corporation), when water suitable for the mill's use is not available for a calculated number of days during the water year. If water is deemed suitable for fewer than the number of days to which Gaylord is entitled, the Department compensates Gaylord for added costs of purchasing a substitute water supply and treating water needed to operate the mill. According to the Department's initial interpretation of the contract provisions, DWR has made payments to Gaylord totaling $2,621,339.58.

On November 19, 1991, the Department negotiated an agreement with Gaylord Corporation regarding another mill Gaylord owns downstream of the mill purchased from Fibreboard. The provisions of that agreement are similar to those contained in the 1987 water entitlement agreement, and payments to date were $386,776.30.

Determination of Payments

The contracts contain a chart that is based on the relationship between the Sacramento River Index and the number of days the corporation is entitled to water of suitable quality. Days for payment is the difference between the entitlement days and actual days of suitable quality. The payment formula is the same in both contracts except for one factor relating to the method of obtaining water from the San Joaquin River. The second mill incurs no measurable pumping costs when taking process water from the river.

There is an unresolved disagreement regarding interpretation of the contract and Gaylord Container has filed a suit in the Sacramento Superior Court. (See Chapter 8.)

Federal Agencies

U.S. Army Corps of Engineers

In addition to its historical leadership role in Delta flood control, the Corps regulates structures or work affecting navigable waters of the United States according to Section 10 of the Rivers and Harbors Act (Title 33, United States Code, Section 403 [1899]) and any activity which results in discharges of dredged or fill material into waters of the United States (which includes wetlands) according to Section 404 of the Clean Water Act.

U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation manages the operation of the Central Valley Project and shares with the Department responsibilities for meeting water quality and flow objectives in the Delta. The Central Valley Project delivers about 7 million acre-feet of water a year to contractors in the Sacramento and San Joaquin Valleys and parts of the San Francisco Bay Area. Under the requirements of the CVP Improvement Act, USBR also supplies water for fisheries and wildlife refuges in the Central Valley.

Because the Department and USBR share Delta responsibilities, the Department coordinates SWP operations with USBR according to the Coordinated Operation Agreement, signed in 1986. That agreement replaced a system of year-to-year agreements regarding the responsibilities of the Department and USBR in the Delta.

In the agreement, USBR agreed to share responsibility for sustaining flows in the Delta during dry periods. The agreement is significant in that the federal government agreed to accept most of the State Water Resources Control Board's water quality requirements for the Delta with certain restrictions as to limitations of State and federal authorities.

Western Delta Municipal Water Users

To compensate the Contra Costa Water District and the city of Antioch for purchasing water of usable quality when such water is not available offshore in the Antioch-Pitts-

burg area, the Department signed contracts with those agencies in 1967 (Contra Costa Water District) and 1968 (city of Antioch).

According to terms of the contracts, the Department compensates each agency for additional costs of purchasing a substitute water supply from the Contra Costa Canal to replace offshore water supplies of usable quality lost because of SWP operations. Credits for the number of days of above-average offshore water supplies of usable quality accrue to offset the number of below-average days in future years.

Information in this chapter was contributed by the Division of Planning, Delta Planning Branch.

Chapter 5

Environmental Programs



Leopard lizard

Significant Events

- Transfers as part of the 1994 drought water bank were accomplished during the July through October period with no apparent impact to fish.
- Staff began work on an environmental impact report for a planned 5-year supplemental water purchase program.
- The December 14, 1994, Delta accord and the SWRCB's draft water quality control plan made significant changes in the reasonable and prudent alternatives required to reach a no-jeopardy opinion in delta smelt and winter run chinook salmon biological opinions. Export/inflow ratios replaced QWEST, the period of cross channel gate closures was lengthened to include the fall/early winter and San Joaquin pulse flows are among the significant changes.
- Although the USFWS made the splittail a candidate species, no action was taken in 1994 because of a budget-related moratorium on new listings.

In early 1994, the Department sponsored a drought water bank that transferred about 200,000 acre-feet from willing sellers to agricultural and urban water users. The 1993 Drought Water Bank Programmatic EIR provided compliance with the California Environmental Quality Act for these transfers. Department staff consulted with staff from the Department of Fish and Game to minimize potential environmental impacts upstream of the Delta as well as impacts to winter-run chinook salmon and delta smelt in the Delta. Ultimately, the water was transferred across the Delta from July through October. During that period, Department staff submitted weekly reports to the State Water Resources Control Board describing the transfers, effects of the transfers on streamflow, and the numbers of fish salvaged that might be attributable to the transfers.

Effects of Drought Water Bank Transfers

The 1994 drought water bank transfers had little or no impact on the salvage of six key fish species: delta smelt, winter-run chinook salmon, splittail, American shad, longfin smelt, and striped bass. Overall, there was no unreasonable impact on these species or to instream and recreational fisheries affected by these transfers.

Late in 1994, Department staff began preparing a draft EIR for a SWP Supplemental Water Purchase Program. That program, expected to last 5 years, will allow SWP contractors to purchase water to meet deficiencies in their Table A entitlements that may occur in any given year. The Department expects that up to 400,000 acre-feet could be purchased and transferred to SWP contractors from a combination of ground water exchange and stored water. The EIR will address potential impacts to upstream, Delta, and service area impacts that might result from the water transfers. An administrative draft of the EIR has been circulated, with public distribution of the draft expected in fiscal year 1995-96.

Biological Opinions

In most years, the delta smelt spends its entire life cycle in the Delta and Suisun Bay and can therefore be affected by project operations. Juvenile winter-run chinook salmon pass through the estuary on their way to the ocean and may be impacted by Delta conditions such as project-induced changes in flow patterns as well as by direct losses at the pumps. To determine if operations of the SWP and CVP might jeopardize the continued existence of these two fish species, the Department joined with the U.S. Bureau of Reclamation in consultations with State and federal fish and wildlife agencies.

Consultations resulted in biological opinions concluding that the continued operation of the two projects could jeopardize the existence of winter-run chinook salmon and delta smelt. The National Marine Fisheries Service issued its long-term opinion for winter-run chinook salmon in February 1993. USFWS issued two consecutive 1-year opinions on delta smelt in 1993 and 1994. The December 15, 1994, Delta Accord resulted in changes to operating conditions and incidental take limits. Consultations were underway to reverse the

opinions, with the new opinions expected in 1995.

Operational Changes

The biological opinions identify operational changes necessary to remove jeopardy due to project operations. The NMFS amendment to the winter-run opinion replaces the QWEST requirements with the more direct export/inflow ratios contained in the Principles for Agreement (see Chapter 1) and the SWRCB draft water quality control plan of December 1994. Those ratios allow a maximum export rate of 65 percent of inflow from November through January, although the export rate may be adjusted by the CALFED operations group to ensure biological protection of the winter-run chinook salmon.

The draft water quality control plan contains new export limits. For example, between April 15 and May 15, the SWP and CVP have a combined maximum 3-day running export rate limitation of 1,500 cfs. The time period may be adjusted to coincide with fish migration, and the maximum export rate may be varied by the CALFED operations group. The draft plan allows a maximum export rate of 35 percent of inflow from February through June. In addition, both opinions contain incidental take statements to help limit the losses of winter-run chinook salmon and delta smelt at the salvage facilities.

Pumping Restrictions. No take-related pumping restrictions were enforced between October 1, 1993 and August 31, 1994, the period for incidental take compliance, since take criteria for winter-run chinook salmon and delta smelt were not exceeded during that period. The final estimate of winter-run sized salmon take (October 1 through May 31) was 868 smolts, below the permit level of 905 smolts. The 1994 delta smelt biological opinion specifies a 14-day running average (threshold value) and monthly total take levels. In May and June 1994 the incidental take limit was exceeded for 18 days. After consultation with USFWS, DWR curtailed pumping for several days.

Delta Cross Channel Standards. The SWRCB draft water quality control plan, addresses operation of the Delta Cross Channel gates. From November 1 through January 31, the gates may close for a total of 45 days if migratory juvenile salmon are present. Full closure of the gates will occur between February 1 and May 20. Between May 21 and June 15, Delta Cross Channel gates are to be closed for 4 consecutive days each week, excluding weekends. No Delta Cross Channel operational measures were specified in the delta smelt biological opinion.

Sacramento and San Joaquin River Flow Requirements. The Principles for Agreement and SWRCB draft water quality

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service, an agency within the Department of the Interior, has the mission to "conserve, protect and enhance fish, wildlife and their habitats for the continuing benefits of the American people." Among the responsibilities of USFWS is administration of the federal Endangered Species Act to provide protection for terrestrial and aquatic plants and animals except anadromous fish. USFWS also works with federal, State, and local agencies and interests in matters regarding wetland protection.

Within California, USFWS is responsible for biological opinions and critical habitat and recovery plans for such threatened and endangered species as the delta smelt. Biological opinions issued by USFWS, particularly the delta smelt opinion, significantly affect SWP and CVP operations. Close interagency coordination is required to operate the projects in conformance with the biological opinion. The Department also works with USFWS to minimize and provide mitigation for environmental impacts related to SWP maintenance.

control plan propose river flow requirements. The lower Sacramento River minimum monthly average flow rate requirement varies by month and depends on water year type. For September through December, a minimum flow of 3,000-4,500 cfs is required past Rio Vista. Operations of the CVP and SWP provide for a base flow from the San Joaquin River when monthly flow is less than the following: about 11,000 cfs from August to April; 6,000 cfs in May and June; and 9,200 cfs in July. A pulse flow is also required in April and May to move delta smelt larvae spawned on the San Joaquin River to suitable rearing habitat in Suisun Bay.

Population Estimates

Figure 5-1 shows population estimates of winter-run chinook salmon through 1994. The spawning escapement was low in 1994, with an estimated 189 fish passing the Red Bluff Diversion Dam on their way to natural spawning grounds in the Sacramento River below Keswick Dam or the Coleman National Fish Hatchery on Battle Creek.

Figures 5-2 and 5-3 show abundance trends of delta smelt through 1994 for the fall midwater trawl and summer tow-net indexes, respectively. Although the 1994 summer tow-net index was the highest since 1982 (Figure 5-3), the fall 1994 midwater trawl index dropped to the lowest fall index on record (Figure 5-2).

Although the fall midwater trawl is generally considered to provide the best estimate of the abundance of prespawning adult delta smelt, information collected in 1994 studies (Table 5-1) indicates that it may not use the most efficient gear to collect juveniles and adults. In these studies a new type of gear, the kodiak trawl, was used to sample delta smelt. (The kodiak trawl is a net towed between two boats, whereas the midwater trawl is towed at mid-depth behind one boat.) Kodiak trawls will be used in subsequent years to obtain better fall indices of delta smelt abundance.

Figure 5-4 shows the most recent fall midwater trawl indexes for Sacramento splittail for the period 1967-1994. The relatively low young-of-the-year index in 1994 is comparable to the low abundance observed during the recent 6-year drought. Several other abundance indexes show similarly low young-of-the-year abundance in dry years.

National Marine Fisheries Service

The National Marine Fisheries Service has primary responsibility for the conservation, management, and development of living marine resources and for the protection of certain marine mammals and endangered species under numerous federal laws. As an agency within the U.S. Department of Commerce, NMFS has responsibilities to the commercial and marine recreational fishing industries and to the general public. NMFS also administers the federal Endangered Species Act with respect to marine and anadromous species such as the winter-run salmon. The mission of NMFS is to "achieve a continued optimum utilization of living marine resources for the benefit of the nation."

NMFS issues biological opinions, critical habitat designations, and recovery plans on winter-run chinook salmon and other anadromous salmonids in California and ensures that conditions specified in these opinions are met by the responsible agencies, including the Department of Water Resources.

Petitions for Additional Listings

In recent years, several petitions for listing additional fish species were submitted to, or are being prepared for submittal to, the federal fish and wildlife agencies. A decision to list splittail as threatened was postponed until after mid-1995. NMFS may act on a petition to list the steelhead trout early in

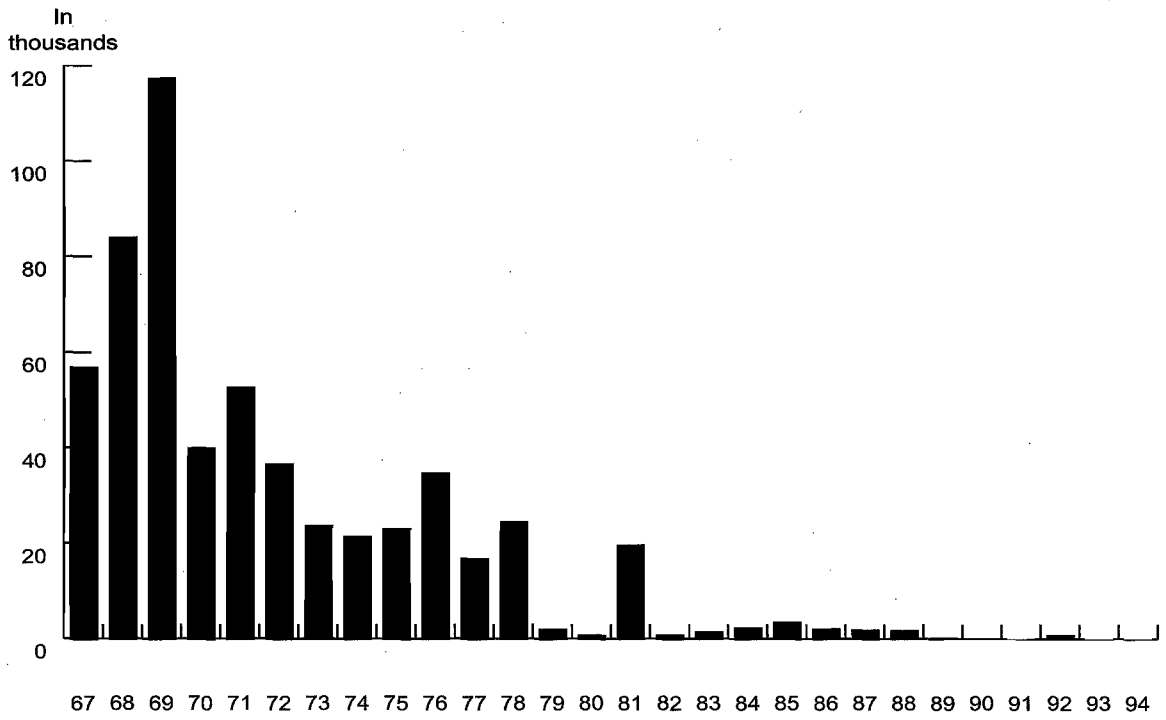
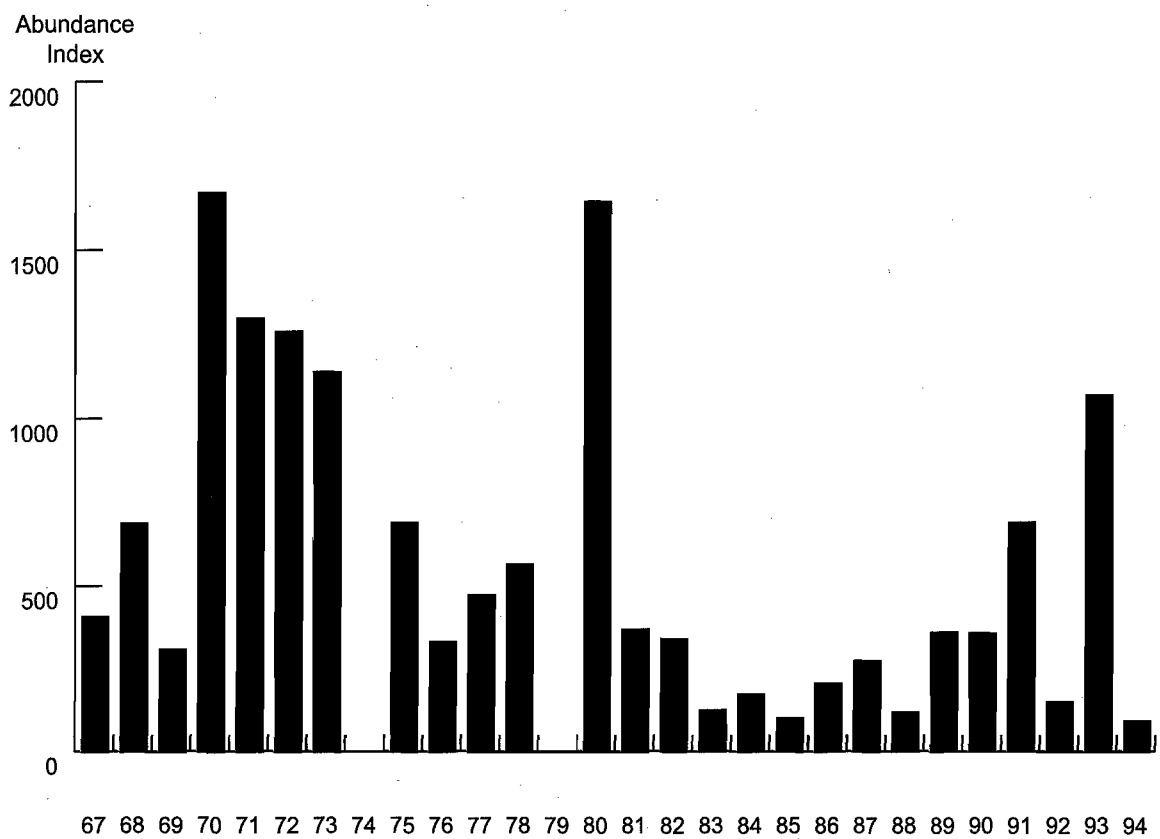
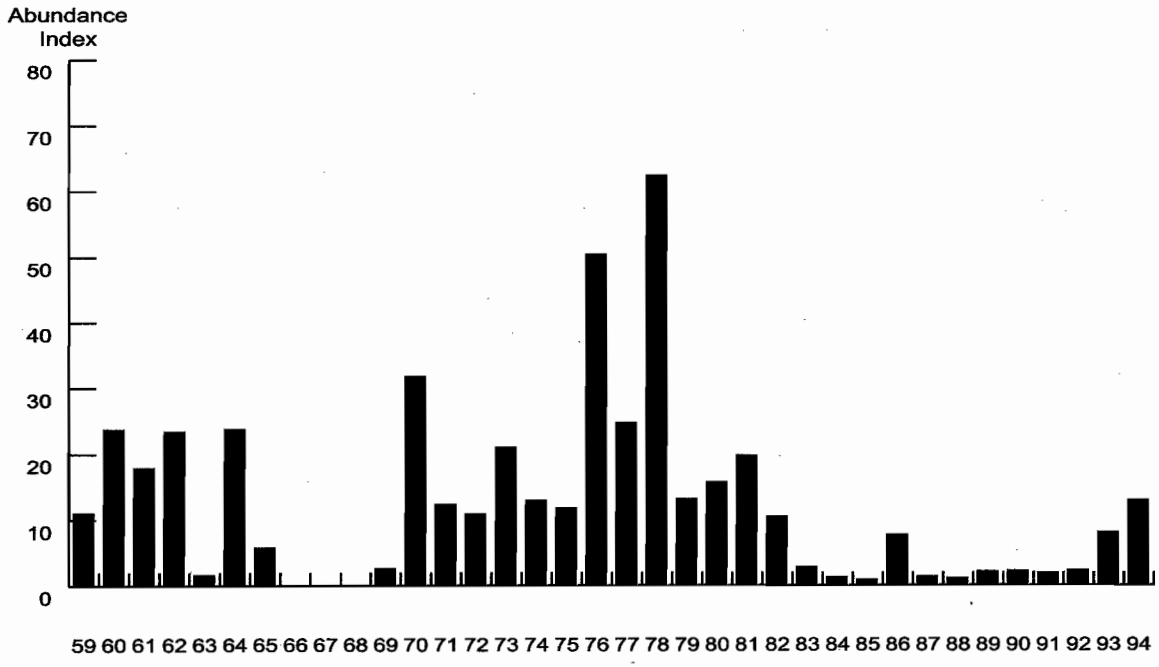


Fig 5-1. Estimated Total Winter Run Chinook Salmon Escapement, 1967 through 1994



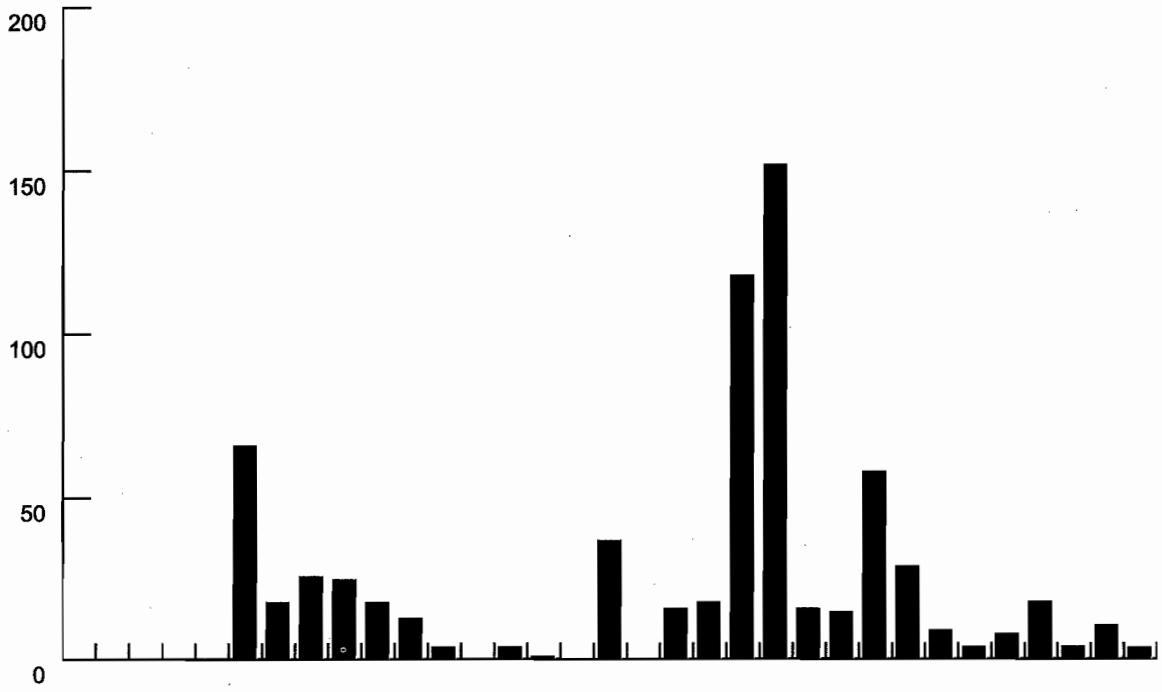
Note: no sampling in 1974 or 1979

Fig 5-2. Delta Smelt Fall Midwater Trawl Abundance Indices, 1967 through 1994



Note: no sampling from 1966-1968

Fig 5-3. Delta Smelt Summer Tow-Net Indices, 1959 through 1994



Note: no sampling in 1974 or 1979

Fig 5-4. Splittail Abundance Index, Fall Midwater Trawl, 1962 through 1994

1996. Some environmental organizations are considering submitting additional petitions for green and white sturgeon and San Joaquin River fall-fun chinook salmon.

Georgiana Slough Acoustical Barrier

Past studies conducted under the auspices of the Interagency Ecological Studies Program demonstrated that juvenile Sacramento Valley chinook salmon migrating toward the ocean are more likely to survive if they stay in the main river channel when moving through the Delta. Those juveniles leaving the river by way of the Delta Cross Channel or Georgiana Slough appear to survive at about one-half the rate of those staying in the river. Survival is indexed by releasing large groups of specially tagged fish at various locations in the river and recovering some of the tags from netting downstream of the Delta (near Chipps Island) and from the ocean fishery.

The winter-run biological opinion requires that the Delta Cross Channel gates be closed during the period when winter-run juveniles are actively migrating downstream. This closure also protects a portion of the other three races: late-fall, spring, and fall runs. During 1993 and 1994, the Department and USBR funded a study to determine if more downstream-migrating salmon in the Sacramento River could be kept in the main channel by an acoustical barrier across the mouth of Georgiana Slough. Under contract to the San Luis and Delta-Mendota Water Authority, the Department and DFG conducted these studies through the Interagency Program.

Results of Studies

Results of the 1993 and 1994 studies demonstrated that the acoustical barrier does deter juvenile salmon from entering the slough. Apparently the young fish detect the low-level sound waves emitted by the 21 underwater speakers and avoid the speaker array, thus staying in the river. The exact guidance efficiency appears to vary with flow and tidal stage but in the 1994 tests averaged better than 50 percent.

Tests will continue into 1995 to provide the fisheries agencies with one more year of data before the Department asks them to consider a barrier installation from October through June every year. Agency concerns are not so much with the exact guidance efficiencies but with possible effects of the sound field on other fish and other salmonid life stages. Biologists are particularly concerned that the sound may block or delay from reentering the Sacramento River those upstream adult winter-run salmon using Georgiana Slough as a

TABLE 5-1
Total Delta Smelt Population Estimates[a]

	September 22, 1994		*September 29, 1994*	
Catch	*Kodiak*	*Mid-Water*	*Kodiak*	*Mid-Water*
Delta Smelt	407	1	234	1
	339	2	136	1
	609	0	190	1
	547	8	80	0
	174	2	17	0
Grand Total	**2,076**	**13**	**657**	**3**

[a] Totals are taken from the Interagency Ecological Programs Delta Smelt Net Evaluation Study in which each of five side by side comparisons were conducted on two separate days.

migration corridor. Although the 1993 and 1994 tests indicated no need for concern in these matters, the 1995 evaluation should fully allay biologists' concerns.

John E. Skinner Delta Fish Protective Facility

The Skinner Fish Facility, situated between Clifton Court Forebay and the Harvey O. Banks Delta Pumping Plant at the intake to the California Aqueduct, was an original feature of the SWP built to salvage fish from water being pumped from the Delta. Salvaged fish are transported by truck to release sites where they are less likely to return to the vicinity of the pumps in the southern Delta.

The Department has significantly improved the fish protection facilities since their construction in the mid-1960s. In the early 1980s, the screens themselves were improved and a new secondary screening system added. In the late 1980s, the Department began work on a holding tank building to improve the efficiency of the fish salvage process and to reduce stress (and losses) of the salvaged fish. New holding tanks are operational and provide fish protection and flexibility for the Department to comply with requirements of the biological opinions for delta smelt and winter-run chinook salmon.

Mitigation Projects

In 1986, the Department and DFG signed an agreement to mitigate for the direct losses of fish at the intake to the aqueduct. The agreement provides funds to implement fishery projects to replace fish lost at the intake facilities since 1986. It also provides an additional $15 million for additional projects in recognition that losses since 1986 would have been greater if there hadn't been losses prior to 1986. Although the agreement focuses on chinook salmon, striped bass, and steelhead rainbow trout, it also considers other fish. Since 1986, the Department spent a total of about $13 million on mitigation projects developed under this agreement, including placing gravel in streams, purchasing and planting hatchery-reared striped bass, and implementing a conjunctive use project to improve salmon migration in Mill Creek in Tehama County.

Predator Removal Program

A major source of mortality for fish nearing the intake to the Skinner Fish Facility screening system appears to be predation by 2- to 3-year-old striped bass. For example, tests show that estimated predator-related mortality of special releases of hatchery-reared fall-run chinook salmon has ranged from about 60 percent to over 95 percent. Calculations to estimate salmon losses for incidental take use a 75-percent predation loss rate.

Although there are numerous questions about the accuracy and applicability of the predation loss rates, all indications are that striped bass pose a threat to juvenile chinook salmon moving across Clifton Court Forebay to the screens. In 1994, DFG and the Department proposed to initiate a large-scale striped bass removal project at the forebay. Under these plans, tens of thousands of striped bass in the 10- to 15-inch size range would have been netted from the reservoir and placed in fish transport trucks for release to San Pablo Bay or other distant locations.

Because striped bass fishing groups strongly opposed the proposed removal project, State agencies could not complete the necessary environmental documentation, and the predator removal test project could not be initiated. In the meantime, studies with subadult stripers tagged with small acoustic transmitters demonstrated that striped bass appear to move freely between the forebay and the Delta. A more thorough investigation of this

movement is scheduled to be conducted during summer 1995. The rapid exchange between Delta and forebay bass populations raises questions about the effectiveness of the predator removal program. Findings suggest that the fish might reestablish themselves in the forebay almost as rapidly as they were removed. Agency staff have shelved plans for a predator removal program for the forebay.

Information for this chapter was provided by the Environmental Services Office and the Environmental Assessment Branch of the Division of Operations and Maintenance.

Chapter 6

Water Quality Programs



Testing water samples at Bryte Laboratory in Sacramento

Significant Events

- The NMFS winter-run chinook salmon and USFWS delta smelt biological opinions guided much of the SWP Delta operations during the first half of 1994.
- The 1994 forecast Sacramento River Index of 8.0 MAF resulted in a Decision 1485 critical year designation and "drought watch" status.
- All Decision 1485 critical year water quality and flow requirements were met during 1994.
- The NMFS 1994 incidental take permit limit (SWP/CVP) of 905 winter-run chinook salmon was not exceeded, and all operational measures in the biological opinion were met except for average QWEST minimum flows, which were exceeded for 6 days in February.
- Salvage estimates set by USFWS delta smelt incidental take permit were exceeded on May 23 and for 17 subsequent days into early June.

The Department of Water Resources monitors SWP water quality throughout the system using an automated network of continuously operating recorders and laboratory analyses of field samples collected weekly, monthly, quarterly, or annually.

Water quality objectives for various beneficial water uses are set by the State Water Resources Control Board, while the Department of Health Services establishes maximum contaminant levels for treated drinking water. Additional contractual water quality objectives at points of delivery are set by Article 19 of the long-term SWP water supply contracts. The SWRCB Water Right Decision 1485 (1978) protects water quality in the Delta and Suisun Marsh.

The Department also conducts special studies to investigate water quality problems or analyze the impact of unique events. In 1994, these studies included an assessment of the algal byproducts MIB and geosmin in the California Aqueduct and Southern California reservoirs; the removal of pond weed build-up in the Clifton Court Forebay; and the control of water temperature entering the Feather River Hatchery at Lake Oroville.

Delta Activities

The Department conducts extensive monitoring activities to protect beneficial uses of water in the Delta and Suisun Marsh as required by SWRCB Decision 1485. The 1992 Central Valley Project Improvement Act (PL 102-575, Title 34) also specifies measures to protect estuary fish and wildlife identified by the Endangered Species Act and restore estuary anadromous fish populations. In December 1993, the U.S. Environmental Protection Agency, under the authority of the Clean Water Act, proposed additional federal criteria to protect estuary habitat. Figure 6-1 shows water quality monitoring sites throughout the Sacramento-San Joaquin Delta.

CVPIA measures, and some of the proposed EPA criteria provided guidance for setting reasonable and prudent alternatives contained in the National Marine Fisheries Service's long-term 1993 winter-run chinook salmon biological opinion and the U.S. Fish and Wildlife Service's 1994 delta smelt biological opinion. The two opinions conditioned SWP and CVP operations in the Delta during 1994.

Decision 1485 Standards

Decision 1485 sets standards for water quality within the Delta and Suisun Marsh, specifies amounts of outflow, and limits the amount of water exported from the Delta. The decision also specifies requirements for monitoring hydrodynamic and biotic conditions throughout the Delta.

Decision 1485 contains constraints on SWP operations in the Delta that differ with water year classification. The water year classification (wet, above normal, dry, or critically dry) is based on the Department's annual May 1 forecast of unimpaired runoff to streams in the Sacramento River basin–the Sacramento River Index. The water year classification also determines trigger conditions for various operational measures specified in the 1994 delta smelt biological opinion.

In 1994, the Department's May 1 forecast of SRI was 8.0 million acre-feet. At only 44 percent of average, the 1994 forecast SRI was the fourth driest on record (since 1906) and less than the 1991 SRI of 8.4 MAF, which was the driest year of the 1987-93 drought. The 1993-94 water year, declared critical for all beneficial uses, ended on September 30, 1994, with an actual total SRI runoff of only 7.8 MAF. Although the Governor officially declared the drought over on February 24, 1993, a "Drought Watch" status was declared for the State on

Station Number and Name	
C3	Sacramento River at Greens Landing
C7	San Joaquin River at Mossdale Bridge
C9	West Canal at mouth of intake to Clifton Court Forebay
C10	San Joaquin River near Vernalis
D4	Sacramento River above Point Sacramento
D6	Suisun Bay off Bulls Head Point near Martinez
D7	Grizzly Bay at Dolphin near Suisun Slough
D8	Suisun Bay off Middle Point near Nichols
D9	Honker Bay near Nichols
D10	Sacramento River at Chipps Island
D11	Sherman Lake near Antioch
D12	San Joaquin River at Antioch Ship Channel
D14A	Big Break near Oakley
D15	San Joaquin River at Jersey Point
D16	San Joaquin River at Twitchell Island
D19	Franks Tract near Russo's Landing
D22	Sacramento River at Emmaton
D24	Sacramento River below Rio Vista Bridge
D26	San Joaquin River at Potato Point
D28A	Old River opposite Ranch Del Rio
D41	San Pablo Bay near Pinole Point
MD7A	Little Potato Slough at Buckley Cove
MD10	Disappointment Slough at Bishop Cut
P8	Middle River at Buckley Cove
P10A	Middle River at Union Point
P12	Old River at Tracy Road Bridge

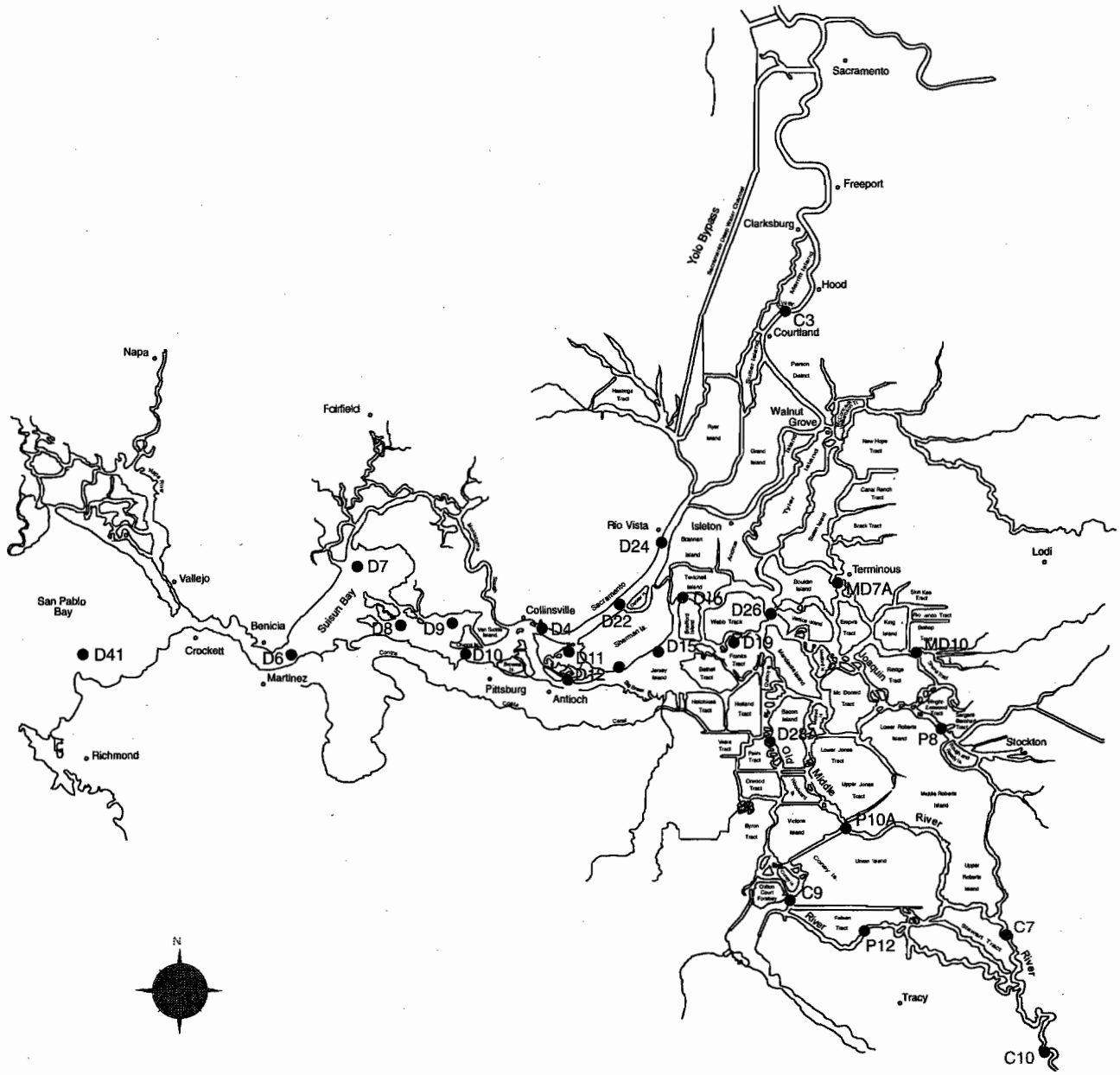


Fig. 6-1. Water Quality Monitoring Sites in the Sacramento-San Joaquin Delta

May 2, 1994, because of continuing dry conditions and a deficient snowpack.

SWP Delta Operations under Decision 1485 and Biological Opinions. Although operating to meet Decision 1485 standards, the SWP is also bound by provisions of the NMFS biological opinion for winter-run chinook salmon (February 1992 and February 1993) and the USFWS biological opinion for delta smelt (May 1993 and January 1994). The opinions, which set new conditions on water project operations to avoid jeopardizing the listed species, led to limited pumping at the Harvey O. Banks Delta Pumping Plant, the federal Tracy Pumping Plant, the SWP Barker Slough Pumping Plant, and the Contra Costa Canal Pumping Plant at Rock Slough. The opinions also set minimum limits for Sacramento and San Joaquin river flows; specified periods of Delta Cross Channel gate closure; and incorporated and expanded the draft Decision 1630 QWEST index, the EPA draft X2 water quality criteria, and the CVPIA spring flow criteria.

Water Quality Standards. In 1994, all Decision 1485 critical year water quality standards were met.

The 1994 delta smelt biological opinion established the estuarine habitat standard X2, an additional water quality criterion that conditions the Delta outflow standard (see *Flow and Export Standards*). This combined water quality and flow standard, X2, requires that salinity at Collinsville be less than or equal to 3.0 mS/cm for at least 1 day prior to the commencement of accounting for compliance with the specified spring DOI flow minimums between April 1 and June 30. This water quality trigger requirement must be met after April 1 but before April 15. Both DOI flow conditions and the water quality X2 conditions were met in 1994.

The Decision 1485 "critical year" municipal and industrial water quality standard for chloride at the Contra Costa Canal Intake near Rock Slough of less than 150 mg/L for at least 155 days (42 percent of the year) was met on June 4, 1994, uninterrupted from the start of the year. However, near the end of September, the chloride level began to rapidly approach the year-round chloride standard of 250 mg/L at the Contra Costa Canal Pumping Plant at Rock Slough. The failure of a critical downstream salinity gauge at Bethel Island prevented the initial salinity rise from being detected.

Moreover, the CVP and SWP were unable to respond with immediate upstream releases because storage at Shasta Lake was needed to meet cold water requirements for fall-run salmon. To rapidly remedy the salinity rise and meet the standard, the SWP stopped pumping at the Harvey O. Banks Delta Pumping Plant on September 21 and 22, then severely restricted pumping to an average rate of just over 200 cfs for the next 3 days. Exports from the CVP Tracy Pumping Plant were also reduced. Delta outflow increased to average over 10,000 cfs during the same period, rapidly decreasing chloride levels in Rock Slough and meeting the standard during September and through the rest of the year.

Flow and Export Standards. Water quality in the Delta is influenced by ocean tides, freshwater outflow from the Sacramento and San Joaquin rivers, local agricultural and municipal discharges, and water exported from the Delta. The Delta Outflow Index is a calculated approximation of the amount of seaward freshwater outflow passing Chipps Island near Pittsburg, beyond the confluence of the Sacramento and San Joaquin rivers.

Delta outflow, as estimated by the Delta Outflow Index, averaged only 7,361 cfs (daily rate) during calendar year 1994. Continuing low precipitation and snowmelt dropped the average DOI to only 4,795 for the 8-month period from April through November. Only 6 days of 1994 had DOI over 25,000 cfs—4 during a February storm period and 2 in December 1994. The highest 1994 mean monthly DOI (17,042 cfs) occurred in Febru-

ary; the highest mean daily DOI (29,521 cfs) occurred December 7, 1994. The lowest mean monthly and mean daily DOI - 2,880 cfs and 1,940 cfs (August 12), respectively–occurred in August 1994.

The Delta outflow and export standards help to protect water quality in the Delta and improve survival of striped bass, salmon, delta smelt, and other important aquatic estuarine species.

During 1994, the Decision 1485 DOI standards for a "critical" water year were in effect. Reasonable and prudent alternatives specified in the delta smelt opinion required additional transport and habitat minimum spring flows consistent with CVPIA to move smelt through the Delta and into Suisun Bay.

Flow Requirements. Decision 1485 and the biological opinions for delta smelt and winter-run chinook salmon contain standards for Delta outflow, QWEST flows, Sacramento River flows at Freeport and Rio Vista, and San Joaquin River flow at Vernalis.

Transport and habitat flow minimums, as measured by the DOI for Decision 1485 "critical year" conditions, were set by the delta smelt biological opinion at 12,000 cfs for 18 days between February 1 and June 30, and at 6,800 cfs for 40 days between April 1 and June 30. The count of 40 days of 6,800 cfs DOI is triggered by the placement of a 2 ppt isohaline line, also referred to as X2, near the confluence of the Sacramento and San Joaquin rivers. This isohaline line is calculated to equal a mean daily, average maximum surface electrical conductivity of 3.0 mS/cm, measured at Collinsville.

The 40-day minimum DOI flow requirement has a component that must be provided by San Joaquin River flows. This component, as measured at Vernalis, was set at 800 cfs in 1994. The 6,800 cfs 40-day minimum DOI, including the San Joaquin River component, was met by mid-May with flows at 6,880 cfs or greater during most of April, and over half of May for a total of 43 days. The other delta smelt Delta outflow requirement, 18 days of 12,000 cfs flow does not require the Collinsville EC trigger during critical years. The 18-day count was easily met by February 25, 1994, and by the period end on June 30, 34 days of 12,000 cfs flow were counted.

The delta smelt opinion also specified a minimum net Delta outflow of 3,500 cfs to be maintained from February 1 to June 30. Decision 1485 sets additional DOI standards from April 1 through 14 and during May, June, and July based on monthly averaged flow values (6,700 cfs, 3,300 cfs, 3,100 cfs, and 2,900 cfs respectively). All delta smelt opinion and Decision 1485 operational criteria for the DOI were met during 1994.

In addition to the San Joaquin river component of the DOI, the delta smelt opinion also specifies minimum San Joaquin River springtime transport flows to move smelt larvae and juveniles into Suisun Bay away from the influence of the CVP and SWP south Delta pumps. The critical year minimum flow is 2,400 cfs (30-day average) between April 1 through May 15 as measured at Vernalis. This flow standard is conditional and triggered by the presence of adult delta smelt in samples from specified San Joaquin River or tributary stations from January through March. This provision was not enacted during 1994 as delta smelt were absent at sample sites. However, flows nearly matched the minimum as the 30-day average actual flow was 2,127 cfs.

Both the winter-run salmon and the Delta smelt biological opinions required minimum QWEST flows (14-day running average) from February until May. The winter-run salmon opinion has an additional QWEST flow requirement during November, December, and January.

A net positive QWEST minimum flow (no 14-day running averaged negative flows) was maintained for most of spring (February 1 through April 30) with the exception of 6 days in February when 14-day averaged

QWEST flow fell to values between -234 cfs and -1 cfs. To bring QWEST values back to compliance, exports at the Banks Pumping Plant almost stopped, dropping from over 3,000 cfs to around 220 cfs during the first 6 days of February. The winter-run salmon opinion QWEST minimum of -2,000 cfs during January 1994, and November through December 1994 was met.

Decision 1485 sets year-round minimum Sacramento River flows at Rio Vista using 30-day running averages. All Rio Vista minimum flows were met.

Export Limitations. During May, June, and July, water exports from the Delta through Banks Pumping Plant are limited by Decision 1485 export standards to 3,000 cfs for May and June and 4,600 cfs for July. Similar limitations apply to the CVP Tracy Pumping Plant for May and June only. However, the need to limit south Delta export pumping to protect winter-run salmon and delta smelt by minimizing loss to pumping operations curtailed combined SWP and CVP pumping operations to a much greater extent. Average monthly Delta exports from May through July fell well below the rates allowed under Decision 1485 export limits.

Limitations on combined SWP and CVP export during March through July were met by foregoing a large potential export volume at both the State and federal Delta pumping plants. This reduction in export, estimated at 1.320 MAF, could have been diverted from the Delta to storage or delivered directly to project contractors. Approximately 80 percent of the export reduction resulted from measures to protect the winter-run salmon.

The December 1993 NMFS Biological Opinion for winter-run salmon contains provisions to minimize loss of salmon smolts associated with export pumping operations at Banks and Tracy pumping plants. The opinion allows exports as long as the estimate of smolts loss or "incidental take" did not exceed 1 percent of the 1993-94 salmon outmigration population. This limitation on pumping considers the combined incidental take estimate for both plants and is in effect from October through May during the main months of salmon migration. The combined incidental take estimate is arrived at using the actual count of winter-run salmon salvage at both the State Skinner Fish facility and the federal Tracy Fish facility multiplied by other predetermined factors such as loss to predatory fish near the pumps.

One percent of the estimated 1994 winter-run salmon population was calculated to be 905 fish. During the first week of January 1994, the State and federal fish facilities first began to salvage winter-run sized salmon for a combined incidental take of 129 fish. Near the end of March, the rate of salvage began to rise and by April 1, 1994, reached a seasonal incidental take total of 730 fish. With more than 2 months remaining of the period when most winter-run salmon smolts migrate through the Delta, sustained exports could have rapidly exceeded the 1 percent estimate. In response, Banks Pumping Plant completely halted operations from March 30 to April 3. Export pumping at Banks was then limited to meeting only South Bay export demands until May 23. During this curtailment period, the mean daily export rate at Banks averaged only 340 cfs, rising above 400 cfs for only 3 days (401 cfs, 573 cfs, and 502 cfs).

During this same period, the Department met with NMFS staff to reconsider the expansion factor used to arrive at the winter-run salmon incidental take estimate and recalculated a lower seasonal take total. Further protection for winter-run salmon resulted from an exchange agreement with USBR to allow most exports through the CVP Tracy Pumping Plant during the period of peak winter-run salmon out migration. Even with pumping severely constrained at the Banks Pumping Plant and pumping rates decreased at Tracy in mid-April, the adjusted combined winter-run number rose to 859 fish by the end of April.

DWR and USBR formally reinitiated consultation on winter-run salmon with NMFS and DFG to formulate additional measures to limit fish loss and improve ability to identify winter-run smolts from other salmon. The consultation discussion focused on salmon size criteria, the use of the QWEST index, the effectiveness of Delta protective measures in the existing biological opinion, and developing a supplemental means of indexing juvenile salmon losses in the Delta. Temperature control measures in the Sacramento River above Red Bluff were also reevaluated.

Beginning in early May, the salvage of winter-run-sized salmon dropped to zero and Banks Pumping Plant slowly increased exports. The average pumping rate between May 24 and May 31, the end of the winter-run salmon smolt outmigration season, was 1,600 cfs. After applying the improved identification criteria, the final adjusted, combined incidental take of winter-run salmon totaled 864 fish (546 SWP, 318 CVP), and was below the estimated 1 percent population level.

Exports at the SWP and CVP pumps were also conditioned for the entire year by the USFWS's Delta smelt biological opinion. During all months of 1994, the State and federal Delta pumping plants set export rates to minimized combined Delta smelt loss to numbers below those quantified in the smelt opinion. The actual salvage counts at the State Skinner and federal Tracy fish facilities are expanded by empirically determined multiplying factors. The reported smelt loss or incidental take estimate is arrived at by combining the current daily expanded salvage with values from the previous 13 days to produce a 14-day running average. A 14-day averaged incidental take estimate above values specified in the opinion re-initiates consultation with the USFWS.

The USFWS biological opinion for Delta smelt set the maximum (14-day) averaged smelt salvage or incidental take to 400 during December 1993 through January 1994, which the Department and USBR easily met. From February through June, the opinion's maximum 14-day average salvage maximum rose to 755. The combined 14-day average incidental take for both facilities remained below 20 from February 1 through the end of April. However, by mid-May the 14-day mean smelt total rapidly increased and the 14-day average exceeded 755 on May 23 and remained above that number for the next 17 days.

The Department and USBR immediately reinitiated consultation with the USFWS and DFG. Export pumping, which had begun to rise at the end of May, was drastically curtailed and limited during June to only one pump at each plant. The Delta Smelt Management Group rapidly adopted a short-term operating plan, in effect until June 15. The plan reduced export pumping to a combined daily rate of less than 2,000 cfs and required a daily mean Delta Outflow of 4,000 cfs. The 14-day average incidental take estimate was reset to begin a new 14-day average on June 1, 1994. Operations by USBR and the Department were then adjusted daily in close consultation with USFWS and DFG. In early June, the consultation process initiated townet surveys in the western and south Delta to determine the origin of the delta smelt arriving at the pumps.

Delta exports during June averaged only 322 cfs at Banks Pumping Plant. Combined Banks and Tracy export rate for June was only 1,894 cfs. By June 15, the 14-day average delta smelt incidental take decreased to 438 and by mid-July had declined to below 100, allowing export pumping to be resumed at higher levels. Delta smelt were not found at either facility during August.

The delta smelt biological opinion also limited exports through Barker Slough Pumping Plant at the start of the North Bay Aqueduct. A pumping restriction took effect when monitoring at three sites upstream of the plant indicated a threshold number of delta smelt juveniles or larvae. When this occurred,

diversions from Barker Slough were reduced within 48 hours to a 3-day running average rate of 65 cfs and maintained at that level for a minimum of 2 weeks.

Delta smelt were first observed near Barker Slough in early March. Exports were limited between April 22 and May 5 and again from May 4 through May 17 due to sufficient smelt presence at monitoring sites. Export pumping rose after May 18 and remained unconstrained for the rest of the year with further smelt detected. The average daily export rate from Barker Slough during the months of April and May was 58 cfs, increasing to 89 cfs during June.

Delta Cross Channel Standards. Decision 1485 and the winter-run salmon biological opinion require closure of the CVP Delta Cross Channel gates from January 1 through April 30. In accordance with Decision 1485, to avoid diverting salmon and striped bass, the gates are closed whenever the daily DOI exceeds 12,000 cfs from January 1 through April 15. DFG can request gate closure from April 15 through May 31 when the DOI exceeds 12,000 cfs but for not more than 2 of 4 consecutive days or for more than 20 days total. The NMFS winter-run salmon biological opinion requires absolute gate closure from February 1 through April 30 and additional closures from October 1 through January 31 conditioned by real-time monitoring for the presence of salmon. However, gate closures are subject to interruption when Delta water quality conditions cannot be reasonably achieved by other means.

The Cross Channel gates were closed on January 8 to provide protection for early arriving winter-run salmon after salvaging the third winter-run sized salmon at the CVP Tracy Pumping plant on January 6. The gates remained closed until May 28, and closed intermittently during June and July. The gates remained open for the rest of the year until closing briefly in mid-November and again in mid-December.

Phytoplankton Surveys. The Department conducted its 1994 survey of phytoplankton abundance and community composition in the upper San Francisco Bay estuary according to Decision 1485 monitoring requirements.

Chlorophyll *a* concentrations were low throughout the upper estuary in 1994, except in the southern and eastern Delta. The upstream northern, western, lower San Joaquin, lower Sacramento, and central Delta regions, as well as the downstream Suisun and San Pablo Bay regions, had concentrations of less than 6 µg/l. Maximum chlorophyll *a* concentrations in the upstream regions commonly occurred in May and were associated with mixed diatom and flagellate phytoplankton community assemblages. In the lower San Joaquin regions, the long chain diatoms *Melosira granulata, Skeletonema potamos,* and *Thalassiosira eccentrica* were also abundant. Phytoplankton communities were growing fairly rapidly in most of the Delta regions in May when chlorophyll *a* concentrations were 60 percent. Chlorophyll maxima in May were followed by a smaller maxima in September of 1-3 µg/l. These phytoplankton communities were composed of the long chain diatoms *T. eccentrica, S. potamos,* and *M. granulata,* which were growing well with chlorophyll *a* concentrations at 60 percent.

The highest chlorophyll *a* concentrations among regions occurred in the southern and eastern Delta regions. Maximum average chlorophyll *a* concentrations occurred in the southern Delta region, where concentrations reached 60 µg/l in June and were associated with concentrations of 100-200 µg/l at Mossdale and Vernalis on the San Joaquin River. The chlorophyll *a* maximum in June was accompanied by maxima in April and June. Chlorophyll *a* concentrations of 60-70 percent suggest that these phytoplankton communities were also growing well. High chlorophyll *a* concentrations also occurred in the eastern

Delta near the Mokelumne River during May when values reached 20 μg/l.

Downstream in the brackish water regions of Suisun and San Pablo bays, chlorophyll *a* concentrations remained below 3.5 μg/l in 1994. Concentrations may have been low in Suisun Bay due to grazing by the clam *Potamocorbula amurensis*. The poor condition of this mixed diatom and flagellate phytoplankton community was suggested by the high phaeophytin and low percent chlorophyll *a* concentrations. In contrast, the phytoplankton community in San Pablo Bay grew well, with chlorophyll *a* concentrations of 60-90 percent. These high percentages occurred despite high densities of *P. amurensis*. The chlorophyll maximum during September was associated with a mixed diatom and flagellate assemblage.

All of the chlorophyll*a* concentrations measured during the 1994 drought year were similar to those measured for recent drought years. These years are characterized by chlorophyll *a* concentrations less than 5 μg/l at the downstream stations and more than 100 μg/l in the southern Delta stations upstream.

Benthic Monitoring Program. The benthic monitoring program records abundance and distribution trends in macro-benthic (bottom dwelling) organism populations. The program also detects and documents the introduction of exotic species into the San Francisco Bay/Delta region. Bottom grab samples and sediment samples are taken monthly from six environmentally diverse sites in the Delta.

When an exotic benthic species is discovered, further studies are commonly implemented to document its spread and influence on the Delta ecosystem. *Potamocorbula amurensis* is an exotic species of Asian clam introduced to the San Francisco Bay estuary in 1986. It is a marine and brackish water organism limited in its upstream range by fresh water. This clam has become established as the dominant organism in most of the regions it has colonized. *P. amurensis* has become the subject of many intensive surveys owing to its ability to filter a large portion of the available food supplies from the water column. The 1994 benthic survey showed a typical fluctuation in *P. amurensis* population densities at stations where it was found.

The area near Collinsville, on the Sacramento River has been near the eastern edge of *P. amurensis* range in the Delta. The clam has been detected there since 1987. Benthic samples in 1994 showed that populations were generally less abundant than in preceding years. Low abundances were probably due to delayed recovery from high flows during the 1993 wet year.

Conversely, samples taken in Grizzly Bay showed an increase in *P. amurensis* abundances compared to 1993. Grizzly Bay has historically shown highest *P. amurensis* densities among any of the Decision 1485 benthic monitoring sites. Population densities in 1993, however, were the lowest recorded since the clam's introduction. The 1994 data show the clam population recovering fully to levels observed during the 1988-1992 period.

P. amurensis populations are found regularly in San Pablo Bay, the western boundary of our study area. Samples taken near Pinole Point in San Pablo Bay show a *P. amurensis* population in 1994 that is lower than the average historical density. This reduction follows a brief but extreme bloom of *P. amurensis* in the area during 1993.

Every year a few new species are observed and added to the list of benthic organisms found in the Delta. Although some species are newly introduced to the system, many of the newly listed species are endemic to the Delta, but were previously undetected in our samples. Five new benthic species were identified this year:

- The mud-dwelling worm, *Monopylephorus evertus*, was found in January 1994 in samples taken near Collinsville on the Sacramento River.

- A new and as yet unidentified species of mud-dwelling Triclad worm was found in June 1994 in samples from San Pablo Bay.
- A sample containing a piece of freshwater sponge taken in July 1994 in Old River opposite Rancho Del Rio yielded a new type of insect. *Xenochironomus xenolabis* is the larvae of a nonbiting midge that burrows into freshwater sponges as it feeds on them.
- Several individuals of the estuarine snail of the genus Barleeia (unidentified species) were found in Grizzly Bay in October and November 1994.
- The most recent addition to our species list, *Synchelidium shoemakeri*, was found in samples from San Pablo Bay in November and December 1994. *S. shoemakeri* is a bottom-burrowing amphipod (small shrimp-like crustacean). Its most notable trait is its eyes, which are so close together on top of its head that it appears to have only one cycloptic eye.

There were no notable anomalies in the population dynamics of other benthic communities observed during 1994.

Rock Barrier Installations

During spring 1994, three temporary rock barriers were installed in the south Delta. One barrier was installed on Middle River and the other two on Old River east of the Delta Mendota Canal intake at Tracy Pumping Plant (Old River at Tracy) and at the confluence of the San Joaquin River (Old River at Head). The Middle River and Old River at Tracy barriers were used to improve water circulation and control water levels during the agricultural irrigation season while the Old River at Head barrier increases the survival of migrating salmon. The barriers were installed as part of the South Delta Temporary Barriers Project, a testing program for long-range south Delta planning proposals, which began in 1991.

The *South Delta Water Management Program Draft Environmental Impact Report* was released to the public in 1990 with the final EIR release expected in December 1995. The program was designed to resolve local south Delta water supply issues within the larger context of the Department's water banking program. The program includes proposals to construct up to four barriers in the south Delta to improve local water levels and circulation patterns and meet other South Delta Water Management Program objectives. Under the related South Delta Contract (see Chapter 4), a 5-year test program will precede construction of the permanent barriers.

Under DFG agreements, the Tracy barrier and the Middle River barrier cannot be completed prior to June 1 if the spring barrier at Old River at Head is not in place. Installation of all three barriers began around April 21 and were coordinated with spring transport flows (San Joaquin River portion of Delta outflow).

The Middle River rock barrier is a temporary, tidally controlled barrier installed near Victoria Canal, about one-half mile south of the confluence of Middle River and Trapper Slough. It has been placed annually since 1987 as specified in an agreement with the Department and the South Delta Water Agency (1986). The barrier was completed April 23, 1994. The agreement is in partial settlement of the South Delta Water Agency Lawsuit described in Chapter 4. The Middle River barrier helps to increase and stabilize water levels for more consistent diversions of agricultural water. It also helps improve circulation in the south Delta. In August 1994, the Middle River Barrier was raised an additional 6 inches for a 1-month test period to determine the most effective height for future, potentially permanent barriers. The removal of the Middle River barrier was completed October 10.

The Old River barrier at Tracy, one of four proposed permanent barriers, has been

temporarily installed each spring since 1991 on Old River, east of the Delta Mendota Canal intake at Tracy Pumping Plant. This year, installation was completed April 24 and boat portage features were completed by May 3. The Tracy spring barrier provides benefits similar to those of the Middle River barrier. The Tracy barrier was completely removed by October 5.

The Old River at Head barrier was installed at the head of Old River near the San Joaquin River confluence. The barrier was completed April 23. This barrier aids spring-migrating salmon in their journey along the San Joaquin River to the Pacific Ocean. The barrier increases net downstream flows in the lower San Joaquin River. These increased flows reduce the number of salmon that swim into South Delta channels where they could get lost, become victims of predation, or get caught at the intakes of Banks or Tracy pumping plants. Due to USFWS concerns over the rapid increase in delta smelt salvage at the SWP and CVP south Delta pumping plants in mid-May, the Old River at Head barrier was breached May 18 and removed by May 20.

Fall Old River Barrier at Head. As part of a 1969 Memorandum of Understanding among the Department, USFWS, USBR, and DFG, the Department installs a temporary rock barrier at the head of Old River during periods of projected low outflow in the fall. The barrier increases net flows down the San Joaquin River and helps alleviate the dissolved oxygen depression (levels less than 5.0 mg/L) that can occur in the eastern portion of the Stockton Ship Channel (near the city of Stockton) due to conditions such as low flows, high water temperatures, high biochemical oxygen demand, or intermittent reverse flow conditions in the upper San Joaquin River. Improved dissolved oxygen levels help salmon survive their upstream migration. The Department is also responsible for monitoring dissolved oxygen levels in the channel through discrete sampling using the monitoring vessel *San Carlos* and through a continuous monitoring station in the Rough and Ready Island area.

Flows in the San Joaquin River in late summer and early fall 1994 were less than 1,000 cfs past Vernalis due to the dry 1993-94 water year. To augment net flows past Stockton, the Department installed the Old River Barrier September 7, 1994. Even with the barrier in place, low dissolved oxygen levels (5.0 mg/L or less) continued to be recorded through late September and early October in the Rough and Ready Island area. Reverse flow conditions dominated the hydrodynamic pattern in the eastern channel during this period, concealing any improvements attributable to placement of the barrier.

Dissolved oxygen levels recovered to greater than 5.0 mg/L in mid-October and further improved to greater than 9.0 mg/L in November owing to improved flow conditions, cooler water temperatures, and the accumulative effects from placement of the barrier. The barrier was removed November 30, 1994.

Municipal Water Quality Investigations Program

The Sacramento-San Joaquin Delta is a source of drinking water to about two-thirds of the population of California. Because the Delta is a relatively unprotected watershed, water quality degradation is possible from many sources, including abandoned mines, industrial and municipal waste water discharges, storm water runoff from cities, agricultural discharges, recreational activities, and illegal dumping. The Municipal Water Quality Investigations Program was established to evaluate the quality of Delta water with respect to its suitability as a drinking water source, to identify sources of water quality degradation, and to evaluate means of eliminating or preventing degradation of Delta water quality.

Participants in the program include Contra Costa Water District and the municipal water contractors of the SWP. Program advisors include

representatives of participating agencies, the U.S. Environmental Protection Agency, California Department of Health Services, and California Urban Water Agencies.

Since water quality concerns are rapidly changing due to imposition of new drinking water regulations and emergence of newly recognized water quality concerns, the MWQI program is intended to be flexible and adaptable to changing requirements. Since the earlier Delta Health Aspects Monitoring Program and Delta Island Drainage Investigations programs merged into the MWQI Program in 1990, the program has continued to evolve. The initial focus of the program was to compile a comprehensive database on water quality parameters of drinking water concern in the Delta. Currently the program is evolving toward investigation into potential means of managing Delta lands and waters in a manner that minimizes adverse impacts on the quality of the drinking water supply.

During the 1994-95 fiscal year, an agreement was finalized that provides for program funding by the municipal contractors of the SWP. Until this year, SWP funds had been used. Because the program benefits contractors supplying drinking water, it was considered appropriate that only municipal contracting agencies be asked to share the cost of the program. As a consequence of completion of this agreement, agricultural contractors are no longer responsible for program funding.

A major current undertaking of the MWQI program is the 5-year update of the State Water Project Sanitary Survey. In October 1990, the consulting firm, Brown and Caldwell Engineers, published the report, *Sanitary Survey of the State Water Project.* This document was in response to a requirement of the California Department of Health Services for the State Water Contractors to conduct a sanitary survey of the SWP, pursuant to a requirement of the State Surface Water Treatment Rule. Under this rule, purveyors of drinking water are required to update their sanitary surveys at 5-year intervals. The SWP contractors supporting the MWQI Program requested this work to be accomplished during fiscal years 1994-95 and 1995-96 under the MWQI Program. Work began during spring 1995. The final report of the SWP Sanitary Survey update is required to be submitted to DHS in March 1996. The work is on schedule.

Bryte Laboratory

The Department's extensive water quality investigations result in thousands of samples annually that require laboratory analysis. Bryte Laboratory, located in West Sacramento, is the primary source of analytical capability utilized for analysis of these samples. The laboratory, which is organized within the Division of Local Assistance, provides service to clients throughout the Department and to other agencies. A wide range of analyses are performed, including minerals, nutrients, metals, pesticides, and a number of other types of analyses. The laboratory undergoes continual modernization as new substances become the focus of attention, and as newer, more accurate, analytical methodology is developed. Because of rapid developments in the field of water quality, the laboratory is constantly evolving, like the programs it serves.

Bryte Chemical Laboratory. Much of the Department's analytical work occurs at the Bryte Chemical Laboratory located in West Sacramento. At the laboratory, thousands of water samples are analyzed for minerals, nutrients, metals, pesticides, and other constituents. During fiscal year 1994-95, a major change was implemented in how the Department has its analytical work done. Prior to this year, individual managers of environmental monitoring programs were responsible for determining whether their analytical work would be done at Bryte laboratory or contracted to outside laboratories. It was the individual manager's responsibility to execute the required contract.

Through a new policy approved by the Director, Bryte Chemical Laboratory management now writes master contracts with out-

side laboratories to provide services to multiple program managers. This policy improves quality assurance by requiring all prospective contractors to undergo standardized, rigorous performance evaluations before contracts are awarded. It also relieves program managers from a considerable administrative burden. The new policy will improve workload management at Bryte Chemical Laboratory by enabling the laboratory management to determine how much of the analytical workload is managed in-house and how much of the work is allocated to contractors. This important policy provides centralization of the data flow so that all computer data will be in a standardized format. Finally, the new policy ensures that all analytical work accomplished by contract laboratories will be reviewed under the Quality Assurance/Quality Control Program to assure specific quality criteria before the data are accepted. Where problem data are identified, the intent is to require the contract laboratory to reanalyze samples or enable the Department to withhold payment for inadequate work. Changes implemented this year set the stage for further modernization of equipment and data handling capabilities scheduled to occur in the coming year.

Quality Assurance/Quality Control. The Quality Assurance/Quality Control Program was established in 1992 by Water Resources Engineering Memorandum No. 60. The purpose of the program is to protect the Department's multimillion dollar annual investment in water-related data. A primary component of the program is training. During Fiscal Year 1994-95, the QA/QC Program presented three training sessions. *Data Quality Assessment, Evaluation, and Management* was presented in Sacramento and Glendale; and *Introduction to Quality Assurance/Quality Control in Water Quality Programs* was presented in Sacramento. The management of the program regularly invites staff of other agencies to participate in the training on a space available basis. The results of this training are beginning to show, as managers of environmental measurement programs throughout the Department apply their training to assure data of known and acceptable quality.

Another major component of the program is issuance of guidance manuals. During the current fiscal year, a number of guidance manuals were published, including Quality Assurance Technical Document 7, *Compilation of Sediment and Soil Standards, Criteria and Guidelines*. An updated edition of *Compilation of Federal and State Drinking Water Standards and Criteria* has also been printed. To date, six technical documents have been published under the QA/QC Program. These documents are intended to standardize data

Quality Assurance/Quality Control

The water-related data collected by the Department must be of a quality that is scientifically supportable. To help protect the Department's large investment in water-related data, the Quality Assurance/Quality Control Program was created in 1992. Under the QA/QC Program, guidance documents are published, training courses are implemented, and technical support is provided to managers of water data collection programs throughout the Department.

In addition to its basic mission of supporting and strengthening the validity, integrity, and credibility of water data collected by the Department, another important objective of the QA/QC Program is to provide leadership in efficient planning and execution of data collection activities. In order to minimize cost, it is necessary to carefully plan, implement, interpret, and evaluate data collection activities. Good data collection programs begin with identification of the data collection goal and establishment of the data quality objectives to meet the goal. This planning is done in advance of actual data collection and helps assure that the correct type and amount of data are collected in order to meet program objectives. Through this process, the Department can avoid collecting inadequate, irrelevant, or extraneous data, and thereby avoid waste.

collection and evaluation practices to assure high quality data. They also provide program managers with tools to plan for collection of the right type and amount of data to provide needed answers while avoiding waste arising from poor quality data, data of the wrong type, and unnecessary data collection. The QA/QC Program also provides staff to manage and evaluate the Department's analytical data under the new master contract policy (see Bryte Chemical Laboratory Section). As analytical detection limits become ever more sensitive, the QA/QC Program will become increasingly important, due to the technical complexity in assessing the presence of very small concentrations of water quality constituents.

Activities Outside the Delta

Activities conducted outside the Delta include scheduled, routine SWP water quality monitoring as well as special studies. Most of these special studies are in response to fish and wildlife issues and to water quality issues of importance to agencies that provide domestic water supply. These agencies face increasingly stringent regulatory requirements and look to the SWP to deliver high quality raw water.

Water Quality Monitoring

The Division of Operations and Maintenance collects detailed water quality information on the concentration and distribution of chemical, biological, and physical parameters at 33 aqueduct and reservoir sites located throughout SWP facilities. Twenty stations are situated south of the Delta at reservoirs, pumping plants, power plants, and check structures of the North Bay, South Bay, Coastal Branch, and California Aqueduct. Other monitoring activities are conducted on the Feather River and at State reservoirs north of the Delta: Lake Oroville, Antelope Lake, Frenchman Lake, and Lake Davis.

The Water Quality Program of the SWP was established in 1968 with completion of the California Aqueduct. Over 60 different chemical constituents are monitored monthly, quarterly, or annually. In addition, 15 automated stations are maintained for continuous monitoring of aqueduct water. The Department maintains two analytical laboratories, the Bryte Laboratory in West Sacramento and the Castaic Laboratory in Southern California, and also contracts for some laboratory services.

Water samples from 15 SWP stations are analyzed monthly to determine levels of dissolved solids and concentrations of nutrients, chloride, sulfate, sodium, trace metals, and other constituents. Herbicides, pesticides, organic substances, and phytoplankton are monitored less frequently. Selected SWP water quality data are available electronically through the DWR Internet home page and reported monthly in the State Water Project Operations Data Report. Laboratory results of sampling at several representative stations during 1994 are presented in Table 6-1.

Delta exports are normally the primary source of water in SWP facilities and reservoirs south of the Delta. Much Delta water is exported south during the winter and spring when the greatest freshwater outflow occurs; as a result, reservoirs south of the Delta are usually supplied with the highest quality water. San Luis Reservoir, the only SWP conservation storage facility between the Delta and Southern California, is usually filled by May 1.

Other sources of water in the SWP include infrequent, localized storm inflow, or, since 1990, nonproject water pumped from ground water basin sources (well water) into the California Aqueduct as part of a drought relief program. The entering ground water volume is quantified and water quality closely monitored for selected minerals, metals, pesticides, and herbicides.

Nonproject Pump-ins

During 1994, SWP water contractors were allocated only 50 percent of requested

TABLE 6-1

1994 Water Quality at Selected State Water Project Locations

Constituents	*Units*	Reporting Limit *< than*	Thermalito Afterbay Outlet to Feather River *mean*	North Bay Aqueduct Barker Slough Pumping Plant *mean*	Harvey O. Banks Delta Pumping Plant *mean*	California Aqueduct at O'Neill (Check 13) *mean*	California Aqueduct at Kettleman City (Check 21) *mean*	California Aqueduct at Highway 119 (Check 29) *mean*	California Aqueduct at Tehachapi Afterbay (Check 41) *mean*	Devil Canyon near San Bernardino *mean*	Article 19 Objectives Month/10 year Average or *Maximum*
Conductance	µS/cm	5	92	384	552	533	583	652	615	427	N/A
Chlorides	mg/l	1	1	31	98	82	92	104	101	59	110/55
Disolved Solids	mg/l	1	60	230	317	305	334	371	353	246	440/220
Hardness	mg/l	1	38	120	121	113	122	136	128	98	180/110
% Sodium	%	N/A	12	25	31	30	30	28	31	29	50/40
Sulfate	mg/l	1	2	33	64	48	42	66	63	38	110/20
Turbidity	NTU	1	NR a)	17	7	5	7 d)	7 c)	7	4	N/A
T.O.C.	mg/l	0.1	NR a)	4.5 b)	4.3	4.3	3.7 f)	NR a)	4.0	3.6	N/A
Alkalinity	mg/l	N/A	42	100	74	76	71 b)	72	80	78	N/A
Arsenic	mg/l	0.001	0.001	0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.05 max
Boron	mg/l	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	N/A
Bromide	mg/l	0.01	0.01 e)	0.05	0.26	0.26	0.26 f)	0.30 g)	0.27 b)	0.22b)	N/A
Chromium	mg/l	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	N/A
Copper	mg/l	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.005	0.005	3 max
Fluoride	mg/l	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.5 max
Magnesium	mg/l	1	4	16	15	15	15	16	15	13	125 max
Manganese	mg/l	0.005	0.006	0.031	0.027	0.015	0.012	0.007	0.005	0.005	N/A
Selenium	mg/l	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.05 max
Zinc	mg/l	0.005	0.007	0.007	0.007	0.006	0.006	0.013	0.006	0.005	15 max

Notes: Turbidity is measured by a continuous recording Nephelometer and expressed as NTU (Nephelometer Turbidity Units), and Specific Conductance is measured by continuous electrical conductivty recorders, except at Thermalito Afterbay and Check 29 which are based on single monthly samples.

Values for chlorides, dissolved solids, hardness, % sodium, and sulfate are correlated from specific conductance except at Thermalito Afterbay and Check 29 which are analytical values. All other selected constituents are the yearly mean of laboratory analytical values sampled monthly.

Nondetectable values assumed equal to reporting limits for calculation of mean.

a) NR= data not collected or recorded at this location
b) mean of eleven values
c) mean of ten values
d) mean of nine values
e) mean of five values
f) mean of three values
g) only one value for this location

deliveries; the Department allowed ground water pump-ins. Nonproject pump-ins provided water supply flexibility by allowing contractors to move ground water supply within their districts during the critical growing season by using the California Aqueduct as transport. The program also enables districts to draw supply from San Luis Reservoir against credit for an equal volume of ground water pumped into the aqueduct; thus making it available as an alternate source when crop demands exceed well-pumping capacity. Significant nonproject ground water pump-ins occurred from May through December 1994. Combined nonproject pump-ins from Westlands Water District and the San Luis Water District along the joint State and federal San Luis Canal totaled 99,390 acre-feet for the year. Nonproject pump-ins were greatest from August through December, averaging almost 12,000 acre-feet per month. October had the highest monthly nonproject inflow of 17,961 acre-feet. Policies related to nonproject pump-ins are being reassessed, particularly with regard to water quality effects.

MIB and Geosmin Problems in the California Aqueduct and SWP Southern California Reservoirs

High concentrations of blue-green algae in reservoirs can lead to taste and odor problems, increased turbidity, and increased concentrations of organic THM (trihalomethane) precursors. Algal-related taste and odor problems in SWP reservoirs have been caused by the algal chemical compounds 2-methyl-isoborneol (MIB) and geosmin, which impart an earthy-musty taste and odor. Although the aqueduct carries untreated water not intended for direct consumption, objectionable tastes and odors from algae cannot be removed by standard water treatment procedures.

During late May and June 1994, geosmin levels at the surface of Castaic Lake increased to objectional levels over 100 ng/L. Geosmin can be detected by sensitive people at levels in excess of 10 ng/L. The high geosmin level was attributed to the planktonic filamentous blue-green algae, *Anabaena circinalis.*

In response, deliveries normally leaving Castaic Lake through the lake's High Tower outlet were instead made through a second Low Tower outlet from greater lake depths where algal growth and geosmin levels were lower. Algal growth was controlled by surface application of copper sulfate July 7. Water sampling for taste- and odor-related algal compounds was doubled to twice weekly and algal lake profiles increased from three to six locations. The lake was treated a second time with copper sulfate on September 7 following a second taste and odor incident caused this time by the compound MIB.

Surface blooms of blue-green algae can be sustained by water turbulence from high or rapidly changing inflows (or outflows) that supply nutrients by mixing deeper nutrient-rich waters. To avoid mixing, inflow from Elderberry Forebay to the lake was limited during June to 11 days. Inflow in August was limited to 13 days and stopped almost entirely from August 28 through October; only 8 days of inflow occurred during this period.

To determine the spacial distribution of the algal by-products geosmin and MIB throughout the SWP, DWR field division and water quality staff sampled many locations on the SWP California Aqueduct in late August. Several SWP reservoirs and source water locations were also sampled.

A single, surface water sample was collected at seven SWP aqueduct sites starting at the Banks Pumping Plant in the Sacramento-San Joaquin Delta down through Check 66 in Southern California. San Luis reservoir was sampled at one site and the SWP southern California reservoirs–Silverwood Lake, Lake Perris, and Castaic Lake–were each sampled at two sites. Additional samples were collected from the Sacramento River at Green's Landing

near Courtland, the San Joaquin River at Vernalis, and the federal Delta Mendota Canal in the San Luis Field Division. Samples were also taken from nonproject ground water inflows at two locations along the San Luis Canal.

Overall, almost 90 percent of the test results were either below detection limits or at levels below the taste and odor sensory threshold of about 10 ng/L (39 of 44 test results). Five samples had levels of MIB or geosmin between 12 and 24 ng/L. With the exception of one value (12 ng/L) found at Check 29, all compounds detected at levels above 10 ng/L were found at sites in the Southern Field Division at Check 60, Check 63, Check 66, and one surface sample at Lake Perris.

Feather River Agreement Temperature Control

During the recent drought of 1987-1992, Oroville Reservoir water survace elevation fell to levels approaching the lowest level ever recorded, which occurred in the 1977 drought-related period. Conditions improved greatly beginning in late 1992 and Oroville levels rose to the highest since 1986. Oroville water levels began the 1994 water year (October 1, 1993) at 839 feet surface elevation and over 100 percent of historical average storage—over 40 feet above the level at the beginning of the 1993 water year (October 1, 1992). Water level slowly dropped through fall 1993 with slight fluctuations and continued to decline until early February 1994 when storm inflows raised Oroville elevation to its peak at almost 839 feet on April 17, 1994. However, dry conditions during most of 1994 dropped the lake elevation back to levels approaching the summer levels of the drought years of 1990, 1991, and 1992.

As in 1990 to 1992, the lake's colder water layers fell below the penstock intake structure of the Edward Hyatt Power Plant. Water discharged from the Hyatt Power Plant was a blend of cool hypolimnetic water layers mixed with warmer epilimnic water. Consequently, the potential existed for water to enter the Feather River Fish Hatchery at temperatures higher than guidelines specified in a 1983 Feather River Agreement between the Department and Department of Fish and Game. The agreement requires a temperature maximum at the Feather River Hatchery during the period of fall-run salmon spawning to be 52 F (+ or - 4 F) during September and 51 F (+ or - 4 F), from October 1 through November 30.

Oroville lake levels fell over 33 feet between August 1 and October 1, 1994. In response, all but two of the movable control shutters were removed from the two intake structures at the Edward Hyatt Power Plant to reach cooler deeper reservoir water levels. In addition, pump-back operations were cut back during the first week of October as temperatures of water entering the Fish Hatchery closely approached water temperature limits. A water chiller, first used in 1991, was reinstalled on October 12, 1994, at the Feather River Fish Hatchery intake of the water supplied to salmon egg trays. By late October, all pump-back operations resumed. These combined efforts ensured that water temperatures were kept within accepted limits at the Feather River Hatchery during the agreement period.

Aquatic Plant Problems at Clifton Court Forebay

During late summer and fall 1993 and 1994, higher pumping rates at Banks were necessary to fill San Luis Reservoir and compensate for pumping capacity eliminated through efforts to protect Delta fisheries. Higher export rates produced higher velocities across the Clifton Court radial intake gates and pulled in a greater mass of floating plant materials from the southern Delta channels. The floating plant materials break apart and join debris from pondweeds growing in the Forebay to form large floating mats. Eventually the mats are pulled toward Skinner Fish Facility during

export pumping where they pile up on the facility trashracks. The accumulation of material results in excess debris in the fish counting tanks and physically impedes water flow into the Banks Pumping Plant. This can result in an elevation differential between the Forebay and Banks Pumping Plant intake leading to an automatic pump shut down.

Aquatic Weed Removal Program. Over the past few years, growth of several aquatic weed species has increased in Clifton Court Forebay. These weeds break apart from wind action or seasonal die-back and drift toward the fish protection facilities, where they reduce overall salvage efficiency. Even with staff regularly removing weeds from the screens, some weeds enter and clog the fish holding tanks. Tests conducted in 1994 at the nearby USBR Tracy Fish Facility (which has a louvered design similar to that of the Skinner Fish Facility) indicate dramatically lower salvage efficiency when screens are clogged.

Department staff explored several techniques to keep the weed problem under control, including herbicides, mechanical harvesting, and automated trash rakes in front of the fish screens. Measures implemented in 1994 and early 1995 included a large-scale application of an approved herbicide and extensive harvesting in the forebay. However, additional measures may still be necessary to control or manage the problem.

During the last week of August 1994, exceptional weed removal efforts were required by maintenance crews at the Skinner trashracks to meet pumping schedules at Banks. Although delivery volume was met, intermittent pump shutdowns for trashrack cleanups resulted in increased pumping cost as some pumping was deferred from the less costly off-peak period to more costly on-peak times. These pumping deferrals continued sporadically for the rest of the year. During October 1994, a pondweed harvester was placed in service in the H.O. Banks Pumping Plant intake channel to reduce the amount of weeds arriving at the trashracks. Export pumping increased during early November 1994 to take advantage of increased Delta outflow following storm events. Civil maintenance crews worked around the clock to remove pondweed from the trashracks during this period.

An estimated 400 acres of the forebay are infested with pondweeds composed primarily of Brazilian eleodea, Eurasian milfoil, and coontail, which often combines with floating water hyacinth. Mechanical weed harvesters have been used to remove pondweeds from the forebay with limited success. During the second half of September 1994, several different herbicide formulations were sprayed within a 4-acre test plot in the southwest lagoon of Clifton Court Forebay. Temperature, EC, and pH were measured during the experimental period. Results from these herbicide plots will be considered with the other pondweed control options to determine the best control method for 1995.

Flooding Little Mandeville Island

On August 2, 1994, a levee failure resulted in flooding Little Mandeville Island with about 1,500 acre-feet of river water. The island, located near Frank's Tract in the central Delta, has an area of 376 acres and is unpopulated. Water monitoring showed no change in Delta water quality due to the island flooding.

Suisun Marsh Activities

Suisun Marsh, consisting of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and sloughs, is the largest contiguous estuarine marsh remaining in the United States (Figure 6-2). Situated in southern Solano County, west of the Sacramento-San Joaquin Delta and north of Suisun Bay, the marsh encompasses more than 10 percent of California's remaining natural wetlands. In addition, the marsh is the resting and feeding ground for thousands of waterfowl migrating on the Pacific Flyway.

Since the early 1970s, the Department, California Legislature, SWRCB, USBR, and

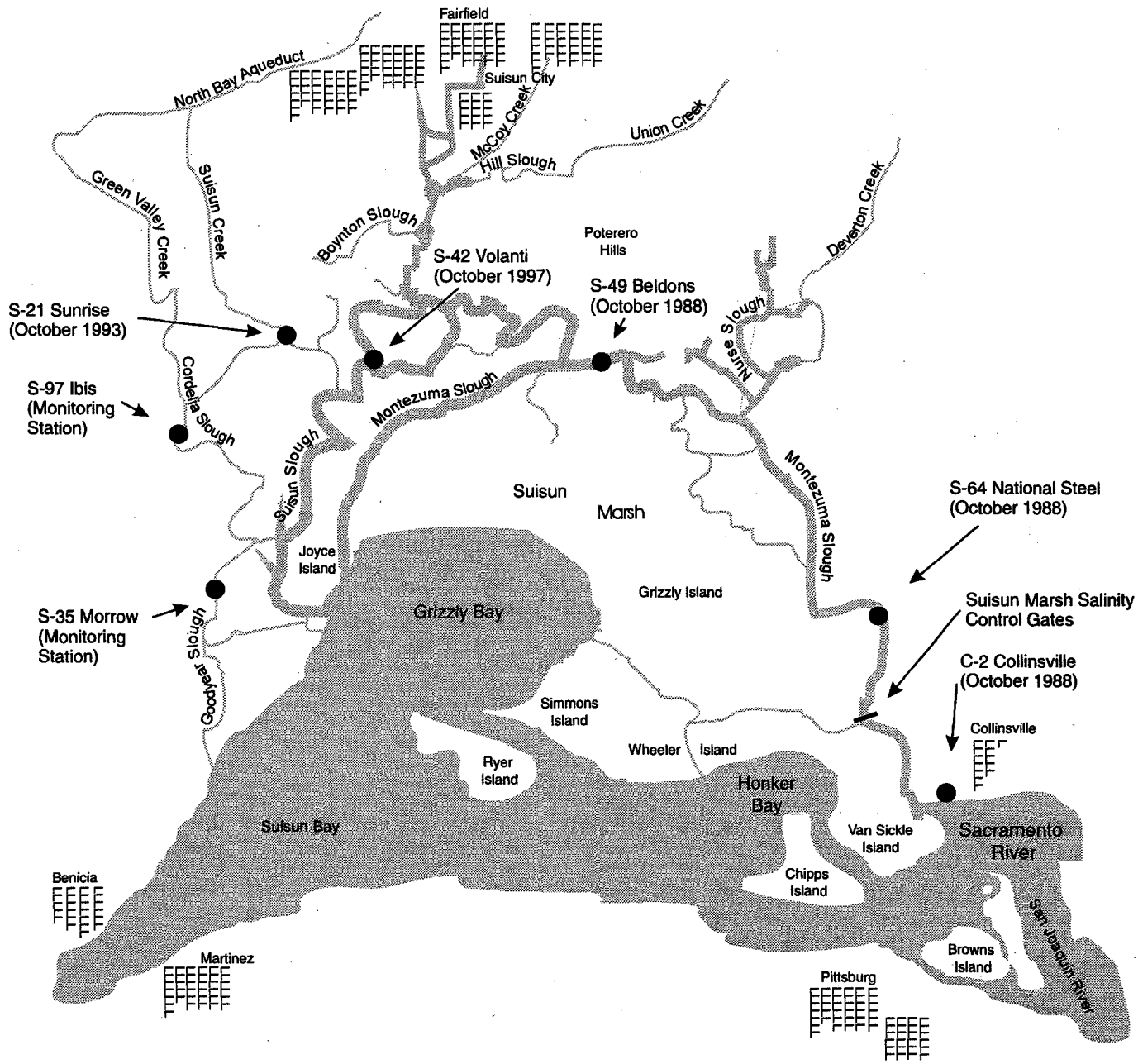


Fig. 6-2. The Suisun Bay and Marsh

The Plan of Protection for Suisun Marsh

The Plan of Protection, published under the requirements of Decision 1485, was designed to ensure that Decision 1485 standards are met. The plan contained a proposal to:

- monitor water quality;
- develop management plans for managed wetlands;
- install, in phases, physical facilities to control channel water salinity for interior marsh sloughs; and
- provide mitigation for construction impacts associated with physical facilities.

The plan also included an environmental impact report that discussed actions identified in the plan and the effects of each action. According to the plan, the Department and USBR, as lead agencies, would prepare supplemental environmental documentation if new significant impacts were identified during the planning and implementation of subsequent actions.

The Plan of Protection suggests six phases to provide protection for the Suisun Marsh. Phase I (Initial Facilities) and Phase II (Suisun Marsh Salinity Control Gates) are complete. Phases III and IV, directed at western Suisun Marsh, have been combined and are identified as the Western Suisun Marsh Salinity Control Project. Discussions about Phase V, the Grizzly Island Distribution System, were initiated with SRCD in 1993. The Potrero Hills Ditch was identified as Phase VI.

At the USBR's request, the SWRCB reset the timetable for complying with the conditions in Decision 1485 from a completion date of October 1, 1984, to a staged implementation plan to be completed by October 1, 1997. The revised time schedule was specified in a letter issued on December 5, 1985, and specific revisions were made to Table II of Decision 1485. The revision also includes options for compliance times and locations for salinity compliance stations.

other agencies have acted to preserve Suisun Marsh as a unique environmental resource. As part of its responsibility for protecting Suisun Marsh, SWRCB included water quality standards for the marsh in Water Right Decision 1485, which applies to the operation of the SWP and CVP. In 1987, the Department, USBR, DFG, and the Suisun Resource Conservation District signed the Suisun Marsh Preservation Agreement. The Preservation Agreement contains specific provisions for the construction of new salinity control facilities to enable the Department to comply with SWRCB standards and terms.

Decision 1485 Standards for Suisun Marsh

The SWRCB set salinity standards in D-1485.The parties agreed to include these salinity standards in the Preservation Agreement to help preserve Suisun Marsh as a brackish tidal marsh and provide optimum source water for the production of food plants for waterfowl. To accommodate a phased-construction schedule for facilities needed to meet the standards, SWRCB revised Decision 1485 standards for Suisun Marsh in a December 5, 1985, order.

SWRCB, through Decision 1485, required the Department and USBR, in cooperation with other agencies, to develop and fully implement a plan to ensure that standards in Decision 1485 were met. In 1984, the Department published the *Plan of Protection for Suisun Marsh*, which included the environmental impact report prepared in cooperation with DFG, Suisun Resource Conservation District, and USBR, with contributions by the U.S. Fish and Wildlife Service.

Amendment Number 2 to the Suisun Marsh Preservation Agreement. Suisun Marsh Preservation Agreement Amendment Number 2 was approved by the California Department of General Services on June 21, 1994. This amendment revises language in Article 7, *Individual Ownership Facilities*, in accordance with Article 17 of the agreement. The agreement provides for cost sharing to improve water management on individual ownerships

within the marsh. The amended agreement revises the cost sharing ratio from 50:50 (SWP/CVP to Suisun Marsh landowners) to 75:25 and directs the SRCD to provide updated ownership management plans to the Department and USBR.

Reports to the State Water Resources Control Board in Support of the Draft Water Quality Control Plan

In preparation for the December 15, 1994, draft *Water Quality Control Plan for the San Francisco Bay/San Joaquin Delta Estuary*, SWRCB held a workshop on October 13, 1994, to receive input on Suisun Marsh issues. Subsequently, and in response to a request for assistance from SWRCB staff, the Department prepared four reports providing information for the draft WQCP: 1) *Program of Implementation for Wildlife Water Quality Objectives for Suisun Bay Area*, which incorporates Suisun Marsh Preservation Agreement language into a Plan of Implementation; 2) *Summary of Salinity Conditions in Suisun Marsh During Water Years 1984-92*; 3) *Summary of Sensitive Plant and Wildlife Resources in Suisun Marsh During Water Years 1984-94*; and 4) *Estimate of Salinity Changes in Suisun Marsh During Water Years 1987-92 Using California Urban Water Agencies and Agricultural Water Users' Criteria*. The Department submitted the four reports to the SWRCB between the end of November 1994 and early January 1995. Copies of these reports were also distributed to SMPA signatory agencies and other interested parties.

The *Program of Implementation* suggested language on two possible approaches to incorporate the SMPA into the Program of Implementation portion of the draft WQCP. The first approach is a strict adoption of the SMPA as the process to protect beneficial uses in the marsh. The second approach includes language to provide for a salinity gradient across the Suisun Marsh recognizing that western marsh salinities are higher than salinities in the eastern marsh.

The *Summary of Salinity Conditions* concluded that the hydrology and salinity response can be differentiated between the western and eastern marsh and suggested that salinity standards could reflect this difference. As indicated in Figure 6-2, Decision 1485 compliance stations in the western marsh include S-42, S-21, S-75 (measured at S-35), and S-97, while S-49 and S-64 in Montezuma Slough, and C-2 at Collinsville are the eastern marsh compliance stations. The report also concluded that the Suisun Marsh Salinity Control Gates are effective and essential for maintaining lower channel water salinities in the eastern marsh and to a lesser degree in the western marsh.

The *Summary of Sensitive Plant and Wildlife Resources* briefly describes the sensitive species' status and habitat requirements and evaluates potential impacts of proposed

State Water Resources Control Board

The State Water Resources Control Board, established by the California Legislature in 1967, oversees water rights and water quality for California. Among its many responsibilities, the SWRCB issues permits for the use of all water except ground water and riparian water; distributes State and federal loans and grants for constructing sewage facilities; adopts water quality control plans, regulations, and policies; and sets water quality standards for the Delta.

To implement its mandate to set Delta water quality standards, the SWRCB issued Water Right Decision 1485: Sacramento-San Joaquin Delta and Suisun Marsh in 1978. That decision focused on SWP and CVP water right permits and operations, requiring the SWP and CVP to maintain Delta water quality as it would have existed without the projects. However, after Decision 1485 was adopted, various water users as well as the federal government challenged it in court. Since then, the Board has updated its Quality Control Plan and intends to update D-1485 in the summer of 1995.

salinity standards. The data used in this report are preliminary results from field studies in support of a Suisun Marsh Biological Assessment requested by SWRCB in 1990. The Department prepared the report to assist SWRCB in its preparation of a biological assessment for consultation with the fish and wildlife agencies on the potential impacts of salinity standards proposed for Suisun Marsh.

In the modeling report, hydrodynamic and salinity modeling with CUWA/AG hydrology (October 1994 version) indicates that Decision 1485 standards would be met at eastern Suisun Marsh stations and SMPA deficiency standards would be met at western Suisun Marsh compliance stations when the SMSCG are operated. However, Decision 1485 standards could not be met at all times at eastern Suisun Marsh compliance stations when the gates are not operated. Also, SMPA normal, as well as deficiency, standards in the western marsh could not be met at all times when the gates are not operated.

Western Suisun Marsh Salinity Control Project

With the release of the draft WQCP (December 1994) and the Department's estimate of resulting salinity conditions in the Suisun Marsh as presented in *Estimate of Salinity Changes in Suisun Marsh For Water Years 1987-92 With CUWA/AG Criteria*, it is unlikely that additional large-scale facilities will be necessary for salinity control in the Suisun Marsh. Consequently, USBR and the Department have halted work on the draft EIR/EIS for the WSCP. In the draft WQCP, SWRCB requested the formulation of a Suisun Marsh Ecological Work Group to evaluate the basis for marsh standards and recommend new standards.

Western Suisun Marsh Salinity Control Test

The Department and USBR initiated the Western Suisun Marsh Salinity Control Test to evaluate a promising alternative action identified during the screening process of the Western Suisun Marsh Salinity Control Project. The purpose of the test is to lower channel water salinity in the northwestern Suisun Marsh (specifically in Cordelia Slough near S-97 and Goodyear Slough near S-35) with flow augmentation in Green Valley Creek. Flow augmentation would assist the Department and USBR in meeting SWRCB salinity standards by using existing waterways. As proposed, this alternative would only be used during periods when salinities at compliance stations were approaching D-1485 standards.

The engineering analysis of the alternatives to control channel water salinities for the WSCP EIR/EIS was based in part on mathematical model results. Another objective of the WSCT was to help confirm model results and provide insight on the extent and rate of salinity control achievable with flow augmentation for dry or critically dry hydrologic conditions.

The WSCT included augmenting Green Valley Creek base flow with North Bay Aqueduct water discharged from the Cordelia Forebay and Lake Berryessa water discharged through the Putah South Canal. The WSCT also included associated field data collection activities. The WSCT was conducted during both the 1993-94 and 1994-95 control seasons.

1993-94 WSCT. The 1993-94 WSCT was originally proposed for January 1, 1994, through September 30, 1994. However, DFG did not endorse the test in December 1993 because a suitable water source that would not impact sensitive fishery resources was unavailable in 1993. Flow augmentation of up to 20 cfs into Green Valley Creek was approved by DFG beginning March 1, 1994. However, during March through May 1994, Green Valley Creek flow augmentation was not necessary because natural creek runoff, Delta outflow, and the operation of the Suisun Marsh Salinity Control Gates were sufficient

to meet standards at all SWRCB Decision 1485 compliance stations in Suisun Marsh. With the exception of the discharge of 10 acre-feet March 8, 1994, to rate the modified spillway at the Cordelia Forebay, no water was discharged into Suisun Marsh during the 1993-1994 WSCT.

1994-95 WSCT. Conducted from September 1994 through May 31, 1995, the 1994-95 WSCT expanded on the WSCT planned for January through May 1994. The 1994-95 WSCT included:

- Green Valley Creek flow augmentation of up to 50 cfs (maximum mean daily flow);
- operation of the SMSCG beginning September 1, 1994;
- field data collection to assist in evaluating alternatives for the WSCP; and
- a dye study as part of the flow augmentation test to estimate source water travel time, determine area of impact of flow augmentation, and provide data to improve model calibration.

Flow augmentation began September 1, 1994, and continued through November 14, 1994, using North Bay Aqueduct water discharged from the Cordelia Forebay. The Department discharged approximately 4,130 acre-feet of NBA water into Green Valley Creek during this period. Mean daily flow augmentation rates varied from 20 cfs to 50 cfs during this period. The SMSCG were operated intermittently during the test period; their detailed operation is discussed in the section on Gate Operations for Water Year 1994.

The Department conducted a dye study during November 1994. The dye was released in conjunction with discharges of 50 cfs into Green Valley Creek at the start of the spring tidal sequence. The dye released in the flow augmentation water moved several miles upstream and then back downstream in Cordelia Slough with high and low tides, respectively.

The water quality monitoring plan developed and conducted for the flow augmentation test included data collection on various water quality parameters, phytoplankton distribution, chlorophyll *a*, phaeophytin, and coliform bacteria levels specified by the San Francisco Regional Water Quality Control Board as a condition of its waiver of discharge requirements issued for the test. The WSCT utilized an extensive network of continuous monitoring stations to collect specific conductance, tide elevation and dissolved oxygen data. From September through November 1994, longitudinal profiles were conducted 7 days a week, twice a day (at high and low slack water) to provide data between fixed stations. Daily longitudinal profiles were conducted again in late January 1995. January sampling was conducted only at low tide to coincide with the initial draining operations on the privately managed wetlands. Several discrete monitoring sites were located strategically throughout the western marsh to provide additional data.

The Department and USBR requested and received a variance from SWRCB for the entire 1994-95 control season in meeting Decision 1485 salinity standards at compliance stations S-21, S-35, and S-97 because of the uncertainty of controlling salinities in western marsh sloughs with creek flow augmentation. The variance is authorized in Resolution No. 94-90, adopted on September 22, 1994, which states that Decision 1485 salinity standards at S-21, S-35, and S-97 are suspended for October and November and modified for December through May to the SMPA deficiency year standards. SWRCB Resolution No. 94-90 also included a variance of SWRCB Decision 1485 suspending salinity standards at compliance monitoring stations S-49 and S-64 for October and November 1994 as part of the Adult Salmon Migration Study (discussed below), a separate unrelated study, developed by the Department and DFG.

During the environmental review for the 1994-95 WSCT, the wildlife agencies did not endorse the use of NBA water during the time adult winter-run chinook salmon may be present in Suisun Marsh. Therefore, alterna-

tive water supplies were being pursued to allow for this test and avoid impacts to endangered species.

Several chinook salmon, identified as fall or late-fall run, were observed in the vicinity of the discharge point from Cordelia Forebay during October and November 1994. Once fish were observed, Department and DFG biologists began fish monitoring and collected and relocated several adult salmon to Cordelia Slough. Results of the salmon observations will be included in a report documenting the 1994-95 WSCT.

Contract Negotiations. In support of the WSCT, the State Water Project Analysis Office began negotiating a short-term (2-year) contract with Solano County Water Agency during 1994. The contract would make Lake Berryessa water available for salinity control in the western Suisun Marsh. Provisions in the contract include the purchase of 6,000 acre-feet of Solano water pool emergency bank water. The emergency bank water was purchased in 1991 by SCWA member agencies and is currently held in storage in Lake Berryessa. The contract was finalized in May 1995.

Adult Salmon Migration Study

An adult salmon migration study conducted in 1993 and 1994 fulfilled a Corps of Engineers permit requirement for the SMSCG. The permit was issued for the construction and operation of the SMSCG. A pilot study was conducted in fall 1993; DFG is preparing a report on its results. Preliminary results from the 1993 pilot study indicate a statistically significant difference in passage times among fish when the flashboards were out and the gates were held open versus when the flashboards were in regardless of gate operation. The final report is currently under DFG staff review.

The 1994 *Adult Salmon Migration Study* was conducted September 26 through November 9, 1994. The purpose of the 1994 study was to estimate the rates and patterns of adult fall-run chinook salmon passage through the SMSCG under three SMSCG configurations: 1) flashboards in and gates operating, 2) flashboards in and gates held open, and 3) flashboards out and gates held open.

Adult salmon were captured using gill nets and sonic tags were inserted into their stomachs. The movement of each tagged salmon was tracked by stationary and mobile hydrophones and receivers. DFG is reviewing the data, but has not indicated when a draft report of the 1994 study will be available for review.

Water Quality Monitoring and Compliance

Environmental Services Office staff conducted longitudinal profiles of Suisun Marsh channels measuring several water quality parameters. In addition to the data collected at the fixed monitoring stations, these profiles will document existing channel water quality conditions, fill data gaps in the database, and add to our knowledge of marsh water quality conditions. The longitudinal profiles are scheduled to correspond to distinct field conditions associated with major operational activities in the marsh.

Generally, the first major annual activity occurs in late September and continues through the end of October when club managers fill their ponds in preparation for the arrival of wintering waterfowl. The second major activity occurs between late October and late January when wetland managers circulate new water through their ponds by exchanging water with adjacent sloughs. The third activity occurs between late January and the end of May when wetland managers fill and drain their ponds in an attempt to leach soil salts. Leaching is intended to enhance waterfowl food plant seed germination by lowering soil salinity. Profiles are also conducted from June to late September when most of the club ponds are dry. During this fourth period, marsh channel water salinity conditions are primarily the result of tidal action.

During the 1993-94 control season, the salinity standards specified in Table II of D-1485 were in effect at two locations in Montezuma Slough (S-49 Beldons landing and S-64 National Steel), two locations in the Sacramento River (C-2 Sacramento River at Montezuma Slough and Mallard Slough), and two locations in the northwestern Suisun Marsh (S-21 Chadbourne Slough at Sunrise Club; S-97 Cordelia Slough at Ibis).

Salinity compliance began October 1, 1994, (1994-95 control season) in the southwestern marsh (S-75 Goodyear Slough, reported at S-35). In September 1994, the Department and USBR requested approval from SWRCB to measure and report compliance at the existing S-35 monitoring station because a suitable location for the S-75 compliance station was not found in Goodyear Slough. The SWRCB granted approval to report compliance at S-35 until proposed facilities for salinity control are implemented in the southwestern marsh.

Marsh-Wide Plant Survey

Overall vegetative composition of Suisun Marsh is determined by a contract with DFG. The composition determination is a condition of the Suisun Marsh Monitoring Agreement and is scheduled to occur every 3 years. Surveys were taken in 1985, 1988, 1991, and 1994; they consist of color aerial photographs in conjunction with ground verification. The 1994 survey included the alignment of the North Bay Aqueduct, the north coast of Contra Costa County along Suisun Bay, the area around Cordelia Forebay, and Suisun Marsh.

Suisun Marsh Mitigation Project

The Island Slough Wetland Development Project in the Grizzly Island Wildlife Area is a SWP/CVP sponsored project to mitigate for wetlands lost because of facilities constructed in accordance with the Suisun Marsh Preservation Agreement and due to the impacts of upstream diverters on the Channel Islands.

Suisun Marsh Preservation Agreement

The Preservation Agreement, like Decision 1485, includes specific salinity compliance standards for marsh channels. However, the Preservation Agreement links the times for subsequent compliance to the date the Suisun Marsh Salinity Control Gates were considered operational. The compliance options for Decision 1485, as revised, are not linked to completion of facilities. Also, the Preservation Agreement includes provisions for higher salinity levels during periods when California experiences a series of adverse hydrologic conditions.

In a petition dated August 30, 1988, the Department, U.S. Bureau of Reclamation, Department of Fish and Game, and Suisun Resource Conservation District requested the State Water Resources Control Board to adopt the Suisun Marsh Preservation Agreement as the means to provide protection for the Suisun Marsh. This action would have modified SWP and CVP water rights. Because new species of concern were identified in the marsh, the SWRCB requested an updated biological assessment to determine the impacts of adopting the Preservation Agreement. A study plan for a biological assessment was sent to the SWRCB on March 2, 1992. The biological assessment was scheduled to be completed and submitted to the SWRCB in 1996.

The Mitigation Agreement directs DFG to acquire, develop, and maintain the mitigation lands. During 1994, DFG acquired the necessary permits to proceed to bid for the construction of the project. Construction of the Island Slough Project should begin in Spring 1996.

Protecting Fish, Plants, and Wildlife

To protect threatened or endangered plants and animals listed since the *Plan of Protection for Suisun Marsh* was adopted in 1984, SWRCB requested the Department and DFG to complete a biological assessment of the

effects of adopting the Suisun Marsh Preservation Agreement as the process to protect the marsh. The agreement allows higher salinities in Suisun Marsh sloughs during adverse (critically dry) hydrologic conditions. Consequently, extensive field surveys of Suisun Marsh and Suisun Bay were conducted to locate and identify rare, threatened, and endangered plant and animal species. During 1994, updated surveys for sensitive plant and wildlife species were conducted. The Department submitted preliminary results of the data collected for the biological assessment to SWRCB during December 1994 in a report entitled *Summary of Sensitive Plant and Wildlife Resources in Suisun Marsh During Water Years 1984-94.* Also during 1994, fish community sampling continued through a contractual arrangement with the University of California through the Davis campus.

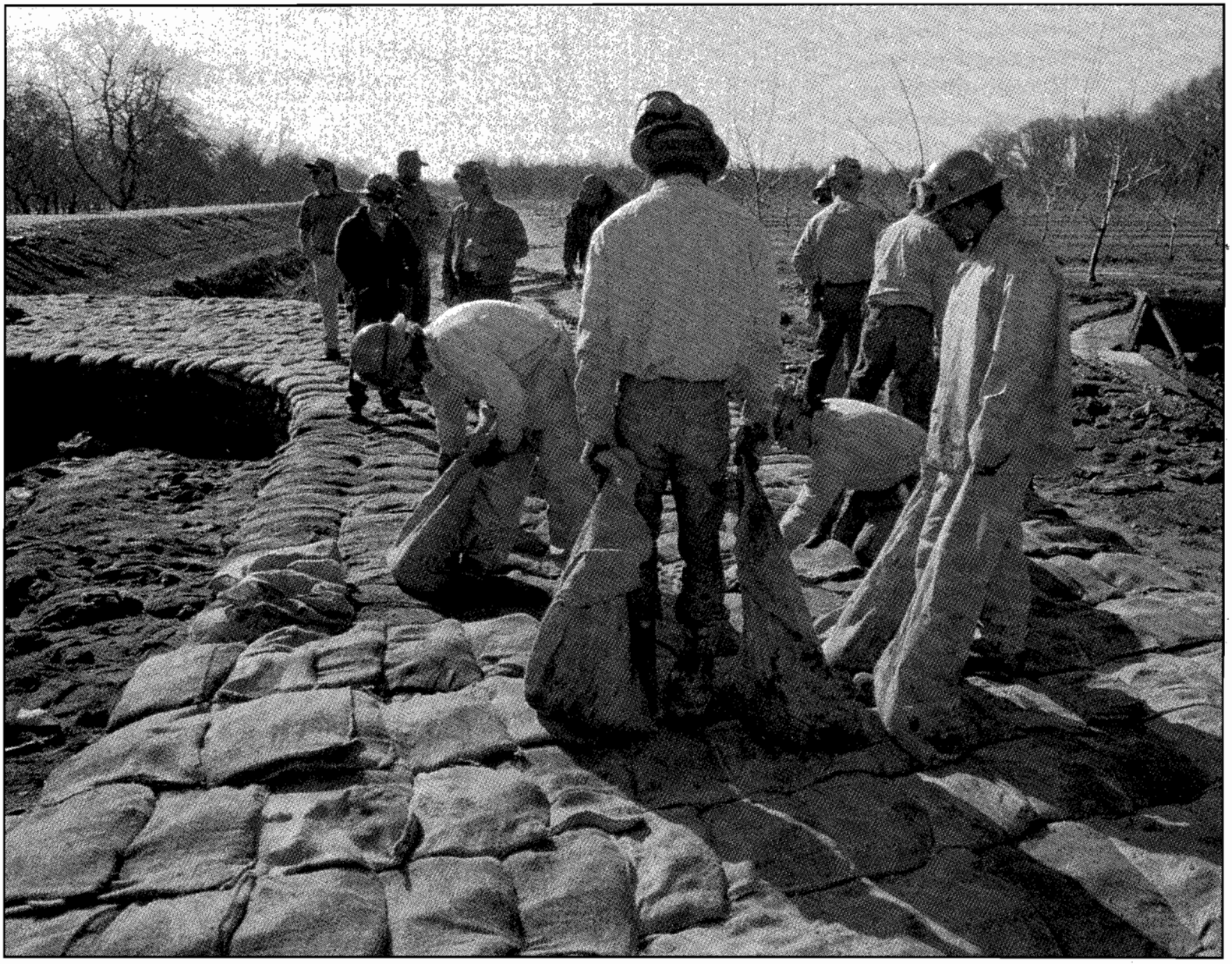
Right-of-Way Activities

During 1994, Division of Right-of-Way staff obtained 10 temporary entry permits to conduct biological surveys and geologic exploration in privately managed wetlands. The surveys are conducted to support preliminary engineering and environmental documentation for the Western Suisun Marsh Salinity Control Project. Specific locations for the surveys are along the alignment for the proposed Cordelia Goodyear ditch and on the privately managed wetlands adjacent to Frank Horan, Chadbourne, and Wells sloughs, and Ibis Cut.

Information for this chapter was provided by the Divisions of Operations and Maintenance (Environmental Assessment Branch), Local Assistance, and the Environmental Services Office.

Chapter 7

Local Assistance Programs



Levee repair

Significant Events

- The San Joaquin Valley Drainage Implementation Program extended its agreement to retain the Program Coordinator until 1996-97.
- SJVDIP developed *Monitoring Plan for the Westside San Joaquin Valley.*
- The program is being evaluated with intentions to make adjustments necessary to be more effective in assisting the local irrigation and drainage districts.
- The report by USGS on movement of trace elements in the Tulare Basin is final.
- The Department will increase the number of well clusters for additional monitoring.
- The Department is cooperating with USBR on installation of real-time monitoring stations on the San Joaquin River.
- The Department has completed nine demonstration projects on drainage reduction.
- A summary of the results of the above projects is being prepared. The final report is expected to be released in late 1995.
- The operators of evaporation ponds began implementation of the waste discharge requirements adopted by the Central Valley Regional Water Quality Control Board.
- The State Water Resources Control Board held evidentiary hearings on the adequacy of the waste discharge requirements and their environmental impact report. SWRCB is expected to make a decision before the end of the calendar year.
- The Department continues to cooperate with the multiagency demonstration project at Westlake Farms. Information for this project has been valuable to the SWRCB proceedings.
- Construction was completed on the Strathmore Public Utility District water quality improvement project, Tulare County. The final site inspection and audit required by the Davis-Grunsky Act have also been completed.
- The Department disbursed approximately $1,500,000 of a $3,000,000 Davis-Grunsky loan to Palmdale Water District and Littlerock Creek Irrigation District for rehabilitation of Littlerock Creek Dam, Los Angeles County.

Through the Division of Local Assistance, the Department of Water Resources manages or participates in several programs to assist local agencies and benefit State Water Project contractors.

One program, the Davis-Grunsky Act program, provides financial assistance to local agencies for constructing water supply projects. Under this program public agencies are awarded loans or grants at a fixed rate of interest and for a fixed repayment period.

Another program, the San Joaquin Valley Drainage Program, addresses drainage problems related to irrigated farmlands. The Department is working with many agencies to solve or mitigate the effects of drainage problems that affect the service areas of SWP contractors.

Two additional programs managed by the Division of Local Assistance are the Site Assessment Program and a program concerned with the review of environmental impact documents. Both programs are designed to protect the SWP and the interests of long-term contractors.

Davis-Grunsky Act

Public agencies have been awarded loans and grants through the Davis-Grunsky Act since 1959. The Act is jointly administered by the Department and the California Water Commission and was designed as complementary legislation to the Burns-Porter Act, which was enacted to help finance construction of the SWP.

Of the original $1.75 billion made available through the Burns-Porter Act, $130 million was reserved specifically for distribution through provisions of the Davis-Grunsky Act. Monies are paid from the California Water Resources Development Fund and the California Water Fund. Loans are repaid to the California Water Resources Development Fund.

Basic Provisions

The broad objective of the Davis-Grunsky Act is to advance the development, control, and conservation of water resources in California. To meet that objective, the Act is designed to:

- provide loans to public agencies for preparing feasibility reports and constructing local water projects if the agencies cannot obtain financing on reasonable terms from other sources;
- provide grants to encourage development of the recreational aspects of local water projects and fish and wildlife habitat; and
- enable California to participate as a partner in the development, construction, or operation of certain water projects when participation is necessary for optimum development of resources.

Public agencies, including cities, counties, districts, or other political subdivisions of the State, may participate in the program. Types of assistance available include:

- loans for constructing local water projects, acquiring sites for reservoirs for proposed water projects, and preparing feasibility reports on proposed projects for which loans have been requested;
- grants for paying the part of the construction cost of dams and reservoirs that are properly allocated to provide recreation, enhance fish and wildlife, and construct initial water supply and sanitary facilities needed for public recreational use of reservoirs; and

- State participation as a partner in a project larger than one that the local agency proposed to construct on its own.

At the program's inception, loans were made at the current market interest rate. In 1967, to be more equitable to the low-income agencies that the program was designed to assist, the Legislature fixed the interest rate at 2.5 percent. The maximum loan repayment period was set at 50 years. At the Department's discretion, however, some agencies were given an initial 10-year deferment with the accumulated interest amortized over the repayment period.

Through 1994, approximately $128.5 million of the allocated $130 million had been disbursed or contracted for loans, grants, and administrative costs. The remaining $1.5 million has been allocated to complete the grant to Littlerock Creek Irrigation District and Palmdale Water District to rehabilitate Littlerock Dam.

Current Activities

The following actions involving funding from the Davis-Grunsky Act occurred from July 1, 1994, through June 30, 1995. They are listed alphabetically according to the name of the agency to which the loan or grant was given:

Home Gardens County Water District. Home Gardens County Water District, San Bernardino County, received its entire loan entitlement. The district received an extension to complete the final project component, which will fulfill water quality standards imposed by the county. The project audit is currently expected to occur in the last quarter of 1995.

Littlerock Creek Irrigation District/ Palmdale Water District. The Department disbursed approximately $1.5 million of the $3 million grant approved for this project in Los Angeles County. The recreational facilities associated with this project should be completed by fall 1995.

Strathmore Public Utility District. Construction was completed on the Strathmore PUD Water Supply Improvement Project, Tulare County. The site inspection and audit required under the Act have been completed.

Agricultural Drainage Program

The Department continues to participate in the multiagency program to implement the recommended plan of the San Joaquin Valley Drainage Program.

In 1989, the Department prepared a 5-year plan for its drainage program, which set objectives for each of the program's four principal activities (drainage monitoring and evaluation, drainage reduction, drainage treatment, and evaporation ponds investigation). A new 5-year plan was completed and approved, reviewing accomplishments since 1989 and setting new objectives for the remainder of the century.

The Department participates in a multiagency feasibility study of waste-water reuse in the San Francisco Bay area. Among the options being reviewed is exporting treated waste water to the San Joaquin Valley in return for exporting the excess salt resulting from the transfer to the Pacific Ocean. The study is just beginning and is to be completed during 1997.

Drainage Monitoring and Evaluation

The USGS and the Department completed their cooperative studies on the occurrence, movement, and fate of selenium in the Tulare Basin area. The final report has been received and is being evaluated.

Over the next 3 years, the Department will install some additional clusters of monitoring wells (well depths ranging from 20 to 200 feet) to complete a monitoring network.

The Department is participating in a cooperative program with USBR to install real-time monitoring equipment on the San

Joaquin River. The equipment will provide local, State, and federal agencies with real-time data to assist in managing drainage releases to the San Joaquin River.

Additional program activities will include a shallow monitoring well canvass conducted in the southern San Joaquin Valley followed by an electrical conductivity canvass. Electrical conductivity will be measured throughout the San Joaquin Valley to produce an EC contour map of high ground water in areas of agricultural drainage problems.

Drainage Reduction

The Department continues to work on demonstration and education programs promoting the practice of improved irrigation and drainage management techniques. By December 1993, the following projects were completed:

- demonstration of new and innovative irrigation management and systems (LEPA, subsurface, improved furrow, and conventional furrow);
- demonstration of improved furrow (short furrows, surge irrigation, automated set changes, etc.);
- study of load/flow relationships;
- demonstration/study of tiered water pricing effect of reducing deep percolation;
- study of ground water contribution to the San Joaquin River;
- demonstration of agroforestry systems, salt balance, etc.;
- study of irrigation efficiency and regional subsurface drainage flows;
- water conservation coordinator with local agencies in irrigation water management; and
- education and training workshops for on-farm irrigation management.

The final reports of these projects are being reviewed. One project entitled *Shallow Ground Water Management* will be completed by the 1995-96 fiscal year.

Summarizing and publishing the findings and recommendations from completed projects have high priority because these results and findings can affect future activities. A first draft summary of seven completed projects is under review and will be available for publication by the end of August 1995.

During the 1994-95 fiscal year, the Department began and continues a number of new projects. These projects consist of:

- a study of plant growth as a function of varying salinity levels,
- a project to evaluate linear move irrigation systems in California,
- a project to evaluate effects of on-farm irrigation management changes on the irrigation district's operation and policies,
- a project to study irrigation management on cracking soils,
- a project to help reduce drainage flows and sediment load to the San Joaquin River, and
- possibly a project on volatization of selenium from drainage water.

In addition, the agricultural drainage reduction and reuse program is soliciting a proposal to study and demonstrate new irrigation management practices in different geohydrological areas of the State.

Drainage Treatment

The Department continues to participate in the multiagency drainage treatment test facility near Tranquility in western Fresno County. The principal activity is a bacterial selenium reduction/removal test program that achieved selenium removal rates of up to 90 percent in 1994 during pilot-scale operation. An operation and evaluations report of 1994 activities is being prepared. The next phase of testing, during 1995, will concentrate on perfecting the process and developing operational and economic feasibility data. Additional studies of alternative carbon sources, as well as

identification and characterization of process wastes, are of primary concern.

Evaporation Ponds

The operators of the agricultural evaporation ponds began implementation of the waste discharge requirements as adopted by the Central Valley Regional Water Quality Control Board in August 1994. Clean wetlands have been provided as compensation for the operation of the evaporation ponds, pond management for some systems has been changed, and structural modifications have begun at many evaporation ponds. Most of these mitigation procedures were developed by researchers funded through the Evaporation Pond Investigation.

Several interested parties filed petitions to the SWRCB to strengthen the waste discharge requirements of the Regional Board. SWRCB held hearings on these petitions and expects to make a decision before the end of the calendar year. In June, SWRCB adopted a settlement agreement between Westlake Farms and most of the petitioners based on a set of protocols developed by USFWS. Six other pond operators reached agreement with USFWS, but not the other petitioners. These six operators can potentially reach an agreement acceptable to the other petitioners before the SWRCB decision, but the remaining operators will probably not reach an agreement.

The Department continues to fund and coordinate research on the evaporation ponds. This past year, research activity was minimal due to budgetary considerations. The National Biological Service study funded by the Department is in the analysis stage, with the final report due at the end of 1995. Data are being collected by consultants to the operators as part of their waste discharge requirements and will be available for analysis, but comprehensive work has been postponed until funding is available.

The Westlake Demonstration Wetland, a cooperative project among the Department, Westlake Farms, USBR, USFWS, and DFG, has been operating since fall 1994. Information collected by USFWS and consultants to Westlake Farms documented a high level of successful breeding by shorebirds. This information has been valuable in the SWRCB proceedings discussed above and will help design wetlands throughout the western United States. The Department began cooperative studies this year to assess invertebrate productivity within the wetlands and other related habitats to make further use of the demonstration project. USFWS and the NBS are conducting related studies to assess the total productivity of demonstration wetlands in relation to other wetland habitats.

Site Assessment

The Site Assessment Program was created in 1993 to protect the Department from acquisition of properties associated with liability due to the presence of toxic or hazardous materials. The program also functions as a source of information to determine real estate value. When Department staff consider acquisition of real estate, staff of the Site Assessment Program are notified and a site assessment is undertaken, generally according to a standardized protocol developed by the American Society of Testing and Materials. During Phase I of the investigation, a records search is undertaken to discover the history of a site. Knowledgeable persons are interviewed and site reconnaissance conducted as part of this investigative phase.

If the Phase I investigation uncovers a possible toxic source, a decision is made whether to avoid the site or proceed with a more thorough site evaluation. When it is impractical to avoid a site potentially containing toxic materials, a Phase II investigation is undertaken, consisting of a site evaluation that may involve collecting samples and employing specialized sensing equipment such as soil-vapor analyzers and geotechnical measuring

devices. The site assessment is documented and the information used to make decisions concerning acquisition of the site. If cleanup is required, the staff prepares waste management plans and the site is remediated as Phase III of the process.

Since inception of the Site Assessment Program, it has often been necessary to undertake site investigations of properties already owned or controlled by the Department. While the high volume of such activity was not anticipated, the Site Assessment Program accommodates those needs as well.

When the program began in 1993, much of the site assessment work was being done by contractors in the employ of the Department of General Services. Use of these services allowed the program to be rapidly activated, but the arrangement resulted in less departmental control over the work than was considered desirable. By the first quarter of the 1995-96 fiscal year, a departmental site assessment contract will be in force, which will improve timeliness of results and allow direct control over the quality of the work produced by contractors.

In addition to site assessment work that will continue to be done by program staff and consultants, the Department formed a multidisciplinary site assessment team consisting of qualified staff from various units within the Department. A training program was developed and implemented to provide the team with the training necessary to allow more site assessment work to be done by departmental staff.

Review of Environmental Impact Documents

The Review of Reports Section in Division of Local Assistance screens State Clearinghouse documents and circulates SWP-related materials for review by staff of the four districts and the divisions of Planning, Operations and Maintenance, and Design and Construction, as appropriate. In addition, other divisions and offices are notified of activities and requested to comment when their expertise is required.

Some environmental impact documents handled by the State Clearinghouse concern proposed activities that would affect the SWP. In 1989, an early-warning system was developed by the Review of Reports Section under which State Clearinghouse documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

In the first year of operation, 25 environmental documents having significance to the SWP were reviewed. In 1994, about 3,300 environmental documents were screened by the Review of Reports Section with a total of 100 referred for detailed review. The Division of Operations and Maintenance received 62 of these referrals.

Of the 100 documents submitted for formal review, approximately 20 percent generated written comments submitted to the lead agency through the State Clearinghouse. These comments included water supply issues, encroachment on physical facilities, and water quality issues. Additional departmental actions involving such items as encroachment permit submittals and informal comments have taken place but cannot be tracked by Review of Reports.

The number of referrals for formal review and comment from 1993 to 1994 did not increase because two new methods of distributing information were developed, resulting in fewer reports being referred for additional review. One method involved distribution by Review of Reports staff documents as information items when the necessity for formal review was unclear. The second method involved development of a weekly summary report circulated throughout the Department, giving program managers condensed project information on all negative declarations and environmental impact reports submitted to

the State Clearinghouse. The Review of Reports Section tracked over 3,100 reports through the State Clearinghouse; these were noted on the weekly reports.

The combination of these two methods gave concerned staff basic information about more projects without the need to review each one in detail, resulting in less time used by review units to screen out projects with marginal impacts on SWP operations and facilities.

Information for this chapter was provided by the Division of Local Assistance.

Chapter 8

Legislation and Litigation



California State Capitol Building in Sacramento

Significant Events

- The Bay-Delta Accord—an agreement among federal, State, urban, agricultural, and environmental water interests—signed on December 14, 1994, resolved many water allocation issues involved in the cases reported in this and previous bulletins. Cases dismissed in whole or in part as a result of the Accord include Westlands Water District, et al. v. U.S., Golden Gate Audubon v. SWRCB, Bay Institute of San Francisco v. USFWS and USBR, and Golden Gate Audubon, et al. v. Browner.

Within the Department of Water Resources, the Assistant Director for Legislation monitors State and federal legislation introduced or enacted, including bills or laws that could impact the State Water Project. Similarly, the Office of the Chief Counsel tracks litigation of potential significance to the SWP and manages litigation involving SWP operations.

Legislation

No significant State or federal legislation affecting the SWP was enacted between July 11, 1994 and June 30, 1995.

Litigation

As of June 30, 1995, the Department was involved in several court cases related to the management of the State Water Project. In addition, the Department monitored other cases that could significantly impact the management of the SWP.

Anderson Farms, et al. v. United States

This case is a claim for inverse condemnation brought in the Federal Court of Claims. Plaintiffs claim that the U.S. has caused a constitutional taking of their land, alleging that the San Luis Canal and ponding basin cause flooding of their land and prevent farming. In addition, the plaintiffs claim the U.S. has contaminated their land with asbestos carried in the flood water. Plaintiffs seek $10,000,000 in compensation for taking of lands and asbestos contamination caused by flooding since 1986 and attorney fees. The Department is not a party but is following the case because of its liability for payments made on the claim under the Joint-Use Facilities Operating Agreement for the San Luis Canal.

City of Barstow v. City of Adelanto

This action is a stream/ground water adjudication for the Mojave River Basin. The Department is named in a cross-complaint by the city of Adelanto, which alleges that the Department should be making additional releases of water, pursuant to Fish and Game Code section 5937, for fish populations below Silverwood Lake. The Department's position is that there is no legal support for application of section 5937 to imported water.

The Department claims no rights to the Mojave River. However, pursuant to an agreement with Las Flores Ranch, the Department provides water to the ranch through the Mojave Siphon based on flows of tributaries into Silverwood Lake. The original diversion works of Las Flores Ranch were rendered unusable by the construction of Cedar Springs Dam and Silverwood Lake.

Westlands Water District, et al. v. United States

The Department is not a party to this lawsuit but is following the suit because of its potential impact on the management of the Central Valley Project and SWP. In May 1993, plaintiffs filed this action to compel the U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service to comply with the National Environmental Policy Act on provisions of the Central Valley Project Improvement Act relating to fishery and wildlife resources. They also want to compel the USBR, USFWS, and National Marine Fisheries Service to comply with NEPA and the Endangered Species Act on the biological opinions for winter-run chinook salmon and delta smelt. Plaintiffs claim that implementation of the CVPIA and the federal ESA resulted in improper reductions of their contractual allocations of water from the CVP. The CVPIA requires USBR to allocate certain amounts of water from the CVP for fisheries and wildlife resources.

In 1993 and 1994, the defendants issued biological opinions under the ESA containing incidental take statements for the endangered winter-run chinook salmon and threatened delta smelt for operation of the CVP and SWP. The biological opinions and incidental take statements include terms and conditions to be implemented by USBR and the Department that constrain project operations and the ability to export waters south of the Delta.

In February 1994, the district court denied the federal defendants' motion to dismiss the case on most of the issues. The case was to be heard in two phases. Phase I consisted of NEPA and economic analysis arguments. Phase II dealt with ESA arguments. In May, the court issued an order granting the plaintiffs' preliminary injunction on the CVPIA claims requiring NEPA review before allocating water for Central Valley wildlife refuges [CVPIA section 3406 (d)(1)] and fish and wildlife restoration [CVPIA section 3406 (b)(2)].

In December 1994, the Ninth Circuit Court of Appeals reversed the lower court, vacating the temporary injunction, holding that while other subsections of section 3406 require EIS review, the two subsections at issue did not. Also in December, an agreement (Bay-Delta Accord) among federal, State, urban, agricultural, and environmental water interests settled many water allocation issues. Subsequent to the accord, the USFWS and NMFS issued 1995 biological opinions on delta smelt and winter-run chinook salmon that recognize project operations described in the accord.

Golden Gate Audubon Society v. State Water Resources Control Board

On May 31, 1991, several environmental groups filed this lawsuit to set aside the Water Quality Control Plan for the Bay-Delta Estuary adopted earlier that month by the State Water Resources Control Board. The plan was adopted at the end of the second phase of the Bay-Delta hearings. In the suit, the groups allege that the plan is defective because it does not include flow objectives and that the California Environmental Quality Act was violated because the SWRCB failed to consider flow alternatives. The Department intervened in support of the SWRCB. In December 1994, the SWRCB circulated a *Draft Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*. After public hearings and comments, the plan was adopted in May 1995 and subsequently the Audubon lawsuit was dismissed. Plaintiffs filed for attorney fees; this issue remains to be heard in Sacramento County Superior Court.

The Bay Institute of San Francisco, et al. v. Babbitt, et al.

In February 1994, plaintiffs filed this action to compel the USFWS to publish final regulations on the critical habitat for delta smelt. On October 3, 1991, USFWS published its proposed listing of delta smelt and its critical habitat pursuant to the ESA. The fish was listed as threatened on March 5, 1993, but USFWS postponed a final listing of critical habitat. The ESA requires listing critical habitat within 2 years of the initial proposal. USFWS issued a revised proposed critical habitat designation on January 6, 1994, and received public comments on the revision until March 7. The Bay Institute claims that the critical habitat should have been finalized in October 1993 and the delay in listing fails to protect the threatened smelt as required by the ESA.

The parties agreed to settle and dismissed the case after USFWS published final regulations for delta smelt critical habitat on December 19, 1994.

Bay Institute of San Francisco v. U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation

On July 12, 1994, nine environmental organizations filed this lawsuit claiming that the USFWS 1994 biological opinion on the

delta smelt does not adequately protect the fish as required under the federal ESA. USBR and the Department operate the CVP and SWP, respectively, pursuant to the biological opinion and incidental take statement. The plaintiffs seek to vacate the 1994 biological opinion and to enjoin CVP and SWP operations from taking any delta smelt at their pumps until a new opinion is issued. The Department and several SWP water contractors intervened.

On November 30, 1994, the case was dismissed based on a settlement agreement between plaintiffs and federal defendants. Settlement terms provide that USBR and USFWS afford plaintiffs an opportunity to receive and provide information on the 1995 delta smelt consultation.

Golden Gate Audubon, et al. v. Browner

On April 10, 1993, plaintiffs brought this action for declaratory and injunctive relief to force the federal Environmental Protection Agency to promulgate water quality standards to protect estuarine habitat and fish and wildlife uses in the San Francisco Bay and Sacramento-San Joaquin Delta. In September 1991, EPA disapproved certain water quality standards adopted by the SWRCB in its Bay-Delta Water Quality Control Plan for not adequately protecting fishery resources as required by the federal Clean Water Act. Plaintiffs filed this suit to compel EPA to promptly prepare, publish, and promulgate water quality standards to replace the disapproved State standards.

In November 1993, the district court approved a settlement agreement requiring the EPA to propose standards by December 15, 1993. On January 6, 1994, EPA published the proposed standards in the Federal Register. In mid-1994, the parties agreed to settlement whereby the EPA would publish final standards in December 1995. On December 15, 1994, State and federal water agencies, along with agricultural, urban, and environmental water interests, agreed on principles for Bay-Delta standards. Subsequently, the EPA published its final rule for Bay-Delta standards, and the case was dismissed.

Porgans, et al. v. Babbitt, et al.

On December 7, 1993, Patrick Porgans and the California Sportfishing Protection Alliance filed this claim based on the Department and USBR 1991-92 exceedances of Decision 1485 water quality standards in the Bay-Delta Estuary. The exceedance in the salinity standards occurred during the last 2 years of the 6-year drought, which were critically dry according to the classification set forth in Decision 1485. In 1992, SWRCB held a hearing where the Department, USBR, and other interested parties presented information on compliance with Decision 1485. In 1993, after closed sessions and a review of the record regarding impacts of the exceedance, the SWRCB noted that minimal harm occurred and that it would not take any action against the Department or USBR.

The case was removed to federal district court in March 1994, where the court dismissed the claim against the federal defendants. The case was remanded to State Superior Court; the plaintiffs have taken no action to pursue the case.

Southern California Bass Council, et al. v. State of California

In late November 1994, the Southern California Bass Council, the Sierra Club, and the Audubon Society filed suit against the Department, challenging under CEQA the Department's mitigated negative declaration prepared for the reconstruction of the intake tower at Silverwood Reservoir. The Department was directed by the Federal Energy Regulatory Commission to replace the existing intake tower to the San Bernardino Tunnel

because the existing tower does not meet current seismic standards. The petitioners claimed the Department's environmental documentation did not provide sufficient mitigation for adverse effects on the environment, including impacts on fisheries and the bald eagle.

At an April 1995, hearing in San Bernardino Superior Court, Judge John Kennedy, Jr. ruled the Department's mitigation measures were indeed sufficient to minimize any significant impacts on the environment. The ruling validated the Department's plans to mitigate possible adverse effects on fish and wildlife resources, including the bald eagle, and recreation at the lake.

In June 1995, the petitioners filed an appeal from the trial court judgment. No order for stay (preventing work from proceeding) was filed, and construction at Silverwood commenced in September 1995. Work is scheduled to be complete by May 1997. Oral argument on the appeal is anticipated to be scheduled in October or November of 1996.

Department of Water Resources v. Nevada Power Company

The Department and Nevada Power are co-owners of Reid Gardner Unit 4, a coal-fired electric generating plant near Las Vegas, Nevada. Nevada Power operates the plant and bills DWR montly for a portion of the costs of operation. A monthly transmission service charge, calculated according to a formula in the Participation Agreement for the plant, is included in the monthly bill. For several years, Nevada Power has been including in the service charge the cost of constructing and operating a transmission line between Utah and Nevada. DWR receives no benefit from the line, but Nevada Power has refused to omit this part of the service charge from DWR's bill.

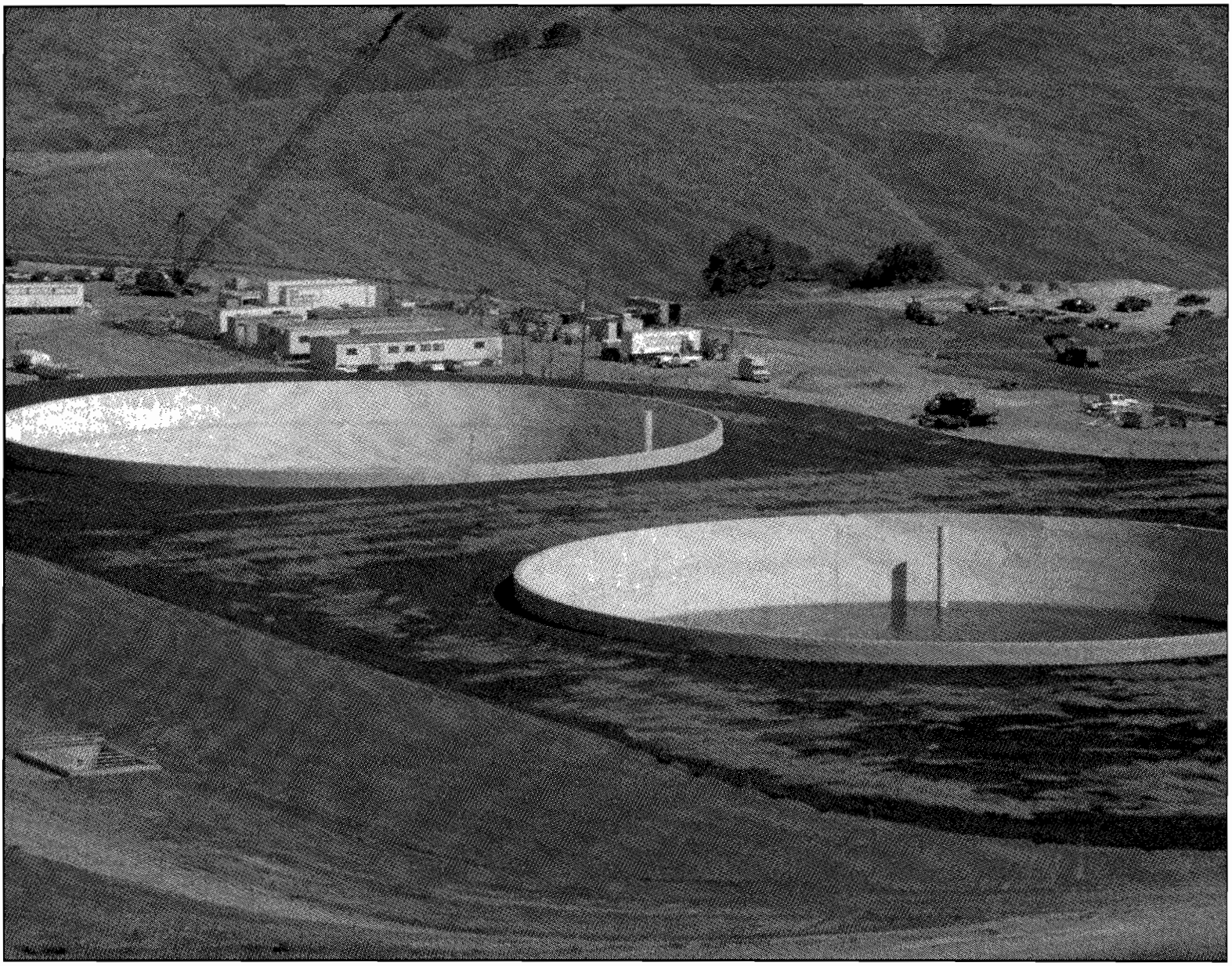
DWR filed suit in Sacramento County Superior Court in January 1995, seeking a declaration that the costs of the Utah/Nevada line be excluded from DWR's service charge, and seeking damages of $1.4 million, the amount that DWR had overpaid when the suit was filed. In the fall 1994, DWR had filed a similar complaint with the Federal Energy Regulatory Commission, which had taken no action by the time the suit was filed.

Information for this chapter was contributed by the Assistant Director for Legislation and the Office of the Chief Counsel.

Part III
State Water Project Operations

Chapter 9

Water Storage



Tank Site 1, Coastal Branch

Significant Events

- Dry conditions returned to California during water year 1993-94, prompting declaration of a "drought watch" status for the State, and subsequent activation of the Drought Water Bank.
- Precipitation statewide for the 1993-94 water year was 65 percent of average, while runoff was 40 percent of average, the fourth lowest runoff of record.
- The Sacramento River Index of unimpaired runoff was only 7.8 million acre-feet, which classified the water year as "critical" under Decision 1485 standards.
- The highest storage at Lake Oroville was at the beginning of the water year and occurred on October 3, 1993, at 2,667,113 acre-feet, 76 percent of normal maximum operating capacity.
- Storage at San Luis Reservoir peaked on January 24, 1994, at 2,032,793 acre-feet, 100 percent of normal maximum operating capacity.

In meeting its contracted obligations to the State Water Project long-term water supply contractors, the Department of Water Resources monitors precipitation, calculates runoff, and operates facilities as required.

During each water year, from October 1 through September 30, the Department monitors and records precipitation, runoff, and reservoir water storage.

Water year 1993-94 saw a return to dry conditions comparable to those of the 6-year 1987-92 drought. In fact, runoff in the Sacramento River region was actually slightly less than in any of the drought years. Reservoir storage statewide started at around 110 percent of average on October 1, 1993, but declined 8 million acre-feet to less than 75 percent by September 30, 1994. Because of carryover SWP storage, higher SWP deliveries than would otherwise be possible could be maintained.

Precipitation

Precipitation statewide in the 1993-94 water year was about 65 percent of average, compared with 140 percent in the previous year. There was little variation among hydrologic regions; all regions were quite dry. Figure 9-1 shows statewide precipitation in water year 1993-94, by hydrologic region, as a percentage of average.

The water year started poorly with California having received only about 55 percent of average rainfall by February 1. Precipitation for the month of February was just slightly above average statewide at 105 percent, which slightly improved the outlook for the year.

Runoff and Water Supply

According to Bulletin No. 1, Water Resources of California, average natural runoff for the Central Valley is 33.6 million acre-feet — about 48 percent of California's total natural runoff. Of this valley runoff, 22.4 MAF, or two thirds, originates in the Sacramento River basin. The San Joaquin River basin (including the Mokelumne River system), contributes 7.9 MAF to the total natural runoff, while 3.3 MAF comes from the streams of the Tulare Lake basin.

However, most of the runoff from the streams of the Tulare Lake basin flow into Tulare Lake on the valley floor, where it evaporates before reaching the sea. Thus, unimpaired runoff (natural runoff), to the Sacramento-San Joaquin Delta includes the 30.3 MAF from the Sacramento and San Joaquin River basins plus any overflow from Tulare Lake basin. Because of large losses in natural valley wetlands and riparian areas, it is not known how much of this unimpaired runoff actually reaches the Delta.

Under today's conditions, an annual average runoff of 3 MAF reaches the Delta from the San Joaquin River basin. However, high flows during wet years skew this average; normal Delta inflow is about half that amount, or 1.5 MAF. Therefore, most of the Delta water supply today— whether for internal use, exports, or outflows— comes from the Sacramento River basin.

The 22.4 MAF of runoff originating within the Sacramento River region is augmented by about 0.9 MAF from the Central Valley Project's Trinity River imports. Prior to reaching the Delta, this runoff is reduced by (in a normal year) Sacramento River area depletion of about 6.0 MAF and reservoir evaporation of about 0.5 MAF. These reductions leave about 16.8 MAF of the natural supply to become Delta inflow.

Adding the 3 MAF of runoff from the San Joaquin River system yields about 20 MAF for average Delta inflow under current conditions. Of this amount, about 1 MAF is required to meet the internal needs of the Delta. Although constraints are reducing diversions, export demands remain around 6 MAF, which leaves about 13 MAF or more for average Delta outflow.

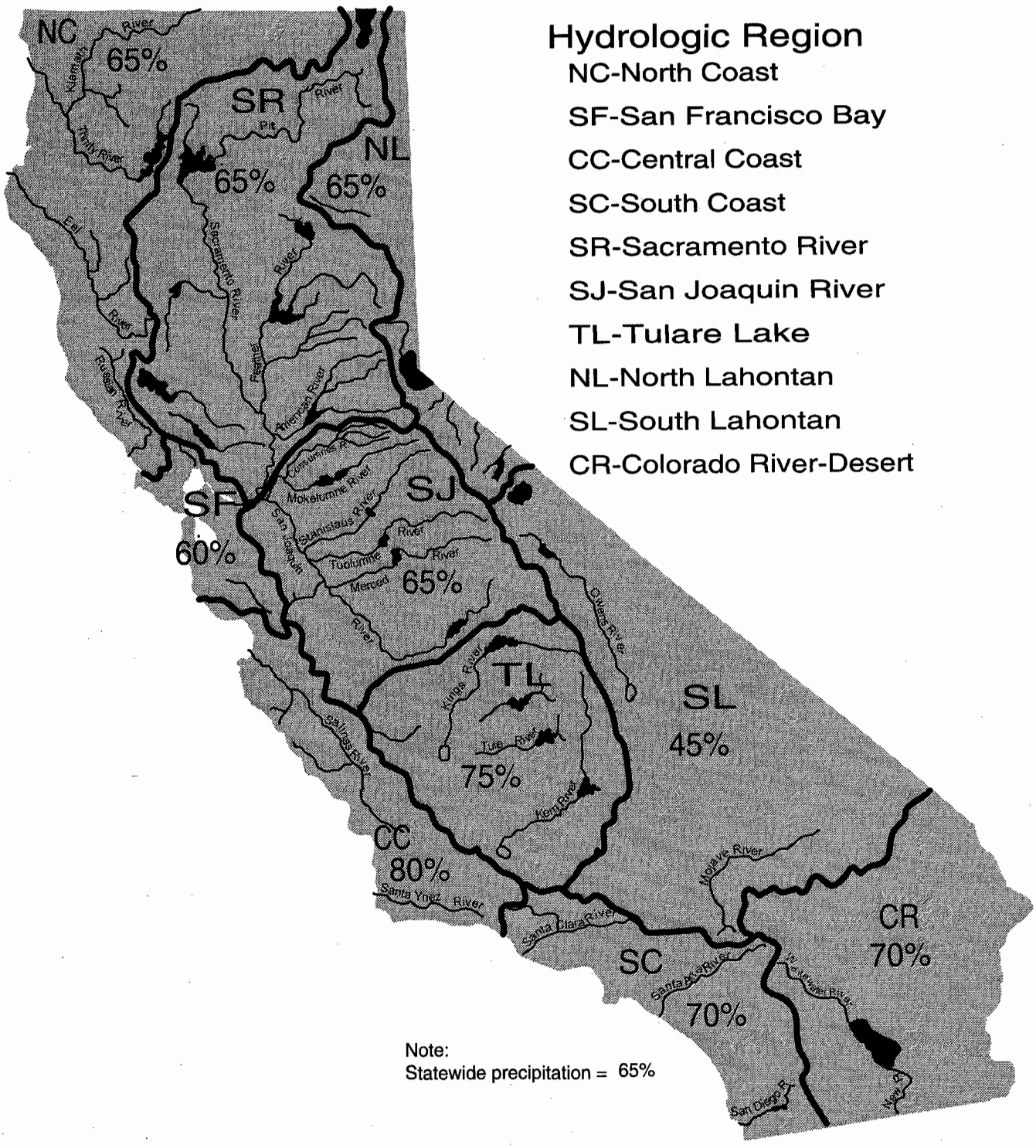


Fig 9-1. Statewide Precipitation by Hydrologic Region, 1993-94 Water Year, in Percentage of Average

However, March was very dry, especially in the northern Sierra Nevada. Consequently, a dry water year deteriorated into a critical water year. Spring showers in April and May, somewhat less than average, failed to improve the State's water outlook.

Runoff

Statewide runoff for water year 1993-1994 was 40 percent of average, much less than the 125 percent reported in 1993. The year started dry, with cumulative runoff for the 3 months October through December measuring 36 percent of average as of January 1. January runoff was only about 30 percent of average. Runoff in subsequent months generally ranged from 40 to 50 percent of average, except for June and July, when poor snowpack provided only about 40 percent the normal runoff. The estimated runoff for April through July was 42 percent of average, close to the 40 percent figure for the entire water year.

Sacramento River Index unimpaired runoff was only 7.8 million acre-feet, down greatly from the 22.2 million acre-feet of water year 1993. That amount of runoff classified the water year as "critical" for the Delta under the State Water Resources Control Board Decision 1485.

As in the previous year, runoff in fall 1994 remained below average and was less than 50 percent of average at the end of December 1994. However, precipitation in the northern Sierra was 95 percent of average and the snowpack was near normal for the date, giving the State a much better outlook for the coming year.

Storage

To collect and store water for future deliveries, the SWP operates a complex system of 28 dams and reservoirs. Lake Oroville, in Northern California, is the first of two primary SWP conservation facilities. Net inflow to Lake Oroville flows from the Feather River. Pumpback operations at Hyatt Powerplant also impact storage.

San Luis Reservoir, in the central part of the State, is the second primary SWP conservation facility and derives its inflow from pumping at Gianelli Pumping-Generating Plant. The remaining 26 dams and reservoirs are used to regulate the conserved supply into water delivery patterns designed to fit local needs.

The following information about those reservoirs, including amounts of unimpaired runoff to Lake Oroville and storage levels for SWP conservation and other storage facilities, is based on the 1993-94 water year.

Lake Oroville. Lake Oroville, the keystone of the SWP, has a maximum capacity of 3,537,580 acre-feet. Runoff from the Feather River is collected and stored in the reservoir for release to the Sacramento-San Joaquin Delta through Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

Inflow to Lake Oroville for the 1993-94 water year totaled about 1.69 million acre-feet, 39 percent of average. Minimum storage occurred September 30, 1994, at 1,683,158 acre-feet, 48 percent of normal maximum operating capacity (3,521,797 acre-feet). Maximum storage occurred October 3, 1993, at 2,667,113 acre-feet, 76 percent of normal maximum operating capacity. On April 17, 1994, spring filling peaked at 2,661,421 acre-feet, slightly less than at the beginning of the water year. See Figures 9-2 and 9-3 for monthly and cumulative inflow into Lake Oroville. Figure 9-4 compares end-of-month storage at Lake Oroville for the 1993 and 1994 calendar years.

San Luis Reservoir. San Luis Reservoir, operated jointly by the Department and the U.S. Bureau of Reclamation according to operating procedures completed in June 1981, has a normal operating capacity of 2,028,000 acre-feet. The SWP share of the San Luis normal operating capacity is 1,062,000 acre-feet.

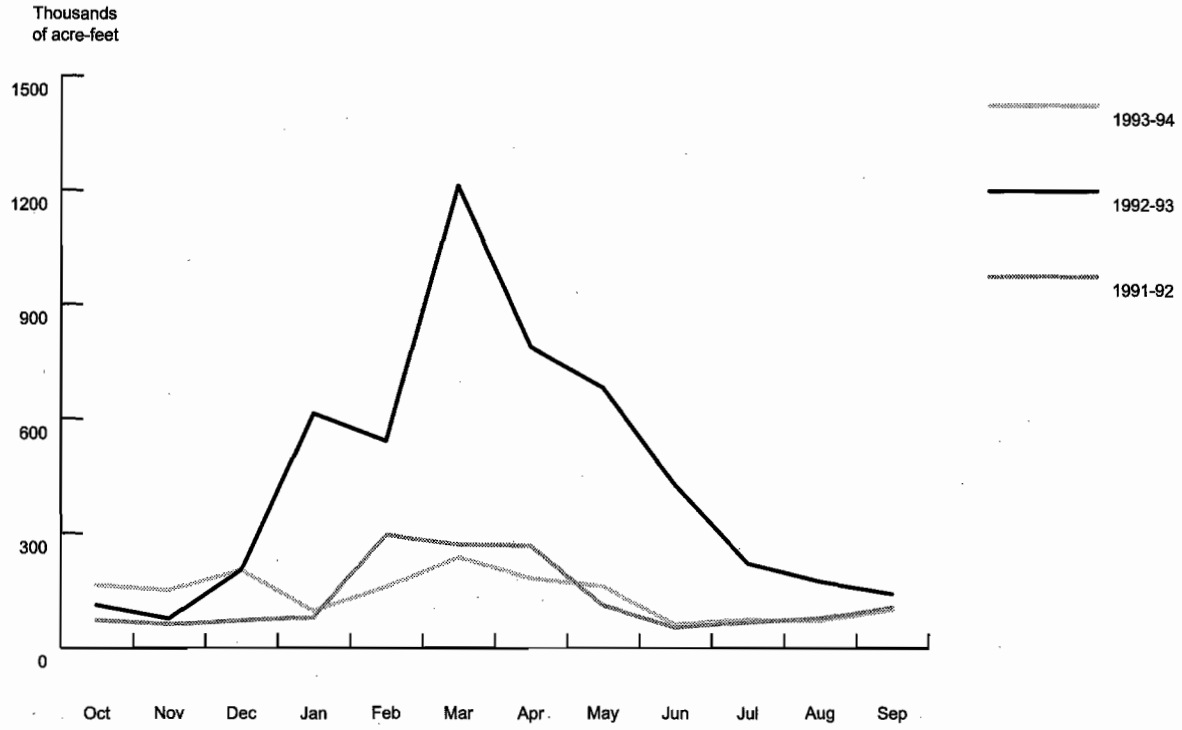


Fig 9-2. Monthly Inflow into Lake Oroville from Feather River, 1991-92 and 1993-94 Water Years

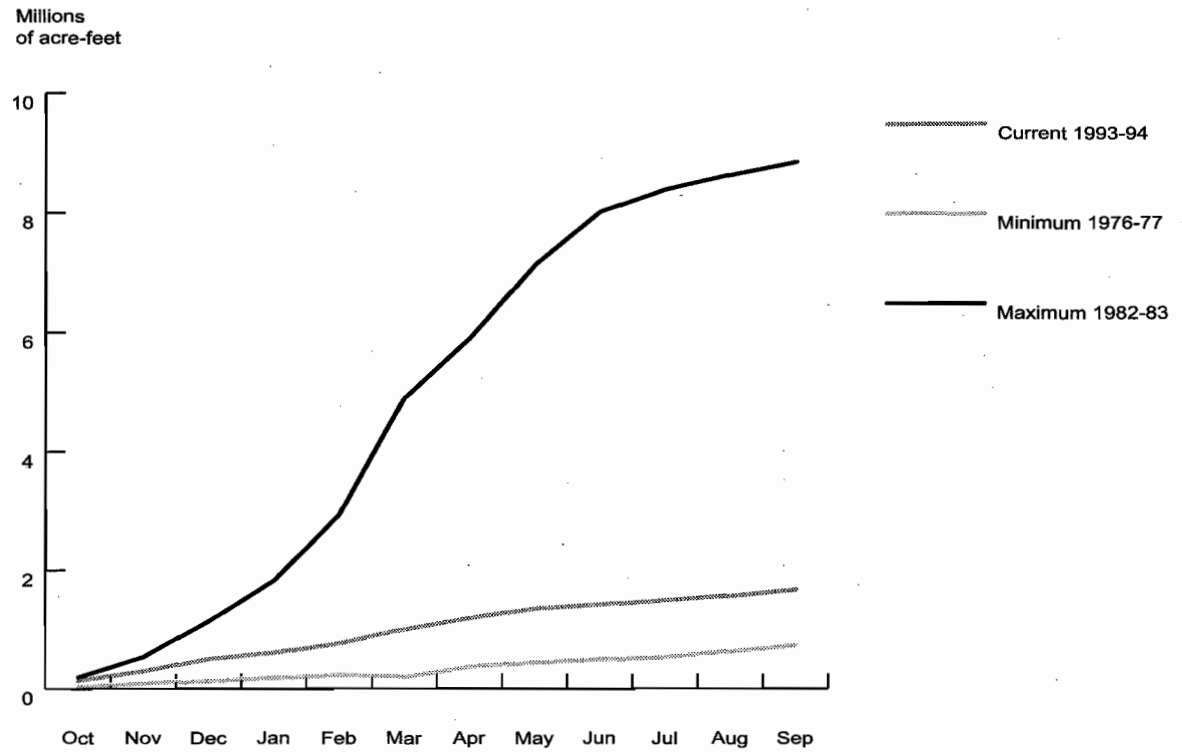


Fig 9-3. Cumulative Inflow into Lake Oroville from Feather River

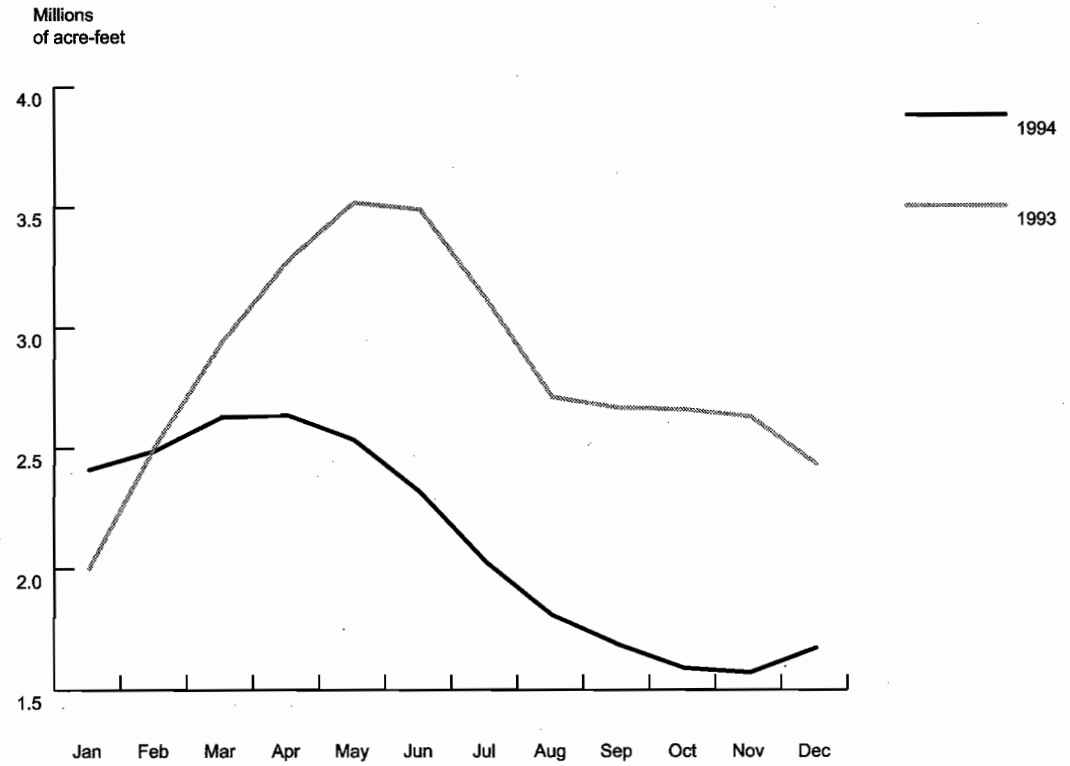


Fig 9-4. End-of-Month Storage in Lake Oroville, 1993 and 1994 Calendar Years

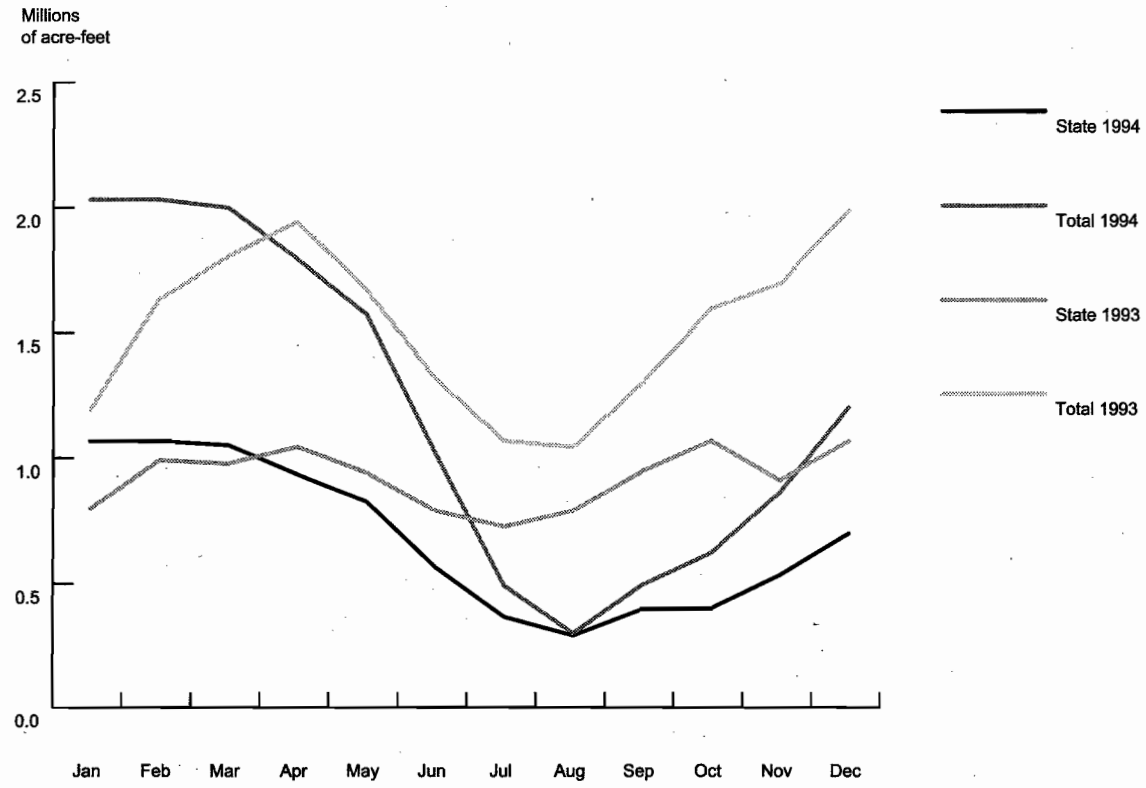


Fig 9-5. End-of-Month Storage in San Luis Reservoir, 1993 and 1994 Calendar Years

At the beginning of the 1993-94 water year, San Luis Reservoir contained 64 percent of its normal maximum operating capacity; the SWP share was 943,656 acre-feet. By January 24, San Luis Reservoir reached its maximum storage for 1994 at 2,032,793 acre-feet, or 100 percent of normal maximum operating capacity. The highest end-of-month SWP share of storage was also in January at 1,066,980 acre-feet (Figure 9-5).

Lake Del Valle. Lake Del Valle, situated off the South Bay Aqueduct, primarily stores water for use in Santa Clara and Alameda counties. At the beginning of the 1993-94 water year, Lake Del Valle held 32,967 acre-feet, about 82 percent of normal maximum operating capacity (39,914 acre-feet). Its highest end-of-month storage occurred in June 1994 at 39,653 acre-feet.

By the end of the 1993-94 water year, storage in Lake Del Valle dropped to 34,599 acre-feet, 83 percent of normal maximum operating capacity. Releases to Arroyo Valle and South Bay Aqueduct from Lake Del Valle totaled 12,230 acre-feet for the 1993-94 water year.

Southern Reservoirs. During normal operating conditions, the Department maintains its four southern reservoirs—Pyramid, Castaic, and Silverwood lakes and Lake Perris—at or near full operating capacity to ensure uninterrupted deliveries of water to Southern California contractors.

At the beginning of the 1993-94 water year, those reservoirs held 607,206 acre-feet, 87 percent of their combined normal maximum operating capacity of 701,321 acre-feet. At the end of the 1993-94 water year they held

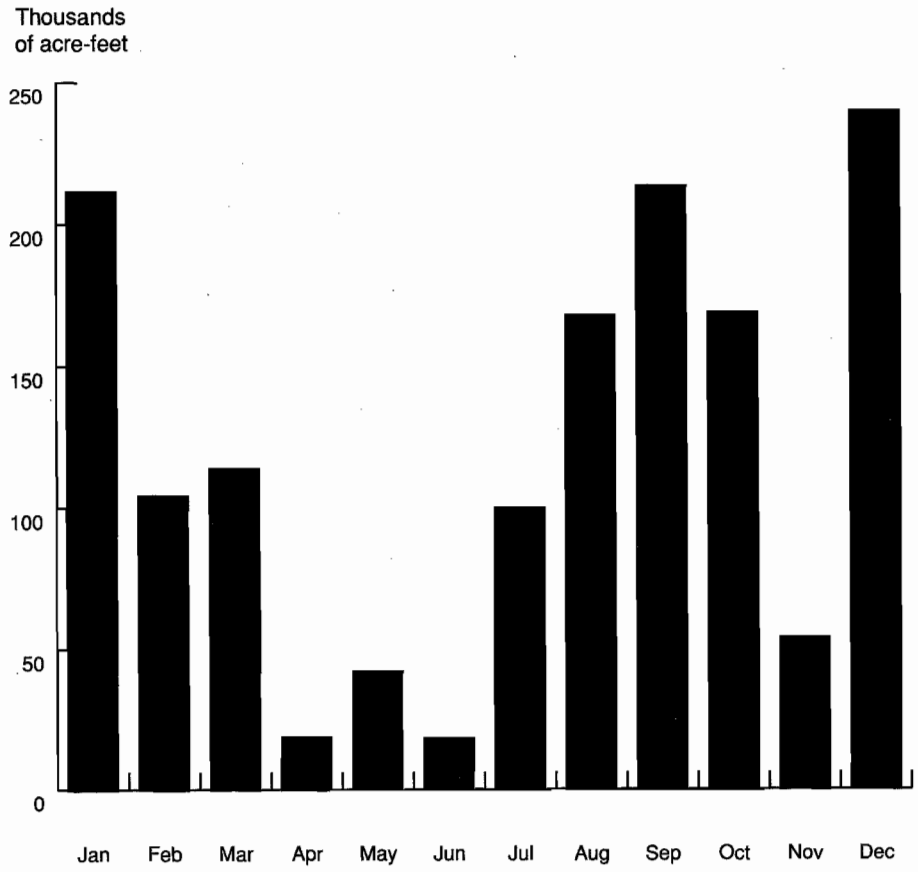


Fig 9-6. Water Pumped at Harvey O. Banks Delta Pumping Plant, Each Month During 1994

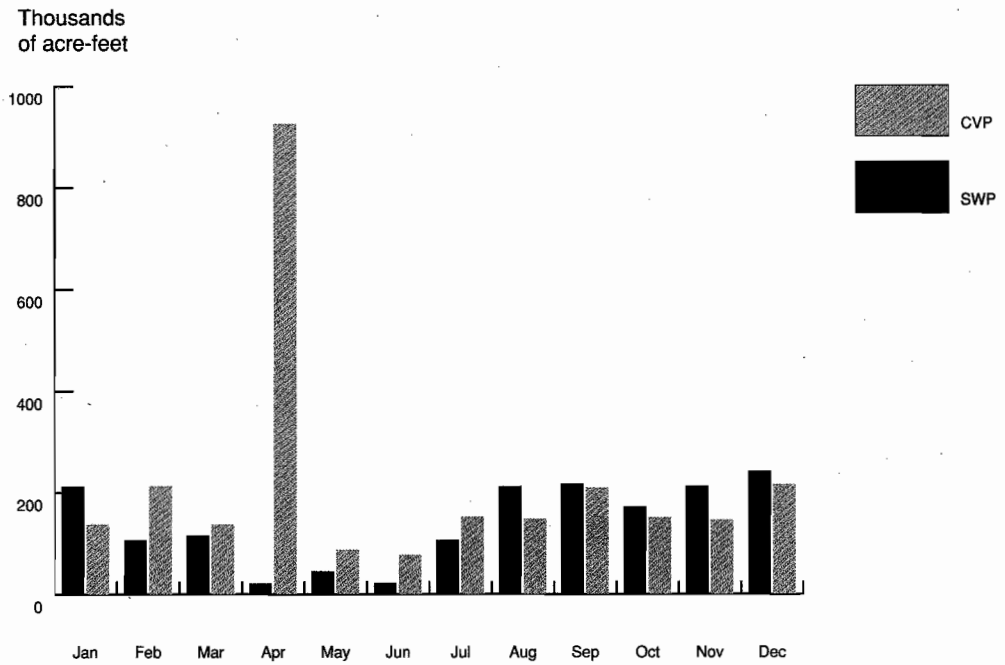


Fig 9-7. Water Diverted from the Sacramento-San Joaquin Delta by State Water Project and Central Valley Project in 1994, by Month

575,091 acre-feet, 82 percent of the combined normal maximum operating capacity.

Diversions from the Delta

The SWP diverts water from the Sacramento-San Joaquin Delta through Harvey O. Banks Delta Pumping Plant and Barker Slough Pumping Plant for delivery to SWP storage facilities and contractors. In 1994, the SWP diverted 1,509,367 acre-feet at Banks Pumping Plant, including 44,984 acre-feet of Central Valley Project water wheeled by the Department. Figure 9-6 shows the amounts of water pumped each month at Banks Pumping Plant; Figure 9-7 shows the monthly amounts of water diverted from the Delta by the SWP and CVP in 1994.

The SWP also diverted 42,959 acre-feet at the Barker Slough Pumping Plant for deliveries through the North Bay Aqueduct for use by North Bay Aqueduct water contractors. From Banks Pumping Plant, water is either delivered to the South Bay area through the South Bay Aqueduct or to the San Joaquin Valley, Central Coastal, and Southern California areas through the California Aqueduct.

In the San Joaquin Valley near Kettleman City, the existing Coastal Branch Aqueduct stub serves agricultural areas west of the California Aqueduct. This branch is now being extended to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties. The extended Coastal Branch is scheduled to be completed in late 1996. In 1994, SWP water delivered to the San Joaquin Valley totaled 940,850 acre-feet. Figure 9-8 shows the amount of water delivered each month.

In 1994, water pumped through Edmonston Pumping Plant for delivery to Southern California totaled 916,434 acre-feet. Figure 9-9 shows the amount of water pumped each month.

1994 Entitlement Water Delivery Requests and Approvals

The Department received initial requests for entitlement water by the State Water Project long-term water supply contractors totaling

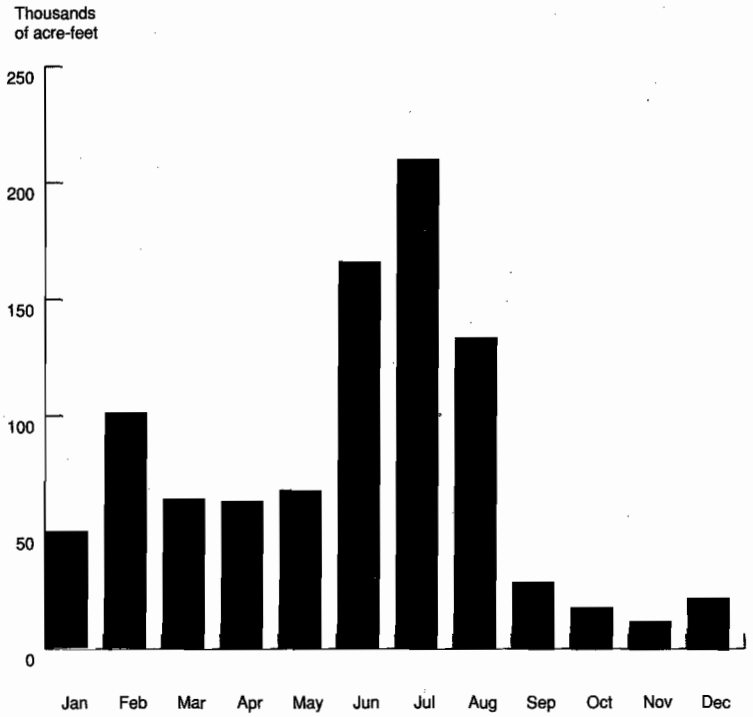


Fig 9-8. SWP Water Conveyed to San Joaquin Valley, Each Month During 1994

3.84 million acre-feet. In December 1993, the Department initially approved 1.56 million acre-feet of 1994 entitlement water or 50 percent of contractors' adjusted requests. Adjusted requests were based on the contractors' maximum entitlement used since 1980, which totaled 3.12 million acre-feet.

In January 1994, at the request of the contractors, the Department agreed to base water allocations for 1994 on Table A entitlement. The contractors agreed to turn back excess allocations in proportion to their Table A entitlement if project supplies had not reached 2.0 million acre-feet by April 15. On February 3, 1994, the Department increased its entitlement allocation to 2.03 million acre-feet or 50 percent of the 4.07 million acre-feet of deliverable Table A entitlement.

Because the precipitation for March was extremely low, and project supplies had not reached 2.0 million acre-feet, the Department, on April 13, 1994, requested that contractors turn back any excess water allocations. The contractors turned back a total of 174,586 acre-feet of their 1994 allocated entitlement water. On May 31, 1994, the Department reallocated 50,000 acre-feet of the turn-back water among those contractors still requesting more water for use in their service area. The Department approved a request by Alameda County Water District on April 29, 1994, for an additional 699 acre-feet of entitlement water to clean up a hazardous spill.

The Department also approved a request made by San Bernardino Valley Municipal Water District on September 30, 1994, to reduce the amount of water the District turned back to the Department by 1,706 acre-feet.

In 1994, the Department approved 1,911,027 acre-feet of 1994 entitlement water, all of which was available for delivery. However, only 1,861,637 acre-feet was delivered.

1994 Interruptible Water Service Program

The Department delivered 112,625 acre-feet of interruptible water to 16 of the 29 SWP long-term water supply contractors. Interrupt-

ible water was available from January 25 through June 20 and for the month of December.

The Department began delivering interruptible water for the first time in 1994. The Interruptible Water Service Program replaced the Surplus, Wet Weather, and 12(d) water programs provided in the long-term water supply contracts. Interruptible water is typically storm runoff, above levels anticipated in the current water year that becomes available for delivery to SWP contractors on short notice. It can be discontinued or interrupted on short notice due to a change in climatic conditions or operational concerns such as water quality standards or fish take requirements.

The program allows SWP contractors to take delivery of water above the approved and scheduled entitlement water for the current year and may result in contractors receiving water above their Table A amount. Interruptible water is delivered to a requesting SWP contractor for the same reasonable and beneficial uses as entitlement water; interruptible deliveries do not impact entitlement allocations for the current year.

Information on precipitation and runoff was contributed by the Division of Flood Management. The Division of Operations and Maintenance, Project Records and Reports, furnished material on storage and diversions from the Delta. Information on water delivery requests and approvals was provided by the State Water Project Analysis Office.

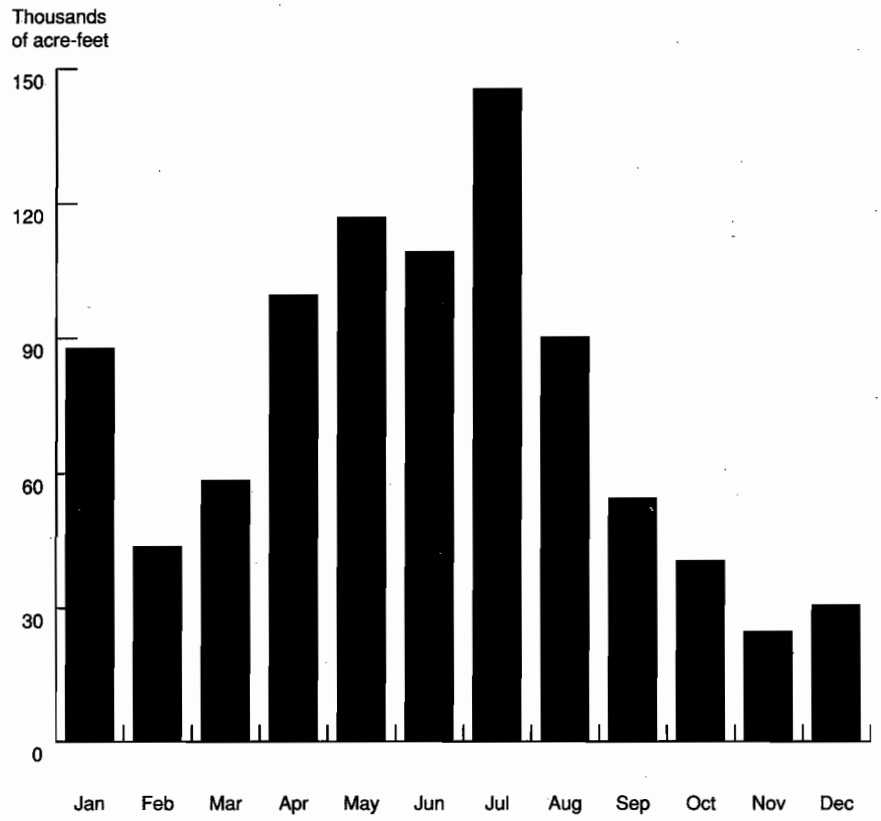
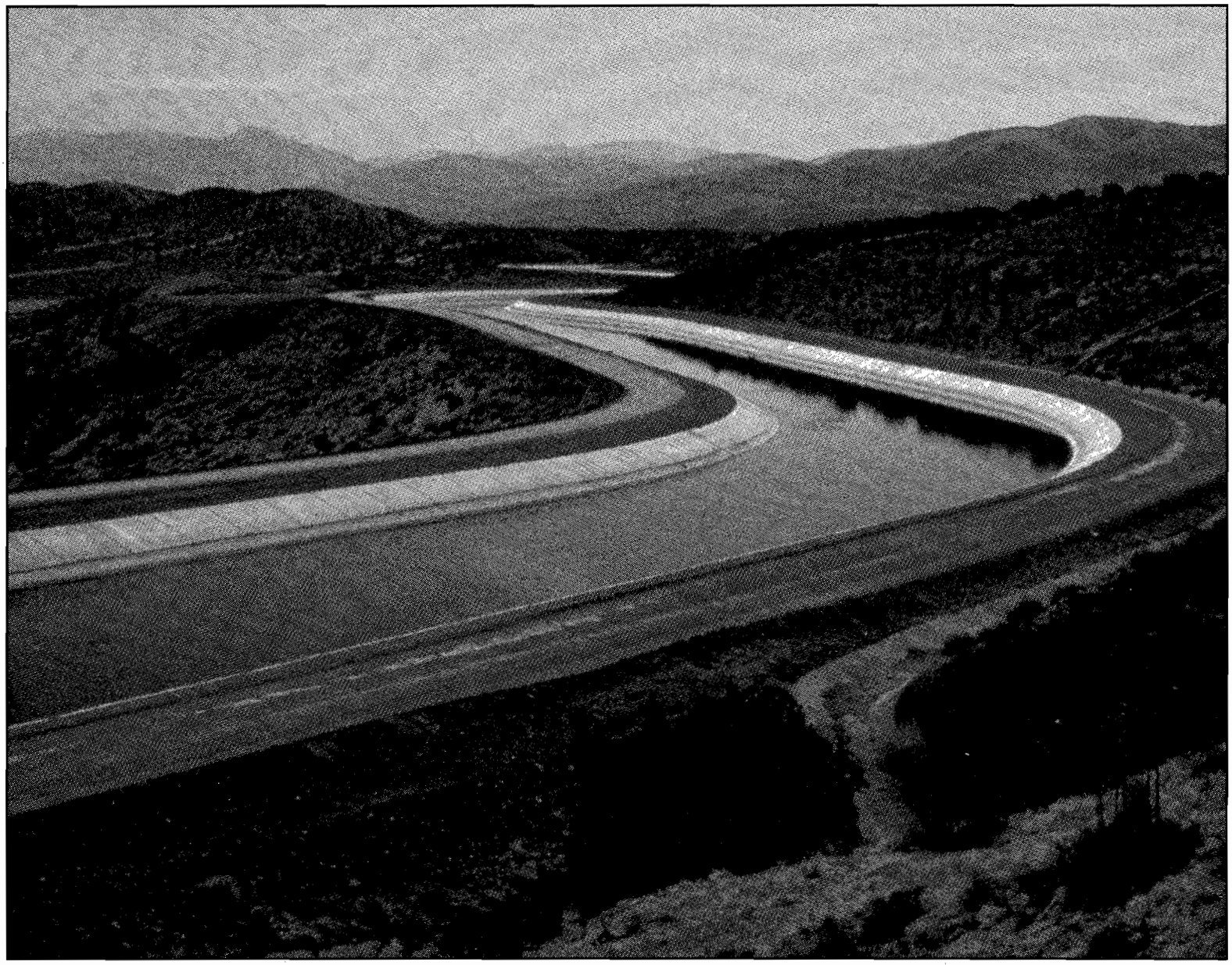


Fig 9-9. Water Pumped at A.D. Edmonston Pumping Plant, Each Month During 1994

Chapter 10

Water Contracts and Deliveries



State Water Project aqueduct through Mojave Desert

Significant Events

- Between September 15, 1994, and January 6, 1995, 7,000 acre-feet of 1987 Advanced Storage Program water and 6,208 acre-feet of 1990 Berrenda Mesa Demonstration Storage Program water was extracted. This water was withdrawn by the La Hacienda Kern Water Bank pumping and conveyance facilities and transported through the Kern County Water Agency's Cross Valley Canal.
- In 1994, the Department initiated the Interrruptible Water Service Program, which allowed SWP contractors to take delivery of 1994 entitlement water above the approved and scheduled allocations.

The long-term water supply contracts between the Department of Water Resources and local agencies for water service from the State Water Project are basic to the project's construction and operation. In return for the State's financing, constructing, and operating the facilities needed to provide water service, the agencies contractually agreed to repay all SWP capital and operating costs.

The long-term water supply contracts, which may be amended as needed, specify amounts of water that may be delivered annually to SWP contractors.

The Department also delivers or conveys water according to short-term agreements with SWP contractors and other agencies.

Long-Term Contracts and Amendments

All the original contracts signed by the Department and local agencies have been amended to incorporate mutually desired changes. Most amendments fall under the following general categories:

- revision of annual entitlements,
- enlargement of the East Branch and extension of the Coastal Branch of the California Aqueduct,
- purchase of excess capacity,
- provisions to carry over entitlement water,
- surplus water provisions,
- unscheduled water provisions, and
- wet-weather provisions.

Long-Term Contracts and Amendments

The first water supply contract was signed with the Metropolitan Water District of Southern California on November 4, 1960. The contract was negotiated by the Department and MWD according to terms of the contracting principles for water service contracts announced by Governor Edmund G. Brown on January 20, 1960.

The MWD contract became the prototype for all water contracts; by the end of 1967, 31 agencies had contracted for water. In addition, a water supply contract was executed with the city of West Covina in December 1963 but was terminated in August 1965; the city's water entitlement was transferred to MWD through an amendment to the district's long-term contract with the Department. Long-term contracts with Hacienda Water District and Devil's Den Water District were also terminated when those districts transferred their water entitlements, through contract amendments, to Tulare Lake Basin Water Storage District (1981) and Castaic Lake Water Agency (1992), respectively. Today the SWP has long-term water supply contracts with 29 agencies. Those contracts have been amended repeatedly to incorporate mutually desired modifications.

All water contracts signed in the 1960s included an estimate of the date water would first be delivered and a schedule of the amount of water the agency could expect to be delivered annually (annual entitlement). That amount was designed to increase gradually until the maximum amount of annual entitlement was reached. The total combined annual entitlement for all water contracting agencies was initially 4,230,000 acre-feet, assuming full development of the SWP.

The contracts were initially designed to be valid for 75 years or until all bonds sold as part of the California Water Resources Development Bond Act were repaid, whichever period was longer. As a result of amendments to contracts in the 1980s, the current combined maximum annual entitlement totals 4,217,786 acre-feet, and the contracts are in effect for the longest of the following periods: (1) the project repayment period, which extends to the year 2035; (2) 75 years from the date of the contract; or (3) the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

TABLE 10-1
Amendments to Water Supply Contracts, by Category

Category (a	*Description*
1. Revision of annual entitlements	Amendments to Table A, "Annual Entitlements," of water supply contracts resulting in changes in amounts of entitlement water
2. Enlargement of East Branch and Extension of Coastal Branch of CA Aqueduct	Amendments for allocating costs and benefits of the enlargement of the East Branch and extension of the Coastal Branch of the California Aqueduct
3. Purchase of Excess Capacity	Amendments to allow contractors to purchase extra water service capacity from the California Aqueduct
4.Provisions to carryover entitlement water [Artilcle 12(e)]	Amendments to allow contractors to carry over entitlement water from one year for delivery in the next year, providing certain water conditions are met
5. Surplus water provisions	Amendments to allow contractors to take delivery of surplus water; that is, water in excess of that required to meet all demands for entitlement water—for example, water to be stored in reservoirs or to meet other SWP requirements
6. Unscheduled water provisions	Amendments to allow contractors to take delivery of unscheduled water; that is, water available for a very short period of time when excess water and SWP pumping capacity are available in the Delta
7. Wet-weather provisions	Amendments to allow contractors to take, under certain conditions, delivery of entitlement water in subsequent years if favorable local weather conditions result in adequate local water supplies

a) See Table 10-2, "Amendments to Water Supply Contracts, June 30, 1994, by Category and Contracting Agency," for names of contractors to which categories apply. In addition, each volume of *The California State Water Project Water Supply Contracts* contains a list of amendments by category.

Table 10-1 lists and describes categories of amendments; Table 10-2 lists contractors to which those categories apply.

No long-term contracts were amended between July 1, 1994, and June 30, 1995.

Agreements with Long-Term Contractors

In 1994 and through June 30, 1995, the Department entered into several agreements with SWP contractors and amended existing agreements.

Agreements

Agreements were executed with long-term contractors as listed below.

Castaic Lake Water Agency. The June 2, 1994, letter agreement among Castaic Lake Water Agency, Metropolitan Water District of Southern California, and the Department recognizes the agreement between Castaic and Metropolitan for the wheeling of Castaic entitlement water through Metropolitan's Foothill Feeder. The agreement also provides for the Department to inspect and monitor the flow meter at the service connection to properly account for the deliveries.

The June 24, 1994, letter agreement between Castaic Lake Water Agency and the Department allowed the transfer of up to 2,100 acre-feet of Castaic's 1994 entitlement water from land leased in Castaic's San Joaquin Valley service area to family-owned lands in Westlands Water District.

Drought Water Bank. Letter agreements providing for the conveyance and delivery of Drought Water Bank water were signed with the following contractors on the specified dates:

- Kern County Water Agency, August 5, 1994;
- Oak Flat Water District, August 16, 1994;
- Santa Clara Valley Water District, August 16, 1994; and
- Tulare Lake Basin Water Storage District, August 16, 1994.

Dudley Ridge Water District. The September 29, 1994, letter agreement among Dudley Ridge Water District, Kern County Water Agency, and the Department provided for the delivery of up to 3,000 acre-feet of water to facilitate an

TABLE 10-2

Amendments to Water Supply Contracts June 30, 1995, by Category and Contracting Agency

Contracting Agency	State Water Project Amendment Category (a 1	2	3	4	5	6	7
Upper Feather River Area							
City of Yuba City	•				•		
County of Butte	•			•	•		
Plumas County Flood Control and Water Conservation District				•			
North Bay Area							
Napa County Flood Control and Water Conservation District	•			•	•	•	
Solano County Water Agency	•		•	•	•	•	
South Bay Area							
Alameda County Flood Control and Water Conservation District, Zone 7	•			•	•		•
Alameda County Water District				•	•	•	•
Santa Clara Valley Water District	•			•	•	•	•
San Joaquin Valley Area							
County of Kings				•	•		•
Devil's Den Water Disrict	•			•	•	•	
Dudley Ridge Water District	•			•	•	•	
Empire West Side Irrigation District	•			•	•	•	
Kern County Water Agency	•				•	•	
Oak Flat Water District				•	•	•	•
Tulare Lake Basin Water Storage District	•			•	•	•	•
Central Coastal Area							
San Luis Obispo County Flood Control and Water Conservation District				•	•		
Santa Barbara County Flood Control and Water Conservation District	•	•		•	•		
Southern California Area							
Antelope Valley-East Kern Water Agency	•	•	•	•	•		
Castaic Lake Water Agency	•			•	•		
Coachella Valley Water District	•	•		•	•		
Crestline-Lake Arrowhead Water Agency	•			•	•		
Desert Water Agency	•	•		•	•	•	
Littlerock Creek Irrigation District	•			•	•		
Metropolitan Water District of Southern California	•	•	•	•	•	•	
Mojave Water Agency	•	•		•	•		
Palmdale Water District	•	•		•	•		
San Bernardino Valley Municipal Water District	•	•		•	•		
San Gabriel Valley Municipal Water District	•		•	•	•		
San Gorgonio Pass Water Agency				•	•		
Ventura County Flood Control District				•	•		

a) Categories correspond to those listed in Table 10-1, "Amendments to Water Supply Contracts, by Category."

exchange for pre-1914 Kaweah River water previously purchased by Dudley Ridge, part of which was exchanged through the September 30, 1994, agreement described below. Water previously scheduled to be transferred to Westlands Water District from Kern would go instead to Dudley Ridge. In exchange, a like amount of water previously scheduled to go from Pixley Irrigation District to Dudley Ridge would be transferred from Pixley to Westlands.

The September 30, 1994, letter agreement among Dudley Ridge Water District, Kern County Water Agency, and the Department provided for the delivery of 835 acre-feet of Kern's 1994 entitlement water to Dudley Ridge. This water was part of an exchange for pre-1914 Kaweah River water previously purchased by Dudley Ridge and banked in Rosedale-Rio Bravo Water Storage District's ground water basin. Rosedale is a member unit of Kern.

Five-Year Agreement for Adjustment of the Variable OMP&R Component. The 1994 agreement between the Department and the water contractors who pay transportation variable OMP&R charges will implement a procedure that should prevent significant overcollections associated with those charges. The Department has agreed to initially bill the participating contractors' transportation variable OMP&R charges based on a reasonable percentage of their annual entitlement water requests rather than the full amount of their requests.

Interruptible Water Service. In 1994, the Department initiated the Interruptible Water Service Program, which allowed SWP contractors to take delivery of 1994 entitlement water above the approved and scheduled allocations. Interruptible water is delivered to a contractor for the same reasonable and beneficial uses as entitlement water and does not impact entitlement allocations for the current year. Each day that interruptible water is delivered, a contractor must also take a specified amount of its approved entitlement water.

Interruptible water becomes available for delivery on a short-term basis as determined by the Department when scheduled project demands are being delivered, and operational requirements for project water deliveries, water quality, and other requirements are being met.

The following contractors participated in the program:

Napa County Flood Control and Water Conservation District;
Solano County Water Agency;
Alameda County Flood Control and Water Conservation District, Zone 7;
Alameda County Water District;
Santa Clara Valley Water District;
Oak Flat Water District;
Castaic Lake Water Agency;
Dudley Ridge Water District;
Empire West Side Irrigation District;
Kern County Water Agency;
Tulare Lake Basin Water Storage District;
Antelope Valley-East Kern Water Agency;
Coachella Valley Water District;
Desert Water Agency;
Mojave Water Agency; and
Palmdale Water District.

Kern County Water Agency. An agreement for a temporary water diversion was signed by Kern County Water Agency, Buena Vista Water Storage District, and the Department on May 14, 1993. The diversion facility, located at Milepost 242.65 in Kern County, added a turnout for irrigation. The agreement was amended on June 1, 1993, to increase the water deliveries at this diversion facility from 25,000 to 50,000 acre-feet.

An agreement among Kern County Water Agency, Buena Vista Water Storage District (a member unit of Kern), and the Department to convert the temporary turnout facility into a permanent turnout was signed May 23, 1994.

Mojave Water Agency. An October 11, 1994, letter agreement between Mojave Water

Agency and the Department allowed a portion of the agency's 1994 entitlement to be delivered from Silverwood Lake into the Mojave River at a rate not to exceed 50 cubic feet per second. Until the East Branch Enlargement is completed, the agency does not have contractual capacity in Reaches 23 and 24. In the interim, the agency agreed to pay use-of-facilities charges for the use of Reaches 23 and 24.

Municipal Water Quality Investigations Agreement. The 1994 agreement between the Department and 15 municipal and industrial contractors implements various activities to ensure determination and protection of SWP water quality to help meet federal and State water quality standards.

Solano County Water Agency Agreement. The 1994 agreement between Solano County Water Agency and the Department allows pumping of Vallejo Permit Water through the North Bay Aqueduct system using SWP power. Under this agreement, Solano will reimburse the Department for power costs associated with the amount of permit water pumped.

Alameda County Flood Control and Water Conservation District, Zone 7. In a water transfer contract signed September 6, 1994, Byron-Bethany Irrigation District made 2,000 acre-feet of water available for delivery to Alameda County Flood Control and Water Conservation District, Zone 7. The Department conveyed 2,000 acre-feet to Zone 7 in Reach 6SB of the South Bay Aqueduct from May through October 1994.

Kern County Water Agency . A water exchange agreement dated June 15, 1995, provided for exchanging up to 10,000 acre-feet between Kern County Water Agency, Tulare Irrigation District, and Westlands Water District. Through this agreement, KCWA will accept delivery of up to 10,000 acre-feet of TID's water, prior to December 31, 1995, in exchange for a like amount of KCWA's entitlement delivered to WWD's service area in Kings County.

Amendments to Agreements

The Department amended an agreement with the following agency.

Kern County Water Agency. In 1990, the Department purchased 98,005 acre-feet of ground water from La Hacienda, Inc., a Kern County corporation. The water is located in the Kern County water basin and can be extracted according to terms of a December 20, 1990, operating agreement between the Department and Kern County Water Agency. After purchasing the water, the Department reconstructed existing wells formerly used by farmers and constructed conveyance facilities on property purchased for the Kern Fan Element of the Kern Water Bank.

Amendments 2 and 3 to the agreement between the Department and Kern for the operation of the Hacienda Ground Water Program were executed. Amendment 2 provided that the Department could extract up to 30,000 acre-feet of water from the basin each year under certain conditions. Amendment 3 revised the budgeting and expenditure format of the program.

In early September 1994, the water contractors asked the Department to begin ground water extractions from the La Hacienda Kern Water Bank facilities to increase carryover storage should the 1994-95 water year turn out to be another poor water supply year. Those facilities can extract water at approximately 133 cfs, which may include 80 cfs being returned to the California Aqueduct by reverse flow and 53 cfs being used to meet local Kern County demands, or all 133 cfs can meet local demands in the Cross Valley Canal.

On September 15, 1994, the Department began withdrawing ground water to reduce 1995 SWP supply deficiencies. In addition to the La Hacienda ground water, the Department was able to extract two other ground water supplies under the operating agreement. Between September 14, 1994, and January 6, 1995, 7,000 acre-feet of 1987 Advanced Storage Program water and 6,208 acre-feet of 1990 Berrenda Mesa Demonstration Storage Program water was extracted.

Short-Term Agreements with Other Agencies

In addition to negotiating agreements with SWP contractors to provide for specified water deliveries, the Department also entered into several agreements with other agencies for water conveyance or exchange for the period July 1, 1994, through June 30, 1995.

Central Valley Project Water

The Department regularly enters into special agreements to convey CVP water, such as agreements with contractors receiving water from the U.S. Bureau of Reclamation through the Cross Valley Canal, a water conveyance facility that connects with the California Aqueduct near Tupman in Kern County. Other agencies or corporations, including the U.S. Department of Veterans Affairs, U.S. Fish and Wildlife Service, and Musco Olive Products, Inc., also receive CVP water through agreements between the Department and USBR.

Cross Valley Canal. In September, October, and December 1994, the Department and six Cross Valley Canal contractors signed agreements to use a portion of the Department's share of storage in San Luis Reservoir for storing CVP water during 1994. DWR storage was not identified in the three-party contracts between the USBR, the Department, and the CVC contractors executed in 1975 and 1976. In 1994, operational constraints were expected to limit availability of excess SWP capacity at the times needed for delivering CVP water directly from the Delta to the Cross Valley Canal turnout. By executing these agreements, the Department provided an alternative to the CVC contractors to store CVP water in San Luis Reservoir for later release. In 1994, the Department delivered 27,762 acre-feet of water to the contractors under these agreements.

In August and September 1994, Lower Tule River Water District and Pixley Irrigation District, respectively, executed agreements with the Department to change the point of delivery during 1994—from the Cross Valley Canal turnout to Westlands Water District turnouts—for up to 7,900 acre-feet of their CVP water identified in three-party agreements with USBR and the Department. However, only Lower Tule River asked the Department to deliver 1,200 acre-feet of CVP water to Westlands WD under its agreement.

A water exchange agreement signed September 23, 1994, provided for Kern-Tulare and Rag Gulch Water Districts to transfer up to 12,000 acre-feet of CVP water to Tulare Lake Basin Water Storage District during 1994. Under this agreement, Kern-Tulare and Rag Gulch Water Districts transferred 6,946 and 2,316 acre-feet of water, respectively, to TLBWSD.

Musco Olive Products, Inc. An annual agreement signed July 12, 1994, provides for the conveyance of up to 200 acre-feet of CVP water to Reaches 1 and 2A of the California Aqueduct for use by Musco Olive Products, Inc. This water was to be conveyed March 1, 1994, through February 28, 1995. Under this agreement, the Department conveyed 178 acre-feet of water during 1994 and 1995.

U.S. Department of Veterans Affairs. An annual agreement signed May 9, 1995, between the Department and the USBR approved the conveyance of up to 450 acre-feet of CVP water to Reach 2B of the California Aqueduct

for the U.S. Department of Veterans Affairs San Joaquin Valley National Cemetery. The water is to be conveyed before December 1995. In 1994, 38 acre-feet were delivered under a similar agreement.

U.S. Fish and Wildlife Service Cooperative Agreement. USBR initiated a cooperative agreement with the Department to deliver Central Valley Project water to the Kern National Wildlife Refuge for USFWS. Under the terms of this cooperative agreement dated September 9, 1994, up to 26,530 acre-feet of CVP water would be delivered from Check 21 to the Buena Vista Water Storage District turnout BV-1B on Reach 10A of the California Aqueduct during the period October 1, 1993, through April 10, 1995. Since the cooperative agreement was signed, three modifications to the agreement have been executed. Under the first modification dated October 31, 1994, additional funding was provided. Under the second modification dated April 14, 1995, the term of the agreement was extended through April 10, 1998; also, additional funds were provided and the quantity of water to be delivered was increased to 82,837 acre-feet. The third modification was executed May 10, 1995; it defined the water delivery rates for calendar year 1995 and specified that those rates will be adjusted annually.

Westlands Water District-Merced Irrigation District Water. Under a water transfer agreement signed February 1, 1995, Merced Irrigation District made available 13,230 acre-feet for delivery to Westlands Water District. The water was pumped into the Department's share of storage in San Luis Reservoir during October and November 1994 for later release. During December 1994, 3,392 acre-feet of water was released for delivery to WWD. The remainder was released for WWD in January 1995.

Westlands Water District–"Turn-In" Agreements. In August 1994, the Department signed two "turn-in" agreements with Westlands Water District. Under the terms of these agreements, WWD could pump up to 100,000 acre-feet of ground water directly into the California Aqueduct from WWD's wells located alongside the aqueduct. In addition, WWD could also pump up to 50,000 acre-feet of ground water into the Mendota Pool for conveyance to the California Aqueduct through WWD's Lateral 7.

During the term of these agreements, March 1994 through February 1995, 16,000 acre-feet of water was conveyed from the Mendota Pool to the California Aqueduct, through Lateral 7, and 84,600 acre-feet of water was pumped directly into the California Aqueduct. The total, 100,600 acre-feet was conveyed by the Department to Reaches 5 through 7 to be used within WWD's service area.

Westlands Water District–Kings River Water. A letter agreement signed May 12, 1995, between the Department and Westlands Water District approved the acceptance into the California Aqueduct of up to 10,000 acre-feet of Kings River Water for delivery to WWD through Reaches 5, 6, and 7 of the California Aqueduct. This nonproject water will be made available to WWD through an agreement between WWD and the Kings River Water Association. The water will be released from Pine Flat Reservoir and will flow to the Mendota Pool via the Kings River and Fresno Slough. WWD will then convey the water from the Mendota Pool to the California Aqueduct through WWD's Lateral 7.

1994 Drought Water Bank and Short-Term Water Purchase Programs

In 1994, to help mitigate effects of the critically dry water year, the Department implemented a drought water bank program with guidelines similar to the successful 1991 and 1992 Drought Water Bank programs. In

1994, the Department also implemented a short-term water purchase program. Information about these two programs follow.

1994 Drought Water Bank. The Department signed agreements for the conveyance of 1994 Drought Water Bank water with four SWP long-term water contractors and three non-SWP contractors. These contracts are described in Table 10-A.

Short-Term Water Purchase. In 1994, the Department signed agreements for the purchase and conveyance of water under the Short-Term Water Purchase Program with six SWP long-term water contractors. These contracts are described in Table 10-B.

Water Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering entitlement water to long-term water supply contractors, the SWP:

- conveys water to and stores water for other public agencies through special contracts and agreements;
- provides water for wildlife and recreational uses; and
- stores, releases, and delivers local runoff water from SWP facilities to agencies that hold local water rights.

In 1994, a total of 2,980,933 acre-feet of water were conveyed to 25 long-term contractors and 25 other agencies. That amount includes 1,861,976 acre-feet of entitlement[1] and 8,200 acre-feet of entitlement-related (recreation/fish and wildlife and Suisun Marsh salinity control) water delivered to long-term SWP contractors as well as 1,110,757 acre-feet of nonentitlement water delivered to satisfy agreements made with SWP contractors and other agencies, including USBR. Figure 10-1 shows amounts of water delivered to various locations during 1994.

[1] Entitlement water is defined as the amount of water long-term contractors may request each year as part of Article 12(a), "Procedure for Determining Water Delivery Schedule," of their water supply contract.

Specific information about water deliveries made to long-term contractors and other agencies during 1994 and historical deliveries from 1962 through 1994 is presented in the following three sections, each with a corresponding table:

1. Water delivered and future credits granted to long-term contractors in 1994 (Table 10-3)
2. Water delivered in 1994, by month (Table 10-4)
3. Annual water entitlements and water conveyed, by water type, from 1962 through 1994 (Table 10-5).

Water Deliveries and Credits to Long-Term Contractors

Table 10-3 shows amounts of water delivered in 1994 and future entitlement credits granted to long-term contractors through 1994. The following information about specific columns in Table 10-3 is arranged by column number.

1994 Entitlement Water Delivered

A total of 1,861,976 acre-feet of entitlement water in all categories was delivered, including 112,625 acre-feet of interruptible water.

Other Water Deliveries. Column 5 includes deliveries of water other than entitlement water, such as deliveries of nonproject water, to long-term water contractors. Nonproject water is generally defined as water purchased from non-SWP agencies. The water is conveyed by the Department and in some instances stored in SWP facilities under special agreements for future deliveries.

In 1994, other water deliveries totaled 108,360 acre-feet.

Total Deliveries. Column 6 shows total amounts of water delivered to long-term contractors. In 1994, the SWP delivered 1,970,336 acre-feet to 25 long-term contractors. This amount included 1,861,976 acre-feet of entitle-

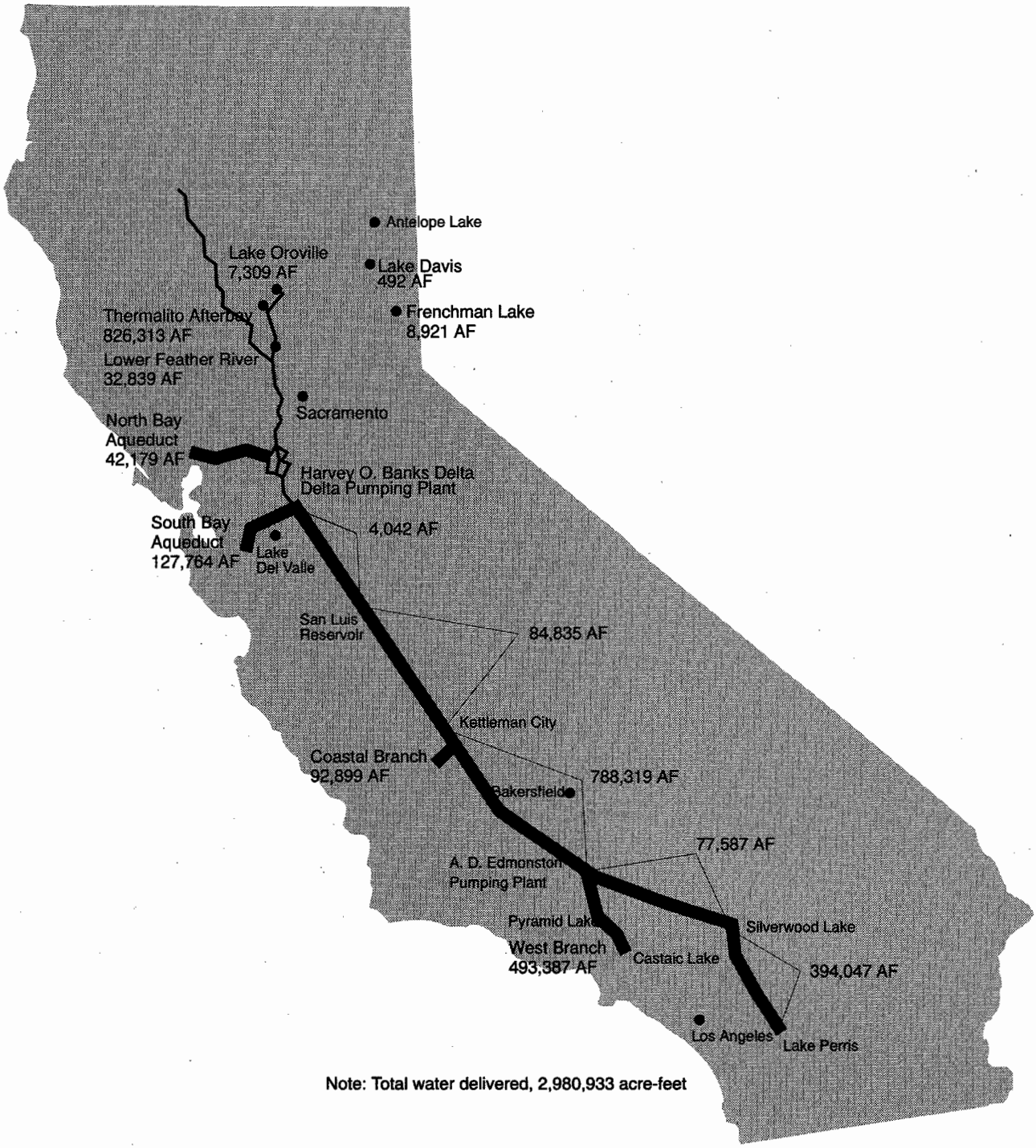


Fig 10-1. Water Delivered in Calendar Year 1994 and Delivery Locations

TABLE 10-A

Agreements for Conveying 1994 Drought Water Bank Water, by Contractor, Date of Contract, and Amount Conveyed in 1994

Contractor	Date of Contract	Amount of Water Conveyed (Acre-Feet)
SWP Agencies		
Kern County WA	August 5, 1994	18,183
Tulare Lake Basin WSD	August 16, 1994	3,525
Oak Flat WD	August 16, 1994	760
Santa Clara VWD	August 16, 1994	5,000
Non-SWP Agencies		
Panoche WD	November 1, 1994	4,900
San Luis WD	October 20, 1994	4,900
Westlands WD	October 17, 1994	66,640

TABLE 10-B

Agreements for Conveying Short-Term Water Purchase Water, by Contractor, Date of Contract, and Amount Conveyed in 1994

Contractor	Date of Contract	Amount of Water Conveyed (Acre-Feet)
Alameda CFCWCD, Z-7	April 29, 1994	11,380
Kern County WA	April 29, 1994	27,380
MWDSC	April 29, 1994	80
Mojave WA	May 5, 1994	800
Tulare Lake Basin WSD	April 29, 1994	11,380
Santa Clara VWD	April 29, 1994	7,380

TABLE 10-3
Water Delivered in 1994 and Credits Granted to Long-Term Contractors through 1994, by Service Area
(Acre-Feet)

Long-Term Water Supply Contractor	Water Deliveries in 1994						Future Entitlement Credits as of January 1, 1995				Future Entitlement Reduction Credit per Articles 7 or 45
	Entitlement Water Deliveries										
	1994 Entitlement (1)	1993 Entitlement Delivered During 1994 (2)	Make-Up Water per Article 12(c) (3)	Total Entitlement (4)	Other Water Deliveries(a (5)	Total Deliveries (6)	Make-up Water per Article 14(b) (7)	Wet-Weather Water per Articles 7 or 45 (8)	1994 Carryover Approved for Delivery in 1995 (9)	Entitlement Total Delivery Credit (10)	(11)
Upper Feather River Area											
City of Yuba City	1,035			1,035		1,035				0	
County of Butte	329			329		329				0	
Plumas County Flood Control and Water Conservation District	492			492		492				0	
North Bay Area											
Napa County Flood Control and Water Conservation District	6,792			6,792		6,792	400			400	
Solano County Water Agency	25,256 (b			25,256	5,734	30,990				0	
South Bay Area											
Alameda County Flood Control and Conservation District, Zone 7	20,542			20,542	16,648	37,190		111,580		111,580	
Alameda County Water District	22,911			22,911		22,911				0	
Santa Clara Valley Water District	57,115			57,115	12,380	69,495				0	
San Joaquin Valley Area											
County of Kings	2,116			2,116		2,116				0	
Dudley Ridge Water District	30,519			30,519	1,900	32,419			1,986	1,986	
Empire West Side Irrigation District	1,666			1,666		1,666			827 (c	827(c	
Kern County Water Agency	655,433			655,433	45,563	700,996			11,418	11,418	
Oak Flat Water District	3,071			3,071	760	3,831				0	2,466
Tulare Lake Basin Water Storage District	62,362			62,362	24,167	86,529			22,137	22,137	
Central Coastal Area											
San Luis Obispo County Flood Control and Water Conservation District	0			0		0				0	
Santa Barbara County Flood Control and Water Conservation District	0			0		0				0	
Southern California Area											
Antelope Valley-East Kern Water Agency	50,552			50,552		50,552				0	
Castaic Lake Water Agency	26,441			26,441		26,441				0	
Coachella Valley Water District	14,102			14,102		14,102				0	
Crestline-Lake Arrowhead Water Agency	785			785	408	1,193				0	
Desert Water Agency	23,257			23,257		23,257				0	
Littlerock Creek Irrigation District	1,098			1,098		1,098				0	
Metropolitan Water District of Southern California	807,866			807,866	80	807,946	20,000		19,442	39,442	
Mojave Water Agency	15,453			15,453	800	16,253	5,000			5,000	
Palmdale Water District	8,418			8,418		8,418				0	
San Bernardino Valley Municipal Water District	9,135			9,135		9,135				0	
San Gabriel Valley Municipal Water District	15,230			15,230		15,230				0	
San Gorgonio Pass Water Agency	0			0		0				0	
Ventura County Flood Control District	0			0		0				0	
Total	**1,861,976**			**1,861,976**	**108,360**	**1,970,336**	**25,400**	**111,580**	**55,810**	**192,790**	**2,466**

a) See Table 10-4 for other water deliveries specified by non-entitlement category for each agency.
b) This amount includes entitlement water to City of Vallejo and Benicia.
c) This amount includes 827 acre-feet entitlement water previously classified as Wet Weather Carryover Water according to the letter agreement of October 1, 1979.

TABLE 10-4
Water Delivered in 1994, by Month
(Acre-feet)

Contracting Agency and Type of Service	Month												1994 Total Deliveries	1994 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Upper Feather River Area														
City of Yuba City														
Entitlement water	0	0	0	0	0	0	527	508	0	0	0	0	1,035	9,600
County of Butte														
Entitlement water	2	26	36	91	0	96	23	0	13	3	14	25	329	1,200
Plumas County Flood Control and Water Conservation District														
Entitlement water	10	8	5	27	40	82	103	100	65	24	14	14	492	1,200
Last Chance Creek Water District														
Regulated delivery of local supply	0	0	0	799	1,868	2,614	1,738	1,615	287	0	0	0	8,921	
Thermalito Irrigation District														
Regulated delivery of local supply	91	85	118	176	240	308	319	320	263	186	115	97	2,318	
Oroville-Wyandotte Irrigation District														
Regulated delivery of local supply	155	120	227	525	734	1,130	1,130	1,160	1,130	686	187	125	7,309	
Western Canal Water District														
Regulated delivery of local supply	748	0	0	14,601	47,733	42,916	44,707	29,688	3,080	24,837	12,941	5,440	226,691	
Joint Water Districts Board	12,100	0	799	52,290	99,556	105,023	109,265	92,239	36,333	32,650	27,890	28,830	596,975	
Oswald WD														
Regulated delivery of local supply	0	0	0	128	231	401	445	133	173	0	0	0	1,511	
Tudor Mutual Water Company														
Regulated delivery of local supply	0	0	0	0	871	1,120	1,248	315	485	32	0	0	4,071	
Garden Highway Water Company														
Regulated delivery of local supply	0	0	0	1,752	3,088	3,223	3,641	2,854	1,193	908	2	0	16,661	
Plumas Mutual Water Company														
Regulated delivery of local supply	0	0	0	1,167	1,284	2,204	1,890	1,265	1,490	261	0	0	9,561	
SWP	12	34	41	118	40	178	653	608	78	27	28	39	1,856	12,000
Non-SWP	13,094	205	1,144	71,438	155,605	158,939	164,383	129,589	44,434	59,560	41,135	34,492	874,018	
Area Total	**13,106**	**239**	**1,185**	**71,556**	**155,645**	**159,117**	**165,036**	**130,197**	**44,512**	**59,587**	**41,163**	**34,531**	**875,874**	**12,000**
North Bay Area														
Napa County Flood Control and Water Conservation District (NCFCWCD)														
Entitlement water	83	208	158	228	228	197	187	718	607	109	531	347	3,601	9,135
Interruptable entitlement water	641	446	0	661	721	311	0	0	0	0	0	411	3,191	
Agency Total	724	654	158	889	949	508	187	718	607	109	531	758	6,792	
Solano County Water Agency														
Entitlement water	107	231	334	264	305	1,110	1,623	1,466	23	0	0	602	6,065	28,080
Interruptable entitlement water	1,397	787	1,903	1,604	1,994	1,485	0	0	0	0	0	864	10,034	
Entitlement water to Benicia	133	329	235	256	226	582	1,177	1,185	1,136	996	115	206	6,576	
Entitlement water to Vallejo	14	8	133	182	171	0	1,057	1,016	0	0	0	0	2,581	
Vallejo permit water*	0	0	0	0	0	1,314	0	0	1,428	1,201	1,402	389	5,734	
Recreation/fish and wildlife water* (Suisun Marsh salinity control)	0	0	6	0	0	0	0	0	1,140	2,471	780	0	4,397	
Agency Total (*excluded water)	1,651	1,355	2,605	2,306	2,696	3,177	3,857	3,667	1,159	996	115	1,672	25,256	
SWP	2,375	2,009	2,769	3,195	3,645	3,685	4,044	4,385	2,906	3,576	1,426	2,430	36,445	37,215
Non-SWP	0	0	0	0	0	1,314	0	0	1,428	1,201	1,402	389	5,734	
Area Total	**2,375**	**2,009**	**2,769**	**3,195**	**3,645**	**4,999**	**4,044**	**4,385**	**4,334**	**4,777**	**2,828**	**2,819**	**42,179**	**37,215**
South Bay Area														
Alameda County Flood Control and Water Conservation District, Zone 7														
Entitlement water	1,543	93	1,925	2,092	1,531	3,927	4,666	307	64	379	1,830	1,826	20,183	40,000
Interruptable entitlement	359	0	0	0	0	0	0	0	0	0	0	0	359	
General Wheeling*	0	0	0	0	443	453	482	405	0	217	0	0	2,000	
Local water*	225	1,622	467	210	297	0	0	0	146	0	168	133	3,268	
1994 Purchase water*	0	0	0	0	0	0	0	4,553	3,964	2,863	0	0	11,380	

TABLE 10-4

Water Delivered in 1994, by Month (Continued)

(Acre-feet)

Contracting Agency and Type of Service	Month												1994 Total Deliveries	1994 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Agency Total (*excluded water)	1,902	93	1,925	2,092	1,531	3,927	4,666	307	64	379	1,830	1,826	20,542	
Alameda County Water District														
Entitlement water	671	1,896	1,759	1,738	2,174	2,464	2,774	2,632	1,920	1,316	1,279	1,291	21,914	42,000
Interruptable entitlement water	880	117	0	0	0	0	0	0	0	0	0	0	997	
Agency Total	1,551	2,013	1,759	1,738	2,174	2,464	2,774	2,632	1,920	1,316	1,279	1,291	22,911	
Santa Clara Valley Water District														
Entitlement water	4,583	1,905	6,255	7,586	6,771	5,139	5,819	0	2,614	5,569	4,459	2,196	52,896	100,000
Interruptable entitlement water	956	3,263	0	0	0	0	0	0	0	0	0	0	4,219	
1994 Water Bank water*	0	0	0	0	0	0	0	0	5000	0	0	0	5,000	
1994 Purchase water*	0	0	0	0	0	0	0	7326	0	54	0	0	7,380	
Agency Total (*excluded water)	5,539	5,168	6,255	7,586	6,771	5,139	5,819	0	2,614	5,569	4,459	2,196	57,115	
Recreation/fish and wildlife water														
Agency Total	5	4	7	9	9	21	25	25	19	8	15	21	168	
SWP	8,997	7,278	9,946	11,425	10,485	11,551	13,284	2,964	4,617	7,272	7,583	5,334	100,736	182,000
Non-SWP	225	1,622	467	210	740	453	482	12,284	9,110	3,134	168	133	29,028	
Area Total	**9,222**	**8,900**	**10,413**	**11,635**	**11,225**	**12,004**	**13,766**	**15,248**	**13,727**	**10,406**	**7,751**	**5,467**	**129,764**	**182,000**
San Joaquin Valley Area														
SWP Water														
Castaic Lake Water Agency														
Entitlement water	599	224	775	444	9	1,287	1,823	2,640	177	0	0	555	8,533	
Transfer Entitlement to Westlands WD	0	0	0	0	0	0	2,100	0	0	0	0	0	2,100	
Interruptable entitlement water	173	716	0	0	0	0	0	0	0	0	0	0	889	
Agency Total (Excludes Transferred Water)	772	940	775	444	9	1,287	1,823	2,640	177	0	0	555	9,422	
County of Kings														
Entitlement water	0	0	0	200	200	350	350	416	0	0	0	600	2,116	4,000
Agency Total	0	0	0	200	200	350	350	416	0	0	0	600	2,116	
Dudley Ridge Water District														
Entitlement water	1,618	780	390	1,825	2,097	6,990	8,423	4,640	514	24	206	28	27,535	57,700
Transfer 1994 water bank water from Westlands WD	0	0	0	0	0	0	0	950	500	450	0	0	1,900	
Transfer Entitlement from Kern County WA	0	0	0	0	0	0	0	862	500	364	0	0	1,726	
Interruptable entitlement water	778	480	0	0	0	0	0	0	0	0	0	0	1,258	
Agency Total	2,396	1,260	390	1,825	2,097	6,990	8,423	5,502	1,014	388	206	28	30,519	
Empire West Side Irrigation District														
Entitlement water	561	285	3	0	70	50	0	0	0	0	0	0	969	3,000
Interruptable entitlement water	204	493	0	0	0	0	0	0	0	0	0	0	697	
Agency Total	765	778	3	0	70	50	0	0	0	0	0	0	1,666	
Kern County Water Agency														
Entitlement water	12,503	28,176	57,079	49,055	51,324	125,097	169,367	62,511	15,410	10,115	7,027	9,295	596,959	1,153,400
Interruptable entitlement water	13,694	44,780	0	0	0	0	0	0	0	0	0	0	58,474	
Transferred entitlement water to Dudley Ridge Water District*	0	0	0	0	0	0	0	862	500	364	0	0	1,726	
1994 Water Bank water*	0	0	0	0	0	0	0	3,561	9,437	4,750	0	435	18,183	
1994 purchase water*	0	0	0	0	0	0	0	27,380	0	0	0	0	27,380	
Agency Total (*excluded water)	26,197	72,956	57,079	49,055	51,324	125,097	169,367	62,511	15,410	10,115	7,027	9,295	655,433	
Oak Flat Water District														
Entitlement water	46	100	137	226	484	695	550	692	0	75	0	0	3,005	5,700
Interruptable Entitlement Water	46	20	0	0	0	0	0	0	0	0	0	0	66	
1994 Water Bank water*	0	0	0	0	0	0	0	150	348	262	0	0	760	
Agency Total (*excluded water)	92	120	137	226	484	695	550	692	0	75	0	0	3,071	

TABLE 10-4
Water Delivered in 1994, by Month (Continued)
(Acre-feet)

Contracting Agency and Type of Service	Month												1994 Total Deliveries	1994 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Tulare Lake Basin Water Storage District														
Entitlement water	3,845	2,655	16	650	451	10,170	2,658	6,157	0	0	740	9,220	36,562	118,500
Interruptable entitlement Water	9,819	15,981	0	0	0	0	0	0	0	0	0	0	25,800	
Transfer 94 Water Bank water to Westands Water District*	0	0	0	0	0	0	0	562	0	0	400	538	1,500	
1994 Water Bank water*	0	0	0	0	0	0	0	196	1431	0	398	0	2,025	
1994 purchase water*	0	0	0	0	0	0	0	11,380	0	0	0	0	11,380	
Exchanged water with Kern-Tulare Water District* (a	0	0	0	0	0	0	7,718	1,158	0	0	0	0	8,876	
Exchanged water with Rag Gulch Water District* (a	0	0	0	0	0	0	0	386	0	0	0	0	386	
Agency Total (*excluded water)	13,664	18,636	16	650	451	10,170	2,658	6,157	0	0	740	9,220	62,362	
Westlands Water District														
Transferred entitlement water from Castaic Lake Water Agency	0	0	0	0	0	0	2,100	0	0	0	0	0	2,100	
Transferred CVP water from Lower Tule River ID*	0	0	0	0	0	0	0	0	0	0	0	1200	1,200	
Transferred CVP water from San Luis Water District*	0	0	0	0	0	0	0	1,300	0	0	0	0	1,300	
Transferred 94 Water Bank water*														
(from Tulare Lake Basin Water Storage District)	0	0	0	0	0	0	0	562	0	0	400	538	1,500	
(to San Luis Water District)	0	0	0	0	0	0	0	0	0	0	45	0	45	
(to Dudley Ridge Water District)	0	0	0	0	0	0	0	950	500	450	0	0	1,900	
1994 Water Bank water*	0	0	0	0	0	0	0	40,055	14,392	10,248	0	0	64,695	
General Wheeling *	0	0	0	0	0	0	0	0	0	0	0	3,392	3,392	
Agency Total	0	0	0	0	0	0	2,100	0	0	0	0	0	2,100	
Panoche Water District														
94 Water Bank water	0	0	0	0	0	0	0	3,005	727	1,168	0	0	4,900	
Agency Total	0	0	0	0	0	0	0	3,005	727	1,168	0	0	4,900	
San Luis Water District														
Transferred CVP water to Westlands Water District	0	0	0	0	0	0	0	1,300	0	0	0	0	1,345	
Transferred 94 Water Bank Water from Westlands Water District	0	0	0	0	0	0	0	0	0	0	45	0	45	
94 Water Bank water	0	0	0	0	0	0	0	2,173	1,614	1,113	0	0	4,900	
Agency Total (excludes transferred CVP Water)	0	0	0	0	0	0	0	2,173	1,614	1,113	0	0	4,900	
Department of Fish & Game														
Recreation Fish & Wildlife	65	31	54	67	60	47	72	71	34	74	39	26	640	
Agency Total	65	31	54	67	60	47	72	71	34	74	39	26	640	
Department of Parks and Recreation														
Recreation Fish & Wildlife	2	0	3	10	6	10	12	13	9	7	3	2	77	
SWP	43,188	93,943	58,454	52,477	54,631	144,646	185,355	78,002	16,644	10,659	8,015	19,726	765,740	1,342,300
Non-SWP	0	0	0	0	0	0	0	90,712	28,449	17,991	798	5,565	143,515	
Area subtotal (SWP water)	**43,188**	**93,943**	**58,454**	**52,477**	**54,631**	**144,646**	**185,355**	**168,714**	**45,093**	**28,650**	**8,813**	**25,291**	**909,255**	**1,342,300**
San Joaquin Valley Area														
CVP Water Conveyed														
Annual Contracts														
Green Valley Water District	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kings County Water District	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lakeside Irrigation Water District	0	0	0	0	0	0	0	0	0	0	0	0	0	
Musco Olive Products, Inc.	18	11	4	19	11	14	23	4	11	22	21	15	173	
Tracy Golf and Country Club	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cawelo Water District	0	0	0	0	0	0	0	0	0	0	0	0	0	
Veterans Administration Cemetery	1	2	5	2	3	4	3	3	2	5	4	4	38	
Subtotal		19	13	9	21	14	18	26	7	13	27	25	19	211
Cross Valley Canal Contracts														
Fresno County	0	0	13	166	163	289	304	115	0	0	0	0	1,050	
Lower Tule River Irrigation District	0	0	140	1,719	1,688	2,992	0	2,835	0	14	298	0	9,686	
Transferred to Westlands Water District	0	0	0	0	0	0	0	0	0	0	0	1,200	1,200	
Pixley Irrigation District	0	0	140	1,719	1,688	2,992	3,647	700	0	0	0	0	10,886	
Rag Gulch Water District [RGWD]	0	287	6	0	741	472	791	42	0	0	0	0	2,339	
Exchanged with Tulare Lake Basin WSD	0	0	0	0	0	0	1,929	387	0	0	0	0	2,316	
Tulare County	0	0	24	293	288	511	902	0	0	29	0	0	2,047	
Kern-Tulare Water District (K-TWD)	0	455	15	1,486	1,134	1,416	2,374	174	0	0	0	0	7,054	
Exchanged with Tulare Lake Basin WSD	0	0	0	0	0	0	5,789	1,157	0	0	0		6,946	
Hills Valley Irrigation District	0	0	15	185	182	322	717	0	0	0	0	0	1,421	
Tri-Valley Water District	0	0	5	63	62	110	188	0	0	57	0	0	485	
Subtotal	0	742	358	5,631	5,946	9,104	16,641	5,410	0	100	298	1,200	45,430	

a) Cross Valley Canal federal water delivered to Tulare Lake Basin WSD under an exchange-agreement with Kern-Tulare and Rag Gulch WD.

TABLE 10-4

Water Delivered in 1994, by Month (Continued)

(Acre-feet)

Contracting Agency and Type of Service	Month												1994 Total Deliveries	1994 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
San Joaquin Valley Area (Continued)														
U.S.Bureau of Reclamation														
Federal wheeling (b	2,427	2,002	0	0	0	0	0	0	0	2,530	3,472	2,971	13,402	
Decision 1485 water	0	0	0	0	0	0	0	0	0	0	0	0	0	
Recreation/fish and wildlife water (San Luis)	54	27	46	63	54	46	70	68	36	66	35	21	586	
Subtotal	2,481	2,002	0	0	0	0	0	0	0	2,530	3,472	2,971	13,456	
Non-SWP	2,500	2,757	367	5,652	5,960	9,122	16,667	5,417	13	2,657	3,795	4,190	59,097	
Area subtotal (CVP water)	**2,500**	**2,757**	**367**	**5,652**	**5,960**	**9,122**	**16,667**	**5,417**	**13**	**2,657**	**3,795**	**4,190**	**59,097**	
Area Summary														
SWP	43,188	93,943	58,454	52,477	54,631	144,646	185,355	78,002	16,644	10,659	8,015	19,726	765,740	1,342,300
Non-SWP	2,500	2,757	367	5,652	5,960	9,122	16,667	96,129	28,462	20,648	4,593	9,755	202,612	
Area Total	**45,688**	**96,700**	**58,821**	**58,129**	**60,591**	**153,768**	**202,022**	**174,131**	**45,106**	**31,307**	**12,608**	**29,481**	**968,352**	**1,342,300**
Central Coastal Area														
San Luis Obispo County Flood Control and Water Conservation District														
Entitlement water	0	0	0	0	0	0	0	0	0	0	0	0	0	25,000
Santa Barbara County Flood Control and Water Conservation District														
Entitlement water	0	0	0	0	0	0	0	0	0	0	0	0	0	45,486
SWP	0	0	0	0	0	0	0	0	0	0	0	0	0	70,486
Non-SWP	0	0	0	0	0	0	0	0	0	0	0	0	0	
Area Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70,486**
Southern California Area														
Antelope Valley-East Kern Water Agency														
Entitlement water	127	1,436	3,371	4,559	5,118	6,290	6,849	6,758	5,164	3,592	2,396	2,003	47,663	138,400
Interruptable entitlement water	1,341	149	0	0	0	0	0	0	0	0	0	0	1,490	
Transferred entitlement water from Mojave Water Agency	32	43	110	109	114	186	239	184	187	81	48	66	1,399	
Agency Total	1,500	1,628	3,481	4,668	5,232	6,476	7,088	6,942	5,351	3,673	2,444	2,069	50,552	
Castaic Lake Water Agency														
Entitlement water	473	9	46	622	952	1,756	2,501	2,489	2,148	1,790	1,160	973	14,919	54,200
Agency Total	473	9	46	622	952	1,756	2,501	2,489	2,148	1,790	1,160	973	14,919	
Coachella Valley Water District														
Entitlement water	963	791	998	998	998	1,094	1,091	1,055	1,057	1,058	1,058	1,058	12,219	23,100
Interruptable entitlement water	0	1883	0	0	0	0	0	0	0	0	0	0	1,883	
Agency Total	963	2674	998	998	998	1,094	1,091	1,055	1,057	1,058	1,058	1,058	14,102	
Crestline-Lake Arrowhead Water Agency														
Entitlement water	67	0	0	0	0	0	127	169	161	99	97	65	785	5,800
Local water*	0	55	55	42	71	131	37	0	0	0	0	17	408	
Agency Total (*excluded water)	67	0	0	0	0	0	127	169	161	99	97	65	785	
Desert Water Agency														
Entitlement water	1,588	1,305	1,647	1,648	1,647	1,805	1,805	1,743	1,743	1,743	1,743	1,736	20,153	38,100
Interruptable entitlement water	0	3,104	0	0	0	0	0	0	0	0	0	0	3,104	
Agency Total	1,588	4,409	1,647	1,648	1,647	1,805	1,805	1,743	1,743	1,743	1,743	1,736	23,257	
Littlerock Creek Irrigation District														
Entitlement water	42	59	71	150	148	198	206	107	52	55	10	0	1,098	2,300
Agency Total	42	59	71	150	148	198	206	107	52	55	10	0	1,098	
Metropolitan Water District of Southern California														
Entitlement water	36,369	20,052	47,435	73,450	70,347	105,687	82,229	64,917	54,781	59,603	52,469	66,134	733,473	2,011,500
Bypass Entitlement water	0	0	0	5,971	19,428	24,816	15,168	1,612	7,398	0	0	0	74,393	
1994 purchase water*	0	0	0	0	0	0	0	0	80	0	0	0	80	
Agency Total (*excluded water)	36,369	20,052	47,435	79,421	89,775	130,503	97,397	66,529	62,179	59,603	52,469	66,134	807,866	

b) Kern National Wildlife Refuge U.S.B.R

TABLE 10-4

Water Delivered in 1994, by Month (Continued)

(Acre-feet)

Contracting Agency and Type of Service	Month												1994 Total Deliveries	1994 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Mojave Water Agency														
Entitlement water	0	803	0	0	0	0	294	2,896	2,712	2,980	2,957	2,795	15,437	50,800
Interruptable entitlement water	0	16	0	0	0	0	0	0	0	0	0	0	16	
Transfered entitlement water to Antelope Valley-East Kern WA*	32	43	110	109	114	186	239	184	187	81	48	66	1,399	
1994 purchase water*	0	0	0	0	0	0	0	800	0	0	0	0	800	
Agency Total (*excluded water)	0	819	0	0	0	0	294	2,896	2,712	2,980	2,957	2,795	15,453	
Palmdale Water District														
Entitlement water	35	14	13	614	719	1,193	1,037	1,352	857	785	885	766	8,270	17,300
Interruptable entitlement water	148	0	0	0	0	0	0	0	0	0	0	0	148	
Agency Total	183	14	13	614	719	1,193	1,037	1,352	857	785	885	766	8,418	
San Bernardino Valley Municipal Water District														
Entitlement water	795	427	408	528	534	991	2,056	1,500	1,050	556	270	20	9,135	102,600
Agency Total	795	427	408	528	534	991	2,056	1,500	1,050	556	270	20	9,135	
San Gabriel Valley Municipal Water District														
Entitlement water	929	0	793	1,450	1,854	1,828	1,520	1,873	1,798	2,240	0	945	15,230	28,800
Agency Total	929	0	793	1,450	1,854	1,828	1,520	1,873	1,798	2,240	0	945	15,230	
San Gorgonio Pass Water Agency														
Entitlement water	0	0	0	0	0	0	0	0	0	0	0	0	0	17,300
Ventura County Flood Control District														
Entitlement water	0	0	0	0	0	0	0	0	0	0	0	0	0	20,000
LADWP														
Local water in	0	0	0	0	0	0	0	0	0	0	0	0	0	
Local water out	0	0	0	0	0	0	0	0	0	0	0	0	0	
Agency Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Recreation/fish and wildlife water	119	68	107	148	157	298	358	715	246	531	95	76	2,918	
SWP	78,361	44,891	101,857	162,544	170,880	249,446	194,457	149,041	131,236	132,236	113,809	141,142	1,669,900	2,510,200
Non-SWP	0	55	55	42	71	131	37	800	80	0	0	17	1,288	
Area Total	**78,361**	**44,946**	**101,912**	**162,586**	**170,951**	**249,577**	**194,494**	**149,841**	**131,316**	**132,236**	**113,809**	**141,159**	**1,671,188**	**2,510,200**
All Agencies														
Total 1994 entitlement water	67,738	61,863	124,132	154,963	167,940	304,080	318,349	172,505	102,151	93,556	79,308	102,766	1,749,351	
Total interruptable entitlement water	30,436	72,235	1,903	2,265	2,715	1,796	0	0	0	0	0	1,275	112,625	
Subtotal (entitlement water delivered)	98,174	134,098	126,035	157,228	170,655	305,876	318,349	172,505	102,151	93,556	79,308	104,041	1,861,976	
Recreation/fish and wildlife water	191	103	171	234	232	376	467	824	308	620	152	125	3,803	
Suisun Marsh salinity control	0	0	6	0	0	0	0	0	1,140	2,471	780	0	4,397	
Subtotal (SWP water)	**98,365**	**134,201**	**126,212**	**157,462**	**170,887**	**306,252**	**318,816**	**173,329**	**103,599**	**96,647**	**80,240**	**104,166**	**1,870,176**	
Vallejo permit water	0	0	0	0	0	1,314	0	0	1,428	1,201	1,402	389	5,734	
Wheeling local water	13,319	1,882	1,666	71,690	155,973	159,070	164,420	129,589	44,580	59,560	41,303	34,642	877,694	
1994 purchase water	0	0	0	0	0	0	0	51,439	4,044	2,917	0	0	58,400	
1994 Water Bank water	0	0	0	0	0	0	0	50,652	33,449	17,991	843	973	103,908	
General Wheeling	0	0	0	0	443	453	482	405	0	217	0	3,392	5,392	
Conveying CVP water Annual Contract	19	13	9	21	14	18	26	7	13	27	25	19	211	
Conveying CVP water (Kern National Wildlife Refuge U.S.B.R.)	2,427	2,002	0	0	0	0	0	0	0	2,530	3,472	2,971	13,402	
Conveying CVP water Cross Valley Canal	0	742	358	5,631	5,946	9,104	16,641	5,410	0	100	298	1,200	45,430	
Conveying CVP water Decision 1485	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conveying CVP water Recreation/fish and wildlife water(San Luis)	54	27	46	63	54	46	70	68	36	66	35	21	586	
Subtotal (other water)	**15,819**	**4,666**	**2,079**	**77,405**	**162,430**	**170,005**	**181,639**	**237,570**	**83,550**	**84,609**	**47,378**	**43,607**	**1,110,757**	
Grand total	**114,184**	**138,867**	**128,291**	**234,867**	**333,317**	**476,257**	**500,455**	**410,899**	**187,149**	**181,256**	**127,618**	**147,773**	**2,980,933**	**4,154,201**

TABLE 10-5

Total Amounts of Annual Water Entitlements and Water Conveyed, by Type, 1962 through 1994

(Acre-Feet)

	Annual Entitlements According to Long-Term Water Supply Contracts							Water Conveyed								
								Deliveries								
Year	Upper Feather River Area (1)	North Bay Area (2)	South Bay Area (3)	San Joaquin Valley Area (4)	Central Coastal Area (5)	Southern California Area (6)	Total (7)	Entitlement Water (8)	Surplus and Unscheduled Water (a (9)	Other Water (b (10)	Feather River Diversions (c (11)	Recreation Water (12)	Subtotal (13)	Initial Fill Water (14)	Operational Losses and Storage Changes (d (15)	Total (16)
1962	0	0	0	0	0	0	0	0	0	18,289	0	18,289	9	272	18,570	
1963	0	0	0	0	0	0	0	0	0	22,456	0	22,456	71	185	22,712	
1964	0	0	0	0	0	0	0	0	0	32,507	0	32,507	171	152	32,830	
1965	0	0	0	0	0	0	0	0	0	44,105	0	44,105	93	729	44,927	
1966	0	0	0	0	0	0	0	0	0	67,928	0	67,928	0	1,746	69,674	
1967	0	0	11,538	0	0	0	11,538	11,538	0	53,605	0	65,143	8,328	4,212	77,683	
1968	550	0	109,900	81,050	0	0	191,500	171,709	121,534	14,777	866,926	0	1,174,946	498,926	117,906	1,791,778
1969	620	0	98,700	168,075	0	0	267,395	193,020	72,397	18,829	794,374	0	1,078,620	510,614	72,196	1,661,430
1970	700	0	114,200	207,700	0	0	322,600	233,993	133,024	38,080	759,759	0	1,164,856	23,947	2,435	1,191,238
1971	890	0	116,200	258,500	0	0	375,590	357,340	296,019	44,119	778,362	8	1,475,848	7,853	5,812	1,489,513
1972	970	0	118,300	420,766	0	201,723	741,759	611,801	423,964	66,638	817,398	6,489	1,926,290	100,274	53,062	2,079,626
1973	1,100	0	120,400	392,352	0	472,400	986,252	694,388	296,416	42,511	800,743	1,155	1,835,213	204,638	53,798	2,093,649
1974	1,230	0	122,400	470,350	0	588,220	1,182,200	874,077	417,676	46,224	911,613	2,118	2,251,708	237,554	10,657	2,499,919
1975	1,610	0	124,500	556,509	0	704,250	1,386,869	1,223,990	622,902	63,793	862,218	3,377	2,776,280	103,352	(94,606)	2,785,026
1976	1,990	0	126,500	555,117	0	824,780	1,508,387	1,373,002	580,110	115,217	946,440	1,745	3,016,514	61,122	(681,025)	2,396,611
1977	2,420	0	128,600	594,100	0	942,201	1,667,321	574,155	0	389,065	581,994	1,111	1,546,325	0	(131,151)	1,415,174
1978	1,850	0	130,700	647,262	0	1,038,222	1,818,034	1,452,699	16,914	121,225	786,517	1,691	2,379,046	64,443	717,370	3,160,859
1979	2,130	0	132,700	715,385	0	1,177,873	2,028,088	1,659,896	648,389	187,630	882,549	1,766	3,380,230	12,302	(83,430)	3,309,102
1980	1,810	500	134,800	770,800	1,946	1,304,914	2,214,770	1,529,749	404,557	46,459	875,045	2,131	2,857,941	0	(26,606)	2,831,335
1981	1,940	650	137,000	830,700	2,813	1,419,365	2,392,468	1,909,562	908,428	279,161	838,557	4,688	3,940,396	0	(802,263)	3,138,133
1982	1,970	800	139,200	889,200	5,626	1,537,749	2,574,545	1,750,024	215,873	154,882	776,330	4,646	2,901,755	0	480,752	3,382,507
1983	2,000	950	141,400	880,648	8,439	1,668,557	2,701,994	1,184,869	13,019	181,453	602,905	7,849	1,990,095	0	(90,997)	1,899,098
1984	3,630	1,100	143,600	991,911	12,698	1,731,398	2,884,337	1,588,619	262,917	381,024	832,332	7,040	3,071,932	0	(140,182)	2,931,750
1985	3,760	1,250	145,800	1,031,749	21,138	1,852,149	3,055,846	1,995,453	307,672	404,842	870,008	4,033	3,582,008	0	92,885	3,674,893
1986	4,190	1,400	148,100	1,139,200	28,210	1,971,190	3,292,290	1,995,636	(e 36,620	(f 193,606	791,737	3,865	3,021,464	0	284,380	3,305,844
1987	4,620	1,550	150,300	1,201,200	35,204	2,091,241	3,484,115	2,130,086	(g 114,907	377,592	831,947	7,672	3,462,204	0	(390,413)	3,071,791
1988	5,060	15,471	152,500	1,258,800	43,722	2,212,782	3,688,335	2,385,122	(h 0	507,076	794,834	4,889	3,691,921	0	(92,850)	3,599,071
1989	5,500	24,615	156,700	1,303,100	56,342	2,411,933	3,958,190	2,853,747	(i 0	474,559	822,276	8,135	4,158,717	0	447,917	4,606,634
1990	6,040	28,190	160,900	1,355,000	70,486	2,487,900	4,108,516	2,582,151	(j 90	424,697	868,219	9,262	3,884,419	0	(528,869)	3,355,550
1991	11,880	29,590	166,400	1,355,000	70,486	2,497,500	4,130,856	549,116	(k 3,521	551,048	565,395	4,879	1,673,959	0	167,435	1,841,394
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	4,138,816	1,471,199	(l 1,156	145,044	613,978	2,605	2,233,982	0	(63,541)	2,170,441
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	4,146,966	2,315,098	0	254,991	822,589	2,609	3,395,287	0	726,123	4,121,410
1994	12,000	37,215	182,000	1,342,300	70,486	2,510,200	4,154,201	1,861,976	0	236,739	874,018	8,200	2,980,933	0	(295,405)	2,685,528
1995																0
1996																0
1997																0
Total	104,340	209,911	3,762,638	22,101,374	568,568	36,666,947	63,413,778	37,534,015	5,898,105	6,000,171	21,569,063	101,963	71,103,317	1,833,697	(181,314)	72,755,700

a) Values include amounts of deliveries to short-term contractors (Mustang Water District, 1970-72; Tracy Golf and Country Club, 1974, 1979, and 1980; and Green Valley Water District, 1974, 1975, 1978, 1979, 1980, and 1985; Granite Construction Company, 1980).

b) Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP contractors.

c) Includes amounts of water diverted under various water rights agreements.

d) Amounts reflect net effect of (1) operational losses from SWP transportation facilities; (2) changes in reservoir storage south of the Delta; (3) storable local inflows to SWP reservoirs; (4) side inflow to San Luis Canal; and (5) inflow into California Aqueduct from Kern River Intertie.

e) Includes 37,170 acre-feet of entitlement water carried over from 1985.

f) Includes 12,270 acre-feet of surplus water carried over from 1985.

g) Includes 639 acre-feet of 1988 entitlement water delivered during 1987 and 16,171 acre-feet of entitlement water recaptured from ground water storage.

h) Includes 67,581 acre-feet of 1987 entitlement water delivered in 1988 and 8,749 acre-feet recaptured from ground water storage.

i) Includes 149,880 acre-feet of 1988 entitlement water delivered in 1989 and 89 acre-feet of 1990 entitlement water delivered during 1989.

j) Includes 128,546 acre-feet of 1989 water delivered in 1990.

k) Includes 27,075 acre-feet of 1990 entitlement water and 148 acre-feet of 1992 entitlement water delivered in 1991.

l) Includes 92,282 acre-feet of 1991 entitlement water delivered in 1992; 3,484 acre-feet of make-up water; and 72,000 acre-feet recaptured from ground water storage (including 57,171 acre-feet of Ground Water Demonstration Program water).

ment water and 108,360 acre-feet of other SWP and nonproject water.

Make-Up Water. Column 7 includes amounts of make-up water credited to contractors according to Article 14(b) of the long-term water supply contracts. Article 14(b) provides for the delivery of water at a later time if, due to necessary investigations, inspections, maintenance, repairs, or replacement of SWP facilities, water is not delivered.

In 1994, long-term contractors who earned credits for make-up water according to Article 14(b) are as follows:

- Napa County Flood Control and Water Conservation District, 400 acre-feet;
- Mojave Water Agency, 5,000 acre-feet; and
- Metropolitan Water District of Southern California, 20,000 acre-feet.

Wet-Weather Water. According to provisions of their water supply contracts, South Bay and certain San Joaquin Valley contractors may reduce deliveries of entitlement water in years when above-average amounts of local water are available; they may request increased deliveries by an equal amount in later years.

No additional credits for wet-weather water were acquired during 1994. Column 8 includes 111,580 acre-feet of credits acquired in previous years.

Carryover Water Approved for Delivery. For several years, the Department has offered contractors the opportunity to carry over a portion of their entitlement water approved for delivery in the current year for delivery during the next year. The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose the water by December 31 of each year.

Because operational constraints may change from year to year, the Department prepares an agreement that lists the conditions of carryover water delivery for a given year. The agreement is signed by participating contractors.

The Department approved 1994 carryover water for delivery in 1995. Contractors who are scheduled to receive delivery of 1994 carryover entitlement in 1995 are as follows:

- Dudley Ridge Water District, 1,986 acre-feet;
- Empire West Side Irrigation District, 827 acre-feet;
- Kern County Water Agency, 11,418 acre-feet;
- Tulare Lake Basin Water Storage District, 22,137 acre-feet; and
- Metropolitan Water District of Southern California, 19,442 acre-feet.

The 827 acre-feet of 1994 entitlement water approved for delivery to Empire West Side Irrigation District in 1994 was previously classified as wet-weather carryover water as defined in a letter agreement dated October 1, 1979.

Total Delivery Credits. Column 10 shows total future entitlement credits according to Article 7 of the long-term water supply contract for specific agencies. On January 1, 1994, the total amount of credits was 192,790 acre-feet, including 111,580 acre-feet of wet-weather water and 55,810 acre-feet of 1994 carryover water.

Reduction Credits. According to the provisions of their water supply contracts, South Bay and San Joaquin Valley contractors may increase their allocated entitlement water (up to their maximum annual entitlement) in years of need, provided that additional water is available from the SWP according to Article 7 or Article 45 of the long-term water supply contracts.

Contractors who increased their allocation of entitlement water in previous years may in any 1 year reduce their supply by the amount the supply had been increased previously. Column 11 shows those credits. Oak Flat Water District has 2,466 acre-feet of future

reduction credits available according to Article 45. At this time no other contractors have reduction credit balances.

Water Delivered in 1994, by Month

During 1994, the SWP provided water service to 50 agencies, including 25 long-term water contractors. Those agencies and the amounts of water delivered to them by month are listed in Table 10-4.

This section and the accompanying table summarize water deliveries for 1994. Information about those deliveries is categorized as State Water Project Water and Nonproject Water.

State Water Project Water. State Water Project water is classified into the following categories:

Entitlement water

current year entitlement (1994)
interruptible entitlement (1994)
Article 14(b) make-up entitlement water

Recreation and fish and wildlife water

enhancement
mitigation.

In addition, the SWP may approve exchanges and transfers of entitlement water among various contractors if certain conditions are met. The SWP may temporarily loan water to contractors if satisfactory arrangements are made for repayment and water is available within the system.

In 1994, SWP water was delivered in the following classifications and amounts:

Entitlement Water. A total of 1,861,976 acre-feet of 1994 entitlement water was delivered to 25 long-term contractors (Table 10-3).

During 1994, a total of 5,225 acre-feet of entitlement water was transferred between five SWP long-term contractors and one non-SWP water agency as follows:

- Kern County Water Agency to Dudley Ridge Water District, 1,726 acre-feet;
- Castaic Lake Water Agency to Westlands Water District, 2,100 acre-feet ; and
- Mojave Water Agency to Antelope Valley-East Kern Water Agency, 1,399 acre-feet.

Water for Recreation and Fish and Wildlife. A total of 3,803 acre-feet of SWP water was conveyed for recreational use and enhancement of fish and wildlife:

Recreational Use: The SWP delivered 598 acre-feet of water for facilities at Lake Del Valle, O'Neill Forebay, Silverwood Lake, Lake Perris, and Castaic Lake. In addition, 2,465 acre-feet were delivered to Castaic Lake and Castaic Lagoon, an impoundment downstream from Castaic Lake devoted entirely to recreation.

Trout Fishery: The SWP released 23 acre-feet of water to maintain a trout fishery in Piru Creek as a condition of obtaining a license from the Federal Energy Regulatory Commission to develop a power plant at Pyramid Lake.

Wildlife Management: The SWP delivered 717 acre-feet of water to use in managing wildlife in the Pilibos Wildlife Area, 40 miles south of Los Banos, and on about 770 acres of land near O'Neill Forebay.

Suisun Marsh Salinity Control. In 1994, the Department conducted a salinity control test to determine whether Green Valley Creek flow augmented by less saline water from Barker Slough would control salinity in the northwestern Suisun Marsh. The spillway of Cordelia Forebay of the North Bay Aqueduct was notched and tested in March; while 4,391 acre-feet were released from the North Bay Aqueduct from September through mid-November. The additional releases controlled water salinity but may have attracted chinook salmon into the channel conveying the Barker Slough water.

Nonproject Water. In 1994, SWP facilities were used to deliver nonproject water for

various agencies according to the terms of water rights and water transfer agreements. The SWP used project facilities to deliver CVP water, water purchased from the 1994 Drought Water Bank, water for the short-term water purchase program, water rights water, and water purchased by Westlands Water District from Merced Irrigation District.

Central Valley Project Water. In 1994, the Department conveyed 59,629 acre-feet of CVP water through SWP facilities. The deliveries were accomplished according to agreements negotiated with USBR throughout the year as well as with participants of existing three-party contracts for the use of the Cross Valley Canal.

Musco Olive Products, Inc.: According to terms of two conveyance agreements with USBR, the Department agreed to convey to CVP water contractors water furnished by USBR at O'Neill Forebay. From January 1 through December 31, 1994, the Department delivered 173 acre-feet of water to Musco Olive Products, Inc., in Reach 2A of the California Aqueduct.

U.S. Fish and Wildlife Service: The Department conveyed 13,402 acre-feet of CVP water for the USFWS according to provisions of a cooperative agreement initiated by the USBR. That water was conveyed in January and February and from October through December 1994 to the Kern National Wildlife Refuge.

Recreational and Fish and Wildlife Use: In 1994, the Department conveyed 586 acre-feet of CVP water to the Department of Fish and Game at O'Neill Forebay and Lateral 4.

U.S. Department of Veterans Affairs: An annual agreement was signed with USBR to convey CVP water for the U.S. Department of Veterans Affairs. A long-term agreement is in the process of being negotiated. In 1994, 38 acre-feet of water was delivered through SWP facilities to maintain the San Joaquin Valley National Cemetery near Santa Nella, California.

Cross Valley Canal Contractors: The Cross Valley Canal in Kern County is used by six CVP water or irrigation districts and two counties to obtain water from the California Aqueduct. These districts and counties include Hills Valley, Lower Tulare River, and Pixley Irrigation Districts; Kern-Tulare, Rag Gulch, and Tri-Valley Water Districts; and the counties of Fresno and Tulare. The Department conveys water from the Delta to the Cross Valley Canal in accordance with individual three-party agreements with USBR and CVC agencies. These agreements expire December 31, 1995. Interim 3-year agreements are being drafted to continue CVC deliveries. The Department expects that long-term agreements will be negotiated within 3 years.

In 1994, a total of 45,430 acre-feet of CVP water was conveyed to all CVC contractors, including 2,613 acre-feet transferred from Rag Gulch Water District to Tulare Lake Basin Water Storage District; 6,946 acre-feet from Kern-Tulare Water District to Tulare Lake Basin Water Storage District; and 1,200 acre-feet from Lower Tulare River Irrigation District to Westlands Water District.

Electrical energy required to convey CVP water through Harvey O. Banks Delta Pumping Plant and Dos Amigos Pumping Plant was supplied as needed by USBR.

Annual Water Entitlements and Water Conveyed, 1962 through 1994

Information about annual water entitlements and water conveyed for the past 33 years is contained in Table 10-5. The following discussion of entitlements and water conveyed is arranged according to column number.

Annual Entitlements. Columns 1 through 7 of Table 10-5 show the amount of long-term contractor entitlement water for years 1962 through 1994 as specified in the

entitlement schedules (Table A, Annual Entitlements) of the long-term water supply contracts.

In some instances those entitlement schedules, projections of each contractor's need for water to 2035, have been amended to meet the needs of individual contractors. The amounts of entitlement water each contractor may request for years 1962 through 2035 may be found in Table B-4, Annual Entitlements to Project Water, in Appendix B.

Water Delivered. Columns 8 through 16 show water delivered or conveyed, including initial fill water and operational losses and storage changes.

Entitlement Water. Column 8 shows amounts of entitlement water delivered each year from 1962 through 1994. In 1994, entitlement water delivered to 25 contractors totaled 1,861,976 acre-feet. That amount includes 112,625 acre-feet of 1994 interruptible entitlement water.

Surplus and Unscheduled Water. Surplus water is water in excess of that required to meet all demands for entitlement water and water to be stored in SWP reservoirs.

Column 9 shows amounts of surplus and unscheduled water delivered from 1962 through 1994. During 1993 and 1994, surplus and unscheduled water were not available.

Other Water. Column 10 includes amounts of water classified as other water delivered in 1994, including CVP water conveyed through SWP facilities; regulated delivery of local supply; water loaned by the SWP; water paid back to the SWP; purchased, emergency relief, and preconsolidation repayment water; Vallejo water rights permit water; drought water bank water; and local water released and taken out of the SWP system.

In 1994, a total of 236,739 acre-feet of other water was delivered.

Feather River Diversions. Column 11 includes amounts of water from the Feather River delivered according to agreements for water rights water. In 1994, a total of 874,018 acre-feet in this category was delivered to contractors in the Feather River area.

Recreation Water. Column 12 shows water conveyed for recreational use or to provide water or improve water quality for fish and wildlife. In 1994, a total of 8,200 acre-feet of SWP water was conveyed for this purpose.

Initial Fill Water. The quantities listed in Column 14 represent the amounts used to initially fill to maximum operational capacities the aqueducts and reservoirs south of the Delta. Initial filling began in 1962 with the filling of the South Bay Aqueduct and was completed in 1979 when Lake Perris reached its maximum operational capacity of 127,000 acre-feet.

Operational Losses. Column 15 indicateds the net difference between water lost through evaporation and seepage, net storage changes in reservoirs south of the Delta, and water gained through inflow from local drainage areas, including inflows into San Luis Canal and from the Kern River Intertie. In 1994, that amount totaled -295,405 acre-feet (negative values are indicated for years when withdrawals and evaporation from reservoirs south of the Delta exceeded the amounts of water added to the reservoirs).

1994 Drought Water Bank and Short-Term Water Purchase Programs

Drought Water Bank. To help mitigate effects of the 1994 dry water year, the Department implemented a drought water bank program with guidelines similar to the successful 1991 and 1992 drought water bank programs. In 1994, the Department also implemented a short-term water purchase program that was conceived in 1993.

In 1994, the Department conveyed a total of 103,908 acre-feet of drought water bank water for four long-term SWP contractors (27,468 acre-feet) and three non-SWP contractors (76,440 acre-feet) as follows:

SWP Contractors

Santa Clara Valley Water District, 5,000 acre-feet;
Kern County Water Agency, 18,183 acre-feet;
Tulare Lake Basin Water Storage District, 3,525 acre-feet;
Oak Flat Water District, 760 acre-feet;

Non-SWP Agencies

Panoche Water District, 4,900 acre-feet;
San Luis Water District, 4,900 acre-feet; and
Westlands Water District, 66,640 acre-feet.

Water Purchase Program. In 1994, the Department conveyed 58,400 acre-feet of purchased water for six long-term contractors as follows:

SWP Contractors

Alameda County Flood Control and Water Conservation District, Zone 7, 11,380 acre-feet;
Santa Clara Valley Water District, 7,380 acre-feet;
Kern County Water Agency, 27,380 acre-feet;
Tulare Lake Basin Water Storage District, 11,380 acre-feet;
Mojave Water Agency, 800 acre-feet; and
Metropolitan Water District of Southern California, 80 acre-feet.

Water Rights Water

Water in this category is transported through SWP facilities to long-term SWP contractors and other agencies according to terms of various local water rights agreements. Some of this water simply passes through SWP conveyance facilities; a portion is stored in SWP reservoirs for release at a later time. In 1994, a total of 883,428 acre-feet of water in this category was delivered to the Feather River, North Bay, South Bay, and Southern California areas.

Feather River Area: Nine nonproject agencies in the Feather River area received 874,018 acre-feet. Those agencies are Last Chance Creek Water District (8,921 acre-feet), Thermalito Irrigation District (2,318 acre-feet), Oroville-Wyandotte Irrigation District (7,309 acre-feet), Western Canal Water District (226,691 acre-feet), Joint Water Districts Board (596,975 acre-feet), Tudor Mutual Water Company (4,071 acre-feet), Oswald Water District (1,511 acre-feet), Garden Highway Water Company (16,661 acre-feet), and Plumas Mutual Water Company (9,561 acre-feet).

North Bay Area: In the North Bay area, 5,734 acre-feet of water was delivered as Vallejo permit water to Solano County Water Agency. The city of Vallejo, as a member agency, has contractual rights to extra capacity in the North Bay Aqueduct to transport this water.

South Bay Area: In the South Bay area, 3,268 acre-feet of local water was delivered to Alameda County Flood Control and Water Conservation District, Zone 7, a SWP contractor. This agency has joint ownership with the Alameda County Water District for the water rights to runoff from the Lake Del Valle watershed.

Southern California: In Southern California, 408 acre-feet of local runoff from the Houston Creek watershed was stored and delivered to Crestline-Lake Arrowhead Water Agency. These local water rights have been signed over to the Department as part of the contractual arrangements for storing and delivering this local runoff for the Crestline-Lake Arrowhead Water Agency.

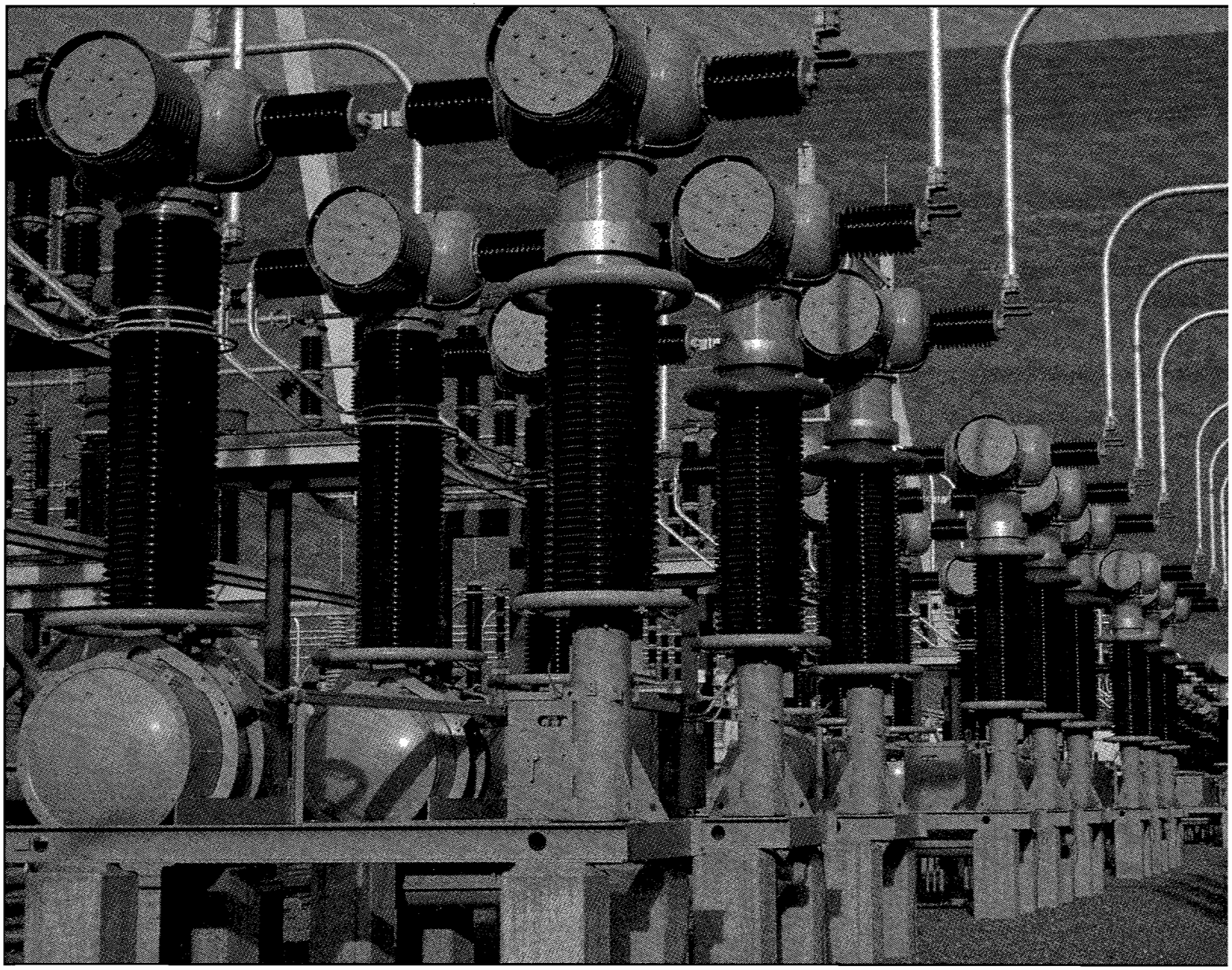
Merced Irrigation District Water

Under a water transfer agreement signed February 1, 1994, Merced Irrigation District made available 13,230 acre-feet for delivery to Westlands Water District. The water was pumped into the Department's share of storage in San Luis Reservoir during October and November 1994 for later release. During December 1994, a total of 3,392 acre-feet was released for delivery to WWD. The remainder was released in January 1995.

Information for this chapter was provided by the State Water Project Analysis Office.

Chapter 11

Power Resources



Switchyard at Oroville Dam

Significant Events

- State Water Project facilities generated 3.62 billion kilowatt-hours of energy in 1994. Because of below-average rainfall in the Feather River watershed, generation at the Hyatt-Thermalito Complex during 1994 was about half that of 1993. However, generation at the SWP recovery plants was about 30 percent more than that of 1993.

- In 1994, the Department purchased 1.12 billion kilowatt-hours of energy at a cost of $20.28 million. Associated costs for capacity, transmission, and dispatching services totaled $26.39 million.

- The Department sold 2.26 billion kilowatt-hours of energy in 1994, resulting in revenues of $52.40 million. The energy was sold to 24 utilities in the Southwest, Pacific Northwest, and Northern and Southern California. The Department also received $7.81 million in revenues for capacity payments and transmission arrangements.

The SWP requires dependable, economical sources of power to deliver affordable water to long-term contractors. Responding to that need, the Department of Water Resources developed and administers a comprehensive power resources program. Key elements of the program include timing generation and pumping schedules strategically, purchasing power resources and transmission services, making short-term sales of occasional power surpluses, and conducting studies of power resources for future needs.

SWP Power Resources Program

The goals of the SWP power resources program are to:

- obtain reliable, environmentally sensitive, and competitively priced power sources and transmission services sufficient for operating the SWP;
- develop and manage power resources to minimize the cost of water deliveries to SWP contractors;
- minimize impacts on the SWP when major contractual power arrangements begin to expire in 2004;
- meet responsibilities and criteria of the Western Systems Coordinating Council; and
- conform with regulations of the California Energy Commission and the Federal Energy Regulatory Commission.

To achieve these goals, the Department constructed its own power facilities and contracted for long-term power resources with many electric utilities. In addition, the Department arranged for transmission service between SWP power resources and pumping loads and interconnected utilities. The power resources program takes advantage of SWP water storage and conveyance capacities that can allow the Department to operate SWP pumps somewhat independently of water delivery needs. This control of pumping loads and generation enables the Department to enter into advantageous agreements with other electric utilities. Those agreements complement the use of SWP generation to meet SWP power requirements.

Existing SWP Power Facilities

The Department owns hydroelectric, coal, and geothermal power plants, either jointly or solely. Figure 11-1 shows the names and locations of those facilities.

Hydroelectric. Economical hydroelectric generation provides the largest share of SWP power resources. The combined 900-megawatt Edward Hyatt Pumping-Generating Plant and Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt-hours in a median water year, while the 3 MW Thermalito Diversion Dam Powerplant adds another 24 million kWh a year.

Generation at existing SWP aqueduct recovery plants, William R. Gianelli, Alamo, Devil Canyon, and William E. Warne, varies with the amount of water conveyed. These four plants generate about one-sixth of the total energy used by the SWP. (William R. Gianelli Pumping-Generating Plant is a joint SWP [222 MW] and U.S. Bureau of Reclamation [202 MW] facility.)

Coal. Since July 1983, the Department has received energy from Reid Gardner Powerplant, a coal-fired facility near Las Vegas, Nevada. Reid Gardner consists of four units. The Department owns 67.8 percent of Unit 4 (169.5 MW based on nameplate capacity of 250 MW), while Nevada Power Company owns the remainder of Unit 4 as well as all of Units 1, 2, and 3.

According to the Reid Gardner Unit 4 Participation Agreement, the Department receives up to 245 MW from Unit 4 (based on

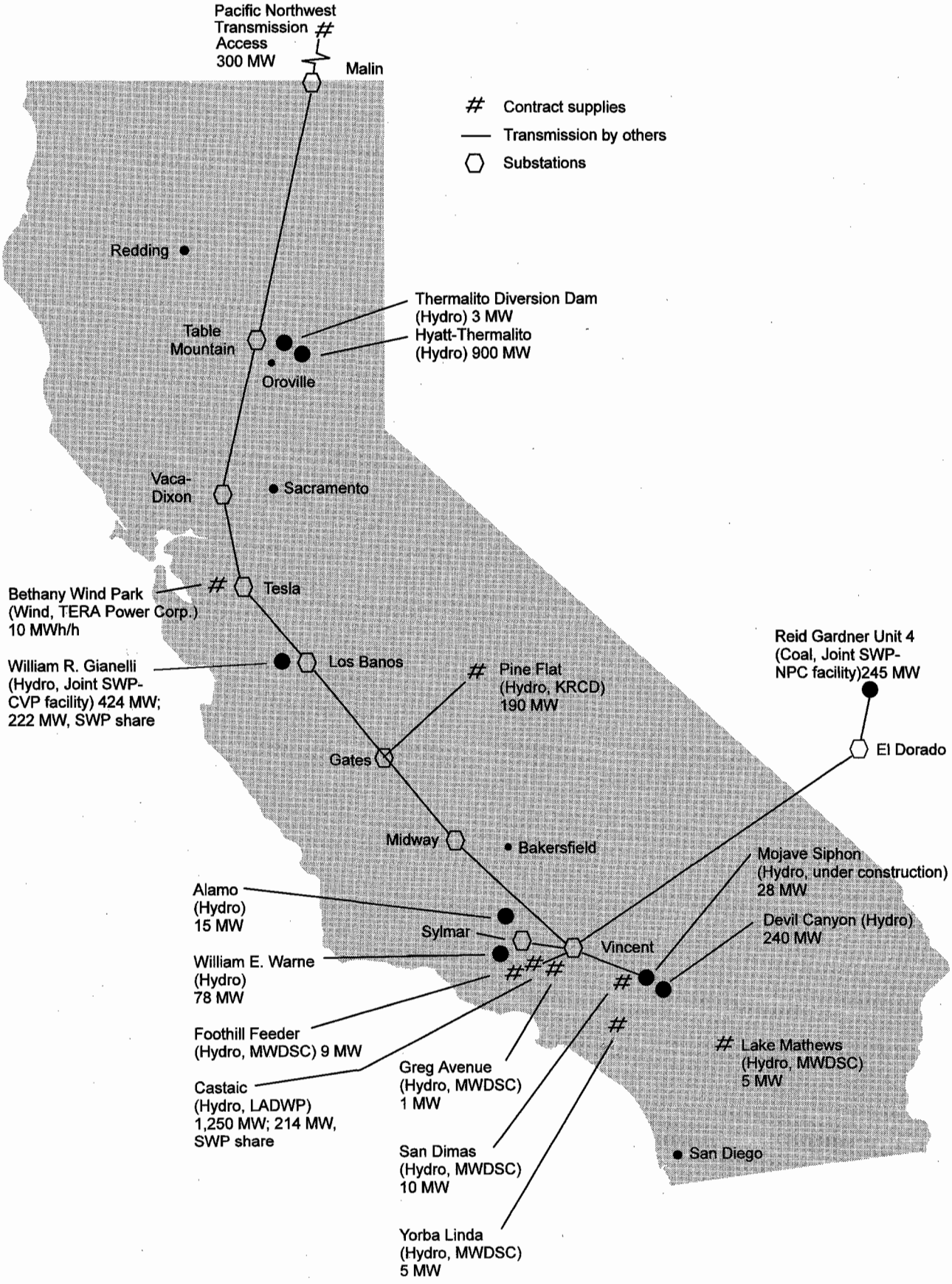


Fig 11-1. Names, Locations, and Generating Capacity of Primary Power Facilitites

an upgraded generating capacity of 275 MW) subject to NPC's limited right to interrupt the Department's energy deliveries during specified periods. Whenever NPC interrupts the Department's scheduled energy, the Department receives payment based on NPC combustion turbine costs.

The turbine at Reid Gardner was upgraded in June 1990 to use the excess boiler capacity of Unit 4. The upgrade increased plant generation capacity by approximately 15 MW. The Department and NPC shared the cost of the upgrade in proportion to their ownership. The Department will allow NPC to use its share of the Unit 4 upgraded capacity and take the energy produced by the Unit 4 upgrade through August 31, 1998. Starting September 1, 1998, the Department will have available for its use the entire amount of the upgraded capacity with energy for the remaining term of the Participation Agreement.

Also beginning in 1998, NPC has the option each year to buy up to 6 percent of Department ownership. The utility must give the Department a 5-year notice to exercise each year's option (1993 notice for 1998 option). NPC did not give a notice in 1993 or 1994 to exercise these options; the Department will therefore retain its full output for 1998 and 1999.

Geothermal. The Department planned to develop and operate two geothermal power plants–Bottle Rock and South Geysers. The Department constructed Bottle Rock Powerplant and operated the facility until 1990; construction of South Geysers Powerplant began in the early 1980s. In addition, the Department leases from the federal government the mineral rights to the Binkley Ranch Club, located north of Bottle Rock, for potential geothermal use.

The Department leased mineral rights to the Binkley Ranch Club from the federal government and obtained necessary permits to construct a well pad on the leasehold, located north of the Francisco leasehold and Bottle Rock Powerplant. The lease provides a supplemental source of steam for Bottle Rock if the economics of operating geothermal facilities improve.

From February 1985 until December 1990, when Bottle Rock Powerplant was taken out of service, the Department owned, operated, and maintained the facility, which is situated in the Geysers area of Lake County. The Department still owns the facility but has taken it out of service because lower-cost energy was available, making it uneconomical to continue drilling for additional steam needed to keep the plant operating. The Department is exploring the possibility of leasing or selling this plant.

The Department planned another geothermal facility, South Geysers Powerplant, in Sonoma County. Three steam wells originally drilled on the property provided the basis for the Department's decision to construct the plant. However, subsequent drilling for steam wells found an insufficient supply of steam to support a 55 MW powerplant.

In 1985, the Department delayed completion of South Geysers due to insufficient steam supply and the availability of other sources of economical energy. On May 4, 1990, Bechtel Power Corporation purchased the major components of the plant (steam turbine generator, condenser, and associated items) for $5.5 million. The Department is exploring the possibility of leasing or selling the steam field and power plant site for alternative uses.

Future SWP Power Facilities

To meet future SWP power requirements, the Department also considers and evaluates new power resources. When considering or evaluating those resources, the Department reviews SWP power requirements and analyzes the type of resource and its cost. A potential power resource may be evaluated according to the following factors:

- ability to meet anticipated power requirements for pumping,
- transmission access availability,
- anticipated water deliveries to contractors,
- cost of the resource,
- availability and cost of financing,
- environmental impacts and costs of mitigation, and
- operating characteristics.

The Department is considering several potential power resources. These include a second unit at Alamo Powerplant, a third unit at William E. Warne Powerplant, additional capacity at Hyatt-Thermalito, and off-stream pumped-storage power facilities as part of the proposed Los Banos Grandes Facilities complex.

To provide for water delivery increases in the future, other facilities are now under development. Devil Canyon Powerplant was enlarged and is now operational; Mojave Siphon Powerplant is being constructed.

Devil Canyon Powerplant Enlargement. In 1993, the Department completed the Devil Canyon Powerplant enlargement to accommodate generating units 3 and 4, which increased the plant's nameplate rating by 160 MW. Commercial operation is scheduled to begin in early 1995 when construction of a second afterbay, started in 1992, is completed.

Mojave Siphon Powerplant. Mojave Siphon Powerplant, under construction on the East Branch of the California Aqueduct, will be located upstream of Silverwood Lake. This power plant, with a nameplate rating of 32.4 MW, is scheduled to begin commercial operation in 1996.

Contractual Resource Arrangements

Through joint development, exchanges, and purchases, the Department obtains a significant amount of capacity and energy for SWP operations from other utilities throughout California, the Northwest, and the Southwest. Under these agreements, the Department can sell, buy, or exchange energy.

Some agreements allow the Department to sell, buy, and/or exchange short-term firm capacity and/or firm energy on an hourly, daily, weekly, or monthly basis. Those agreements permit more efficient use of the Department's generating resources and more efficient scheduling of energy deliveries.

Negotiations continue with various utilities in the Pacific Northwest to develop long-term arrangements for purchases, sales, and exchanges to take advantage of the Department's 300 MW transmission capacity on the Extra-High Voltage Pacific Northwest Intertie.

To reduce SWP power costs, the Department will continue to use the EHV Intertie and to negotiate with utilities in California, the Northwest, and the Southwest for purchases and sales of power.

Table 11-1 lists the Department's power contracts.

Joint Development. In 1966, the Department entered into a contract with the Los Angeles Department of Water and Power for the joint development of the West Branch of the California Aqueduct. The LADWP constructed and operates Castaic Powerplant, which is electrically connected to the LADWP transmission system at the Sylmar Substation.

The Department receives capacity and energy at the Sylmar Substation based on weekly water schedules through the West Branch.

Energy Exchanges. The largest portion of the energy used by the SWP is provided by the 1979 Power Contract and the 1981 Capacity Exchange Agreement with Southern California Edison Company. Service began in April 1983 under the Power Contract and in April 1987 under the CEA.

According to terms of the Power Contract, the Department provides SCE with up to:

- 350 MW of capacity and approximately 40 percent of the energy from Hyatt-Thermalito,

TABLE 11-1

Power Contracts, by Title and Date Signed

Contract Title and Date Signed	*Name of Contractor*	*Purpose*	*Effective Through*
1. West Branch Cooperative Development (9/2/66)	Los Angeles Department of Water and Power	Provides for joint development of Castaic Power Project on California Aqueduct, West Branch	Dec. 31, 2014
2. Extra High Voltage (EHV) Intertie (8/1/67)	Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company	Provides transmission of 300 MW of EHV from Oregon border to specific points in California by SWP and purchase of off-peak energy to extent of purchased transmission capacity	Dec. 31, 2004
3. Fourth Supplemental Resolution, Oroville (9/28/77)	Department of Water Resources (DWR) Resolution	Replaces power sale contract; effective 4/1/83	Repayment of last bonds or Nov. 29, 2017, whichever later
4. District-State Hydroelectric Power Sale Contract (1/9/78)	Metropolitan Water District of Southern California	Provides for purchase of output from five small hydro developments totaling 29.5 MW of capacity; effective 4/1/83	At least to Mar. 31, 2008
5. San Diego Gas and Electric Company EHV Settlement (5/25/78)	San Diego Gas and Electric Company	Establishes extent of SDG&E obligation to supply off-peak energy during the remaining term of EHV contract and resolves disputes concerning Department of Water Resources use of its EHV transmission entitlement	Dec. 31, 2004
6. Reid Gardner Unit 4 Participation (7/11/79)	Nevada Power Company	Establishes joint ownership of an additional unit at an existing coal-fired plant near Las Vegas	July 25, 2013
7. Southern California Edison-Department of Water Resources 1979 (10/11/79)	Southern California Edison Company	Establishes rate of SCE off-peak energy under EHV contract; effective 1/1/83	Dec. 31, 2004
8. Firm Transmission Service Agreement (10/11/79)	Southern California Edison Company	Provides transmission service between El Dorado and Vincent substations for Reid Gardner	July 25, 2013
9. Power Contract (10/11/79)	Southern California Edison Company	Beginning 4/1/83, provides: a. Transmission service in SCE service area b. Rights to purchase up to 300 MW firm capacity and/or spinning reserves c. Rights to purchase off-peak energy d. Exchanges of off-peak energy for 485 MW of DWR on-peak capacity	Dec. 31, 2004
10. Pine Flat (11/6/79)	Kings River Conservation District	Purchases hydroelectric output from Pine Flat Power Plant	Mar. 31, 2034
11. Emergency Service Agreement (7/21/80)	Southern California Edison Company	Establishes emergency service between parties	Dec. 31, 2004
12. Capacity Exchange Agreement (9/17/81)	Southern California Edison Company	Effective 4/2/87, exchanges 225 MW of on-peak capacity from Hyatt-Thermalito for: a. Up to 600 MW of SCE capacity during off-peak periods b. Up to 225 MW of SCE capacity during partial-peak periods c. A 75 percent reduction in transmission service charges for transmission under power contract and firm transmission service agreement d. An annual payment of $900,000 to DWR	Dec. 31, 2004
13. Power Sale Agreement (5/14/82)	TERA Power Corporation	Provides for sale of energy to Department from wind-powered generation facilities constructed by TERA	May 2, 2002
14. Generation Replacement Agreement (6/14/82)	Southern California Edison Company	Provides energy from DWR resources to replace lost generation of two SCE plants on San Bernardino Valley Municipal Water District System	May 31, 2012

TABLE 11-1
Power Contracts, by Title and Date Signed (Continued)

Contract Title and Date Signed	*Name of Contractor*	*Purpose*	*Effective Through*
15. Southern California Edison EHV Settlement Agreement Pacific Gas and Electric EHV Settlement Agreement (12/31/82)	Southern California Edison Company/ Pacific Gas and Electric Company	Establishes extent of DWR's ability to exercise its rights to 300 MW of EVH transmission from Pacific Northwest. PG&E agreement also defines rate for EHV off-peak energy purchases	Dec. 31, 2004/ Jan. 1, 2005
16. Interchange Agreement (6/29/83)	San Diego Gas and Electric Company	Exchanges energy between SDG&E and DWR	July 31, 2010
17. Greg Avenue Powerplant Energy Exchange Agreement (8/29/83)	Los Angeles Department of Water and Power	Exchanges DWR entitlement to Greg Avenue Powerplant energy for credit and off-peak energy	Until terminated by either party upon two-year advance written notice
18. Economy Energy Agreement (9/22/83)	Los Angeles Department of Water and Power	Permits sale of economy energy bilaterally	Until terminated by either party
19. Coordination Agreement between Southern California Edison and Department of Water Resources (10/8/83)	Southern California Edison Company	Sells nonfirm energy to SCE; allows short-term exchanges; allows SCE to bank energy at San Luis Reservoir; allows for seasonal capacity and energy exchange	Dec. 31, 2005
20. Energy Interchange Agreement (6/6/84)	Tucson Electric Power Company	Permits sale of economy energy bilaterally	Dec. 31, 2008
21. Energy Interchange Agreement (7/27/84)	City of Glendale	Permits sale of economy energy bilaterally	Dec. 31, 2012
22. Energy Interchange Agreement (7/27/84)	City of Pasadena	Permits sale of economy energy bilaterally	Dec. 31, 2011
23. Energy Interchange Agreement (7/27/84)	City of Riverside	Permits sale of economy energy bilaterally	Dec. 31, 2013
24. Energy Interchange Agreement (7/31/84)	City of Burbank	Permits sale of economy energy bilaterally	Dec. 31, 2013
25. Interconnection Agreement (7/31/84)	Nevada Power Company	Permits sale of economy energy bilaterally	Dec. 31, 2006
26. Energy Interchange Agreement (9/17/84)	City of Anaheim	Permits sale of economy energy bilaterally	Dec. 31, 2013
27. Service Agreement (11/1/84)	Montana Power Company	Permits sale of economy energy bilaterally	Until terminated by either party
28. Economy Energy Agreement (11/6/84)	Salt River Project	Permits sale of economy energy bilaterally	Dec. 31, 2013
29. Energy Interchange Agreement (12/1/84)	Northern California Power Agency	Permits sale of economy energy bilaterally	Dec. 31, 2009
30. Southern California Edison-Department of Water Resources Interruptible Transmission Service Agreement (12/19/84)	Southern California Edison Company	Provides interruptible transmission service between Palo Verde Generating Station and Vincent Substation, between El Dorado and Mead substations, and so forth	Dec. 31, 2004
31. Service Agreement (1/7/85)	Idaho Power Company	Sells firm and nonfirm energy to DWR	Until terminated by either party
32. Energy Interchange Agreement (4/18/85)	El Paso Electric Company	Permits sale of economy energy bilaterally	Dec. 31, 2010
33. Interconnection Agreement (4/18/85)	Portland General Electric Company	Permits sale of economy energy bilaterally	Dec. 31, 2010
34. Energy Interchange Agreement (4/30/85)	Seattle City Light	Permits sale of economy energy bilaterally	Dec. 31, 2015
35. Interconnection Agreement (4/30/85)	Pacific Power and Light Company	Permits sale of economy energy bilaterally	Dec. 31, 2009
36. Power and Energy Interchange Agreement (6/3/85)	Arizona Public Service Company	Permits sale of economy energy bilaterally	Dec. 31, 2010
37. Service Agreement (8/13/85)	Washington Water Power Company	Sells nonfirm energy to DWR	Until terminated by either party

TABLE 11-1
Power Contracts, by Title and Date Signed (Continued)

Contract Title and Date Signed	*Name of Contractor*	*Purpose*	*Effective Through*
38. Energy Interchange Agreement (8/20/85)	City of Santa Clara	Permits sale of economy energy bilaterally	Dec. 31, 2008
39. Service Agreement (9/1/85)	Western Area Power Administration (Sacramento Area Office)	Sells nonfirm energy to Western Area Power Administration	Dec. 31, 2004
40. Bonneville Power Administration (9/5/87)	Bonneville Power Administration	Provides for purchase of surplus BPA energy at Oregon-California border	Dec. 4, 2017
41. Department of Water Resources-Metropolitan Water District Coordination Agreement (2/26/88)	Metropolitan Water District of Southern California	Provides for bilateral energy transactions and exchanges; SWP and MWD Colorado River Aqueduct operations coordination	Sep. 30, 2017
42. Energy Interchange Agreement (4/7/88)	City of Vernon	Permits sale of economy energy bilaterally	Dec. 31, 2013
43. Energy Interchange Agreement (4/12/88)	Eugene Water and Electric Board	Permits sale of economy energy bilaterally	Dec. 31, 2013
44. Capacity/Energy Interchange (9/13/88)	Modesto Irrigation District	Sells capacity and associated energy to MID as available; bilateral sale of economy energy	Dec. 31, 2017
45. Agreement of Cotenancy in the Castle Rock Junction-Lakeville 230-kV Transmission Line (5/10/89)	Pacific Gas and Electric Company, Northern California Power Agency, and City of Santa Clara	Establishes transmission ownership of Castle Rock Junction-Lakeville 230-kV transmission line	Dec. 31, 2014
46. Castle Rock Junction-Lakeville Transmission Service Agreement (5/10/89)	Northern California Power Agency and City of Santa Clara	Provides transmission service to NCPA and City of Santa Clara	Dec. 31, 2014
47. Interchange Agreement (8/15/89)	Turlock Irrigation District	Permits sale of economy energy bilaterally	Dec. 31, 2013
48. Agreement for Sale of Interruptible Energy (10/1/89)	British Columbia Power Export Corporation	Sells B. C. Hydro surplus interruptible energy to DWR	Dec. 31, 2010 or on one-month notice by either party
49. Power Sale Agreement (11/18/92)	City of Vernon	Sells firm capacity and associated energy, 1993-1994	Dec. 31, 1993
50. Power Sale Agreement (3/31/90)	Modesto Irrigation District	Sells firm capacity and associated energy, 1991-1992	Dec. 31, 1994
51. Capacity/Energy Interchange (11/13/90)	Sacramento Municipal Utility District	Permits bilateral sale of capacity and associated energy, and economy energy	Dec. 31, 2015
52. Power Sale Agreement (12/13/90)	Turlock Irrigation District	Allows 1993-94 sale of firm capacity and associated energy	Dec. 31, 1994
53. Power Purchase Agreement (4/28/91)	Pacific Power and Light Company	System purchase of firm capacity and associated energy (100 MW)	Dec. 31, 2004
54. Power Sale Agreement (12/23/92)	Modesto Irrigation District	Sells capacity and associated energy, 1993-1997 associated energy	Dec. 31, 1997
55. Energy Purchase Agreement (6/14/82)	San Bernardino Valley Municipal Water District	Provides for SBVMWD to pay for energy supplied to SCE under the Generation Replacement Agreement, and gives DWR the option to develop four small hydro plants on the SBVMWD system	May 31, 2012
56. Comprehensive Agreement (4/22/82)	Pacific Gas and Electric Company	Provides 1,355 MW of firm energy transmission service in PG&E service areas effective 4/1/83	Dec. 31, 2004 with option for 10-year extension
57. Power Sale Agreement (4/27/92)	City of Riverside	Permits sale of capacity and associated energy (20 MW, May to October)	Until terminated by either party

- 120 MW of capacity and all the energy generated by Devil Canyon Powerplant units 1 and 2, and
- 15 MW of capacity and all the energy generated by Alamo Powerplant.

In return, the Department receives off-peak energy from SCE equal to the amount of energy provided to SCE from Hyatt-Thermalito, Devil Canyon Powerplant, and Alamo Powerplant plus an additional amount of energy as payment for the capacity. The amount of additional energy is determined annually based on the Capacity-Energy Exchange Formula defined in the 1979 Power Contract. The formula determines the value of capacity in dollars and converts the dollar amounts into an equivalent amount of off-peak energy.

According to terms of the CEA, each year the Department must provide 412.5 million kWh of energy to SCE during on-peak periods at a maximum delivery rate of 225 MW. SCE returns, during mid-peak and off-peak periods, approximately 110 percent of the energy the Department provides.

In addition, SCE waives 75 percent of its charges to the Department for specified firm transmission service provided to SWP pumping and generating facilities. SCE also makes an annual payment of $900,000 to the Department.

The Department contracts for the energy output of five hydroelectric plants owned and operated by the Metropolitan Water District of Southern California. The total capacity of those plants is 30 MW. To use this resource efficiently, the Department included it in the exchange arrangements with SCE.

According to terms of the 1979 Power Contract, SCE receives energy from four of the powerplants—Lake Mathews, Foothill Feeder, San Dimas, and Yorba Linda. In return, the Department receives off-peak energy from SCE averaging 107 percent of the total energy provided to SCE from those plants. All the energy from the fifth plant—Greg Avenue—is provided to LADWP according to a 1983 agreement between LADWP and the Department. The utility returns 98.8 percent of this energy to the Department during off-peak periods.

Purchases. The Department obtains a significant amount of energy through long-term and short-term purchase agreements with utilities in California, the Northwest, and the Southwest.

Long-Term Purchases . The Department purchases hydroelectric energy generated by other utilities. The output of the 165 MW Pine Flat Powerplant, owned and operated by the Kings River Conservation District, supplies the SWP about 400 million kWh of energy in median water years.

The Department purchases wind-generated energy from TERA Power Corporation. The energy is delivered from the Bethany Wind Park to the South Bay Pumping Plant near Tracy. Originally TERA installed 168 wind machines, with a total capacity of 9.45 MW. However, because of mechanical failures and subsequent litigation involving the developer, investors, and manufacturers, many machines are out of service. As of December 1994, approximately 50 units were generating about 4.8 million kWh.

The Department signed an agreement with PacifiCorp of Portland, Oregon, to purchase 100 MW of firm capacity and associated energy. That agreement was effective June 1, 1991, and will continue through 2004.

Short-Term Purchases. The Department contracted with Pacific Gas and Electric Company, SCE, and Bonneville Power Administration (a federal agency created to market energy) to purchase power when needed.

Additionally, according to terms of the 1988 Coordination Agreement between the Department and MWDSC, the Department may purchase surplus energy from MWDSC's Colorado River Aqueduct system. The Coordination Agreement provides for coordinated operation between the SWP and MWDSC's

Colorado River Aqueduct system. It also provides for

- monthly surplus firm energy sales to MWDSC;
- economy energy sales to MWDSC;
- surplus energy purchases from the Colorado River Aqueduct system; and
- energy exchanges between the Department and MWDSC.

As of December 1994, the Department also had 27 other agreements to purchase interruptible economy energy to satisfy unexpected, short-term energy shortages. Table 11-1 presents information about contracts for economy energy sales, purchases, transmission services, and long-term power agreements.

Contractual Transmission Arrangements

Although able to acquire transmission independently, the Department depends on other sources for transmission services. PG&E and SCE are the Department's primary providers of transmission service between SWP power resources and pumping loads and interconnected utilities for purchases, sales, and exchanges of power.

Long-Term Transmission Service. Under the Comprehensive Agreement with PG&E, the Department receives 1,355 MW of firm transmission service over the PG&E transmission system between SWP pump loads and power resources in Northern and Central California. The agreement allows the Department to request and receive additional firm and interruptible transmission service if needed.

To interconnect the SWP loads and resources in Southern California, the Department receives transmission service from SCE over the SCE transmission system under the SCE-DWR Power Contract and Firm Transmission Service Agreement.

The Department arranged for 300 MW of long-term transmission entitlement under the 1967 EHV Contract with PG&E, SCE, and the San Diego Gas and Electric Company.

Other SWP transmission needs are currently met by contractual arrangements with California utilities.

The Department works with various public and private utilities to study the need for and feasibility of additional transmission capacity between Northern and Southern California and the Southwest.

Midway-Wheeler Ridge. The 1982 Extra High Voltage Settlement Agreement with PG&E gave the Department the option to purchase 75 percent of the Midway-Wheeler Ridge transmission lines. In early 1989, the Department exercised its option and purchased a 75-percent share of the lines from PG&E. The Department's purchase consists of 49.5 circuit-miles of 230 kV double circuit transmission from Midway Substation to the interconnection point of the Chrisman Pumping Plant and 3 circuit-miles of tap lines to Buena Vista, Teerink, and Chrisman Pumping Plants.

The Geysers Transmission. The 1982 Comprehensive Agreement with PG&E provided the Department the option to purchase a share of the 230 kV double circuit transmission line between Castle Rock Junction in the Geysers Area and the Lakeville Substation. In 1984, the Department exercised that option and purchased 165 MW of the transmission line. The Department, along with the Northern California Power Agency, the City of Santa Clara, and PG&E, entered into the Agreement of Cotenancy in the Castle Rock Junction-Lakeville 230 kV Transmission Line to set forth their rights and obligations as tenants-in-common and for the use, operation, and maintenance of that transmission line.

Because of a reduction in the Department's generation resources in the Geysers area, the Department did not need its full 165 MW share of this line. Therefore, the Department entered into the Castle Rock-Lakeville Transmission Service Agreement with North-

ern California Power Agency and the city of Santa Clara in April 1989. For more information about the amounts and types of service, see Table 11-A.

Reinforcements and Additional Facilities. As provided in the Comprehensive Agreement with PG&E, the Department requested that the utility add hardware reinforcements to the transmission system between Los Banos and Midway substations. Those reinforcements were requested to reduce the curtailment of firm transmission service between Department resources and loads. PG&E determined that reinforcements, estimated at more than $85 million, could be delayed and possibly avoided if the Department would be willing to drop portions of SWP pump load and generation during certain PG&E transmission system emergencies.

In response, the Department worked with PG&E to develop a Remedial Action System to ensure that dropping portions of pump load and generation would increase service reliability without adversely affecting SWP operations. The remedial action system was constructed and declared operational July 22, 1993, at a cost to the Department of about $5 million. As of that date, the Department began receiving more reliable transmission service.

Pacific Northwest Intertie. In August 1967, the Department contracted for 300 MW of transmission capacity on the EHV Pacific Northwest Intertie from the California-Oregon border to the Table Mountain, Tesla, Los Banos, and Midway substations. The Department retains its entire 300 MW share of EHV capacity for access to the Pacific Northwest until 2005; 100 MW of this capacity is committed to receiving the long-term purchase of 100 MW from PacifiCorp.

California Oregon Transmission Project. In December 1984, the Department signed a memorandum of understanding with many public and private California utilities. As implemented in the Interim Participation Agreement and the Long-Term Participation Agreement, the Department has an option (which can be exercised during a 5-year period beginning in January 2005) to purchase 97 MW of transmission capacity on the third 500 kV transmission line that connects California with the Pacific Northwest. The transmission line

TABLE 11-A
Castle Rock-Lakeville Transmission Service Agreement

Type of Service	*Amount of Service*	*Years of Service*
Long-Term Transmission Service		
NCPA	24.0 MW	through Dec. 31, 2014
Santa Clara	31.0 MW	through Dec. 31, 2014
Short-Term Transmission Service		
NCPA	48.457 MW	through May 31, 1996
	9.7 MW	June 1, 1996, through Dec. 31, 1996
Santa Clara	6.543 MW	through Sep. 30, 1996
Additional Transmission Service		
NCPA	11.9 MW	June 1, 1996, through Dec. 31, 1996
	16.0 MW	January 1, 1997, through December 31, 1997
Santa Clara	0.5 MW	January 1, 1994, through December 31, 1994

began operation March 17, 1993. The LPA has been executed by all the participants except one; therefore, operation of the California Oregon Transmission Project continues under the terms of the IPA.

Power Contract. Pursuant to the Power Contract with SCE, the Department requested that the utility upgrade and install the necessary additional transmission facilities between Devil Canyon Powerplant and Calelectric Substation to accommodate the increased generating capability of the Devil Canyon Powerplant.

Load Management

Through an extensive computerized network, the SWP controls the timing of its pumping load. That control system allows the Department to minimize the cost of power it purchases by maximizing pumping during off-peak periods when power costs are lower—usually at night—and to sell power to other utilities during on-peak periods when power values are high. By taking advantage of this flexibility in scheduling SWP pumping load and generation, the Department reduces the net cost of power needed for SWP deliveries.

Sales of Excess Power. When generation from SWP power resources occasionally exceeds requirements, the Department sells the excess power on the market. Currently, the Department has contracts with about 30 utilities and marketers for short-term purchase, sale, or exchange of power. In addition to selling firm power, the Department may sell power on a day-to-day or hour-to-hour basis according to the terms of its interchange agreements and of the Western System Power Pool agreement. These agreements provide the basis for making economy energy transactions, short-term capacity and energy sales or exchanges, unit commitments, and transmission service purchases. Through these contracts, the Department sells excess capacity and energy at market rates.

In determining the most advantageous time to sell power, the Department considers projected SWP operations and changes in the power market as well as energy losses and transmission and dispatching costs.

SWP Power Operation in 1994

Tables 11-2 through 11-5 present statistical information about SWP power operation for calendar year 1994, including energy consumed and generated, energy exchanged and purchased, and power sold.

Energy Consumed

In 1994, energy used at the 22 SWP pumping and power plants totaled 5.1 billion kWh. Table 11-2 shows the amount of energy used each month at SWP pumping and power plants to operate the SWP.

According to terms and conditions of various water conveyance contracts and exchange agreements, some water belonging to the Central Valley Project is pumped through the SWP Harvey O. Banks Delta Pumping Plant and through the CVP-SWP joint-use facilities at Dos Amigos Pumping Plant and William R. Gianelli Pumping-Generating Plant. USBR furnishes the energy for pumping this water.

Energy Generated

Table 11-3 shows amounts of energy generated at SWP facilities in 1994, as well as energy purchased for SWP operations.

Hydroelectric and Coal. The Hyatt-Thermalito power complex in Oroville produces a large amount of SWP energy. In 1994, Hyatt-Thermalito generated 1.5 billion kWh of energy. That amount was about 60 percent of the amount generated in 1993. The decrease in generation was due to below-average rainfall in the Feather River watershed during calendar year 1994.

Energy generated at SWP recovery plants--Alamo, Devil Canyon, William R. Gianelli, and William E. Warne--totaled about

TABLE 11-2

Energy Used at Pumping Plants and Power Plants in 1994, by Month

(Millions of Kilowatt-Hours)

Pumping Plants and Power Plants	Month												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Hyatt-Thermalito Pumping-Generating Plant (pumpback and station service)	14.03	7.44	26.32	31.55	15.10	34.38	12.93	24.63	31.98	25.60	32.16	54.01	310.13
North Bay Interim Pumping Plant	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Barker Slough Pumping Plant	0.42	0.36	0.49	0.60	0.68	0.96	0.75	0.82	0.76	0.79	0.46	0.51	7.60
Cordelia Pumping Plant	0.69	0.62	0.47	0.84	0.89	0.83	0.73	1.01	0.95	0.57	0.66	0.79	9.05
South Bay Pumping Plant	7.89	8.45	10.24	14.21	14.90	11.25	12.09	13.56	9.58	4.81	3.51	4.08	114.57
Bottle Rock Powerplant (station service)	0.11	0.11	0.10	0.07	0.07	0.06	0.05	0.06	0.06	0.07	0.07	0.07	0.90
Del Valle Pumping Plant	0.01	0.06	0.10	0.26	0.42	0.06	0.01	0.01	0.01	0.01	0.01	0.02	0.98
Harvey O. Banks Delta Pumping Plant	61.89	30.54	33.06	6.19	12.90	6.08	28.65	47.92	62.10	48.30	60.97	69.22	467.82
William R. Gianelli Pumping-Generating Plant (SWP share)	114.62	64.81	10.71	32.71	0.10	0.13	1.13	11.25	50.83	42.00	-0.02	67.64	395.91
Dos Amigos Pumping Plant (SWP share)	18.97	19.66	14.81	20.44	24.08	35.42	44.88	28.09	12.37	8.26	7.26	7.85	242.09
Buena Vista Pumping Plant	22.91	12.92	18.28	27.60	31.72	34.12	44.79	28.43	15.62	11.45	9.45	8.42	265.71
John R. Teerink Wheeler Ridge Pumping Plant	24.86	12.71	17.19	28.46	33.65	32.38	42.69	26.92	16.18	12.35	10.35	9.20	266.94
Ira J. Chrisman Wind Gap Pumping Plant	56.57	28.85	38.52	64.38	76.16	71.68	95.14	60.30	36.01	27.30	22.85	20.56	598.32
A. D. Edmonston Pumping Plant	201.86	101.10	136.10	227.69	267.20	249.39	333.11	208.02	124.83	94.91	80.59	72.37	2,097.17
Alamo Powerplant (station service)	0.06	0.05	0.05	0.06	0.06	0.06	0.08	0.08	0.08	0.07	0.05	0.06	0.76
Pearblossom Pumping Plant	19.91	1.74	5.04	36.03	36.94	42.01	47.62	27.34	24.07	15.80	13.71	15.60	285.81
Devil Canyon Powerplant (station service)	0.19	0.16	0.10	0.09	0.04	0.00	0.05	0.21	0.12	0.21	0.26	0.25	1.68
Oso Pumping Plant	15.63	11.67	13.43	10.98	14.86	10.18	17.33	11.11	3.13	3.72	3.36	1.60	117.00
William E. Warne Powerplant (station service)	0.05	0.04	0.01	0.01	0.03	0.08	0.02	0.08	0.13	0.09	0.09	0.14	0.77
Las Perillas Pumping Plant	0.15	0.25	0.53	0.78	0.88	1.38	1.62	1.14	0.42	0.33	0.08	0.10	7.66
Badger Hill Pumping Plant	0.34	0.63	1.42	2.09	2.33	3.69	4.37	3.02	1.06	0.84	0.17	0.21	20.17
Subtotal	449.30	238.55	321.05	472.51	533.02	534.07	686.99	488.29	363.33	257.18	282.58	319.64	4,946.51
High voltage transmission losses	12.16	14.97	18.50	10.17	8.90	12.41	12.90	11.69	14.25	8.37	14.61	14.53	153.46
Total Energy Required	**461.36**	**253.52**	**339.55**	**482.68**	**541.92**	**546.48**	**699.89**	**499.98**	**377.58**	**265.55**	**297.19**	**334.17**	**5,099.97**

TABLE 11-3

Energy Generated and Purchased in 1994, by Month

(Millions of Kilowatt-Hours)

Sources of Energy	Month												
	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*	*Total*
SWP Energy Sources													
Hyatt-Thermalito Powerplant	77.97	51.69	76.01	125.15	168.38	185.18	215.56	172.93	137.85	120.33	80.10	89.49	1,500.64
William R. Gianelli Pumping-Generating Plant (SWP share)	0.00	0.00	7.11	31.65	27.46	57.76	36.18	13.89	1.60	(0.01)	0.00	0.97	176.61
Alamo Powerplant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	1.18	2.27
Devil Canyon Powerplant	15.64	11.73	22.60	45.24	70.89	86.49	72.88	48.06	41.60	24.90	18.63	26.25	484.91
Reid Gardner Unit 4 (a	120.28	121.81	102.84	114.23	(1.85)	98.11	125.48	133.32	109.43	82.30	107.37	93.01	1,206.33
William E. Warne Powerplant	32.26	24.68	30.04	24.50	31.20	20.83	36.07	23.07	6.54	7.60	9.28	3.12	249.19
Subtotal	246.15	209.91	238.60	340.77	296.08	448.37	486.17	391.27	297.02	235.12	216.47	214.02	3,619.95
Energy Sources from Long-Term Agreements (b													
Castaic Powerplant	39.05	47.85	46.30	39.00	51.27	33.63	61.54	34.47	11.81	12.04	18.26	11.31	406.53
Metropolitan Water District of Southern California hydroelectric powerplants	10.89	7.95	8.12	10.54	17.48	18.54	15.89	14.35	13.66	9.61	9.65	9.57	146.25
Pine Flat Powerplant	(0.16)	1.05	4.31	14.02	28.76	90.88	55.14	9.15	(0.19)	(0.20)	0.00	(0.19)	202.57
TERA Power Corporation	(0.02)	0.02	0.18	0.56	0.72	0.72	0.97	0.82	0.57	0.18	0.08	(0.02)	4.78
PacifiCorp	52.05	47.76	54.00	52.00	52.19	52.41	52.00	54.00	50.18	56.10	43.20	47.91	613.80
Power exchange delivered to SCE	(71.48)	(71.68)	(111.85)	(147.71)	(183.96)	(234.08)	(222.47)	(177.38)	(162.02)	(122.51)	(104.68)	(95.32)	(1,705.14)
Power exchange received from SCE	364.12	289.44	272.35	346.00	252.37	227.14	336.91	403.30	319.83	277.29	367.09	357.78	3,813.62
SCE-SBVMWD Generation Replacement Energy	0.00	(1.56)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.56)
Power System Deviations Account Transactions	1.34	(0.08)	(0.39)	1.02	0.81	(0.47)	0.30	(0.78)	(0.44)	(1.37)	2.02	(1.04)	0.92
Subtotal	395.79	320.75	273.02	315.43	219.64	188.77	300.28	337.93	233.40	231.14	335.62	330.00	3,481.77
Short-Term Purchases (b													
Bonneville Power Administration	0.00	0.00	0.00	0.00	12.01	5.30	4.55	0.00	0.00	0.00	0.00	0.00	21.86
Eugene Water and Electric Board	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.40
Los Angeles Department of Water and Power	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
Pacific Gas and Electric Company	0.55	0.00	0.00	0.00	0.00	2.38	0.08	0.00	0.00	0.00	0.00	0.00	3.01
Portland General Electric	10.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.11
Salt River Project	0.00	0.00	0.60	0.00	18.98	7.68	21.04	2.92	20.10	15.23	0.00	8.91	95.46
Southern California Edison Company	0.60	0.00	0.00	0.00	22.90	4.28	0.00	0.00	0.00	0.00	0.00	0.00	27.78
Subtotal	11.26	0.00	0.60	0.00	55.09	19.64	25.67	2.92	20.10	15.63	0.00	8.91	159.82
Total Energy Generated and Purchased	653.20	530.66	512.22	656.20	570.81	656.78	812.12	732.12	550.52	481.89	552.09	552.93	7,261.54
Less Energy Sales (a	(191.74)	(277.14)	(172.67)	(173.52)	(28.89)	(110.30)	(112.23)	(232.14)	(172.94)	(216.34)	(254.90)	(218.76)	(2,161.57)
Total Energy Provided to the SWP	**461.46**	**253.52**	**339.55**	**482.68**	**541.92**	**546.48**	**699.89**	**499.98**	**377.58**	**265.55**	**297.19**	**334.17**	**5,099.97**

a) The upgrade energy of 94,618 MWh from Reid Gardner Unit 4 is not included.

b) Amounts show actual energy available for SWP use and include transmission losses, return energy provided for by specific contracts, and other necessary adjustments.

913 million kWh in 1994, about 50 percent more than the amount generated in 1993.

In 1994, the SWP share of energy generated at the coal-fired Reid Gardner Unit 4 totaled 1.21 billion kWh.

Contractual Resource Arrangements and Cost

SWP power operations rely on contractual arrangements as well as SWP facilities. Those contractual arrangements include joint development projects, energy exchanges, purchases, and transmission. (See Table 11-1.)

Joint Development. Through the West Branch Cooperative Development Agreement with LADWP, the Department receives energy based on the amount of water scheduled through the West Branch. In 1994, LADWP provided 406.5 million kWh for the Department's share of energy generated at Castaic Powerplant.

Energy Exchanges. The Department has two agreements with SCE to purchase and/or exchange power. According to terms of the 1979 Power Contract (in effect since April 1983), part of the output of the Hyatt-Thermalito complex and all output of Alamo and Devil Canyon powerplants are delivered to SCE. Generally, the energy is delivered to SCE during on-peak periods and is returned to the Department during off-peak periods. Additional energy is delivered to the Department during off-peak periods for payment of capacity made available to SCE. According to the terms of the CEA, which has been in effect since April 1987, the Department delivers energy to SCE each year during on-peak periods and, in return, receives a greater amount of off-peak energy as well as transmission considerations. Those two exchange agreements resulted in a net of about 2.11 billion kWh to the SWP in 1994.

If conditions are favorable, the Department will occasionally enter into energy exchanges with other utilities.

Purchases and Costs. In 1994, the Department purchased 1.12 billion kWh of energy at a cost of $20.28 million. Associated costs for capacity, transmission, and dispatching services totaled $26.39 million. Other SWP power costs, including those for debt service at Pine Flat Powerplant, totaled $22.43 million. See Table 11-4 for amounts of power, transmission, and other services purchased in 1994 and costs of purchases.

Long-Term Purchases. According to terms of the Kings River Conservation District contract, the Department receives the total output of the 165 MW Pine Flat Powerplant. The plant provided over 207 million kWh to the SWP in 1994 at a total cost of $1.6 million.

The Department also has two other contracts for purchasing energy. One contract is with PacifiCorp, from which the Department purchased 614 million kWh in 1994; the other contract is with TERA Power Corporation for energy produced at Bethany Wind Park near South Bay Pumping Plant. About 50 wind turbines were operational at the end of 1994 and provided about 4.8 million kWh of wind-generated energy during the year.

Under the MWDSC Small Hydro Contract, the Department received 136 million kWh of energy in 1994 from five small hydroelectric power plants on the MWD system at a cost of $6.3 million.

The net gain to SWP during 1994 from its long-term contracts was 3.48 billion kWh (see Table 11-3).

Short-Term Purchases. Existing resources and long-term power and transmission contracts ensure that the SWP has enough power to meet long-term needs. Periodically, when SWP power requirements exceed resources during daily operations, short-term purchases meet the difference.

In 1994, the SWP purchased short-term energy from seven utilities. The short-term energy purchases totaled 159.8 million kWh (Table 11-3).

TABLE 11-4

Power, Transmission, and Other Services Purchased in 1994 and Costs of Purchases, by Area

Name of Supplier	Type of Service Purchased	Energy (kwh)	Energy Cost (Dollars)	Capacity and Transmission Cost (Dollars)	Total Cost (Dollars)
Power and Transmission Purchases					
Northwest Area					
Bonneville Power Administration	Firm and nonfirm energy	21,855,000	383,060		383,060
PacifiCorp (a	Firm and nonfirm energy; capacity	613,795,000	9,425,485	16,358,010	25,783,495
Portland General Electric Company	Firm energy	10,109,000	247,671		247,671
Northern California Area					
Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas and Electric Company	EHV transmission			1,500,000	1,500,000
Kings River Conservation District	Hydroelectric energy	206,561,745	1,576,397		1,576,397
Pacific Gas and Electric Company	Firm and nonfirm energy; transmission and capacity	3,005,000	63,825	3,798,151	3,861,976
TERA Power Corporation	Wind energy	4,777,416	326,059		326,059
Southern California Area					
Los Angeles Department of Water and Power	Nonfirm energy	1,200,000	33,336	99,371	132,707
Metropolitan Water District of Southern California	Hydroelectric energy	135,988,916	6,305,806		6,305,806
Southern California Edison Company	Firm and nonfirm energy; transmission	27,775,000	481,125	3,128,794	3,609,919
Southwest Area					
ENRON Power Marketing, Inc.	Nonfirm energy	400,000	4,000		4,000
Nevada Power Company				1,502,821	1,502,821
Salt River Agricultural Improvement and Power District	Nonfirm energy	95,453,000	1,433,807		1,433,807
Subtotal		1,120,920,077	20,280,571	26,387,147	46,667,718
Other Purchases					
Kings River Conservation District	Pine Flat operations and maintenance				3,601,932
	Pine Flat debt service				5,066,242
Los Angeles Department of Water and Power	Hydro power plant scheduling				1,150
	Sediment Removal at Castaic Powerplant				11,161
Nevada Power Company	Reid Gardner Unit 4 operations and maintenance				13,206,962
Pacific Gas and Electric Company	Midway-Wheeler Ridge and Bottle Rock transmission				150,992
	Pine Flat ownership and Lakeville Line operations and maintenance				102,092
	South Bay transformer operations and maintenance				12,433
Southern California Edison Company	FERC filings				301,579
TERA Power Corporation	South Bay transformer operations and maintenance credit				(13,159)
Subtotal					22,428,951
Total					**69,096,669**

a) Interest credit of $28,444 on annual adjustment not included.

Transmission Arrangements. SCE waives 75 percent of its charges to the Department for specified firm transmission service provided to SWP pumping and generating facilities. In 1994, the saving to the Department from SCE waiving 75 percent of its firm transmission charges was $7.84 million.

Sales of Excess Power

In 1994, the Department sold 2.26 billion kWh of energy to 24 utilities for total revenues of $52.40 million. The Department also received $7.81 million in revenues for capacity payments and transmission arrangements. See Table 11-5 for information about energy and other services sold and the revenue received.

Forecasting Power Operations

Each year after reviewing the water contractors' water delivery requests and the construction schedule for future facilities, the Department forecasts SWP power requirements through 2035. Although the Department forecasts power requirements until 2035, it pays particular attention to forecasts through 2004, the year major power contracts expire. For discussion of post-2004 operations, see "Post-2004 Studies" at the end of this chapter.

Actual SWP power requirements may vary significantly from the amounts forecasted. Those variations are due to the amount of water available and delivered in a given year. For example, dry conditions in Northern California could result in a reduction of the amount of water available for delivery. If full deliveries cannot be made, less power will be used than was originally forecasted. Power requirements could also decrease during a wet year because of the availability of water in the San Joaquin Valley or Southern California.

Conversely, power requirements could exceed the amount originally forecasted if actual water deliveries are greater than the amounts estimated. For example, if additional pumping is needed to refill reservoirs south of the Delta after an unexpected dry year, more power will be used than was initially forecasted.

Criteria

The Department bases its forecast of electric power primarily on SWP pumping power requirements to deliver water for SWP contractors' short-term and long-term water delivery requests. Requirements are based on the amount of energy to be used to deliver entitlement water requested by water contractors, including losses in reservoirs and aqueducts; recreation water; and water to replace storage in reservoirs south of the Delta.

Short-term power requirements, based on the actual water supply and reservoir storage levels, are determined for the current and two ensuing years of operation. Long-term operational studies for the remaining years are based on median-year water supply conditions and optimal reservoir storage levels.

Water Delivery Assumptions. The forecast for power requirements in 1995 was based on water supply projections made by the Department. When making the forecast, the Department assumed that 1995 water supplies would be sufficient to meet entitlement deliveries of 3.2 million acre-feet. That amount of water represents approval of full deliveries of contractors' needs in 1995.

For 1996 through 2004, the power requirements forecast was based on hydrologic conditions sufficient to meet the water contractors' full entitlement of up to 3.9 million acre-feet.

Load Management Goals. The SWP is operated to minimize pumping requirements during hours when power costs are highest. Thus, the highest power requirements or demands for SWP capacity occur during nights, weekends, and holidays, when power costs are lowest. Because the Department has the flexibility to regulate SWP pumping loads on an hourly basis, maximum SWP pumping is scheduled during the off-peak hours (10 p.m. to

TABLE 11-5

Energy Sold in 1994 and Revenue from Sales, by Area

Name of Purchaser	*Energy Sold (KWh)*	*Revenue from Energy Sales (Dollars)*	*Revenue from Capacity and Transmission Sales (Dollars)*	*Total Power Sales (Dollars)*
Pacific Northwest Area				
Bonneville Power Administration (a	89,930,000	2,000,600		2,000,600
PacifiCorp	129,993,000	2,610,117		2,610,117
Portland General Electric Company	56,250,000	1,310,317		1,310,317
Seattle City Light	62,930,000	1,430,825		1,430,825
Western Area Power Administration, Mid-Pacific	159,336,000	3,580,955		3,580,955
Northern California Area				
Hetch Hetchy Water and Power	140,275,000	3,451,875		3,451,875
Lassen Municipal Utility District (b	51,482,000	1,166,180		1,166,180
Modesto Irrigation District	187,998,000	4,327,778	2,278,500	6,606,278
Northern California Power Agency (c	153,289,000	3,502,531	258,760	3,761,291
Pacific Gas and Electric Company (d	44,900,000	1,140,244		1,140,244
Sacramento Municipal Utility District	611,332,000	13,582,258		13,582,258
City of Santa Clara (e	11,285,000	207,040	33,722	240,762
Turlock Irrigation District	63,568,000	1,786,696	2,280,600	4,067,296
Southern California Area				
City of Burbank	590,000	13,995		13,995
City of Glendale	2,070,000	52,668		52,668
Los Angeles Department of Water and Power			663,000	663,000
City of Pasadena	345,000	8,280		8,280
City of Riverside	5,902,000	179,211	810,000	989,211
Southern California Edison Company	6,049,000	120,502	905,099	1,025,601
City of Vernon	12,998,000	281,621		281,621
Southwest Area				
ENRON Power Marketing, Inc.	106,317,000	2,500,860		2,500,860
Louis Dreyfus Electric Power (f	110,222,000	2,491,849		2,491,849
Nevada Power Company	233,497,000	6,286,085	575,832	6,861,917
Salt River Agricultural Improvement and Power District	15,515,000	369,730		369,730
Total	**2,256,073,000**	**52,402,217**	**7,805,513**	**60,207,730**

a) Late payment penalty of $267 is not included.
b) Late payment penalty of $1,475 is not included.
c) Transmission line operations and maintenance charge of $13,414 is not included.
d) Transmission dispatching and scheduling charge of $4,000 is not included.
e) Transmission line operations and maintenance charge of $17,326 is not included.
f) Energy Reservation Charge of $175,000 is not included.

8 a.m. Monday through Saturday and all day on Sunday and holidays).

By scheduling as much off-peak pumping as possible, the Department can utilize neighboring utilities' inexpensive surplus generation. Conversely, the Department maximizes hydroelectric generation during the on-peak hours.

Forecasted Loads for 1996 through 2004

Total SWP energy requirements for 1996 are projected to be about 14,753 million kWh. The requirements increase to about 14,995 million kWh in 2004.

Transmission losses, included in the forecast, are about 594 million kWh in 1996; 627 million in 1999; and 630 million in 2004. Table 11-6 presents a forecast of energy to be delivered to SCE as well as the amount of firm energy to be sold to other utilities.

On-Peak. The SWP annual on-peak energy requirements are expected to increase from 6,329 million kWh in 1996 to about 7,082 million kWh in 2004 (Figure 11-2). Table 11-7 shows the Department's forecast of the peak demands or the highest on-peak and off-peak capacity requirements for 1996 and 1999.

Off-Peak. During off-peak periods, the annual energy requirement remains fairly constant at about 7,900 million kWh with the exception of 1995 through 1997, years when the short-term planning model is used (Figure 11-3). The constant level of energy requirements indicates that the SWP is operating at full capacity during off-peak periods.

Forecasted Resource Mix

The Department uses a variety of power resources to meet estimated SWP power requirements. Those requirements include power generated at SWP facilities as well as resources received through transfers, purchases, and exchanges. With the exception of the nonfirm purchases and a portion of the firm power purchases (post-1995), the Department either owns or has contracted for most of its long-term power resources.

The Department also uses a different combination of resources to meet its on-peak and off-peak energy requirements. In forecasting resources to meet pumping loads, the Department determines the amount of on-peak and off-peak energy expected from each resource from 1996 through 2004.

Years 1995 through 2004. Figures 11-2 and 11-3 illustrate the amounts of on-peak and off-peak energy the Department expects from each resource type during 1996 through 2004. The effect of maximizing hydroelectric generation during on-peak hours is indicated by a comparison of the Hyatt-Thermalito and recovery generation components included in those figures.

On-Peak. As Figure 11-4 indicates, hydroelectric generation will provide the greatest amount of on-peak energy. The combined hydroelectric energy generated from Hyatt-Thermalito and the five aqueduct recovery plants will provide about 59 percent of energy requirements forecasted during on-peak periods with Mojave Siphon operation scheduled in 1996.

Increases in on-peak energy requirements will be met with firm and nonfirm purchases.

Off-Peak. Diversity power exchanges with SCE provide a large portion of the off-peak resources. In 1996, those exchanges will provide about 4.585 billion kWh or 47 percent of the total off-peak energy used by the SWP; that amount will decrease to 3.718 billion kWh in 2004. Power purchases, along with generation from Hyatt-Thermalito, contract hydro, coal, and the recovery plants, will provide the remaining off-peak resources (Figure 11-5).

Year 1999 On-Peak. In 1999, the annual SWP on-peak energy requirements are expected to be about 7.034 billion kWh (Figure 11-2). As Figure 11-6 indicates, hydroelectric generation is expected to supply the largest amount of energy during this period. Hyatt-

TABLE 11-6

Energy Requirements for 1996, 1999, and 2004, and Full Development

(Millions of Kilowatt-Hours)

Type of Requirement	*1996*	*1999*	*2004*	*Average Year Operation After Full Development*
Pumping Plants				
North Bay Aqueduct Plants				
Barker Slough	10.5	9.6	10.4	10.2
Cordelia	11.9	12.6	14.5	14.1
South Bay Aqueduct Plants				
South Bay	148.5	162.9	162.9	162.9
Del Valle	0.8	2.0	1.9	1.9
California Aqueduct Plants				
Harvey O. Banks Delta	1,125.7	1,234.6	1,237.7	1,233.1
William R. Gianelli	165.8	281.9	295.3	289.5
Dos Amigos	514.1	533.0	534.2	534.5
Buena Vista	613.7	643.1	645.0	645.6
John R. Teerink Wheeler Ridge	713.4	748.8	751.1	751.9
Ira J. Chrisman Wind Gap	1,518.7	1,598.8	1,600.7	1,602.0
A. D. Edmonston	5,362.5	5,640.2	5658.0	5,664.1
East Branch Plants, California Aqueduct				
Pearblossom	782.8	789.8	794.0	795.7
West Branch Plants, California Aqueduct				
Oso	304.9	333.3	333.8	333.9
Coastal Branch Plants, California Aqueduct				
Las Perillas	10.6	12.7	12.7	12.7
Badger Hill	26.6	32.2	32.2	32.2
Devil's Den	15.3	34.0	34.0	34.0
Bluestone	13.7	34.0	34.0	34.0
Polonio Pass	13.1	34.0	34.0	34.0
Subtotal (a	11,352.6	12,134.3	12,186.1	
Transmission losses (b	593.8	627.3	629.9	
Total	11,946.4	12,761.6	12,816.0	
Other				
Energy obligations to Southern California Edison Company (c	2,700.8	2,188.6	2,179.3	
Firm contracts sales	105.6	0.0	0.0	
Grand Total	**14,752.8**	**14,950.2**	**14,995.3**	

a) Energy requirements are based on energy used to deliver SWP contractors' requested entitlement water, recreation water, reservoir and aqueduct losses, and replacement of reservoir storage south of the Delta. Energy requirements for 1994 are based on delivering 100 percent of entitlement requests.

b) Transmission losses are determined by contractual arrangements with utilities.

c) Energy obligations are based on existing Power Contract and Capacity Exchange Agreement with Southern California Edison Company.

TABLE 11-7

On-Peak and Off-Peak Electrical Capacity Requirements Projected for 1996 and 1999

(Thousands of Kilowatts)

Type of Requirement	1996		1999	
	On-Peak	Off-Peak	On-Peak	Off-Peak
Pumping Plants				
North Bay Aqueduct Plants				
Barker Slough	2.3	2.3	1.6	1.6
Cordelia	2.8	2.8	2.1	2.1
South Bay Aqueduct Plants				
South Bay	23.0	23.0	20.6	20.6
Del Valle	1.0	1.0	.09	.09
California Aqueduct Plants				
Harvey O. Banks Delta	123.0	252.0	240.3	249.6
William R. Gianelli	1.0	177.0	51.3	211.3
Dos Amigos	63	110.0	79.3	100.4
Buena Vista	70.0	96.0	69.3	94.3
John R. Teerink Wheeler Ridge	88.0	106.0	79.4	105.2
Ira J. Chrisman Wind Gap	187.0	221.0	174.6	223.0
A. D. Edmonston	613.0	736.0	643.6	760.4
East Branch Plants, California Aqueduct				
Pearblossom	147.0	82.0	71.6	149.7
West Branch Plants, California Aqueduct				
Oso	12.0	72.0	40.8	40.8
Coastal Branch Plants, California Aqueduct				
Las Perillas	3.0	3.0	3.2	3.2
Badger Hill	6.0	6.0	8.6	8.6
Devil's Den	4.0	4.0	5.2	5.2
Bluestone	4.0	4.0	5.2	5.2
Polonio Pass	4.0	4.0	5.2	5.2
Total Capacity Needed to Pump Entitlement Water	**1,354.1**	**1,902.1**	**1,507.2**	**1,987.1**
Other				
Firm contract sales	20	20	0	0
Transmission losses	62.0	100.0	70.2	95.8
Reserve margin (10 percent of pumping, firm sales, and losses)	237.0	237.0	128.0	128.0
Capacity to Southern California Edison Company	700.0	475.0	710.0	485.0
Total Capacity Requirements	**2,373.1**	**2734.1**	**2,415.4**	**2,695.9**

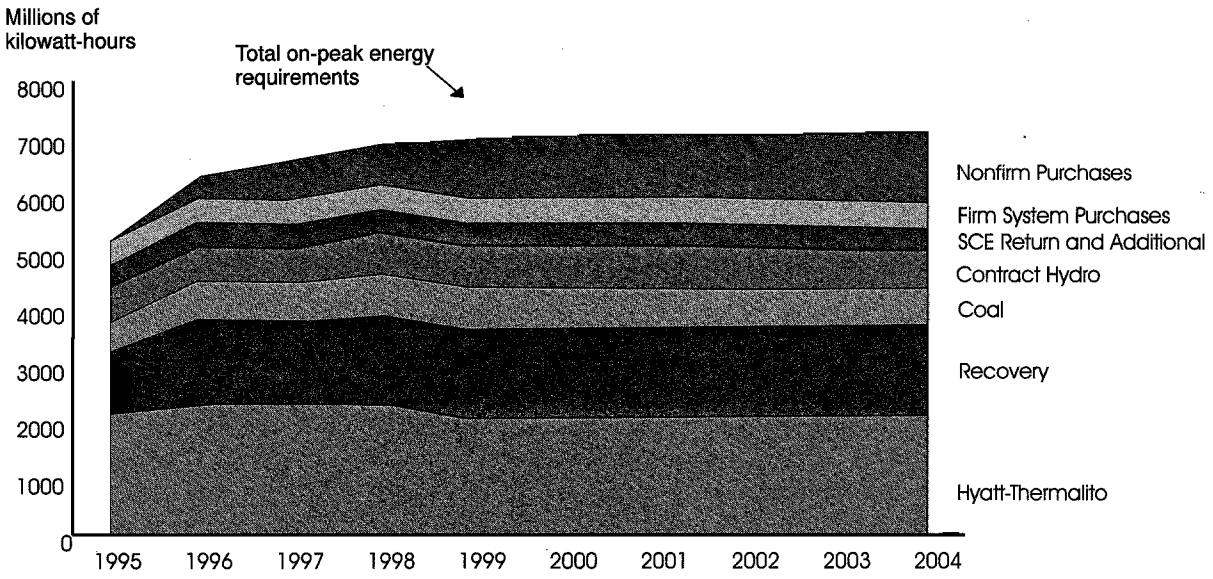


Fig 11-2. Estimated On-Peak Energy Requirements and Resources for 1995 through 2004

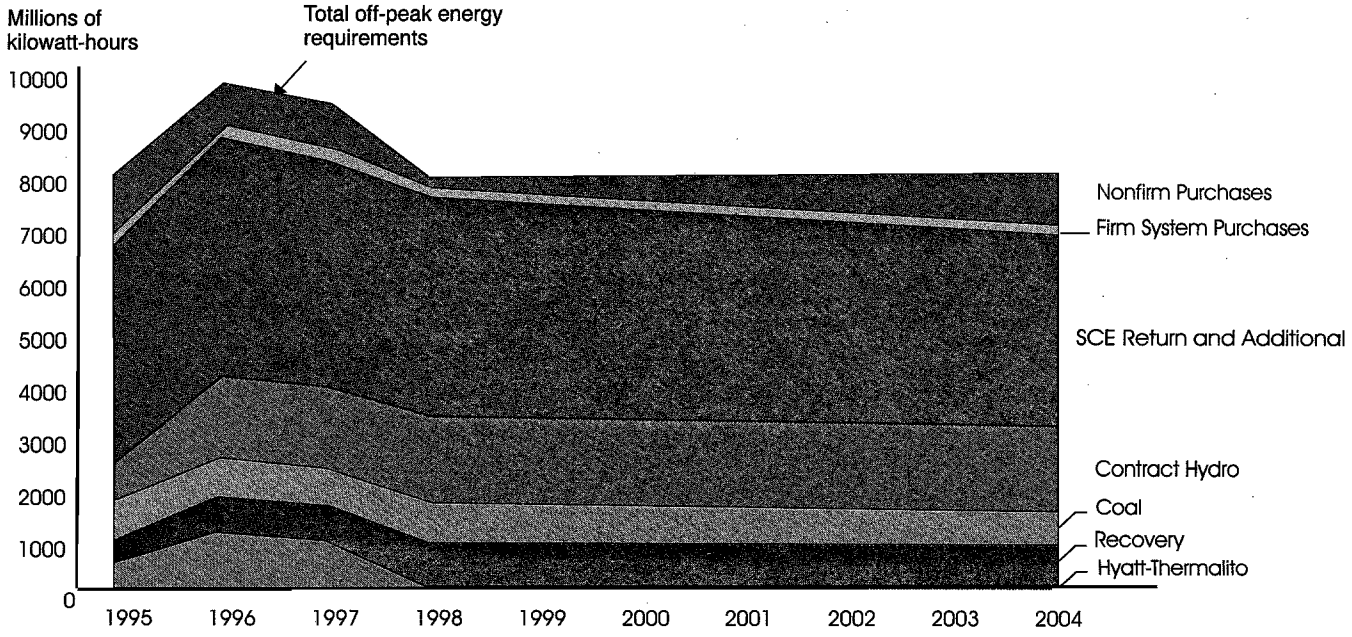


Fig 11-3. Estimated Off-Peak Energy Requirements and Resources for 1995 through 2004

Thermalito will provide about 30 percent or 2.085 billion kWh, and recovery generation will provide about 22 percent or 1.577 billion kWh.

Year 1999 Off-Peak. The annual off-peak energy requirements for 1999 are about 7.942 billion kWh (Figure 11-3). As Figure 11-7 shows, power contracts with SCE provide about 51 percent of SWP off-peak energy. In 1999, those exchanges will provide about 4.021 billion kWh.

Table 11-8 lists the amount of energy each resource is expected to produce during 1999.

Post-2004 Studies

Beginning in 2004, many of the Department's major power and transmission service contracts begin to expire. These contracts include those that collectively provide for nearly all the SWP transmission needs and also provide a large portion of energy resources.

To prepare for the expiration of these contracts, the Department formed a task force composed of engineers within the Division of Operations and Maintenance to analyze the SWP expected power requirements for the period beyond 2004 and determine the most cost effective way to meet those requirements.

Forecasting Power Costs

Currently, the Department meets SWP power requirements through a mix of the SWP's own power resources and energy obtained through contracts and exchanges. To continue meeting SWP power needs with the most economical power sources available, the Department annually estimates the:

- amount of energy to be generated by its own resources;
- amount of energy to be purchased; and
- cost of producing and purchasing energy listed above.

In forecasting the cost of meeting SWP power needs, the Department also includes energy sales. When producing power through its own resources, the SWP may temporarily have power in excess of its needs and commitments. Consequently, the Department may sell surplus power to other utilities. Payments to the Department may be made in cash or with energy from power exchanges.

Costs of Energy Resources

Costs for energy resources are based on the actual SWP cost of generation and any costs for power purchases. Power purchase costs occur when energy requirements exceed available SWP resources. To minimize the

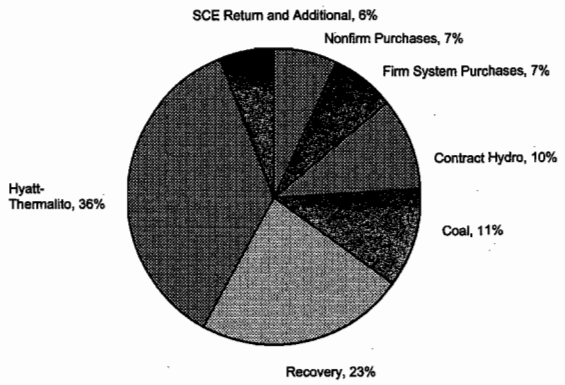


Fig 11-4. Estimated On-Peak Energy Resource Mix for 1996

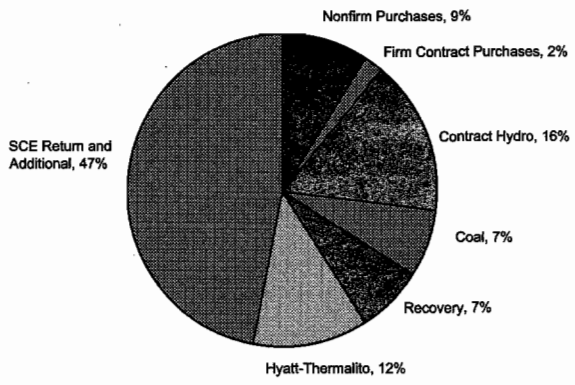


Fig 11-5. Estimated Off-Peak Energy Resource Mix for 1996

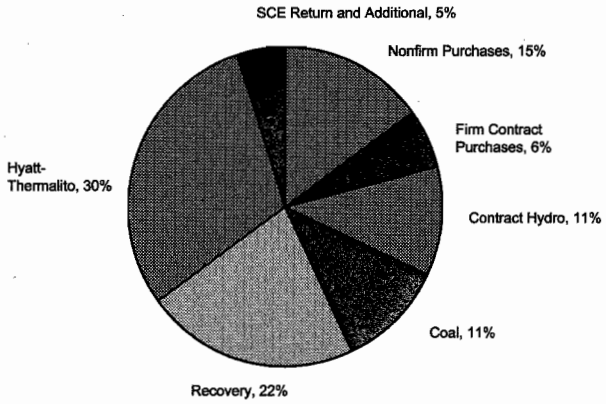


Fig 11-6. Estimated On-Peak Energy Resource Mix for 1999

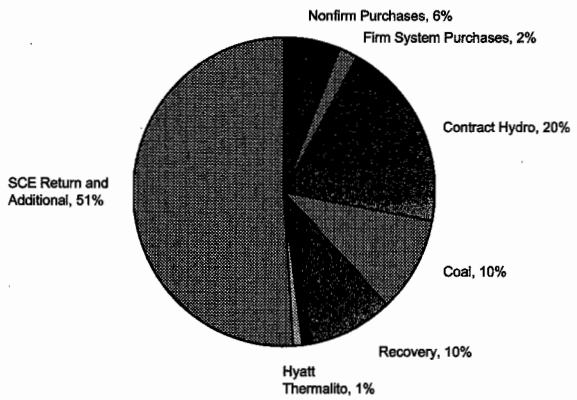


Fig 11-7. Estimated Off-Peak Energy Resource Mix for 1999

cost of potential power purchases, the Department does most of its pumping in the off-peak period when energy is least expensive.

Forecasts of the resources mix and unit rate costs to meet SWP requirements for 1996, 1999, and 2004 are shown in Tables 11-9 and 11-10. Energy requirements range from 13.34 billion kWh in 1996 to 12.82 billion kWh in 2004. The corresponding unit rates range from 22.97 mills per kWh in 1996 to 29.40 mills per kWh in 2004. The increase in the unit rates results from the increased costs of energy resources, which result from an increase in power purchases. In the energy projection, the Department assumes that all nonfirm purchases will be met through unspecified sources and that any surplus energy will be sold as nonfirm energy. The Department forecasts include only nonfirm purchased energy. No considerations were given to firm purchased capacity and energy.

The pumping cost of the SWP is based on the energy requirements for pumping and the associated transmission losses for delivering entitlement water, recreation water, and water lost in reservoirs and aqueducts and replenishing reservoir storage south of the Delta. Firm capacity and surplus energy in excess of expected SWP requirements are available for sale. The sale of firm capacity and surplus energy helps reduce the cost of pumping.

Table 11-10 presents the current projections in mills per kWh of the average unit costs of energy from the various resources. Those projections include allowances for future escalation of operation and maintenance costs and appropriate allowances for escalation of fuel costs (generally 5 percent per year).

After 2004 the cost of power resources will vary greatly with the end of some of the Department's major power contracts. With the CPUC considering market pricing of energy in the future, future long-term energy contracts would be inappropriate for estimating power costs beyond 2004.

Composite Resource Costs. The composite resource costs listed in Table 11-10 represent the weighted average unit cost of all SWP energy resources including power purchases.

Forecasted Unit Values for Surplus Power Sales. The unit values of potential sales of surplus energy were estimated by escalating the projected 1995 value of 24.0 mills per kWh for on-peak energy sales and 20.0

Table 11-8

Estimates of On-peak and Off-peak Energy Produced in 1999, by Type of Resource

(Millions of kilowatt-hours)

	1999		
Type of Resource	*On-peak*	*Off-peak*	*Annual*
Hydro			
Hyatt-Thermalito	2,085	44	2,129
Recovery			
Alamo	54	64	117
Devil Canyon	894	334	1,228
William R. Gianelli	207	2	209
Mojave Siphon	41	58	99
Thermalito Diversion Dam	12	12	23
William E. Warne	370	355	724
Subtotal	1,577	851	2,427
Coal			
Reid Gardner	741	782	1,523
Contract Hydro			
Castaic	571	571	1,142
Metropolitan Water District of Southern California small hydro	0	154	154
Metropolitan Water District of Southern California Colorado River Aqueduct	0	664	664
Pine Flat	210	210	420
Subtotal	781	1,599	2,381
Power Contract			
Alamo additional	0	49	49
Alamo return	0	117	117
Devil Canyon additional	0	570	570
Devil Canyon Return	0	807	807
Hyatt additional	0	1,532	1,532
Hyatt return	0	852	852
Subtotal	0	3,927	3,927
Capacity exchange agreement	360	94	454
Firm system purchase	0	0	0
Nonfirm purchases	1,049	467	1,516
PacifiCorp	438	175	613
TERA Power Corporation	3	3	6
Subtotal	1,850	739	2,589
Total	7,034	7,942	14,977

TABLE 11-9

Estimated Energy Resources for 1996, 1999, 2004, and Full Development

(Millions of Kilowatt-Hours)

Energy Resources, Requirements, and Sales	*1996*	*1999*	*2004*	*Average Year Operation After Full Development*
SWP Energy Resources				
Alamo Powerplant	48	117	117	123
Bottle Rock Powerplant	0	0	0	
Devil Canyon Powerplant	1,205	1,228	1,219	1,282
William R. Gianelli Pumping-Generating Plant	155	209	214	231(c
Hyatt-Thermalito Powerplants	3,497	2,129	2,129	2,129
Mojave Siphon Powerplant	108	99	100	107
Thermalito Diversion Dam Powerplant	25	23	23	23
William E. Warne Powerplant	607	724	725	733
Energy Resources from Agreements				
Castaic Powerplant	1,034	1,142	1,144	
Colorado River Aqueduct energy purchase	664	664	664	
Energy purchase	1,255	1,516	2,243	
Firm system purchases	0	0	0	
Metropolitan Water District of Southern California hydroelectric plants	160	154	160	
PacifiCorp	615	613.2	613.2	
Pine Flat Powerplant	307	420	420	
Reid Gardner Powerplant	1,393	1,523	1,146	1,400(c
Southern California Edison exchange (a	2,264	2,192	1,899	
TERA Power Corporation	2	6	0	
Total Resources	**13,339**	**12,762**	**12,816**	**6,079**
SWP Energy Requirements and Sales				
SWP energy requirements (b	11,946	12,762	12,816	
Firm energy sales	106	0	0	
Surplus economy energy sales	1,287	0	0	

a) Amounts show net energy gained from Southern California Edison Company under the 1979 Power Contract and 1981 Capacity Exchange Agreement. For additional information about these agreements, see "Exchanges" this chapter.

b) Requirements are based upon energy needed to deliver SWP contractors' requested entitlement water, recreation water, reservoir and aqueduct losses, and replacement of reservoir storage south of the Delta. The amounts shown include transmission losses but do not include energy deliveries to SCE pursuant to the 1979 Power Contract and 1981 Capacity Exchange Agreement.

c) SWP share.

TABLE 11-10

Estimated Average Unit Costs of Power Resources for 1996, 1999, and 2004

(Mills per Kilowatt-Hour)

Power Resources	*1996*	*1999*	*2004*
SWP Power Resources			
Alamo Powerplant	47.00	47.00	47.00
Bottle Rock Powerplant.	0.00	0.00	0.00
Devil Canyon Powerplant	25.00	25.00	25.00
William R. Gianelli Pumping-Generating Plant	25.00	25.00	25.00
Hyatt-Thermalito Powerplants	7.36	12.06	11.98
Mojave Siphon Powerplant	57.00	57.00	57.00
Thermalito Diversion Dam Powerplant	29.30	32.20	32.45
William E. Warne Powerplant	25.00	25.00	25.00
Power Resources from Agreements			
Castaic Powerplant	25.00	25.00	25.00
Colorado River Aqueduct energy purchase	23.11	23.11	23.11
Metropolitan Water District of Southern California hydroelectric plants	40.60	42.46	43.11
Pine Flat Powerplant	37.67	31.82	34.81
Reid Gardner Powerplant	40.97	54.43	53.24
Southern California Edison exchange	—	—	—
TERA Power Corporation	70.00	70.00	0.00
Firm system purchases	0.00	0.00	0.00
Energy purchase on-peak	28.61	33.02	41.95
Energy purchase off-peak	23.11	26.68	33.88
Capacity purchases (a	0.00	0.00	0.00
Composite Cost of Resources	21.40	25.93	27.45
Firm energy sales	65.66	0.00	0.00
Value of potential on-peak energy sales	28.61	28.61	28.61
Value of potential off-peak energy sales	23.11	23.11	23.11
Value of potential capacity sales (a	4.00	4.00	4.00
Net Cost of State Water Project Power	20.77	25.93	27.45
Transmission cost	2.20	2.04	1.95
Effective Unit Cost (b	22.97	27.97	29.40

a) The unit rate is dollars per kilowatt-month.
b) Costs include an allowance for future cost escalation.

mills per kWh for off-peak energy sales at rates published in the Wharton Econometric Forecasting Associates long-term forecast 1994 for the period of 1995-2012.

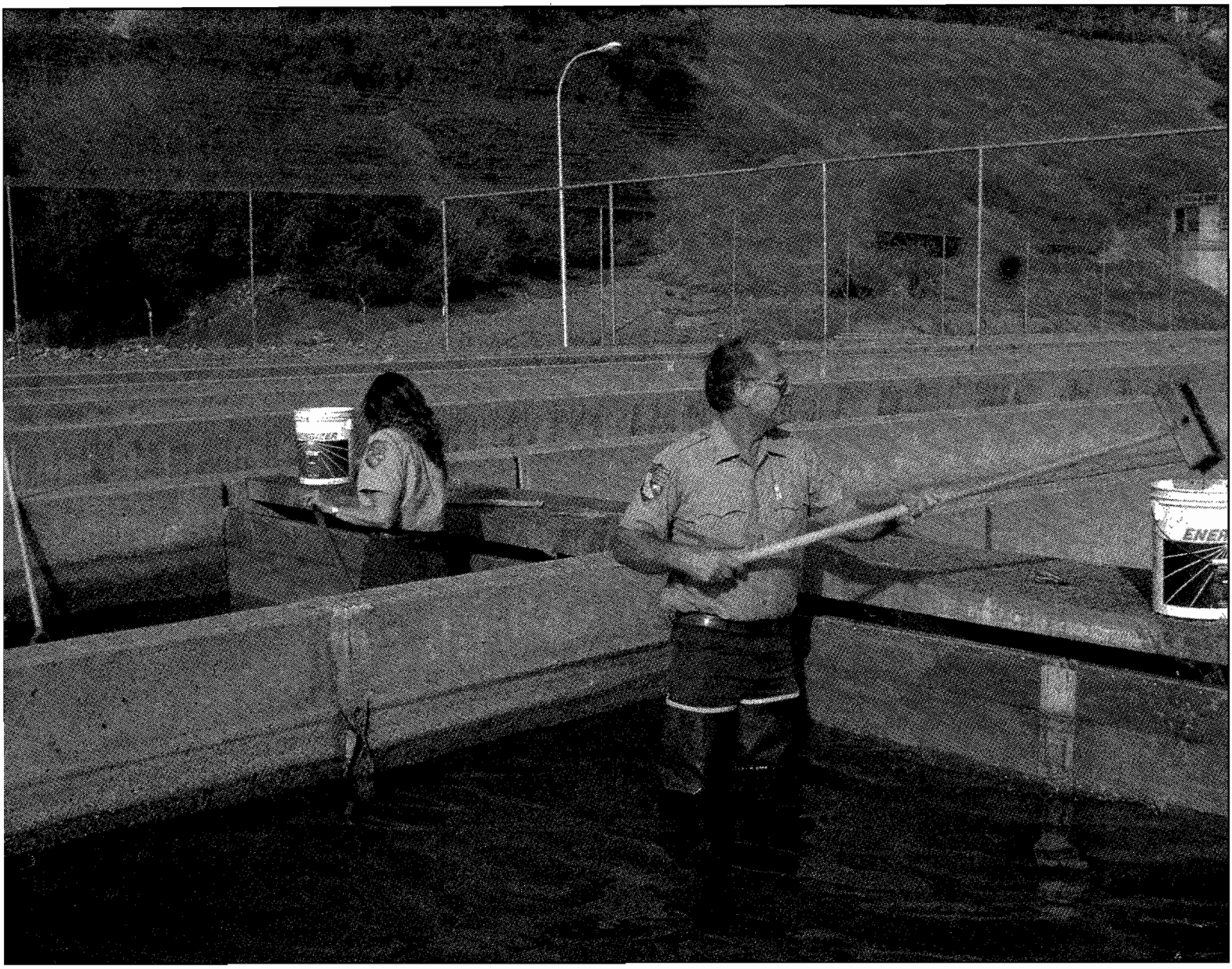
Net Costs. The net cost of SWP energy is the unit cost of the energy actually used for the SWP. The net cost of energy is calculated by adding all the energy resource costs and subtracting any power sales revenues. The amounts of unit transmission costs included in Table 11-10 were determined by dividing the total annual expenditures SWP made for power transmission services by the total SWP annual energy requirements. This calculation does not include the 75 percent of SCE firm transmission service costs waived according to the provisions of the 1981 Capacity Exchange Agreement with the Department, which became effective in 1987.

The amounts of effective unit costs included in Table 11-10 represent the average costs for energy used to operate the SWP, exclusive of any surplus or unscheduled water service. However, because of allocation adjustments for costs of off-aqueduct power facilities and credits for generation at SWP recovery plants, the unit costs included in the table do not represent actual energy costs reflected in the annual Statements of Charges distributed to the water contractors.

Information for this chapter was provided by the State Water Project Analysis Office.

Chapter 12

Facilities Maintenance



Feather River Fish Hatchery

Significant Events

- On January 17, 1995, an earthquake measuring 6.6 on the Richter scale occurred near Northridge (in the San Fernando Valley). SWP facilities sustained only minor damage due to the quake, but operations of West Branch facilities were disrupted for several days due to problems in the electrical transmission system in Southern California.
- On Friday March 10, 1995, a large leak was discovered at the base of the left canal embankment at Milepost 333.53 near Lancaster.
- In August and December 1994, a Federal Energy Regulatory Commission Special Consulting Board met to discuss grouting the AB joint and selected broken piezometer tubing at Oroville Dam. Although some of the grouting was accomplished in spring 1995, work remains to be done. The Special Consulting Board will meet again in fiscal year 1995-96.
- The 5-year FERC Board convened in October 1994 for Devil Canyon-Cedar Springs complex, Pyramid Dam, and Elderberry Forebay-Castaic Powerplant.
- In December 1994, Angeles Tunnel was inspected by staff from headquarters and the Southern Field Division, along with a member of the 5-year FERC Board. The last inspection was in December 1984.
- In January 1995, the new Devil Canyon Powerplant Second Afterbay was filled.
- In May 1995, the 5-year Department of Water Resources Consulting Board for Pyramid and Castaic dams was convened. The Board's dam safety evaluation found that the performance of both dams was satisfactory.
- From March 9-11, 1995, intense storms along the Central Coast and adjacent inland areas caused severe flooding. The flooding caused deep erosion and undermined the I-5 bridge foundation causing its collapse. Seven people died in this tragedy.

The Department of Water Resources, through the Division of Operations and Maintenance, monitors all State Water Project facilities to ensure that they are safe and reliable. Operations and Maintenance staff at Department headquarters annually inspect and report on all facilities to document any deficiencies. Those inspections allow facilities to be maintained at the highest level possible with available staff and resources.

The Department conducts several types of inspections of SWP facilities. Operations and Maintenance staff collect and evaluate data about the performance of each facility. Engineers from the Division of Safety of Dams inspect jurisdictional SWP dams annually to ensure that each dam is in satisfactory condition as to safety. The engineers evaluate proposed modifications to existing dams as well as the design and construction of new jurisdictional dams. The Federal Energy Regulatory Commission also inspects all the licensed SWP facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock, and power plant. Finally, the Department is required to contract periodically with independent consultants to review the safety of SWP dams and power facilities.

Inspecting and Maintaining Project Dams

Between July 1, 1994, and June 30, 1995, Department personnel inspected and performed routine and scheduled maintenance on SWP dams. Division of Safety of Dams' engineers also inspect SWP dams annually with O&M personnel. Some inspections were conducted under FERC and *California Water Code* requirements to evaluate SWP dam facilities every 5 years. Others activities were performed by the Division of Operations and Maintenance as routine inspections.

Oroville-Thermalito Area

Inspections required by FERC regulations and the *California Water Code* were conducted at the Oroville-Thermalito complex in early 1995. In addition, the Department continued follow-up studies and remediation activities in response to earlier inspections conducted under FERC and *Water Code* requirements.

In the 5-year review of 1989, the FERC independent consulting team expressed concern about broken instrumentation tubing in Oroville Dam and made specific recommendations regarding its repair. This broken tubing was also of concern to the 1989 independent safety review board initiated by the Division of Safety of Dams. Therefore, the Division of Operations and Maintenance asked the Division of Design and Construction to investigate the problem.

This investigation led to the 1992 memorandum report *Investigation of Recent Instrumentation Performance at Oroville Dam.* The report recommended that hydraulic tubing be grouted at specific locations within the core block. Because of the unique application and the level of control required for this activity, the Department used in-house staff and a grouting consultant to evaluate remediation alternatives during 1995.

Southern Field Division

In fall 1994 and spring 1995, FERC and the Division of Safety of Dams convened sepa-

rate 5-year boards of independent consultants to evaluate Castaic Dam, Elderberry Forebay, and Pyramid Dam. Both boards found the dams satisfactory for continued operation and made only minor recommendations that are being carried out.

Routine Inspections

Routine inspections were conducted at Frenchman, Antelope, and Grizzly Valley dams in the Upper Feather River Area; at Oroville area dams; at Clifton Court, Bethany, Patterson, and Del Valle dams in the Delta Field Division; at Sisk, O'Neill, Los Banos Detention, and Little Panoche dams in the San Luis Field Division; and at Cedar Springs, Pyramid, Castaic, and Perris dams in the Southern Field Division.

Independent Reviews

The Department periodically employs consultants to independently review the safety and assess the conditions of SWP dams, power plants, and other facilities. Consultants are selected based on their geotechnical, structural, and civil engineering knowledge and background as well as their expertise in evaluating the performance of dams.

In preparing their reports, consultants inspect facilities and review surveillance data and other information prepared by Department staff. The Department then prepares action plans based on the consultants' recommendations.

Consultants performed the following reviews for the Department.

FERC Reviews

To comply with the Federal Energy Regulatory Commission's regulations, consultants review FERC-licensed dams and power generation facilities owned by the Department. These reviews, which may be conducted by one or more consultants, are scheduled every 5 years.

In July, August, and December 1994, a Special Consulting Board, approved by FERC reviewed Oroville Dam piezometer operation and remedial instrumentation grouting.

California Water Code Reviews

To comply with the *California Water Code*, the Department is required to retain a consulting board to review:

- the adequacy of the design of a dam the Department proposes to construct; and
- the safety of the completed construction, including the terms and conditions for the Certificate of Approval.

A board of three consultants was retained to review the adequacy of the design and construction of Devil Canyon Powerplant Second Afterbay. During design and construction this board made independent findings about conditions that affect the safety of the dam and reservoir. Since February 1990, 16 consulting board meetings and inspections have been conducted. The final meeting was held at the end of June 1995. The board reviewed the safety of the completed structure and the terms and conditions included on the Certificate of Approval issued by the Division of Safety of Dams.

To further comply with the *California Water Code*, the Department is required to retain a review board at least once every 5 years to review the operational performance of Department-owned dams.

In May 1995, a three-member board reviewed the performance of and inspected Castaic and Pyramid dams. Both dams were found to be satisfactory for continued operation.

Maintaining Other Project Facilities

The Department continually monitors all SWP facilities and performs repairs and modifications as necessary to ensure safe, reliable water delivery. Headquarters staff con-

ducts annual inspections of project facilities and prepares inspection reports for each field division. Each report lists action items to ensure that follow-up inspections and reports are made.

In fiscal year 1994-95 two major activities occurred:

- emergency repair at Milepost 333.53 on the East Branch of the California Aqueduct; and
- emergency, short-term, and long-term actions at the Arroyo Pasajero watershed.

Emergency Repair at Milepost 333.53

On Friday, March 10, 1995, a large leak was observed at the base of the left canal embankment at Milepost 333.53. The flow was exiting a few feet upstream of a double box culvert. It removed material from beneath the embankment and caused the embankment surface to collapse along a 10-foot wide erosion channel that reached to the embankment crown. Southern Field Division immediately began lowering the pool elevation and took other actions that prevented the embankment from failing completely. By Wednesday, March 15, the pool was completely emptied.

Design and Construction staff along with Operations and Maintenance staff inspected the area. They found that differential settlement over the box culverts caused the canal lining to crack and the lining joints to separate, which allowed water to flow directly from the canal into the embankment, causing the erosion. This problem required major repair including removing broken panels, excavating within the canal, replacing the material that eroded, sealing open joints and cracks, and applying a geomembrane and shotcrete cover. The Department awarded an emergency contract to complete the $800,000 repair in a timely manner.

Arroyo Pasajero Program

The juncture of the Arroyo Pasajero and the San Luis Canal (California Aqueduct) poses a particularly difficult problem for SWP maintenance. The Arroyo Pasajero, or Coalinga stream group, drains approximately 530 square miles west of the California Aqueduct near Coalinga in Fresno County. During periods of heavy rainfall, the Arroyo Pasajero and its tributaries transport a heavy sediment load. The sediment deposits have formed a 450 square mile alluvial fan with its apex at the eastern margin of Pleasant Valley (Anticline Ridge) extending nearly to the the San Joaquin Valley trough.

Flood control facilities for Arroyo Pasajero at the San Luis Canal, which traverses the fan and poses a barrier to Arroyo flood flows include a retention basin designed to store storm runoff and sediment deposits. Observing the effects of floods in 1969 and later, the Department realized that both the volumes of runoff and sediment have proven to be greater than estimated in the original design of the retention basin.

March 1995 Flooding Emergency. In March 1995, another large flood, similar to the flood of 1969, reemphasized the importance of the Department's emergency, short-term, and long-term actions to minimize flooding impacts both to the aqueduct and surrounding lands. From March 9-11, intense storms along the Central Coast and adjacent inland Central Valley areas of California produced severe flooding, including the flooding in the Arroyo Pasajero watershed. The peak flood flow at the Interstate 5 bridge over the Arroyo, which occurred about 8:30 p.m. on March 10, was an estimated 33,000 cfs. The estimated flood volume was 33,500 acre-feet. The flooding caused deep erosion, which undermined the I-5 bridge foundation and caused its collapse.

Seven people traveling along I-5 died in this tragedy. Flood waters filled the Arroyo Pasajero retention basin, flooded nonproject lands both east and west of the aqueduct, moved railroad tracks, flooded local roads, inundated farmland, ruptured an oil pipeline, and caused other damage.

On March 11 at about 6:30 a.m., flood waters breached the embankment of the retention basin at Milepost 157.4. This breach caused uncontrolled flow of approximately 3,000 acre-feet of sediment-laden water into the aqueduct, damaged 15 panels of canal lining, and threatened the structural integrity of the east side canal embankment. The Department took numerous emergency actions to protect the aqueduct, both before and after the breach occurred, including opening the Gale Avenue inlet gates within the retention basin and opening the evacuation culvert to allow flow to the east side of the aqueduct. In addition, the Cantua and Salt Creek watersheds, which lie approximately 20 miles to the north of the Arroyo Pasajero, experienced significant flooding during this same storm. Approximately 600 feet of the Aqueduct's western embankment was overtopped. The overtopping and the ungated drain inlets at Milepost 135 resulted in over 10,000 acre-feet of flood water and 800,000 cubic yards of sediment entering the Aqueduct. The inflow caused severe damage to the Aqueduct's concrete liner and resulted in millions of dollars associated with sediment removal costs.

By March 14, the water level in the retention basin had subsided enough to permit repair of the breach at Milepost 157.4. A more permanent repair, along with repair of the canal lining, will be accomplished in fiscal years 1995-96 and 1996-97.

Significant Issues for the Arroyo Pasajero. March 1995 floods at the Arroyo Pasajero and nearby streams were the largest experienced since the completion of the California Aqueduct. Damages were widespread and devastating. As a direct result of the public concern, the following actions were taken:

- The Department began developing a management level forum to provide interested entities early access to the Arroyo Pasajero flood control planning studies and enable them to participate in project formulation activities.
- The Department began reconnaissance level studies of flood control programs for Salt Creek, Cantua Creek, Martinez Creek, Domengine Creek, and Arroyo Hondo.
- Planning activities for Arroyo Pasajero and the Cantua Creek Stream Group were transferred to the Division of Planning.

The scope of the contract for sedimentation studies, hydrology studies, and mapping programs were increased to evaluate the impacts of the March 1995 floods.

Short-Term Actions. Since 1969, the Department and U.S. Bureau of Reclamation, the agency responsible for designing the section of aqueduct affected by Arroyo Pasajero, have been working to minimize the effects of heavy flooding. In 1980, it was discovered that runoff from Arroyo Pasajero contained a significant amount of asbestos. This discovery, in conjunction with the high cost of removing sediment from the aqueduct, led the Department to adopt operating procedures to minimize the amount of runoff entering the aqueduct.

The Department currently uses existing facilities to control flood waters at Arroyo Pasajero, mitigate damage to the aqueduct and surrounding lands, and minimize the amounts of airborne and waterborne asbestos entering the aqueduct. To minimize airborne asbestos, the Department plants a vegetative cover on retention basin lands owned by USBR and managed by the Department. Waterborne asbestos entering the aqueduct impacts downstream water treatment systems, which must restrict the allowable amounts of asbestos in drinking water to comply with federal safe drinking water

standards. The cost of treating the water increases as the asbestos content increases.

A draft environmental impact report for an *Interim Standard Operating Procedure*, prepared by the Department in June 1993, identifies the preferred alternative for operating the aqueduct and related facilities at Arroyo Pasajero. This alternative enumerates, in order of priority, the designated path of flood waters at the existing retention basin adjacent to the aqueduct. Essentially, the priority is to:

1) impound flood waters west of the aqueduct,
2) allow flows to the east of the aqueduct via the evacuation culvert if the water level continues to rise, and
3) allow flood waters to enter the aqueduct via the inlet gates at Gale Avenue as a last resort.

The DEIR is being revised to reflect the March 1995 flood experience and the final EIR for the ISOP is scheduled to be released in 1996. Once approved, the ISOP will govern operations at Arroyo Pasajero, until a permanent solution can be developed to protect the facilities.

Long-Term Actions. At the SWP contractors' request, the Department sought the involvement of the U.S. Army Corps of Engineers in identifying viable long-term solutions to the Arroyo Pasajero drainage and sediment problems. In the meantime, the Department will continue to rely on existing facilities and the ISOP to protect the aqueduct.

The Corps completed the *Arroyo Pasajero Reconnaissance Report* for flood control in November 1992. This report was certified in Washington, D.C. and allows the Corps to proceed with a feasibility study. A feasibility study will further evaluate flood control alternatives for Arroyo Pasajero to arrive at the preferred plan.

After signing an initial project management plan and cost-sharing agreement, the Department and the Corps initiated a joint feasibility study in January 1994. The study will run through 1997 with a projected cost of $5.6 million. The Department, as local sponsor, is committed to 50 percent of the total study cost; furthermore, the Department will supply one-half of its commitment as in-kind services within the various study tasks. The Department and USBR concur that the feasibility study is consistent with the intent of the existing Agreement for Operation of Joint-Use Facilities governing the San Luis Unit of the SWP. Therefore, USBR intends to share in the Department's study cost pursuant to the Joint-Use Agreement.

Through December 1994, the Department had obtained aerial photography for over 250 square miles, coordinated with the Corps on public involvement pursuant to the study, completed a hydrologic analysis of the watershed, and further defined the specific parameters governing the alternatives to be investigated. In June 1995, the Department and the Corps decided to use the Department's Division of Planning to manage the assessment of long-term alternatives to the Arroyo Pasajero flooding and sediment problems.

As of June 1995, Department efforts to map the Arroyo Pasajero watershed, develop a hydrologic model, and evaluate alternative conveyance facilities downstream of the San Luis Canal were nearing completion.

Several public meetings were held in the wake of the devastation that resulted from the March 1995 floods on Arroyo Pasajero. As a result of these meetings, urging from public officials, and direction from the California Water Commission, the Department established an Arroyo Pasajero Multi-Agency Forum—a forum comprised of managers of concerned agencies and other interested parties that provides them early access to study findings and provides them an opportunity to participate in the formulation of project alternatives.

The March 1995 floods at Salt and Cantua creeks also resulted in overtopping the western embankment of the San Luis Canal and the deposition of about 800,000 cubic yards of sediment into the canal. In response to these problems, the Department initiated a reconnaissance level study for flood control measures for Martinez Creek, Domengine Creek, Salt Creek, Cantua Creek, and Arroyo Hondo.

Repairs and Modifications

Table 12-1 presents information, arranged chronologically, about significant maintenance activities at SWP pumping and power plants. The table includes information about incidents resulting in outages exceeding 120 hours.

Information for this chapter was provided by the Division of Operations and Maintenance and the Division of Safety of Dams.

TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1994, by Month

Month	*Facility*	*Description*
January 1994	Badger Hill Pumping Plant	Unit 1 out of service from January 20 to February 18 for annual mechanical preventive maintenance.
	Harvey O. Banks Pumping Plant	#2 penstock and Units 4 and 5 out of service from January 3 to January 21 to remove, repair, and reinstall Unit 4 discharge valve and repack Unit 4 pump.
	California Aqueduct	Check 27 out of service from January 17 to February 2 to install new anodes.
	Devil Canyon Powerplant	Unit 2 out of service from January 31 to June 29 for annual preventive maintenance.
	Edward Hyatt Powerplant	Unit 6 out of service from January 3 to January 21 for annual preventive maintenance and repair of an oil leak. Unit 2 out of service from January 28 to February 18 for annual maintenance.
	Las Perillas Pumping Plant	Unit 3 out of service from January 1 to January 10 for annual maintenance.
	Pearblossom Pumping Plant	Unit 8 out of service from January 20 to February 8 for efficiency testing.
	Pine Flat Powerplant	Unit 1 out of service from January 3 to January 28 for annual maintenance.
	South Bay Pumping Plant	Unit 5 out of service from January 10 to January 17 for annual maintenance. Unit 1 out of service from January 18 to January 27 for annual maintenance.
	Thermalito Powerplant	Unit 1 out of service from January 20 to March 4 for annual maintenance and to replace blade trunnion seal.
February 1994	Badger Hill Pumping Plant	Unit 2 out of service from February 16 to March 23 for annual mechanical maintenance.
	Devil Canyon Powerplant	Unit 2 out of service from February 22 to June 29 to repair turbine shutoff valve.
	Edward Hyatt Powerplant	Unit 3 out of service from February 22 to April 15 for annual maintenance and replacement of downstream seat O rings on the turbine shutoff valve.
March 1994	Badger Hill Pumping Plant	Unit 3 out of service from March 23 to April 20 for annual maintenance.
	Dos Amigos Pumping Plant	Unit 2 out of service from March 31 to September 30 for Unit overhaul.
	William R. Gianelli Pumping-Generating Plant	Unit 2 out of service from March 16 to March 31 to complete overhaul. Unit 8 out of service from March 16 to April 1 to complete overhaul.
	Pearblossom Pumping Plant	Unit 8 out of service from March 9 to April 11 to repair leak in discharge valve and to paint motor housing.Unit 8 out of service from March 9 to April 11 to repair leak in discharge valve and to paint motor housing.
	Thermalito Pumping Generating Plant	Unit 2 out of service from March 15 to April 8 for annual maintenance.
April 1994	Harvey O. Banks Delta Pumping Plant	Units 10 and 11 out of service from April 10 to April 26 to repair unit 11 discharge valve trunnion.

TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1994, by Month (continued)

Month	*Facility*	*Description*
April 1994	California Aqueduct	Check 34 out of service from April 7 to June 10 to install new anodes.Check 55 out of service from April 18 to May 20 to recoat gates.
	Pearblossom Pumping Plant	Unit 4 out of service from April 25 to June 30 for warranty inspection. Unit 6 out of service from April 30 to May 7 for annual maintenance. Unit 9 out of service from April 25 to May 9 to paint stator area.
	Reid Gardner Powerplant	Unit 4 out of service from April 30 to May 27 for annual maintenance.
	John R. Teerink Wheeler Ridge Pumping Plant	Unit 5 out of service from April 1 to November 11 to replace impeller.
	Thermalito Pumping-Generating Plant	Unit 3 out of service from April 12 to May 6 for annual maintenance.
	William E. Warne Pumping Plant	Unit 1 out of service from April 4 to April 15 for annual maintenance. Unit 2 out of service from April 18 to April 29 for annual maintenance.
May 1994	Devil Canyon Powerplant	Units 1 and 2 out of service from May 10 to May 27 to install turbine shutoff valve on Unit 2. Unit 3 out of service from May 23 to June 17 for annual maintenance.
June 1994	California Aqueduct	Checks 14 and 15 out of service from June 10 to September 15 to recoat the gates. Check 31 out of service from June 27 to August 8 to recoat the gates. Check 53 out of service from June 2 to August 8 to recoat the gates and install cathodic protection.
July 1994	Harvey O. Banks Delta Pumping Plant	Unit 2 out of service from July 20 to August 12 for stator measurement.
	Devil Canyon Powerplant	Unit 4 out of service from July 19 to August 8 for annual maintenance.
August 1994	California Aqueduct	Check 51 out of service from August 30 to November 4 to recoat the gates.
September 1994	Buena Vista Pumping Plant	Unit 2 out of service from September 7 to September 30 for annual maintenance and to replace the impeller.
	Dos Amigos Pumping Plant	Unit 2 out of service from September 7 to September 30 for biannual maintenance.
	William R. Gianelli Pumping Generating Plant	Units 5 and 6 out of service from September 6 to September 14 for biennial inspection.
	Oso Pumping Plant	Unit 2 out of service from September 13 to the year's end for annual maintenance and to replace the impeller.
	South Bay Pumping Plant	Units 1 and 8 out of service from September 26 to November 1 to replace pumps and motors.
October 1994	Badger Hill Pumping Plant	Unit 6 out of service from October 14 to year's end for annual maintenance.
	Ira J. Chrisman Wind Gap Pumping Plant	Units 1,2, and 3 out of service from October 21 to November 1 to repair dresser coupling packing on the discharge line.
	California Aqueduct	Check 22 out of service from October 27 to November 30 to install 35 anodes.
	Dos Amigos Pumping Plant	Unit 5 out of service from October 17 to November 11 for biennial inspection and maintenance.

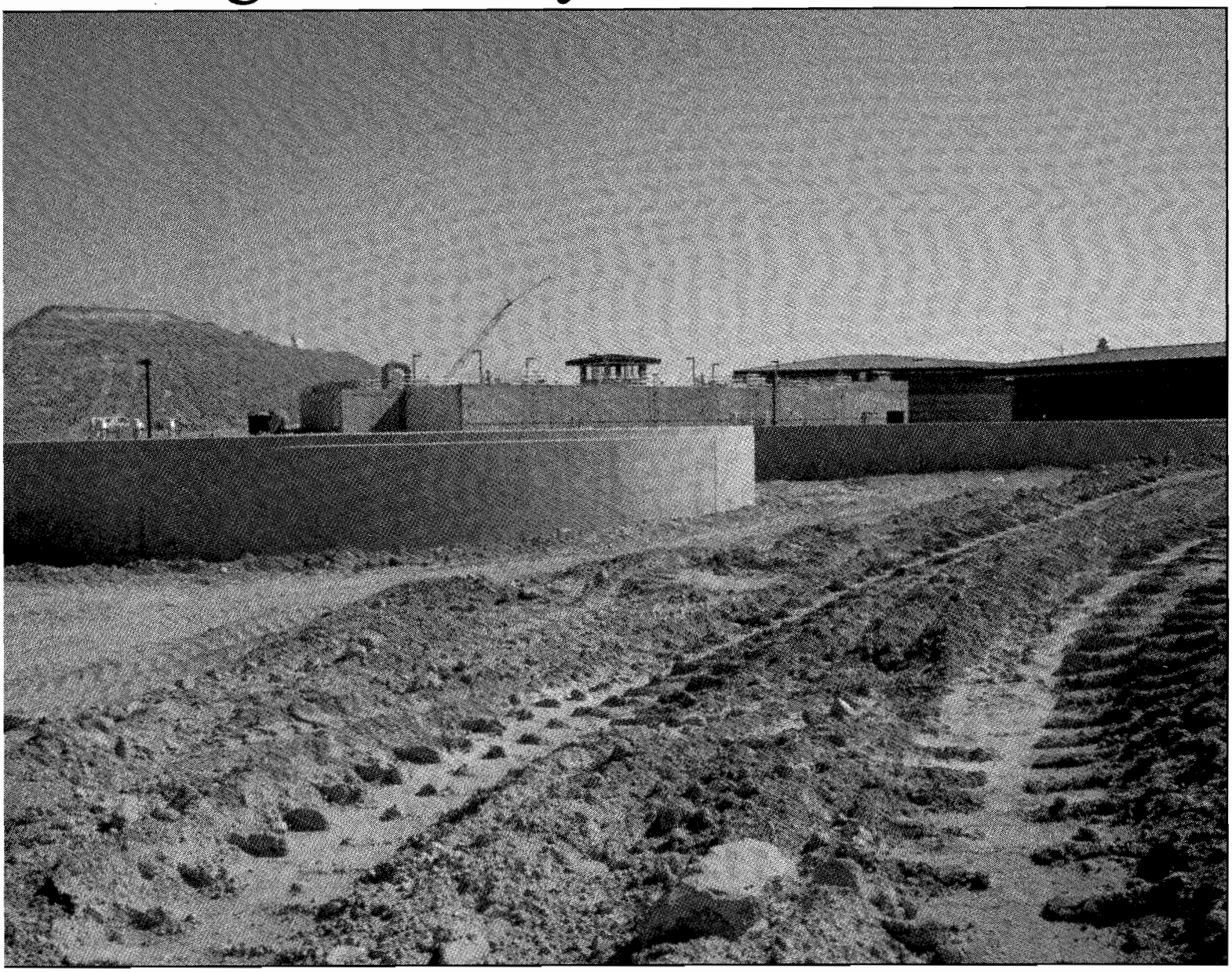
TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1994, by Month (continued)

Month	*Facility*	*Description*
October 1994	Pine Flat Powerplant	Units 1, 2, and 3 out of service from October 28 to December 9 for annual maintenance and Doble testing.
	Edward Hyatt Powerplant	Unit 1 out of service from October 27 to November 22 for annual maintenance. Unit 4 out of service from October 3 to October 26 for annual maintenance.
	Thermalito Pumping Generating Plant	Unit 2 out of service from October 3 to years end for annual maintenance and to realign shaft and stator.
	William E. Warne Pumping Plant	Unit 2 out of service from October 3 to year's end for annual maintenance and relay trip testing.
November 1994	Harvey O. Banks Delta Pumping Plant	Units 8 and 9 out of service from November 28 to December 9 to relabel wiring in the exciter cubicle.
	Devil Canyon Powerplant	Unit 2 out of service from November 28 to year's end for annual electrical and mechanical maintenance.
	Dos Amigos Pumping Plant	Unit 1 out of service from November 15 to year's end for biennial inspection and maintenance.
	A.D. Edmonston Pumping Plant	East discharge line out of service from November 28 to December 23 for inspection and to replace downstream seat O ring on Unit 7.
	Edward Hyatt Powerplant	Unit 6 out of service from November 28 to December 21 for annual maintenance.
December 1994	Harvey O. Banks Delta Pumping Plant	Units 10 and 11 out of service from December 12 to December 28 to relabel wiring in the exciter cubicle.
	California Aqueduct	Pool 6 out of service from December 1 to December 16 for cleaning.
	Edward Hyatt Powerplant	Unit 5 out of service from December 27 to year's end for annual maintenance.
	Las Perillas Pumping Plant	Unit 6 out of service from December 13 to year's end for annual mechanical maintenance.
	Oso Pumping Plant	Unit 3 out of service from December 16 to year's end for annual electrical maintenance and to overhaul the discharge valve.
	Pearblossom Pumping Plant	Unit 2 out of service from December 19 to December 30 for annual maintenance.
	William E. Warne Pumping Plant	Unit 1 out of service from December 6 to December 16 to install secondary knife disconnects.

Chapter 13

Design, Construction, and Right of Way



Construction on Tank site 1, Coastal Branch

Significant Events

- In fiscal year 1994-95, the Department completed construction of the following facilities:

  Devil Canyon Powerplant Second Afterbay, which will permit full use of the new generating units at Devil Canyon Powerplant and improve downstream water delivery capabilities;

  Mojave Siphon Second Pipeline, which provides three new 12-foot-diameter pipelines to supply the generating units at Mojave Siphon Powerplant.

- In March 1995, the impoundment flood plain levee at Arroyo Pasajero Impoundment Basin broke at California Aqueduct Milepost 157.4. Within a day, emergency crews completed the repairs and returned the aqueduct to service.

- Also in March 1995, a leak in the California Aqueduct, at Milepost 333.53, was repaired under an emergency contract (see Chapter 12).

- The Resources Building Department Data Center remodel was completed.

- In fiscal year 1994-95, the Division of Land and Right of Way acquired 4,158 acres in fee title and aquired easement rights over 902.95 acres for State Water Project use.

Construction of the initial facilities of the State Water Project began in 1957 with the relocation of the Western Pacific Railroad yards and Highway 70 near Oroville. In 1962, the Department made the first water deliveries from the SWP from the partially completed South Bay Aqueduct; work began on Oroville Dam and the joint-use San Luis facilities in the same year.

In 1963, work began on the Governor Edmund G. Brown California Aqueduct; by 1968, the SWP delivered water to long-term contractors in the San Joaquin Valley. The SWP delivered water to Lake Perris, its southernmost point, with the 1973 completion of the initial SWP facilities.

From the early 1970s to the late 1980s, design and construction activities centered on building power plants and adding pumping units and turbine-generators deferred from the initial construction of the SWP, enlarging or extending aqueduct reaches, and providing facilities to ensure water quality in the Delta. In the 1990s, design and construction activities have focused on repairing and replacing components of existing facilities, constructing Phase II of the Coastal Branch to deliver water to San Luis Obispo and Santa Barbara counties, and possibly extending the SWP to the San Gorgonio Pass service area.

Design and Construction Activities

Between July 1994 and June 1995, the Division of Design and Construction worked on about 40 design projects that were in progress or completed. Table 13-1 lists those projects along with expected or actual completion dates.

In addition to designing those projects, the Design Office conducted deficiency studies of dams, canal embankments, and other SWP facilities during fiscal year 1994-95, including Oroville, Del Valle, Castaic, and Pyramid dams; Peace Valley Pipeline; and Lower Quail Canal. The investigations will help the Department develop contracts in fiscal year 1995-96 to construct remedial seepage control filters at Lower Quail Canal Embankment and perform seepage repair to arrest and prevent subsurface erosion along Peace Valley Pipeline. The Department will also conduct instrumentation grouting at Oroville Dam.

Sixty-eight construction projects were in progress or completed between July 1994 and June 1995. Those projects are listed in Table 13-2. The table also shows project costs, the dates contractors received the Notice to Begin Work, and the dates when work was operationally complete and recommended for acceptance. Costs shown in Table 13-2 are actual costs of completed work or estimated costs of construction in progress.

Information in Tables 13-1 and 13-2 is organized geographically according to construction divisions. Within each division, facilities where design or construction activities occurred are listed alphabetically. Descriptions of activities taking place at each facility are listed chronologically according to the date work began.

Oroville Division

The Special Consulting Board for the Oroville facilities met twice to review instrumentation grouting at Oroville Dam. The three-person Consulting Board was formed on the recommendation of the Federal Energy Regulatory Commission. In April 1995, crews grouted drill holes to seal the Monolith 14 AB Joint in Oroville Dam coreblock. In

TABLE 13-1

Design Activities, July 1994 through June 1995, by Division

Construction Division and Facility	*Construction Contract*	*Date Design Began*	*Design Completion Date*
Oroville Division			
Oroville Dam	Instrumentation grouting program	May 1994	April 1995
Lake Oroville, Thermalito Forebay, and Thermalito Afterbay	Modifications to recreational facilities	December 1994	June 1995
Delta Division			
Delta Levees	Install seismographs for seismic studies	June 1993	September 1995
Grant Line Canal	Temporary rock barrier	January 1995	August 1995
Sherman Island	Overland water supply	January 1995	Fall 1995
Old River and Middle River	Temporary rock barriers	October 1993	June 1995
Suisun Marsh	Grizzly Island Fish Screen	January 1994	December 1994
North San Joaquin Division			
Delta Operations and Maintenance Center	Remodel vehicle storage buildings	August 1993	July 1995
South Bay Aqueduct	Memorandum Report: Del Valle Dam Piezometer System	December 1993	July 1995
California Aqueduct	Report: Cross Drainage Flood Flows and Cross Drainage Facilities	July 1994	June 1995
San Luis Division			
San Luis and Coalinga Operations and Maintenance Centers	Women's lockers and restroom facilities	March 1993	June 1995
California Aqueduct	Emergency repairs, Arroyo Pasajero	March 1995	March 1995
Dos Amigos Pumping Plant	Furnish automatic voltage regulators, Units 1-6	September 1993	March 1995
	Field installation, remote terminal units	July 1993	July 1995
	Oil containment system	June 1995	October 1995
Wm. R. Gianelli Pumping-Generating Plant	Seismic retrofit, access bridge	November 1994	July 1995
Coastal Branch Phase I			
Las Perillas and Badger Hill Pumping Plants	Furnish replacement switchgear and excitation equipment	November 1993	August 1994
Check 22 to Devil's Den Pumping Plant	Fiber optic cable installation	October 1994	May 1995
Coastal Branch Phase II			
Pipeline Reaches:			
Calf Canyon to Cuesta Tunnel	Pipline Reach 4	June 1993	August 1994
Cuesta Tunnel to Fiscalini Ranch	Pipeline Reach 5A1	September 1993	April 1995
Fiscalini Ranch to Talley Farms	Pipeline Reach 5A2	September 1993	June 1995
Devil's Den, Bluestone, and Polonio Pass Pumping Plants	Completion contract	January 1994	November 1994
Calf Canyon	Tank site 2	January 1994	February 1995
Devil's Den to Lopez Turnout	Furnish and install flowmeters	April 1993	March 1995
Devil's Den to Fiscalini Ranch	Standby engine/generator	March 1993	February 1995
South San Joaquin Division			
Lost Hills Operations and Maintenance Subcenter	Prefabricated metal warehouse	April 1994	March 1995
Buena Vista Pumping Plant	Field installation, remote terminal units	July 1994	July 1995
Tehachapi Division			
A.D. Edmonston Pumping Plant	Furnish rock slope protection for blast/paint facility	October 1993	June 1995
	Furnish bulkhead gates	November 1993	June 1994
	Visitors Center modifications	April 1992	February 1995
	Field installation, remote terminal units	July 1994	July 1995

TABLE 13-1
Design Activities, July 1994 through June 1995, by Division (Continued)

Construction Division and Facility	*Construction Contract*	*Date Design Began*	*Design Completion Date*
Mojave Division			
California Aqueduct	Emergency repair, M.P. 333.5	March 1995	March 1995
	Lining repairs M.P. 331.9, 334.7, and 344.14	March 1994	August 1995
Santa Ana Division			
San Bernardino Tunnel	Replace intake structure	May 1991	June 1995
Devil Canyon Second Afterbay	Completion contract	April 1994	September 1995
Santa Ana Pipeline	Excavation, inspection, and repair of pipeline	August 1992	June 1995
Devil Canyon Powerplant	Field installation, remote terminal units	July 1994	July 1995
West Branch			
Gorman Creek	Erosion remediation	June 1992	Fall 1995
Oso Pumping Plant	Field installation, remote terminal units	February 1994	August 1995
Lower Quail Canal	Extended internal seepage blanket	November 1994	June 1995
Vaquero Recreation Area	Repair landslides	May 1994	December 1995
Pyramid Dam	Erosion remediation, emergency spillway	December 1994	June 1995
Castaic Dam	Evaluation, left abutment stability, static and dynamic loadings	June 1992	Fall 1995

addition, the Special Consulting Board guided the development of specialized grout formulations and grouting techniques. The grout materials, if approved by the Board, will be used in fiscal year 1995-96 to grout and seal the defective instrumentation tubing at Oroville Dam.

Designs for five recreation facilities at Lake Oroville, Thermalito Forebay, and Thermalito Afterbay are in progress. These projects include:

- major modification of the facilities at the Lime Saddle Recreation Area;
- major modification of the boat ramp at Thermalito Afterbay at Wilbur Road;
- a new restroom facility at the Monument Hill recreation area;
- floating campgrounds for Lake Oroville; and
- a new comfort station at the north forebay recreation area.

Construction of the first three items is scheduled to begin in late fall 1995. Construction of the floating campgrounds and the new comfort station at the north forebay recreation area is scheduled for spring 1996.

Delta Facilities

Work at Delta facilities involved the following projects.

Delta Levees Seismic Studies. For the installation of downhole seismographs at four sites in the Delta, the following tasks have been completed:

- deep boreholes drilled (September 1994); and
- site work completed and instruments installed at all four sites (March 1995).

All four strong motion sites should be operational by September 1995. The seismographs will help engineers define the seismic risk for Delta levees by determining the potential for soft Delta soils either to amplify or attenuate earthquake motions.

Rock Barriers on Grant Line Canal. The Department completed the design for a temporary rock barrier on Grantline Canal near Tracy Road. This barrier will raise and stabilize water levels during the irrigation season when agricultural diversions are greatest. Construction is scheduled for irrigation season 1996.

TABLE 13-2

Construction Activities, July 1994 through June 1995, by Division

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date	Ending Date	Contract Costs (Thousands of dollars)
Delta Facilities				
	Temporary Rock Barriers 1994-95, Middle River and Old River (94-01)	March 1994	December 1995	544
Suisun Marsh	Construct Grizzly Island Fish Screen Facilities (95-01)	May 1995	October 1995	380
North San Joaquin Division				
Harvey O. Banks Delta Pumping Plant	Furnish spare coils—Harvey O. Banks Delta Pumping Plant (94-24)	November 1994	September 1995	375
Miscellaneous Activities	Modify vehicle storage building—Delta Operations and Maintenance Center (94-30)	February 1995	July 1995	158
John E. Skinner Delta Fish Protective Facility	Construct fish facility structure, new holding tank screens, and make improvements, Phase III (90-35)	December 1990	January 1995	4,593
South Bay Pumping Plant	Furnish pumps (92-18)	October 1992	June 1995	1,270
	Furnish motors (92-19)	October 1992	June 1995	2,000
	Furnish 5kV switchgear (93-32)	January 1994	February 1995	871
San Luis Division				
San Luis and Coalinga Operations and Maintenance Centers	Construct women's facilities additions, civil maintenance buildings (94-27)	December 1994	June 1995	169
California Aqueduct	Emergency repairs—Arroyo Pasajero Impoundment Area, Milepost 157.4 (95-08)	March 1995	March 1995	44
Dos Amigos Pumping Plant	Furnish automatic voltage regulator units–unit numbers 1-6 (95-04)	June 1995	June 1996	332
Coastal Branch				
Coastal Branch Phase I				
Badger Hill and	Modify HVAC system (93-07)	July 1993	October 1994	715
Las Perillas Pumping Plants	Furnish replacement switchgear and excitation equipment (94-28)	November 1994	November 1995	713
Coastal Branch Phase II	Construct pipeline Reach 1 (93-14)	December 1993	June 1995	26,160
	Furnish pump units (93-25)	December 1993	December 1996	4,231
	Construct Tank 1 facilities (93-27)	December 1993	July 1996	25,400
	Construct initial pumping plants (93-30)	January 1994	May 1995	14,345
	Construct pipeline Reach 2 (93-33)	March 1994	September 1995	35,894
	Furnish ball valves (93-34)	April 1994	December 1996	3,575
	Construct pipeline Reach 3 (94-05)	June 1994	February 1996	28,114
	Modify Cuesta Tunnel (94-10)	June 1994	December 1995	5,673
	Construct pipeline Reach 4 (94-29)	January 1995	March 1996	27,910
	Complete construction, three pumping plants (94-31)	March 1995	September 1996	13,463
	Construct Tank 2 facilities (95-02)	June 1995	September 1996	9,077
San Luis Obispo Powerplant	Furnish turbine and generator (93-31)	February 1994	January 1995	600
San Luis Obispo & Casmalia Hills Pumping Plant	Furnish switchboard and switch gear (94-26)	November 1994	December 1994	35
Devil's Den, Bluestone,	Furnish switchgear (94-03)	July 1994	August 1995	2,177
and Polonio Pass	Furnish power transformers (94-11)	July 1994	April 1996	1,250
Pumping Plants	Furnish air chambers (94-12)	July 1994	March 1996	3,580
	Furnish and install bridge cranes (94-21)	September 1994	July 1996	2,214
Devil's Den to Casmalia	Furnish power circuit breakers and switchyard equipment (94-04)	July 1994	December 1996	845
Devil's Den Pumping Plant to	Furnish fiber optic cable (93-12)	August 1993	May 1995	800
Vandenberg AFB	Furnish butterfly valves and turbine bypass valve (94-06)	July 1994	September 1995	4,626
Las Perillas Pumping Plant to Lopez Turnout	Furnish engine generator sets (95-03)	June 1995	August 1996	865
Devil's Den to Valve Vault Facility	Furnish acoustic velocity flowmeters (95-05)	June 1995	August 1996	409
South San Joaquin Division				
Buena Vista Pumping Plant	Furnish stator coils (92-21)	October 1992	November 1994	385
Ira J. Chrisman Wind Gap	Furnish motor stator coils (92-11)	July 1992	May 1996	582
Pumping Plant	Furnish motor stator coils and spare windings (92-12)	October 1992	February 1995	820

TABLE 13-2

Construction Activities, July 1994 through June 1995, by Division (Continued)

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date	Ending Date	Contract Costs (Thousands of dollars)
Miscellaneous Activities	Construct warehouse—Lost Hills Operations and Maintenance Subcenter (94-34)	April 1995	August 1995	285
Tehachapi Division				
A. D. Edmonston Pumping Plant	Furnish motor stator coils (93-01)	April 1993	August 1995	962
	Furnish bulkhead gates (94-15)	August 1994	March 1995	224
	Slope protection (94-17)	September 1994	October 1994	95
	Modify visitors center (94-35)	April 1995	October 1995	123
Mojave Division				
Alamo Powerplant	Furnish and install Kaplan Turbine (80-16)	October 1980	September 1996	2,800
	Furnish and install generator number 1 (83-14)	August 1983	September 1996	2,900
East Branch Enlargement Canals and siphons	Construct second pipeline, Mojave Siphon (91-33)	March 1992	February 1995	52,500
Mojave Siphon Power Plant	Furnish and install turbines, generators, and governors (89-13)	August 1989	January 1996	14,600
	Furnish control switchboards (91-31)	March 1992	April 1995	806
	Furnish power transformer (92-15)	December 1992	July 1995	451
	Complete power plant (92-30)	February 1993	September 1995	6,817
	Acoustic velocity flowmeters (93-18)	October 1993	October 1995	437
Mojave Siphon and Devil Canyon Powerplants	Furnish butterfly valves (91-15)	August 1991	December 1995	4,451
Pearblossom Pumping Plant Enlargement, Phase II	Install vertical centrifugal pumps (87-04)	May 1987	November 1995	2,800
	Install motors (87-48)	June 1988	July 1995	8,493
	Install pump discharge valve units (88-18)	July 1988	November 1994	1,542
Santa Ana Division				
East Branch Enlargement				
Devil Canyon Powerplant	Install turbines, governors, and valves (87-15)	July 1987	December 1995	10,200
	Construct Devil Canyon Second Afterbay (92-16)	November 1992	November 1994	49,100
	Repair erosion at penstocks (94-23)	August 1994	November 1994	829
Miscellaneous Activities	Multiplant acoustic velocity flowmeters Oroville, Delta, San Luis, and San Joaquin Field Divisions (89-28)	September 1989	September 1994	5,082
	Remodel DWR Data Center 1416 Ninth Street, 7th floor Resources Building (93-09)	June 1993	September 1994	1,293
	Furnish and install above-ground fuel storage tanks—Pearblossom Operations and Maintenance Subcenter, Southern California Operations and Maintenance Center, Oso Pumping Plant, and Cedar Springs Dam Maintenance Station (93-11)	December 1993	September 1995	386
	Furnish and install above-ground fuel storage tanks—San Luis, Coalinga, and Delta Operations and Maintenance Centers (94-07)	May 1994	April 1995	547
	Remove underground storage tank San Joaquin and Southern Field Divisions (94-02)	April 1994	April 1995	145
	Gravel Restoration—Stanislaus River (94-18)	August 1994	August 1994	117
	Repair Low Flow Stream Crossing and Channel at Big Rock Siphon (94-13)	August 1994	December 1994	159
	Emergency Leak Repair—Mile Post 333.53, California Aqueduct (95-09)	March 1995	April 1995	735
	Reconstruct primary operating road—Southern Field Division (94-22)	August 1994	October 1994	680

Sherman Island Overland Water Supply. The North Delta Water Agency is reviewing designs for an overland water supply system for Sherman Island. Construction is planned for summer 1995.

Rock Barriers at Old River and Middle River. As required under various agreements, the Department constructed and removed the annual temporary barriers at Old River and Middle River. The construction and removal of these barriers alternately:

- raises and stabilizes water levels affected by agricultural water diversions during the irrigation season, and
- increases fall flows in the lower San Joaquin River to help migrating salmon and steelhead trout survive.

For improved contract administration, the Department can issue separate construction orders to permit the construction of several barriers under a single contract. High water flows in spring 1995 allowed the Department to forego barrier construction for the spring.

Suisun Marsh. The Design Office performed preliminary investigations for two designs that may reduce salinity in the western Suisun Marsh. One study investigated the possibility of pumping treated effluent from the Fairfield-Suisun Sewer Subregional Water Treatment Plant into Green Valley Creek. The other study looked into the possibility of obtaining water from the city of Benicia by tapping into an existing pipeline that runs along Highway 680 and diverting the water into Goodyear Slough. Both studies involved the transfer of 10 to 20 cfs of water. Work involved preliminary design and cost estimates.

The Design Office helped the Department obtain environmental permits necessary for dredging the Morrow Island Distribution System. Work involved editing text and providing drawings. Although scheduled to begin in 1996, construction may be postponed until 1997 because of delayed environmental permits.

Construction of the Grizzly Island Fish Screen is under way in the Grizzly Island Wildlife Area of Suisun Marsh. The screen is intended to eliminate entrainment losses of fish when water is diverted from Montezuma Slough into Grizzly Slough through two culverts. This project includes :

- removal and reinstallation of an existing walkway,
- construction of an intake structure,
- fabrication and installation of a cylindrical intake fish screen with an air burst cleaning system, and
- installation of a slide gate.

The project will be completed in October 1995.

North San Joaquin Division

The Division of Design and Construction completed a report updating hydrologic and hydraulic data for cross-drainage flood flows and cross-drainage facilities along the North San Joaquin reach of the California Aqueduct. The report presents descriptions of the watershed and cross-drainage facilities, hydraulic design criteria for the cross-drainage facilities, methods used in selecting design rainfall and design floods, and hydrologic modeling and flood routing of flows with return periods of 100 years and 500 years.

There are 90 drainage facilities along this reach of the aqueduct with over 445 square miles of drainage area, not including the two major drainage areas crossing at canal siphons.

John E. Skinner Delta Fish Protective Facility. Although most contract work at the site was completed in February 1994, the contractor delivered three wedge-type valves to replace existing units in early January 1995. After installation, one of the new valves failed, and Operations and Maintenance personnel returned the valve for remanufacture

and reshipment. All valves are currently operational.

Harvey O. Banks Delta Pumping Plant. In March 1994, the Department received a 480-volt AC switchgear manufactured under a contract awarded in March 1993. The switchgear enhances the operational capabilities of the plant's peripheral electrical systems.

Work began in November 1994 to furnish spare coils for one 34,500-hp pumping unit and one 11,250-hp pumping unit; delivery is expected by September 1995.

Delta Operations and Maintenance Center. In February 1995, the Department awarded a construction contract to add air-conditioned office space to the existing vehicle storage building. The contractor will also remove asbestos from the building. The work is scheduled for completion by July 1995.

South Bay Aqueduct. Civil Design completed a memorandum report recommending that the twin tube hydraulic piezometer system in Del Valle Dam be abandoned. Engineers wrote the report in response to the 1990 Director's Board recommendation to develop and document rationale supporting the decision to abandon the piezometer system.

South Bay Pumping Plant. In early 1994, contractors delivered new pumps and motors for the plant. The new equipment will allow existing units to be removed for major repairs and maintenance. The contractors who furnished the equipment will provide technical assistance to Department personnel during installation and testing.

A contract to furnish 5 kV switchgear equipment for the South Bay Pumping Plant was let in January 1994; the work was completed in early 1995.

San Luis Division

Design of an oil containment system for Dos Amigos Pumping Plant will be completed in fall 1995, with construction expected in spring 1996. Design of modifications to the access bridge at the Gianelli Pumping/Generating Plant will be completed in fall 1995. These modifications will increase the stability of the bridge during an earthquake.

Civil Design completed a feasibility study evaluating east-side flood control alternatives to protect the California Aqueduct at Arroyo Pasajero.

Design for the repair of damage to the concrete lining of the California Aqueduct at Cantua Creek and Arroyo Pasajero will be completed in spring 1996. The concrete lining was damaged when flood flows during heavy storms in March 1995 overtopped the embankment. (See Chapter 12.)

Following these storms, a leak in an oil pipeline upstream of the Arroyo Pasajero Impoundment Basin and a break in the impoundment flood control levee (California Aqueduct, Milepost 157.4) necessitated emergency levee repairs. Within a day, emergency repairs were completed, and the aqueduct was returned to service.

A contract to construct women's locker and restroom facilities at the San Luis and the Coalinga operations and maintenance centers was awarded in December 1994. Construction is scheduled to be completed by June 1995.

A contract was awarded in June 1995 to furnish automatic voltage regulators for Dos Amigo Pumping Plant, Units 1 to 6. Completion is expected by June 1996.

Coastal Branch

Work performed under the construction contract awarded in June 1993 to modify the heating, ventilating, and air conditioning systems at the existing Las Perillas and Badger Hill pumping plants was completed in September 1994. Replacement of the switchgear and excitation system at these two plants began in Novem-

ber 1994 and is scheduled to be completed by November 1995.

Construction contracts for the new Coastal Branch Phase II facilities are administered by the Coastal Project Headquarters in San Luis Obispo. Field offices in Shandon and Santa Maria support the Project Office in San Luis Obispo.

Environmental protection continues to be a primary concern for construction of Phase II. Compliance with environmental requirements has limited contractors' ability to work after dark and increased the cost of the project.

Twenty of the 22 construction contracts required for this project have been awarded. Advertising for construction of Reaches 5A1 and 5A2, the two remaining Department contracts, is scheduled for July 1995. Two awarded contracts will be terminated and equipment contracts will be scaled back to reflect the changes due to the deletion of Casmalia Hills Pumping Plant; San Luis Obispo Powerplant; Tank Sites 3, 4, and 5; and Pipeline Reaches 5B and 6 from Department work. Termination and deletion negotiations with the contractors continue. The Department's portion of the Phase II project is scheduled to be operational in late 1996.

During fiscal year 1994-95, Notices to Begin Work were issued and construction is underway for the following construction contracts:

- furnish switchgear, three pumping plants;
- furnish power circuit breakers and switchyard equipment, Devil's Den to Casmalia pumping plants;
- furnish butterfly valves and turbine bypass valve, Devil's Den Pumping Plant to Vandenberg AFB;
- furnish power transformers, three pumping plants;
- furnish air chambers, three pumping plants;
- furnish and install bridge cranes, three pumping plants;
- furnish switchboard and switchgear, Casmalia Hills Pumping Plant and San Luis Obispo Power Plant (contract terminated);
- construct pipeline reach 4;
- complete construction, three pumping plants;
- construct tank site 2;
- furnish engine generator sets, Las Perillas Pumping Plant to Lopez Turnout; and
- furnish acoustic velocity flowmeters, Devil's Den to Valve Vault Facility.

Construction on contracts awarded in prior years is in progress as follows:

- furnish fiber optic cable, Devil's Den to Vandenberg AFB;
- construct pipeline reach 1;
- furnish pump units, Devil's Den, Bluestone, Polonio Pass, and Casmalia Hills pumping plants (Casmalia pumps terminated);
- construct tank site 1;
- construct pumping plants, initial;
- furnish turbine and generator, San Luis Obispo Powerplant (contract in process of termination);
- construct pipeline reach 2;
- furnish ball valves;
- construct pipeline Reach 3; and
- modify Cuesta Tunnel.

South San Joaquin Division

Work in the South San Joaquin Division involved projects at the following facilities.

Buena Vista and Chrisman Pumping Plants. Contracts to furnish and replace stator coils for the two plants were awarded in October 1992. Stator coils for Buena Vista and coils and windings for Chrisman Pumping Plant were delivered in November 1994 and February 1995, respectively. A contract to furnish coils for the the 22,000 hp units at Chrisman was

awarded in 1992 and is scheduled for completion in May 1996.

Lost Hills Operation and Maintenance Subcenter. A contract was awarded in April 1995 to construct a prefabricated metal warehouse at the Lost Hills Operations and Maintenance Subcenter. Completion, scheduled for March 1996, has been delayed. This warehouse will be used initially to store equipment to be installed at the Coastal Branch Phase II project.

Tehachapi Division

Work performed under a construction contract for rock slope protection behind Edmonston Pumping Plant was completed in October 1994. This work will protect the future blast/paint facility from falling rocks. Design work on the contract to provide the blast/paint facility was completed in June 1995. Construction of the facility is scheduled to begin in January 1996.

Work continues on a contract to furnish stator coils at A. D. Edmonston Pumping Plant by August 1995. Manufacturing a second set of production coils is completed and the coils have successfully completed the 400 hours voltage endurance test. Five bulkhead gates at A. D. Edmonston were furnished under a contract awarded in August 1994.

A contract for the modification of A. D. Edmonston Pumping Plant Visitors Center was awarded in March 1995 with completion scheduled for October 1995. Modifications include construction of a visitors' seating area and a soundwall to accommodate displays.

Mojave Division

An emergency repair of the California Aqueduct was completed in April 1995. Piping along a culvert at Milepost 333.5 caused severe erosion of embankment material. Flow was stopped, the pool was dewatered, and the aqueduct was repaired.

Design has been completed for the repair of three areas of the California Aqueduct, at Mileposts 331.9, 334.07, and 344.14, where severe cracking occurred.

Alamo Powerplant. Based on an analysis of data gathered in 1988 and 1991, the Department's consultants recommended that a new shaft be installed and an existing bearing be stiffened as a possible solution to a shaft vibration problem.

Manufacturing and shop testing of the new generator shaft and new lower generator guide-bearing bracket were completed in May 1993. Extensive testing in 1994 and 1995 showed shaft vibrations continued to register outside acceptable limits. As a result, an air injection system to reduce shaft vibrations was tested at load rejection. Test results indicated air injection successfully reduced shaft vibrations. A permanent system will be installed by September 1996.

California Aqueduct. Several construction jobs were completed during the fiscal year. Construction to enlarge Mojave Siphon was essentially complete in February 1995. This work, called the Mojave Siphon Second Pipeline, provided three new 12-foot-diameter pipelines to supply the generating units at Mojave Siphon Powerplant. Repair of the low-flow stream crossing and channel at Big Rock Siphon was completed in December 1994.

Mojave Siphon Powerplant. Construction of the initial Mojave Siphon Powerplant structure and fabrication of a gantry crane began in fall 1990 and were completed in summer 1993. Construction of the plant's final phase is scheduled for completion in 1995.

Manufacturing of the three vertical Francis turbines, generators, and governors for the new Mojave Siphon Powerplant is complete, and the equipment has been delivered to the job site; installation is in progress with completion expected by early 1996. In-

stallation of other equipment such as cranes, switchgear, switchboards, a power transformer, and butterfly valves is essentially complete. Work on the acoustic velocity flowmeters is in progress, scheduled for October 1995 completion.

Pearblossom Pumping Plant. Installation of pumps, motors, and valves at Pearblossom Pumping Plant is essentially complete; minor modifications are expected to continue through November 1995.

Santa Ana Division

Activities in the Santa Ana Division involved designing a replacement San Bernardino Tunnel Intake, enlarging Devil Canyon Powerplant, and beginning construction of the Devil Canyon Second Afterbay.

San Bernardino Tunnel Intake. Design work was completed and bids received to replace the existing San Bernardino Tunnel Intake with a more earthquake resistant and efficient structure. Construction of the new facility is scheduled to begin in July 1995 with the award of the contract and start of fabrication of long-lead-time equipment. Work at the site is scheduled to begin in September 1995 and be completed by May 1997.

Devil Canyon Powerplant and Second Afterbay. Two new generating units (numbers 3 and 4) were operational in early fall 1992. Final performance and efficiency testing was conducted in early 1993. Analysis of the test data revealed the units did not meet the operational characteristics specified. The equipment contractor is working on a solution. Testing of the units continues.

Work began in November 1992 to construct an 850-acre-foot capacity second afterbay adjacent to Devil Canyon Powerplant to permit full use of the new generating units and improve downstream water delivery capabilities. Construction was essentially completed in early 1995.

Erosion repair at the Devil Canyon Powerplant penstocks was completed in November 1994. Manufacture of butterfly valves for Devil Canyon Powerplant is in progress; delivery is expected by July 1995. A contract to reconstruct the primary operating road (mile 367.54 to 399.57) was awarded in August 1994 and completed in November 1994.

Santa Ana Pipeline. Preparation of plans and specifications for the excavation, inspection, and repair of approximately 40 blockouts for the prestressing cable of the pipeline was completed in June 1995. Contract work is scheduled to begin in fall 1995.

West Branch

Design work to repair landslides and other minor damage at the Vaquero Recreation Area at Pyramid Reservoir was completed with construction currently scheduled for summer 1996. The Design Office completed a study of alternative conveyances to bypass the Peace Valley Pipeline and/or Warne Powerplant. A study of ongoing subsurface erosion along the Peace Valley Pipeline was completed; recommended work will begin in summer 1995. Final design was completed on repairs to the Pyramid Dam spillway. Construction is expected to be completed by mid 1996.

Design work began on remediation of active, deep erosion gullies along Gorman Creek. Final design is expected to be completed in fall 1995; construction is anticipated to be completed prior to the rainy season. Design work also continued on measures to protect State facilities from large flows in Gorman Creek.

Civil Design completed a memorandum report documenting the stability evaluation of Castaic Dam's left abutment. The report concluded that the abutment is stable for both static and dynamic loading conditions.

Miscellaneous

A contract for Multiplant Acoustic Velocity Flowmeters for the Oroville, Delta, San Luis, and San Joaquin field divisions was completed in September 1994. Work on the contract to remodel the Department's Data Center, which began in June 1993, was completed in September 1994.

Several construction contracts are under way to remove and/or install fuel tanks at various project facilities. A project started in December 1993 to furnish and install above-ground fuel storage tanks at Pearblossom Operations and Maintenance Subcenter, Southern California Operations and Maintenance Center, Oso Pumping Plant, and Cedar Springs Dam Maintenance Station is expected to be completed by September 1995; underground storage tanks were removed between April 1994 and April 1995 in the San Joaquin and Southern field divisions; and a contract to furnish and install above-ground fuel storage tanks at San Luis Operations and Maintenance Center, Coalinga Operations and Maintenance Subcenter, and Delta Operations and Maintenance Center began in May 1994 and was essentially complete by April 1995.

In August 1994, a contract was awarded and completed to improve spawning habitat for fall-run chinook salmon in the Stanislaus River. This project restored three gravel beds along a 5-mile stretch between Oakdale and Knights Ferry.

Right of Way Activities

The Department has spent a net total of $229.5 million to acquire rights-of-way and mitigation lands for the SWP from inception to June 30, 1995. In fiscal year 1994-95, the Department:

- spent $12.9 million in excess of credits for returned condemnation deposits to acquire land and easement rights, no surplus property was sold;
- acquired twelve parcels (approximately 4,158 acres) in fee for a total purchase price of $11,913,859;
- acquired easement rights over 88 parcels (902.95 acres) for a total price of $1,064,024; and
- managed 87 leases for a total revenue of $525,236.

Coastal Branch, Phase II

To date, the Department has secured rights for construction on Reaches 1, 2, 3, 4, 5A, and portions of 5B and 6; Tank Sites 1 and 2; Cuesta Tunnel; and Devil's Den, Bluestone, and Polonio Pass pumping plants. In fiscal year 1994-95, the Department:

- obtained approximately 100 temporary entry permits for geological, archaeological, and environmental studies and surveys for project design and regulatory permits;
- obtained fee rights and easements (922.81 acres over 77 parcels) for pipeline, temporary construction, and access roads at a cost of $1,056,619;
- acquired two full-take parcels (107 acres) for $1,630,753; and
- purchased electrical transmission line easements over 11 parcels of land totaling 21.14 acres to allow PG&E to construct a dedicated 70kV electrical line from its ARCO substation to the three pumping plants in Reach 1. The easements were purchased for a total price of $7,405; escrows for electrical line easements over the remaining 20 parcels will close next fiscal year.

In addition to the Department's actions, the California Water Commission approved Resolutions of Necessity for 46 parcels, enabling the Department to continue with condemnation proceedings.

San Joaquin Field Division

For State Water Project operations, the Department acquired in fee one parcel (212.82 acres) for $426,000. The parcel is adjacent to the Buena Vista Pumping Plant.

Interim North Delta Program

For the future Hood Test Facility, the Department purchased a 121.79-acre parcel along the Sacramento River near the town of Hood in Sacramento County for $1,120,000.

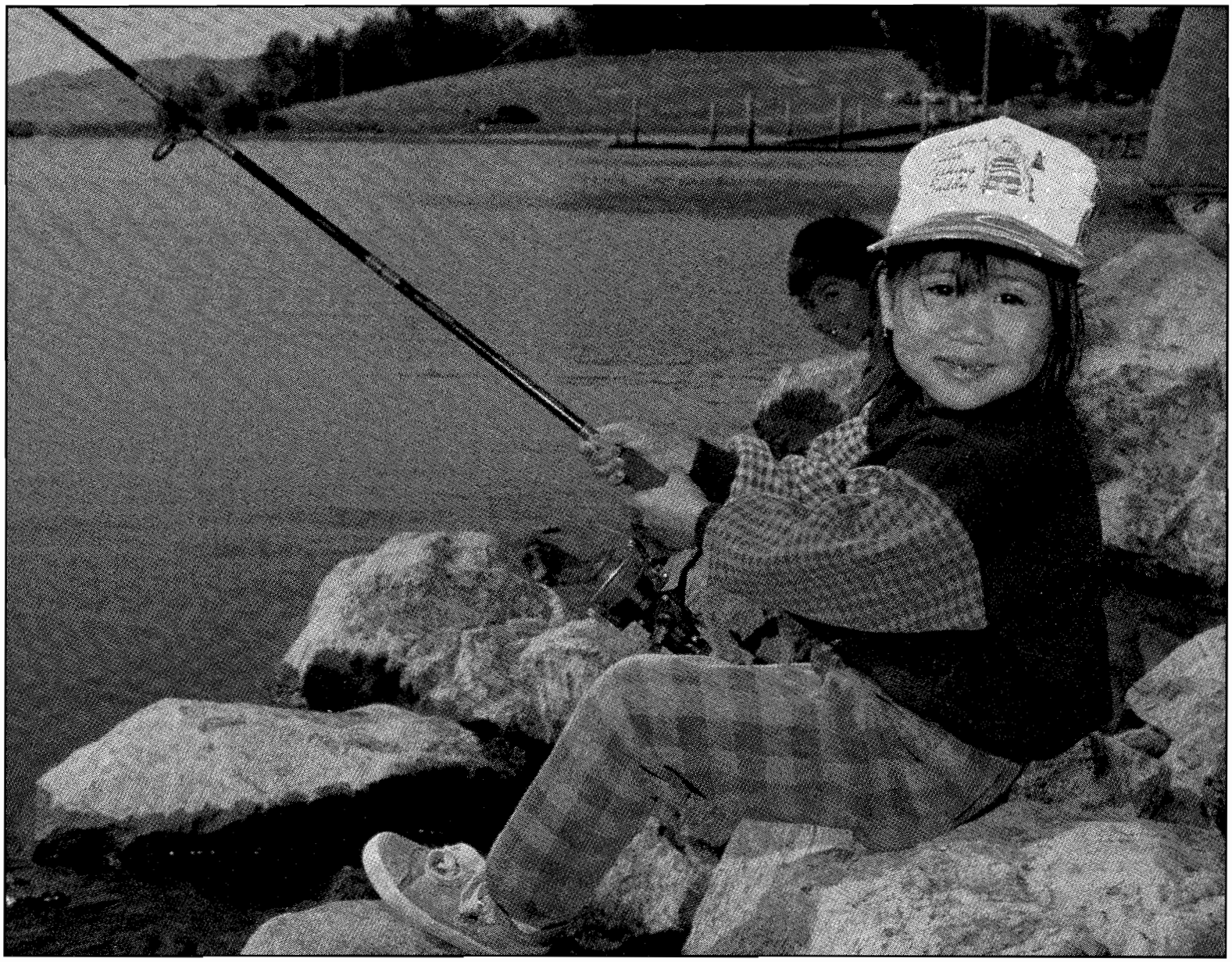
West Delta Program-Sherman Island

The Department purchased nine parcels (3,715.87 acres) for a total cost of $8,737,106. The Department now owns 5,752 acres of the 10,000-acre island and continues to negotiate with willing sellers to purchase additional parcels.

Information for this chapter was provided by the Divisions of Engineering and Land and Right of Way.

Chapter 14

Recreation Programs



Children fishing at SWP facility

Significant Events

- Camping facilities at Castaic Lake were completed and opened for public use in 1994. The 72 recreational vehicle campsites are situated along the eastern shore of Castaic Lagoon and are the first sites developed since the lake opened for public recreational use in 1972.

- As directed by the Federal Energy Regulatory Commission, the Department will construct a new water intake structure to the San Bernardino Tunnel at Silverwood Lake. The *Initial Study and Final Mitigated Negative Declaration*, prepared for the project in October 1994, acknowledged that this project will probably have substantial short-term impacts on recreation because the lake will be drawn down. These impacts include the general disruption of recreational activities at the lake and the temporary closure of some recreation areas owing to construction and the planned drawdown. While having a substantial short-term negative effect on recreational use, this project will probably not result in a long-term reduction in park use. The Department will prepare a detailed recreation mitigation plan for Silverwood Lake in 1995.

- In 1993, as part of a response to a directive from the Federal Energy Regulatory Commission, the Department proposed constructing a 35-mile mountain bicycle trail at the Lake Oroville Complex. About half this trail was opened for public use in 1994. Since opening, these segments of trail have been heavily used. Additional sections of the trail should be opened in 1995; the entire project should be completed sometime in 1996-97.

The State Water Project is a multipurpose project with many benefits for California residents. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP offers extensive and varied recreational opportunities — tours, sight-seeing, fishing, hunting, camping, boating, water skiing, bicycling, and swimming.[1]

Recreation Areas

The SWP has developed 37 recreation areas or sites throughout California, including 17 fishing access sites. Figure 14-1 shows the names and locations of each area.

Recreation-Days. In 1994, SWP facilities received 4.75 million recreation-days of use, a decrease from the 5.40 million recreation-days recorded in 1993 (Table 14-1). Recreation use at the 17 developed fishing access sites and along the California Aqueduct Bikeway also decreased from 68,500 recreation-days in 1993 to 48,300 recreation-days in 1994.

Most SWP recreation and visitor use was concentrated at the major reservoirs, where well-developed facilities accommodate the public. Fifty percent of the total SWP recreational use in 1994 occurred at the four major reservoirs in Southern California: Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris.

Since SWP first began delivering water in 1962, more than 130 million recreation-days have been recorded at SWP recreational facilities.

Facility Planning

During 1994, the following recreation planning reports or studies were completed:

[1] According to the Davis-Dolwig Act (1961, *Water Code* sections 11900-11925), the Department has overall responsibility to acquire land, plan recreation, and ensure that enhancement of fish and wildlife habitat is included as part of the State Water Project. In addition, Federal Energy Regulatory Commission License Numbers 2100 and 2426 require the Department to plan for recreational and associated activities at licensed SWP facilities.

TABLE 14-1

Recreation-Days Recorded in 1994, by Division and Facility

Division	*Number of Days*
Oroville Field Division	
Frenchman Lake	210,000
Antelope Lake	71,800
Lake Davis	258,300
Lake Oroville and Thermalito Forebay	534,800
Thermalito Afterbay and Oroville Wildlife Area	200,000
Total	**1,274,900**
Delta Field Division	
Lake Del Valle	451,600
Bethany Reservoir	24,400
Fishing Access Sites	
Niels Hansen	100
Cottonwood Road	100
California Aqueduct	
Walk-in fishing	16,100
Bikeway	800
White Slough Wildlife Area	11,200
Total	**504,300**
San Luis Field Division	
San Luis Reservoir	184,100
O'Neill Forebay	345,900
Los Banos Reservoir	46,800
California Aqueduct	
Walk-in fishing	21,300
Wildlife areas	7,400
Total	**605,500**
San Joaquin Field Division	
Fishing Access Sites	
Kettleman City	700
Lost Hills	700
Buttonwillow	700
California Aqueduct	
Walk-in fishing	5,200
Total	**7,300**
Southern Field Division	
Silverwood Lake	439,600
Lake Perris	1,298,700
Pyramid Lake	218,800
Castaic Lake	400,200
Fishing Access Sites	
77th Street East	700
Longview Road	200
California Aqueduct	
Walk-in fishing	2,500
Bikeway	600
Total	**2,361,300**
Grand Total	**4,753,300**



1. Antelope Lake Recreation Area
2. Frenchman Lake Recreation Area
3. Lake Davis Recreation Area
4. Lake Oroville State Recreation Area
5. White Slough Wildlife Area
6. Bethany Reservoir
7. Lake Del Valle State Recreation Area
8. Bikeway from Bethany Reservoir to O'Neill Forebay (70 miles)
9. Grant Line Road Fishing Access Site
10. Niels Hansen Fishing Access Site
11. Orestimba Fishing Access Site
12. Walk-in Fishing (63 miles)
13. Cottonwood Road Fishing Access Site
14. San Luis Reservoir State Recreation Area
15. Los Banos Reservoir
16. Canyon Road Fishing Access Site
17. Mervel Avenue Fishing Access Site
18. Fairfax Fishing Access Site
19. Access to Walk-in Fishing (208 miles of accessibility along the aqueduct)
20. Three Rocks Fishing Access Site
21. Huron Fishing Access Site
22. Avenal Cutoff Fishing Access Site
23. Kettleman City Fishing Access Site
24. Lost Hills Fishing Access Site
25. Buttonwillow Fishing Access Site
26. Pyramid Lake State Recreation Area
27. Castaic Lake State Recreation Area
28. Munz Ranch Road Fishing Access Site
29. Bikeway from Quail Lake to Silverwood Lake (107 miles, not all accessible)
30. 70th Street West Fishing Access Site
31. Walk-in Fishing (83 miles)
32. Avenue S Fishing Access Site
33. 77th Street East Fishing Access Site
34. Longview Road Fishing Access Site
35. Silverwood Lake State Recreation Area
36. Lake Perris State Recreation Area
37. San Jacinto Wildlife Area

Fig 14-1. Locations of Recreation Areas

- *Vista del Lago Wastewater Disposal and Reuse System - Management Information Report.* This report discusses and reevaluates the wastewater disposal options available for Vista del Lago Visitors Center, including an option for developing a tertiary treatment plant that can be used to dispose and reuse effluent for beneficial purposes.
- *Quail Lake Recreation Development Plan.* This report presents a plan for further recreation development at Quail Lake, a SWP facility. This plan presents a way to control and manage increased use while reducing vandalism and destruction of SWP facilities and property.

The following recreation planning activities also occurred in 1994:

- The East Bay Regional Park District completed its preliminary plans and specifications for development of the 5-mile-long Del Valle Northeast Shore Fire Trail. The EBRPD operates and maintains the recreational facilities within the State's Lake Del Valle properties. The Department reviewed and commented on the plan and continues to assist EBRPD in meeting its 1996 completion schedule.
- The Department planned to open portions of the California Aqueduct Bikeway along the East Branch of the aqueduct in Southern California. After the bikeway was closed in 1989 for construction of the East Branch Enlargement, the Department received hundreds of requests from bikers and hikers to reopen the facility.

New Facilities

Construction continued on the recreation facilities under development at Liebre Peninsula on Pyramid Lake. Those facilities, which are expected to be completed in mid-1995, include the Vaquero Beach Area, a day-use area located below the Vista del Lago Visitors Center. Once completed, the beach is likely to be heavily used, especially because of the closure of Castaic Lagoon to swimming.

Recreation Financing

Recreational facilities are financed according to legislation enacted by the Davis-Dolwig Act (1961), Assembly Bill 12 (1966), amd Assembly Bill 1441 (1989).

The Davis-Dolwig Act declared that providing for the enhancement of fish and wildlife and for recreation in connection with State water projects benefits all the people of California and that the costs attributable to such enhancement should be borne by them. The act also provided a procedure through which the Department was to be reimbursed for those project costs allocated to recreation and fish and wildlife enhancement and for costs of acquiring property for recreation development.

The reimbursements were included in the Department's budget as appropriations from the General Fund and used by the Department to pay for operations, maintenance, power, and replacement costs associated with operating the SWP.

Assembly Bill 12 provided for a $5 million annual appropriation from tideland oil and gas revenues for joint costs of State water projects allocated to recreation, enhancement of fish and wildlife, and purchases of land for recreational uses. Through the 1985-86 fiscal year, the Department received $90 million from tideland oil and gas revenues for funding joint capital costs and recreational land purchases.

Assembly Bill 1442, known as the "Offset Legislation," offsets moneys owed the Californis Water Fund by the SWP with reimbursements owed the project by the General Fund under the Davis-Dolwig Act.

Appendix D to Bulletin 132, *Costs of Recreation and Fish and Wildlife Enhancement*, contains specific information about capital costs allocated to fish and wildlife enhancement and recreational enhancement and recreational development. This report to the Legislature is published annually by the Department.

Improvements to Facilities

At Castaic Lake, Los Angeles County completed and opened 72 recreational vehicle camp sites along the eastern shore of Castaic Lagoon. These sites represent the first camping facilities to be developed at Castaic Lake since its opening in 1972. In addition, a fishing pier accessible to persons with disabilities was constructed along the eastern end of the lagoon to improve shoreline fishing.

Fish Plantings

In 1994, the Department of Fish and Game continued its fish-planting activities at 11 SWP facilities and one facility owned by the Metropolitan Water District of Southern California (Lake Skinner). Total plantings of trout and chinook salmon decreased by 17 percent in 1994 (Table 14-2).

At the Feather River Fish Hatchery and the Thermalito Afterbay rearing ponds, 25,935,800 fish were produced in 1994, up 92 percent from 1993. That figure includes 19,127,100 chinook salmon and 6,808,700 steelhead trout. Of the chinook salmon reared, 9,110,100 were fingerlings, and 10,017,000 were advanced fingerlings. Of the steelhead reared, 6,601,100 were fingerlings, and 207,600 were yearlings.

TABLE 14-2
Fish Planted in 1994
(Thousands)

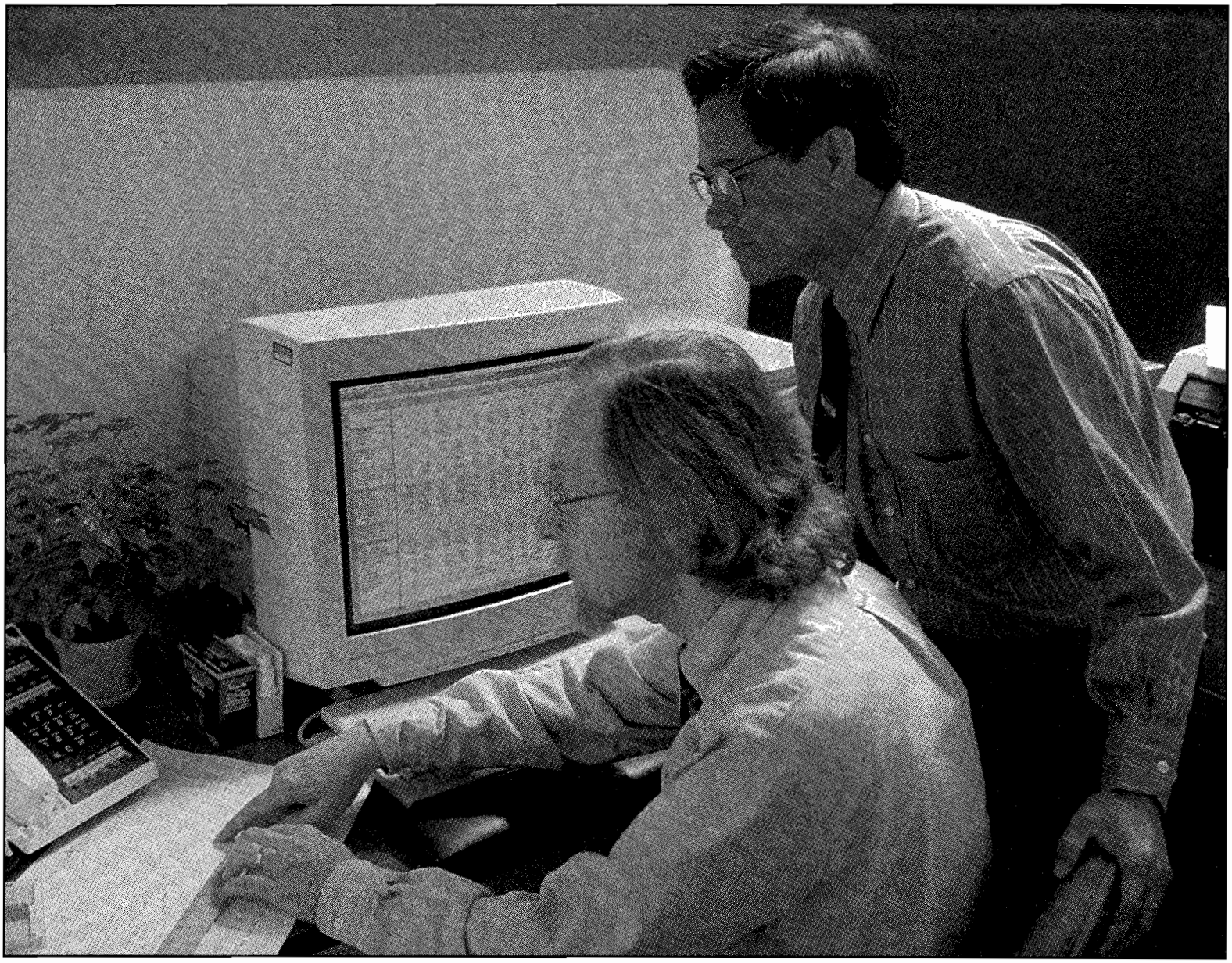
Location and Size	*Trout*				*Chinook Salmon*	*Total*
	Eagle Lake	*Rainbow*	*Brown*	*Brook*		
Antelope Reservoir						
Catchable		9.6		7.6		17.2
Fingerling	47.0					47.0
Lake Davis						
Catchable	33.7					33.7
Frenchman Reservoir						
Subcatchable		44.0				44.0
Fingerling	126.0	276.3				402.3
Lake Oroville						
Catchable					55.2	55.2
Subcatchable			50.0			50.0
Thermalito Forebay						
Catchable		77.4	5.8			83.2
Lake Del Valle						
Catchable		39.6				39.6
Los Banos Reservoir						
Catchable		13.8				13.8
Pyramid Lake		No Fish Planted				
Castaic Lake						
Catchable		43.8				43.8
Castaic Lagoon						
Catchable		41.7				41.7
Silverwood Lake						
Catchable		3.1				3.1
Lake Perris						
Catchable		63.9				63.9
Lake Skinner (a						
Catchable		48.9				48.9
California Aqueduct		No Fish Planted				
Total	**250.7**	**618.1**	**55.8**	**7.6**	**55.2**	**987.4**

a) Included in SWP fish planting program, but not a SWP facility.

Information on recreation use at SWP facilities was provided by the Division of Local Assistance, Central District. Material on safety was contributed by the Office of Water Education. The State Water Project Analysis Office furnished information on recreation financing.

Chapter 15

Financial Analysis



Annual analysis of SWP financial status

Significant Events

- In December 1994, the Department and representatives of certain of the SWP contractors adopted the Monterey Agreement, a comprehensive set of principles to serve as the basis for negotiating certain amendments to the Water Supply Contracts. Provisions relating to SWP financing that will be amended or added include the following:

  - reduce total annual SWP entitlements by 45,000 acre-feet of agricultural water entitlements as payment for the Kern Water Bank. All fixed charges for this reduction will be added to the contractors' Delta Water Charge;

  - establish a general capital operating fund;

  - return contractor payments in excess of SWP financial obligations as follows:

    - money for agricultural contractors is put into a trust fund for rate management;

    - money for urban contractors is returned directly to them.

- On March 13, 1995, the Department sold $152 million of variable rate Water System Revenue Bonds, Series N. This is the first variable bond issued by the Department. The major advantages of variable rate debt are:

  - the initial borrowing rate is lower than that of fixed rate bonds;

  - variable rate bonds can be retired, in whole or in part, at any time and do not contain the minimum 10-year call provisions.

This chapter presents both a summary and a detailed explanation of the SWP current financial analysis, capital costs and requirements, revenues and expenses, and bond activities for years 1995 through 2010. Details of the financial analysis are presented in tables, figures, and line item descriptions throughout this chapter.

The Department performs a financial analysis annually to ensure that the SWP financing program will have sufficient funds to meet construction obligations; project operation, maintenance, power, and replacement costs; bond debt service payments; and repayment of California Water Fund monies expended for construction. The results of the current financial analysis, dated June 30, 1995, are presented in Tables 15-1 and 15-2.

Future conditions may change the financial analysis. Contingencies that could change the financial analysis include:

- alterations in schedules of currently planned construction for future facilities;
- changes in economic conditions, including changes in interest rates and in SWP contractor entitlements due to changes in amounts of water needed, conserved, or reclaimed;
- completion of Delta transfer facilities;
- development of additional sources of water not foreseen at this time;
- deviations from the assumptions regarding actual rates of price escalations for future construction from those currently assumed for cost estimates;
- enlargement of the San Luis Canal;
- increases in capital costs related to additional conservation facilities; and
- outcomes of lawsuits now pending before the courts.

Capital Requirements and Financing

In conducting the current analysis, the Department projected that future construction and Davis-Grunsky Act Program costs through the year 2010 will total $647 million. Special capital requirements for revenue bond financing of these construction costs are projected at $100 million for a total capital requirement of $747 million. This projection includes construction and financing costs for the following significant SWP facilities planned for completion by 2010:

- Coastal Branch of the California Aqueduct;
- Suisun Marsh Facilities;
- North and south Delta facilities; and
- Gorman Creek Channel modifications on the West Branch of the California Aqueduct.

Most of these capital requirements will be financed from the projected sale of $641 million of revenue bonds. The remaining $106 million will be financed from current bond proceeds, capital resources revenues, and the transfer of excess revenues not needed for operation costs, debt service, or repayment of the California Water Fund.

The analysis of capital requirements and financing presented in Table 15-1 does not include the costs and financing of all facilities needed to develop the remaining yield necessary to meet the total 4.2 million acre-feet contractual commitment to long-term SWP water contractors. Also, Table 15-1 does not include costs of associated works that are essential for realizing full benefits from the SWP but are financed and constructed by local interests or State agencies other than the Department of Water Resources. Those facilities include onshore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures among various SWP purposes is detailed in Table 15-3.

Capital Requirements

Lines 1 through 18 in Table 15-1 show actual and projected SWP capital requirements through 2010. Estimates of future capital expenditures include allowances for escalation of costs at 5 percent per year from 1995 through 2010. Capital expenditures for the SWP also include requirements other than those for construction, such as disbursements made as part of the Davis-Grunsky Act Program (Line 14) and special capital requirements under revenue bond financing (Line 15).

The Department will decide to construct facilities only after examining alternatives and completing environmental documentation and other review processes.

Line 1, Initial Project Facilities, includes only those facilities completed before 1974 (see Bulletin 132-74, Chapter 2). Additional costs after 1973 and estimated costs of remaining work on the initial SWP facilities are not included.

Line 2, North Bay Aqueduct, Phase II, consists of pipelines, pumping plants, and a small reservoir necessary to divert water from the western Delta to Napa and Solano counties for urban use. Phase II connected with the Phase I facilities completed in 1968 and are included in the initial project facilities discussed in Line 1. Phase II became operational in May 1988.

Line 3, Delta and Suisun Marsh Facilities, shows historical costs in Column 1 that include planning costs for general Delta facilities and historical costs associated with the previously planned Peripheral Canal and overland water delivery facilities for the western Delta.

Also included are historical planning costs for Suisun Marsh as well as construction costs for the Suisun Marsh Salinity Control Gates and an access road. The projected amounts include projected planning costs plus projected costs for constructing three permanent barriers in the Delta and an additional intake at Clifton Court Forebay.

The projected amounts also include projected costs for constructing additional Suisun Marsh facilities: Cordelia-Goodyear Ditch, culverts and flow controller at Goodyear Slough, and the Frank Horan Water Delivery System.

Line 4, Final Four Units at Harvey O. Banks Delta Pumping Plant, includes costs of the final four 1,067-cfs units, which became operational in spring 1992, and final payments for plant equipment.

Line 5, Coastal Branch Aqueduct, Phase II, includes all costs for the planning, design, and construction of Phase II of the Coastal Branch of the California Aqueduct. The first major construction contract for Phase II facilities was awarded in October 1993. Completion of Phase II is currently scheduled for November 1996 at a cost of $416 million.

Line 6, West Branch Aqueduct, shows costs for all facilities on the West Branch except William E. Warne Powerplant. Costs for Warne Powerplant are included in Line 9. Projected costs include approximately $10 million for Gorman Creek channel modifications.

Line 7, East Branch Enlargement, includes expenditures for first-stage construction of the East Branch Enlargement, including the enlargement share of power plant costs at Mojave Siphon and Devil Canyon. (The remaining power plant costs are included in Line 9.) Estimated East Branch Enlargement costs by facility are presented in Table 15-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement. Construction of Unit 2 has been deferred.

All costs in Line 7 are allocated to and repaid by the seven Southern California contractors participating in the East Branch Enlargement.

Line 8, East Branch Improvements, shows all aqueduct costs on the East Branch not allocated to the enlargement project. Those costs include improvements constructed concur-

TABLE 15-1

Capital Requirements and Financing, June 30, 1995

(Thousands of dollars)

Line Number	Line Item	Calendar year 1952-1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Calendar year 2006	2007	2008	2009	2010	Total 1994-2010	Total 1952-2010
CAPITAL REQUIREMENTS																				
1.	Initial Project Facilities	2,202,316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,202,316
2.	North Bay Aqueduct, Phase II	89,668	816	1,128	812	7	0	0	0	0	0	0	0	0	0	0	0	0	2,763	92,431
3.	Delta & Suisun Marsh Facilities	201,080	11,838	11,676	29,013	38,930	15,899	1,787	0	0	0	0	0	0	0	0	0	0	109,143	310,223
4.	Final 4 Units at Banks Delta Pumping Plant	47,413	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	47,530
5.	Coastal Branch Aqueduct, Phase II	76,783	217,404	117,159	2,449	1,262	555	176	0	0	0	0	0	0	0	0	0	0	339,005	415,788
6.	West Branch Aqueduct	95,713	250	10,269	107	84	35	0	0	0	0	0	0	0	0	0	0	0	10,745	106,458
7.	East Branch Enlargement	414,572	12,442	820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,262	427,834
8.	East Branch Improvements	132,458	9,722	20,191	4,765	144	48	0	0	0	0	0	0	0	0	0	0	0	34,870	167,328
9.	Power Generation and Transmission Facilities	659,335	2,703	36	35	35	15	0	0	0	0	0	0	0	0	0	0	0	2,824	662,159
10.	Additional Conservation Facilities	125,867	6,924	6,164	6,184	6,330	6,481	6,637	3,127	3,127	3,127	3,127	3,127	3,127	3,127	3,127	3,127	3,127	69,990	195,857
11.	San Joaquin Drainage Facilities	41,859	2,663	2,835	2,741	2,717	2,627	2,706	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	43,749	85,608
12.	Other Costs	287,593	6,141	4,229	4,316	1,455	841	0	0	0	0	0	0	0	0	0	0	0	16,982	304,575
13.	**TOTAL PROJECT CONSTRUCTION EXPENDITURES**	**4,374,657**	**271,020**	**174,507**	**50,422**	**50,964**	**26,501**	**11,306**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**643,450**	**5,018,107**
14.	Davis-Grunsky Act Program Costs	126,174	3,826	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,826	130,000
15.	Special Capital Requirements Under Revenue Bond Financing	503,260	35,119	24,714	15,900	16,563	0	7,420	0	0	0	0	0	0	0	0	0	0	99,716	602,976
16.	**TOTAL CAPITAL REQUIREMENTS**	**5,004,091**	**309,965**	**199,221**	**66,322**	**67,527**	**26,501**	**18,726**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**746,992**	**5,751,083**
17.	Power Facilities Capital Requirements	1,210,591	10,275	36	35	35	15	0	0	0	0	0	0	0	0	0	0	0	10,396	1,220,987
18.	Water Facilities Capital Requirements	3,793,500	299,690	199,185	66,287	67,492	26,486	18,726	5,873	5,873	5,873	5,873	5,873	5,873	5,873	5,873	5,873	5,873	736,596	4,530,096
FINANCING OF CAPITAL REQUIREMENTS																				
Power Revenue Bond Proceeds																				
19.	Power Revenue Bonds through Series H	1,161,676	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,161,676
20.	Future Power Revenue Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21.	**SUBTOTAL, POWER REVENUE BONDS**	**1,161,676**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,161,676**
Water Revenue Bond Proceeds																				
22.	East Branch Enlargement, Current Bonds	359,866	38,713	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38,713	398,579
23.	East Branch Enlargement, Future Bonds	0	64,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64,000	64,000
24.	Water System Facilities, Current Bonds	846,297	113,287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113,287	959,584
25.	Water System Facilities, Future Bonds	0	86,000	190,000	120,000	125,000	0	56,000	0	0	0	0	0	0	0	0	0	0	577,000	577,000
26.	**SUBTOTAL, WATER REVENUE BONDS**	**1,206,163**	**302,000**	**190,000**	**120,000**	**125,000**	**0**	**56,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**793,000**	**1,999,163**
Other Capital Financing																				
27.	Initial Project Facilities Bond Proceeds	1,480,449	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,480,449
28.	Davis-Grunsky Act Program Bond Proceeds	126,174	3,826	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,826	130,000
29.	Application of California Water Fund Monies (Tideland Oil Revenues)	484,202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	484,202
30.	Interim Financing	137,421	12,579	(7,335)	(56,419)	(63,473)	20,501	(43,274)	0	0	0	0	0	0	0	0	0	0	(137,421)	0
31.	Application of Capital Resources Revenues to Construction	365,070	(11,103)	13,721	0	0	0	0	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	16,348	381,418
32.	Revenue Transfers Applied	42,936	2,663	2,835	2,741	6,000	6,000	6,000	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	71,239	114,175
33.	**SUBTOTAL, OTHER CAPITAL FINANCING**	**2,636,252**	**7,965**	**9,221**	**(53,678)**	**(57,473)**	**26,501**	**(37,274)**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**(46,008)**	**2,590,244**
34.	**TOTAL FINANCING OF CAPITAL REQUIREMENTS**	**5,004,091**	**309,965**	**199,221**	**66,322**	**67,527**	**26,501**	**18,726**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**5,873**	**746,992**	**5,751,083**

TABLE 15-2

State Water Project Revenues and Expenses, June 30, 1995

(Thousands of dollars)

Line Number	Line Item	Calendar year 1952-1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	1995-2010	1952-2010
	Project Revenues																			
1.	Capital resources revenues	786,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	786,180
	Water Contractor Payments																			
2.	Transportation capital	2,087,091	108,443	117,545	125,923	126,479	126,601	126,655	126,663	126,668	126,667	126,665	126,665	126,664	126,664	126,663	126,662	126,661	1,998,288	4,085,379
3.	Transportation minimum	2,360,551	193,525	210,702	223,004	223,548	224,319	226,562	222,599	216,077	200,756	196,446	190,673	186,128	180,711	195,159	189,805	185,269	3,265,283	5,625,834
4.	Transportation variable	1,022,338	88,476	120,257	138,376	122,233	133,257	137,147	140,591	144,699	148,643	152,898	137,200	139,426	141,509	144,703	147,181	150,191	2,186,787	3,209,125
5.	Delta Water Charge	969,336	86,725	85,388	85,914	86,368	86,998	87,729	88,837	89,297	89,516	89,738	89,953	90,169	90,390	90,616	90,845	91,109	1,419,592	2,388,928
6.	East Branch Enlargement payments	115,061	36,447	41,913	42,997	43,051	42,980	43,946	43,987	43,699	43,717	42,330	42,362	42,410	42,466	42,461	42,506	42,626	679,898	794,959
7.	Water Revenue Bond Surcharge	92,873	18,013	40,381	41,343	45,276	47,476	49,259	49,237	49,910	49,880	50,930	50,996	51,090	51,173	51,033	51,106	51,352	748,455	841,328
8.	*Subtotal water contractor payments under long-term water supply contracts*	*6,647,250*	*531,629*	*616,186*	*657,557*	*646,955*	*661,631*	*671,298*	*671,914*	*670,350*	*659,179*	*659,007*	*637,849*	*635,887*	*632,913*	*650,635*	*648,105*	*647,208*	*10,298,303*	*16,945,553*
9.	Revenue bond cover adjustments	0	(28,113)	(28,703)	(30,973)	(32,383)	(32,340)	(32,297)	(32,291)	(32,296)	(32,152)	(29,780)	(29,712)	(29,497)	(29,537)	(29,562)	(33,288)	(33,303)	(496,227)	(496,227)
	Other Revenues																			
10.	Federal payments for project oper. costs	111,477	0	18,031	9,345	9,367	9,371	9,388	9,388	9,391	9,391	9,391	9,391	9,391	9,391	9,391	9,391	9,391	149,409	260,886
11.	Appropriations for operating costs allocated to recreation	16,657	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,657
12.	Local agency payments under Davis-Grunsky loan repayment contracts	31,402	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	32,000	63,402
13.	Revenue Bond Proceeds	386,399	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	386,399
14.	Interest Earnings on Operating Rev.	387,794	7,325	7,460	7,035	7,155	7,285	8,420	8,565	9,720	9,885	10,055	10,240	10,435	10,640	10,860	11,090	11,335	147,505	535,299
15.	Payments under Oroville-Thermalito power sale contract	249,279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	249,279
16.	Miscellaneous revenues	51,593	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51,593
17.	*Subtotal, other revenues*	*1,234,601*	*18,135*	*18,681*	*18,380*	*18,522*	*18,656*	*19,808*	*19,953*	*21,111*	*21,276*	*21,446*	*21,631*	*21,826*	*22,031*	*22,251*	*22,481*	*22,726*	*328,914*	*1,563,515*
18.	**Total operating revenues**	**7,881,851**	**521,651**	**606,164**	**644,964**	**633,094**	**647,947**	**658,809**	**659,576**	**659,165**	**648,303**	**650,673**	**629,768**	**628,216**	**625,407**	**643,324**	**637,298**	**636,631**	**10,130,990**	**18,012,841**
19.	**Total operating revenues and Capital Resources Revenues**	**8,668,031**	**521,651**	**606,164**	**644,964**	**633,094**	**647,947**	**658,809**	**659,576**	**659,165**	**648,303**	**650,673**	**629,768**	**628,216**	**625,407**	**643,324**	**637,298**	**636,631**	**10,130,990**	**18,799,021**
	Project Expenses																			
20.	Project operations, maintenance, and power costs	3,253,512	283,186	313,191	331,782	314,268	329,600	335,385	336,306	334,174	334,888	335,373	316,223	314,208	311,053	309,895	307,085	305,464	5,112,081	8,365,593
21.	Deposits to Replacement Reserves	103,378	7,680	7,458	7,423	7,459	7,458	7,458	7,458	7,458	7,458	7,458	7,458	7,458	7,458	7,458	7,458	7,458	119,516	222,894
22.	Deposits to special reserves under revenue bond financing	604,406	(23,923)	10,614	10,268	30,250	7,330	3,686	(3,251)	(4,175)	(6,214)	(4,327)	(4,497)	(3,405)	(2,539)	1,859	(1,422)	(2)	10,252	614,658
23.	Capital resources expenditures	365,070	(11,103)	13,721	0	0	0	0	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	16,348	381,418
	Payments of Debt Service																			
24.	Principal repayments on bonds sold through June 30, 1995 (current bonds)	910,424	65,139	70,185	77,416	79,720	83,031	86,490	90,425	94,370	89,905	94,610	97,885	102,180	106,845	126,945	133,900	140,700	1,539,746	2,450,170
25.	Interest on bonds sold through June 30, 1995 (current bonds)	3,189,120	162,999	162,554	158,990	154,943	150,807	146,441	141,914	136,751	131,680	126,974	122,112	117,191	112,009	106,575	99,688	92,428	2,124,056	5,313,176
26.	Future East Branch enlargement bond principal repayments	0	0	610	645	685	725	770	815	865	915	970	1,030	1,090	1,155	1,225	1,300	1,375	14,175	14,175
27.	Future East Branch enlargement bond interest payments	0	0	3,806	3,769	3,730	3,689	3,646	3,599	3,551	3,499	3,444	3,386	3,324	3,258	3,189	3,116	3,038	52,044	52,044
28.	Future Water Bond principal repayments	0	0	0	770	2,525	3,745	5,095	5,405	6,230	6,605	7,000	7,420	7,865	8,335	8,845	9,370	9,930	89,140	89,140
29.	Future Water Bond interest payments	0	0	0	5,160	16,514	23,562	30,838	30,532	33,568	33,194	32,798	32,378	31,932	31,460	30,960	30,430	29,867	393,193	393,193
30.	**Total Principal**	**910,424**	**65,139**	**70,795**	**78,831**	**82,930**	**87,501**	**92,355**	**96,645**	**101,465**	**97,425**	**102,580**	**106,335**	**111,135**	**116,335**	**137,015**	**144,570**	**152,005**	**1,643,061**	**2,553,485**
31.	**Total Interest**	**3,189,120**	**162,999**	**166,360**	**167,919**	**175,187**	**178,058**	**180,925**	**176,045**	**173,870**	**168,373**	**163,216**	**157,876**	**152,447**	**146,727**	**140,724**	**133,234**	**125,333**	**2,569,293**	**5,758,413**
32.	*Subtotal Debt Service*	*4,099,544*	*228,138*	*237,155*	*246,750*	*258,117*	*265,559*	*273,280*	*272,690*	*275,335*	*265,798*	*265,796*	*264,211*	*263,582*	*263,062*	*277,739*	*277,804*	*277,338*	*4,212,354*	*8,311,898*
33.	**Total Operating Expenses and Debt Service**	**8,425,910**	**492,788**	**573,329**	**596,223**	**610,094**	**609,947**	**619,809**	**614,576**	**614,165**	**603,303**	**605,673**	**584,768**	**583,216**	**580,407**	**598,324**	**592,298**	**591,631**	**9,470,551**	**17,896,461**
34.	Net revenues	242,121	28,863	32,835	48,741	23,000	38,000	39,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	660,439	902,560
	Application of Net Revenue																			
35.	California Water Fund Repayment	199,185	26,200	30,000	32,000	0	0	0	0	0	0	0	0	0	0	0	0	0	88,200	287,385
36.	Revenues used for capital expenditures	42,936	2,663	2,835	2,741	6,000	6,000	6,000	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	71,239	114,175
37.	Revenues available for capital expend.	0	0	0	14,000	17,000	32,000	33,000	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	501,000	501,000

TABLE 15-3
Allocation of Capital Expenditures
(Thousands of dollars)

Facilities and Construction Divisions	Expenditures Incurred Through 1994	Future Expenditures	Total	Preliminary Allocation Among Project Purposes: Water Supply and Power Generation	Flood Control (a	Recreation and Fish and Wildlife Enhancement	Other (b
Project Construction Expenditures							
Upper Feather Division	17,704	0	17,704	1,183	0	16,521	0
Oroville Division	564,051	491	564,542	477,509	70,661	16,372	0
Delta Facilities Division	302,179	109,143	411,322	353,737	0	57,585	0
North Bay Aqueduct	93,635	2,763	96,398	96,398	0	0	0
South Bay Aqueduct	76,794	249	77,043	55,375	7,519	14,149	0
California Aqueduct:							
North San Joaquin Division	250,161	12,611	262,772	253,838	0	8,934	0
San Luis Division	235,046	855	235,901	227,880	0	8,021	0
South San Joaquin Division	292,085	795	292,880	276,186	0	16,694	0
Tehachapi Division	316,927	278	317,205	299,124	0	18,081	0
Mojave Division	350,362	1,714	352,076	332,008	0	20,068	0
Santa Ana Division	220,672	33,156	253,828	239,360	0	14,468	0
West Branch	526,382	10,745	537,127	506,511	0	30,616	0
Coastal Branch	91,149	339,005	430,154	430,154	0	0	0
Subtotal, California Aqueduct	2,282,784	399,159	2,681,943	2,565,061	0	116,882	0
Other Project Facilities:							
Small Hydroelectric Power Generating Facilities	84,282	2,824	87,106	87,106	0	0	0
Off-Aqueduct Power Generating Facilities	438,032	0	438,032	438,032	0	0	0
East Branch Enlargement	414,571	13,262	427,833	427,833	0	0	
San Joaquin Drainage Facilities	48,375	43,749	92,124	0	0	0	92,124
Planning and Preoperations	52,971	69,990	122,961	122,961	0	0	0
Unassigned	(721)	1,820	1,099	0	0	0	1,099
SUBTOTAL, PROJECT CONSTRUCTION EXPENDITURES	4,374,657	643,450	5,018,107	4,625,195	78,180	221,509	93,223
OTHER CAPITAL REQUIREMENTS							
Davis-Grunsky Act Program	126,174	3,826	130,000	0	0	0	130,000
TOTAL CAPITAL EXPENDITURES	**4,500,831**	**647,276**	**5,148,107**	**4,625,195**	**78,180**	**221,509**	**223,223**

a) Reflects the Department's allocation to flood control, regardless of federal payments.
b) Includes costs currently unassigned to other purposes; for example, planning costs of deleted features of project facilities; initial costs of inventoried items; joint costs assigned to federal government; and costs assigned to Davis-Grunsky Act Program.

rently with the enlargement work. Costs for power plant construction at Mojave Siphon and Devil Canyon are not included in this line. Projected costs include $33 million for reconstruction of the San Bernardino Tunnel Intake.

Line 9, Power Generation and Transmission Facilities, does not include the East Branch Enlargement share of costs for Devil Canyon and Mojave Siphon Powerplants shown in Line 7 of Table 15-1. Estimated capital costs for facilities included in Line 9 are shown in Table 15-5.

Line 10, Additional Conservation Facilities, shows projected costs—for financial analysis purposes and planning additional conservation facilities. Specific planning activities and projected spending amounts for 1996 through 2010 are shown in Table 15-6. Expenditures for these items are being reviewed. Construction costs of additional conservation facilities are not included in the financial analysis.

Line 11, San Joaquin Drainage Facilities, includes projected costs of the San Joaquin Valley Drainage Monitoring Program. The activities in this program are monitoring, evaluating, reducing, and treating drainage; and investigating evaporation ponds.

The Department assumes that the costs of the drainage program will continue to be financed by appropriations from the California Water Fund. No costs included in Line 11 are charged to SWP water contractors.

Line 12, Other Costs, includes items such as general design and construction costs, costs of completing operation and maintenance facilities, and costs of other completion activities for the initial facilities of the California Aqueduct. Portions of those costs ultimately will be allocated to aqueduct units described in the preceding paragraphs.

Line 13, Total Project Construction Expenditures, is the total of Lines 1 through 12.

Line 14, Davis-Grunsky Act Program Costs, shows costs of the Davis-Grunsky Act Program, a financial assistance program to provide grants and loans to public agencies for constructing local water projects.

As of December 31, 1994, the Department had disbursed $128.5 million (including $7.3 million for administration) in grants and loans for local agencies throughout the State. Funds for Department projects currently authorized will be disbursed prior to 1995.

Line 15, Special Capital Requirements under Revenue Bond Financing, presents special capital requirements at the time revenue bonds are sold. The financial analysis assumes that proceeds from any future revenue bonds will be used to pay for bond discounts, bond issuance costs, and debt service reserve requirements.

Information about the application of proceeds to these special requirements for actual and assumed revenue bond sales is presented in Table 15-7.

Line 16, Total Capital Requirements, is the total of Lines 13, 14, and 15.

Line 17, Power Facilities Capital Requirements, shows the total capital requirements for power facilities included in Lines 1 through 12 and that part of Line 15 associated with revenue bonds sold for power facilities.

Line 18, Water Facilities Capital Requirements, shows the total capital requirements for water facilities included in Lines 1 through 12 and that part of Line 15 associated with revenue bonds sold for water facilities.

Capital Financing

The State Water Project was constructed with three general types of financing: Burns-Porter, revenue bonds, and capital resources. Lines 19 through 33 of Table 15-1 present specific information about those sources of financing.

Burns-Porter Act. Burns-Porter financing is derived from the sale of California Water Resources Development Bonds (general obligation bonds) and State Tideland Oil Revenues deposited in the California Water Fund

TABLE 15-4
Estimated Costs for East Branch Enlargement

Facility	*Dollar Amounts (in millions)*
Aqueduct and siphons	$127.1
Pearblossom Pumping Plant	65.8
Alamo Powerplant	5.0
Mojave Siphon Powerplant	42.9
Devil Canyon Powerplant and Second Afterbay	187.0
Total	**$427.8**

TABLE 15-5
Estimated Capital Costs for Power Generation and Transmission Facilities

Power Plants and Transmission Lines	*Dollar Amounts (in millions)*
Power Plants	
Reid Gardner, Unit 4	$260.6
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
William E. Warne	84.5
Alamo	43.5
Mojave Siphon	34.9
Thermalito Diversion Dam	13.8
Subtotal	*$644.6*
Transmission Lines	
Midway-Wheeler Ridge	$10.7
Geysers-Lakeville	6.9
Total	**$662.2**

TABLE 15-6
Estimated Costs for Planning Additional Conservation Facilities

Activity	*Project Expenditures (millions)*
Los Banos Grandes project	$7.8
Future Water Supply	46.2
Other Planning Costs	16.0
Total	**$70.0**

TABLE 15-7

Application of Revenue Bond Proceeds

(Millions of dollars)

	Application of Revenue Bond Proceeds						
		Other Capital Requirements					
Bond Series (a	Construction Expenditures	Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Discount and Financing Costs (b	Subtotal	Total Principal Amount of Bonds
Oroville	218.0	2.6	19.9	1.5	3.0	27.0	245.0
Devil Canyon-Castaic	126.4	0.0	10.0	0.7	2.1	12.8	139.2
Pyramid Series A	74.0	0.0	19.2	1.0	1.6	21.8	95.8
Reid Gardner Series B	146.1	0.0	41.9	0.0	12.0	53.9	200.0
Reid Gardner Series C	91.1	0.0	17.9	7.9	8.1	33.9	125.0
Small Hydro-South Geysers Series D	49.6	0.0	19.9	0.0	5.5	25.4	75.0
Bottle Rock Series E	96.9	0.0	22.0	3.7	2.4	28.1	125.0
Alamo-South Geysers Series F	59.1	0.0	14.2	0.0	1.7	15.9	75.0
Reid Gardner Series G	1.6	0.0	0.0	0.0	237.9 (c	237.9	239.5
Power Facilities Series H	22.2	0.0	0.0	0.0	184.5 (d	184.5	206.7
East Branch Enlargement Series A	108.3	0.0	12.6	0.0	11.1	23.7	132.0
Water System Facilities Series B	97.4	0.0	0.0	0.0	2.6	2.6	100.0
Water System Facilities Series C	0.6	0.0	0.0	0.0	8.4 (e	8.4	9.0
Water System Facilities Series D	95.9	0.0	2.9	0.0	1.2	4.1	100.0
Water System Facilities Series E	0.4	0.0	0.0	0.0	8.6 (f	8.6	9.0
Water System Facilities Series F	0.0	0.0	0.0	0.0	160.0 (g	160.0	160.0
Water System Facilities Series G	86.8	0.0	4.6	0.0	8.6	13.2	100.0
Water System Facilities Series H	85.5	0.0	5.7	0.0	8.8	14.5	100.0
Water System Facilities Series I	158.9	0.0	5.8	0.0	15.3	21.1	180.0
Water System Facilities Series J	0.0	0.0	0.0	0.0	649.8 (h	649.8	649.8
Water System Facilities Series K	88.6	0.0	3.1	0.0	8.3	11.4	100.0
Water System Facilities Series L	0.0	0.0	0.0	0.0	537.8 (i	537.8	537.8
Water System Facilities Series M	166.0	0.0	9.9	0.0	14.1	24.0	190.0
Water System Facilities Series N	137.0	0.0	6.0	0.0	8.6	14.6	152.0
Subtotal	1,910.4	2.6	215.6	14.8	1,902.0	2,135.0	4,045.8
Future Water System Facilities Bonds	501.0	0.0	17.0	0.0	59.0	76.0	577.0
Future East Branch Enlargement Bonds	56.9	0.0	2.0	0.0	5.1	7.1	64.0
Grand Total	2,468.3	2.6	234.6	14.8	1,966.1	2,218.1	4,686.8

a) Reflects actual bond issues for all except future water system facilities and future East Branch Enlargement bonds.
b) Bond discount and financing costs include debt service reserves for East Branch Enlargement and water system facilities bonds.
c) Total discount was $2.8 million; remaining amount was used to refund Reid Gardner Series B bonds.
d) Total discount was $2.7 million; remaining amount was used to refund portions of Reid Gardner Series C and Small Hydro-South Geysers Series D bonds.
e) Includes funds applied to water system facilities Series B and C debt service reserves.
f) Includes funds applied to water system facilities Series D and E debt service reserves.
g) Includes $11.0 million for debt service reserves and $9.0 million for discounts; remaining amount was used to refund a portion of Reid Gardner Series G bonds.
h) Includes $26.3 million for debt service reserves and $20.5 million for discounts; remaining amount was used to refund portions of prior issues of Power Facilities Revenue bonds and Water System Revenue bonds.
i) Includes $11.1 million for discounts; remaining amount was used to refund portions of prior issues of Water System Revenue bonds.

as authorized by the Burns-Porter Act (*Water Code* sections 12930-12944), approved by voters in November 1960. The Burns-Porter Act authorized an issue of $1.75 billion of general obligation bonds of the State, which are repaid by revenues received according to the water supply contracts. Of that authorization, $130 million has been reserved specifically for the Davis-Grunsky Act Program.

Proceeds from the sale of general obligation bonds are deposited in the California Water Resources Development Bond Fund-Bond Proceeds Account, from which monies may be expended only for the construction of SWP facilities and for the Davis-Grunsky Act Program. Approximately 36 percent of the expenditures through 1994 for construction and the Davis-Grunsky Act Program were financed with general obligation bonds.

Monies deposited in the California Water Fund are appropriated for purposes outlined in the Burns-Porter Act. Such deposits are derived from a portion of the State Tideland Oil Revenues according to a continuing authorization. In 1989, legislation was enacted to provide for a schedule to repay the California Water Fund as required by the Burns-Porter Act.

Revenue Bonds. Revenue bond financing is derived from the sale of revenue bonds as authorized by the Central Valley Project Act (California *Water Code* sections 11100-11925). The Department's authority to issue revenue bonds was confirmed by a decision of the California Supreme Court in 1963 (*Warne* v. *Harkness*, 60 Cal. 2d 579).

Proceeds from the sale of revenue bonds are deposited in the Central Valley Water Project Construction Fund, from which money is expended only for purposes specified in the resolution authorizing each bond sale. Those purposes, in addition to paying construction, planning, and right-of-way costs, may include funding the Debt Service Reserve Account, paying interest on bonds, and paying water system operating expenses during a specified period.

As of June 30, 1995, the Department had sold $4.0 billion of revenue bonds. That amount includes $152 million of Water System Revenue Bonds, Series N, sold March 3, 1995. Additional issues of revenue bonds are planned to fund future SWP construction.

Capital Resources. Capital resources financing is derived from payments and appropriations (including a portion of Tideland Oil Revenues) authorized by a variety of special contracts, cost-sharing agreements, and legislative actions concerning the SWP, plus accrued interest on these funds.

Capital resources revenues are deposited in the Central Valley Water Project Construction Fund and may be expended for paying interest on general obligation bonds and costs of constructing SWP facilities.

According to the Department's financial management policy, the capital resources revenues are used first to cover any general obligation bond debt service that exceeds available revenues.

Capital Financing Sources

Capital financing sources include power revenue bonds, East Branch Enlargement bonds, water system facilities bonds, initial project facilities bonds, proceeds from the Davis-Grunsky Act, California Water Fund monies, and capital resources revenues.

Line 19, Power Revenue Bonds through Series H, includes the proceeds applied from power revenue bonds for the Oroville, Devil Canyon, Castaic, Warne, Reid Gardner, Bottle Rock, Alamo, South Geysers, and small hydro projects.

Line 20, Future Power Revenue Bonds, projects no future power revenue bond sales for the financial analysis.

Line 21, Subtotal, Power Revenue Bonds, is the total of Lines 19 and 20.

Line 22, East Branch Enlargement, Current Bonds, shows that $360 million of Water

System Revenue Bond proceeds have been applied to the East Branch Enlargement project through December 31, 1994. Of this total amount, $305 million was used for construction expenditures and $55 million for bond discounts, interest costs, and debt service reserves.

Line 23, East Branch Enlargement, Future Bonds, shows the Department's estimate that $64 million in additional bonds will be required to complete construction of the East Branch Enlargement, first stage, and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 24, Water System Facilities, Current Bonds, shows that through December 31, 1994, $846 million of proceeds from Water System Revenue Bonds, Series A through Series N, were applied to SWP projects other than the East Branch Enlargement. Of this total amount, $721 million was used to pay for construction expenditures and $125 million to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 25, Water System Facilities, Future Bonds, shows that future water revenue bonds are needed to provide $501 million for construction of SWP water system facilities and $76 million for bond discounts, interest costs, and debt service reserve requirements.

Line 26, Subtotal, Water Revenue Bonds, is the total of Lines 22 through 25.

Line 27, Initial Project Facilities Bond Proceeds, shows the amount of general obligation bonds sold to provide initial financing costs for SWP facilities and for costs of planning certain additional conservation facilities.

Financing initial facilities from general obligation bonds was completed in mid-1972 and totaled $1,444 million—$1,750 million Burns-Porter Act authorization less $130 million reserved for the Davis-Grunsky Act Program and $176 million "offset" for additional conservation facilities. (The Burns-Porter Act provides that to the extent California Water Fund monies are expended, an equal amount of general obligation bonds are reserved [offset] for financing the construction of additional conservation facilities in certain watersheds.)

In mid-1972, the reservation of offset bonds was effectively limited to $176 million—the total amount of California Water Fund monies expended up to that time. By mid-1972 all general obligation bonds authorized by the Burns-Porter Act had been offset, reserved for the Davis-Grunsky Act Program, or used for SWP construction.

Approximately $8.5 million of the offset bonds was used to finance planning studies of the Middle Fork Eel River Development. This financial analysis is not based on the use of any offset bond proceeds to meet capital requirements. If at some time the State constructs an additional conservation facility as specified in *Water Code* Section 12938, the remaining offset bonds could be sold.

Line 28, Davis-Grunsky Act Program Bond Proceeds, shows, for simplification, the entire $130 million of capital expenditures authorized for the Davis-Grunsky Act Program according to the Burns-Porter Act as being funded by proceeds from the sale of general obligation bonds. In fact, $28 million from the California Water Fund was used for the program in lieu of bond proceeds prior to 1969.

In making the financial analysis, the Department assumes that all authorized Davis-Grunsky bonds will be sold prior to 1996.

Line 29, Application of California Water Fund Monies, shows the amount of SWP costs financed under the Burns-Porter Act, which provides that any available money in the California Water Fund must be used for construction in lieu of proceeds from the sale of general obligation bonds.

When the Burns-Porter Act became effective in late 1960, approximately $97 million had been accumulated in the fund. That balance plus subsequent appropriations, interest earnings, and other miscellaneous income

to the fund through December 31, 1994, was used to finance a total of $512 million of SWP costs.

Line 30, Interim Financing, shows the net annual amounts of money borrowed from (positive number) or repaid into (negative number) the Commercial Paper program. The Note program was established in March 1993 to provide an on-going source of interim financing for Water System Projects prior to permanent financing from the sale of long-term revenue bonds. The Department has authority to issue up to $150 million of Water Revenue Commercial Paper Notes. The financial analysis assumes that all outstanding notes will be repaid before the end of the analysis period.

Line 31, Application of Capital Resources Revenues to Construction, presents the Capital Resources Revenues applied for capital expenditures.

Line 32, Revenue Transfers Applied, shows monies assumed to be transferred to the California Water Fund according to provisions of the Burns-Porter Act and subsequently reappropriated to construction (see Line 36 in Table 15-2). Projected amounts for 1995 through 2010 include funds to finance expenditures for San Joaquin drainage facilities, as indicated in Line 11 of Table 15-1, and expenditures for additional conservation facilities, as indicated in Line 10.

Line 33, Subtotal, Other Capital Financing, is the total of Lines 27 through 32.

Line 34, Total Financing of Capital Requirements, totals Lines 21, 26, and 33.

Annual Revenues and Expenditures

In conducting the financial analysis of SWP operations, the Department concluded that projected payments by contractors and other revenues will be adequate to pay annual operations, maintenance, power, and replacement costs and meet all repayment obligations on funds used to finance SWP construction and other authorized costs during the period 1995 through 2010. Data on annual revenues and expenditures are presented in Table 15-2. A detailed discussion of each line item is presented below.

Project Revenues

State Water Project revenues consist primarily of SWP contractor payments required under their individual long-term water supply contracts. Those revenues are deposited in two funds: the Central Valley Water Project Revenue Fund, where all revenues pledged to revenue bonds are placed, and the California Water Resources Development Bond Fund-Systems Revenue Account, where all other SWP operating revenues are placed. Use of those funds is limited to paying operating costs and debt service, except that revenues in excess of those costs may be transferred to the California Water Fund.

Line 1, Capital Resources Revenues, includes:

- federal payments for SWP capital expenditures;
- appropriations for capital costs allocated to recreation;
- appropriations for SWP capital expenditures prior to passage of the Burns-Porter Act and according to Senate Bill 261 (1968);
- payments from Los Angeles Department of Water and Power for Castaic power development;
- advances from water contractors for construction of requested works;
- investment earnings on the Capital Resources Account; and
- investment earnings on unexpended revenue bond proceeds.

Historically, appropriations for capital costs allocated to recreation and fish and wildlife enhancement have amounted to $5 million per year, which has been appropriated by the California Legislature from Tideland Oil Rev-

enues. According to legislation enacted in 1989, the amount owed to the SWP by the State for costs allocated to recreation and fish and wildlife enhancement is offset against the amount the SWP owes to the California Water Fund.

Lines 2 through 7, Water Contractor Payments, show amounts of the separate elements of water contractor payments.

Amounts in Line 4 also include revenues sufficient to cover costs associated with sales of excess power. Appendix B of this bulletin presents a detailed explanation of payments identified in Lines 2 through 7.

Operations, maintenance, power, and replacement costs are repaid as they are incurred as part of the Transportation Charge; therefore, no interest charges are included. Construction costs included in the Transportation Charge and all construction and annual OMP&R costs included in the Delta Water Charge are to be repaid with interest at the Project Interest Rate.

The Project Interest Rate, as defined in Article 1(r) of the standard provisions for water supply contracts, is the weighted average of the rates paid on securities issued and loans obtained to finance SWP facilities, excluding Oroville Revenue Bonds.

According to the original contract provisions, the basis for determining the Project Interest Rate was the weighted average of rates paid on general obligation bond sales only. In 1969, after Oroville Revenue Bonds were issued, the contract was amended to expand the basis to include rates on all other securities sold and loans obtained thereafter for financing SWP facilities, including revenue bonds (see Bulletin 132-70, page 28).

However, not all proceeds from the sale of revenue bonds are melded into the calculation of the Project Interest Rate. Only those proceeds applied to construction costs (the only application of general obligation bonds permitted by law) and those consumed by the bond discount (a component of the total interest cost of a revenue bond issue) are included in the calculation (see Table 15-8).

Calculations for determining the Project Interest Rate do not include proceeds from the sale of revenue bonds for Off-Aqueduct Power Facilities, the East Branch Enlargement facilities, or water system facilities defined in the Water Revenue Bond Amendment. Table 15-9 is a list of all bond sales by date and presents basic information used in the calculation of the Project Interest Rate.

Information about contractor water charges in Appendix B is based on known conditions and substantiates the Department's determination of 1996 water charges billed July 1, 1995. However, information about significant differences between the sum of future charges included in Lines 2 through 7 of Table 15-2 and the substantiation of 1996 charges included in Appendix B are as follows:

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 1994. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-1995 charges in Appendix B represent charges as they should have been according to currently known conditions. Pre-1995 charges included in Table 15-2 are those actually paid as part of previously determined bills.
- Charges in Appendix B are unadjusted for past overpayments or underpayments. Charges included in Table 15-2 for 1995 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-1995 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch Enlargement share of the Series A through Series N bonds. Charges in Table 15-2 also include amounts of the debt service and cover for assumed future bonds.

TABLE 15-8

Effect of Revenue Bond Proceeds on Project Interest Rate

(Millions of dollars)

Project	Revenue Bond Proceeds: Applied to Construction Costs	Less Portion of Proceeds Derived from Interest Earnings Prior to Delivery of Bonds	Plus Bond Discount and Financing Costs	Subtotal, Proceeds Included in Calculating Project Interest Rate	Principal Amount of Bonds	Percentage of Total Amount Included in Calculating Project Interest Rate
Devil Canyon-Castaic Project Revenue Bonds	125.3	1.5	1.4	125.2	139.2	90.0
Pyramid Project Revenue Bonds (Series A)	71.2	0.5	1.1	71.8	95.8	75.0
Alamo Project Bond Anticipation Note	16.8	0.1	0.3	17.0	24.4	70.0
Small Hydro Project I Revenue Bonds (Series D)	25.4	0.2	1.5	26.7	37.5	71.0
Alamo Project Revenue Bonds (Series F)	38.9	0.3	0.7	39.3	50.0	79.0
Power Facilities						
Revenue Bonds (Series H)						
Facility						
Pyramid Project	5.0	0.0	0.1	5.1	5.1	100.0
Alamo Project	1.7	0.0	0.0	1.7	1.7	100.0
Small Hydro Project I	25.2 (a	0.2	0.4	25.4	35.6	71.0
Water System Revenue Bonds (Series J)						
Facility						
Pyramid Project	—	—	75.9	75.9	94.5 (b	76.0
Alamo Project	—	—	45.6	45.6	57.1 (b	80.0
Small Hydro Project	—	—	27.5	27.5	38.8 (b	71.0
Water System Revenue Bonds (Series L)						
Facility						
Small Hydro Project	—	—	1.5	1.5	2.1 (b	71.0

a) Amount consists of 71 percent of proceeds deposited in escrow account to refund portion of Series D bonds ($35.1 million) plus deposits to construction account ($0.3 million).
b) Represents amount of principal used to refund portions of prior bond issues.

- The water bond revenue surcharge in Appendix B applies only to the Series B through Series N bonds. Surcharge values included in Table 15-2 apply to Series B through Series N bonds and to assumed future issues required to finance any SWP construction.

Line 8, Subtotal, Water Contractor Payments under Long-Term Water Supply Contracts, is the total of Lines 2 through 7.

Line 9, Revenue Bond Cover Adjustments, represents the credit to contractors resulting from the cover of 25 percent of 1 year's debt service for Off-Aqueduct Power Facility Bonds and Water System Revenue Bonds. Cover is collected as required by the bond resolutions to provide security to the bondholders.

For off-aqueduct facilities, that amount is charged annually to contractors and collected through the minimum OMP&R component of the Transportation Charge. For the East Branch Enlargement facilities, the cover is collected through the capital component of the East Branch Enlargement Transportation Charge. For water system facilities, that amount is collected through the water bond surcharge. If not needed to meet annual bond service, the cover is credited to the contractors in the following year.

Line 10, Federal Payments for Project Operating Costs, shows federal payments made according to the December 31, 1961, agreement between California and the United States providing for the Department to operate and maintain the San Luis Joint-Use Facilities. According to the January 12, 1972, supplement to the agreement, the U.S. Bureau of Reclamation initially paid 45 percent of OM&R costs for those activities. (The percentage does not apply to power costs; USBR

TABLE 15-9

Bond Sales and Project Interest Rates, by Date of Sale

Bond Sales	Date of Sale	Dollar-Years (a (Thousands)	Interest Cost (Thousands)	Interest Cost (b (Percent)	Project Interest Rate (c (Percent)
$ 50,000,000 Bond Anticipation Notes	11/21/63	26,944	531	1.971	1.971
$100,000,000 Series A Water Bonds	2/18/64	3,402,000	119,750	3.520	3.508
$ 50,000,000 Series B Water Bonds	5/05/64	1,726,000	60,986	3.533	3.516
$100,000,000 Series C Water Bonds	10/07/64	3,452,000	123,764	3.585	3.544
$100,000,000 Series D Water Bonds	2/16/65	3,497,900	122,403	3.499	3.531
$100,000,000 Series E Water Bonds	11/23/65	3,497,900	130,029	3.717	3.573
$100,000,000 Series F Water Bonds	6/08/66	3,497,900	137,359	3.927	3.638
$100,000,000 Series G Water Bonds	11/22/66	3,497,900	143,788	4.111	3.711
$100,000,000 Series H Water Bonds	3/21/67	3,497,900	129,261	3.695	3.709
$100,000,000 Series J Water Bonds	7/18/67	3,497,900	143,199	4.094	3.754
$100,000,000 Series K Water Bonds	11/14/67	3,497,900	163,887	4.685	3.853
$150,000,000 Revenue Bonds, Oroville Division, Series A	4/03/68	5,228,700	270,289	5.169	
$100,000,000 Series L Water Bonds	7/11/68	3,497,900	166,918	4.772	3.941
$100,000,000 Series M Water Bonds	10/22/68	3,497,900	169,989	4.860	4.021
$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/01/69	3,423,460	195,902	5.722	
$ 46,761,000 Cumulative 1970 General Fund Borrowing, repaid 7/10/70	-	4,938	346	7.007	
$200,000,000 Series N and P Bond Anticipation Notes	6/16/70	200,000	11,660	5.830	4.030
$100,000,000 Series N Water Bonds	2/02/71	3,447,900	190,292	5.519	4.148
$100,000,000 Series Q Bond Anticipation Notes	3/10/71	100,000	2,349	2.349	4.143
$100,000,000 Series P Water Bonds	4/21/71	3,397,900	193,377	5.691	4.255
$150,000,000 Series Q and R Water Bonds	1/09/71	5,171,850	265,734	5.138	4.342
$ 40,000,000 Series S Water Bonds	3/28/72	1,399,160	76,509	5.468	4.371
$139,165,000 Devil Canyon-Castaic Revenue Bonds(d	8/08/72	4,776,204	258,839	5.419	4.457
$ 10,000,000 Series T Water Bonds	3/20/73	185,265	9,491	5.123	4.459
$ 10,000,000 Series U Water Bonds	1/13/76	158,750	8,731	5.500	4.462
$ 10,000,000 Series V Water Bonds	11/15/77	158,750	7,573	4.770	4.462
$ 95,800,000 Pyramid Hydroelectric Revenue Bonds(d	0/23/79	2,260,072	172,495	7.632	4.584
$150,000,000 Reid Gardner Project, Series A Bond Anticipation Notes	7/1/81	347,906	29,572	8.500	
$ 75,600,000 Bottle Rock Project, Bond Anticipation Notes	12/1/81	264,600	25,137	9.500	
$ 24,400,000 Alamo Project, Bond Anticipation Notes (d	12/1/81	24,266	2,305	9.500	4.589
$200,000,000 Reid Gardner Project, Series B Revenue Bonds	7/07/82	4,623,137	553,793	11.979	
$125,000,000 Reid Gardner Project, Series C Revenue Bonds	1/16/82	2,720,045	255,744	9.402	
$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds(d	1/16/82	837,769	84,587	10.097	4.666
$ 37,500,000 South Geysers Project, Series D Revenue Bonds	1/16/82	930,325	90,021	9.676	
$125,000,000 Bottle Rock Project, Series E Revenue Bonds	4/27/83	2,624,805	225,102	8.576	
$ 50,000,000 Alamo Project, Series F Revenue Bonds(d	4/27/83	1,190,763	100,836	8.468	4.727
$ 25,000,000 South Geysers Project, Series F Revenue Bonds	4/27/83	608,550	52,578	8.640	
$239,505,000 Reid Gardner Project, Series G Revenue Bonds	3/15/85	4,524,136	425,840	9.413	
$206,690,000 Power Facilities Series H Revenue Bonds(d	6/20/86	4,430,520	347,745	7.849	4.713
$132,000,000 East Branch Enlargement, Series A Water System Revenue Bonds	7/15/86	3,427,165	254,915	7.438	
$100,000,000 Series B Water System Revenue Bonds	5/05/87	2,564,012	194,817	7.598	
$ 9,000,000 Series C Water System Revenue Bonds	2/01/87	324,000	31,995	9.875	
$100,000,000 Series D Water System Revenue Bonds	6/14/88	2,640,510	201,253	7.622	
$ 9,000,000 Series E Water System Revenue Bonds	1/29/88	324,000	31,995	9.875	
$160,030,000 Series F Water System Revenue Bonds	3/15/89	2,779,838	189,261	6.808	
$100,000,000 Series G Water System Revenue Bonds	3/06/90	2,434,175	172,277	7.077	
$100,000,000 Series H Water System Revenue Bonds	1/10/91	2,459,172	168,857	6.866	
$180,000,000 Series I Water System Revenue Bonds	5/14/91	4,366,680	294,090	6.735	
$649,835,000 Series J Water System Revenue Bonds	1/16/92	12,422,222	745,198	5.999	
$100,000,000 Series K Water System Revenue Bonds	5/12/92	2,366,783	147,064	6.214	
$ 9,000,000 Series W Water Bonds	8/19/92	95,250	6,172	6.480	
$537,830,000 Series L Water System Revenue Bonds	5/01/93	11,414,859	640,518	5.611	4.620
$ 2,000,000 Series X Water Bonds	9/01/93	26,000	1,247	4.796	4.621
$190,000,000 Series M Water System Revenue Bonds	2/01/93	4,332,420	164,574	4.984	
$152,000,000 Series N Water System Revenue Bonds	3/03/95	3,007,600	150,106	5.472	
Total		**148,112,501**	**8,928,892**		
Portion allocated to Project Interest Rate		**63,815,877**	**2,948,650**	**4.621**	**4.621**

a) Amount represents a unit equivalent to one dollar of principal amount outstanding for one year.
b) Amount represents the total interest cost (without regard to premiums received) divided by the total dollar-years, expressed as a percentage.
c) Amount is determined by dividing cumulative interest costs by cumulative dollar-years and expressed as a percentage. Oroville Field Division Power Revenue Bonds for Off-Aqueduct Facilities and Water System Revenue Bonds, which do not affect the Project Interest Rate, are excluded.
d) These revenue bonds and revenue bond anticipation notes were sold at the following net interests costs. The following amounts (representing the sum of proceeds used for construction and the bond discount) were used in the calculations of the Project Interest Rate:

Devil Canyon-Castaic Revenue Bonds:	5.446 percent	$126,893,000
Pyramid Hydroelectric Revenue Bonds:	7.680 percent	$ 75,586,000
Alamo Bond Anticipation Notes:	10.036 percent	$ 18,034,000
Small Hydro Project I, Series D Revenue Bonds:	10.275 percent	$ 28,012,000
Alamo Project, Series F Revenue Bonds:	8.525 percent	$ 40,114,000
Power Facilities, Series H Revenue Bonds:	7.926 percent	$ 42,340,000

and the Department provide their own power to pump their water through the joint facilities.)

The percentage paid by USBR is reviewed every 5 years by USBR and the Department. For calendar years 1981 through 1986, the federal share of operations and maintenance costs was 44.47 percent. The most recent review of the percentage paid by the USBR was completed in 1987 and resulted in a federal share of 44.09 percent for calendar years 1987 through 1994. The amounts in Line 10 are based on the assumption that the federal share will continue at 44.09 percent for calendar years 1995 through 2010.

Line 11, Appropriations for Operating Costs Allocated to Recreation, shows appropriations made under the Davis-Dolwig Act. In passing the Davis-Dolwig Act, the California Legislature declared its intent that except for funds provided according to Assembly Bill 12 (1966), the Department budget will include appropriations of monies from the General Fund necessary for enhancement of fish and wildlife and recreation in connection with State water projects.

Annual OMP&R costs allocated to recreation and fish and wildlife enhancement are paid by annual appropriations from the General Fund. For fiscal years 1983-84 through 1993-94, no funds were appropriated for enhancement of fish and wildlife and recreational purposes. No appropriations are indicated for 1995 through 2010.

According to legislation enacted in 1989, the amount owed to the SWP by the State for costs allocated to recreation and to fish and wildlife enhancement is offset against the amount the SWP owes to the California Water Fund.

Line 12, Local Agency Payments under Davis-Grunsky Loan Repayment Contracts, shows the repayments for the $52.4 million of loans disbursed as of December 31, 1994. Repayment on any future loans was assumed to be beyond the period covered by the financial analysis.

Line 13, Revenue Bond Proceeds, includes bond proceeds classified as special reserves according to the description of revenue bond financing in Line 15 of Table 15-1. Those proceeds, used for capitalized OMP&R costs, revenue bond service, and debt service reserves, are not classified as revenues but are included in this line to simplify the financial presentation.

Line 14, Interest Earnings on Operating Revenues, includes interest earnings on unexpended proceeds from the sale of general obligation bonds, interest on operating reserves, and other short-term investment earnings on SWP revenues.

Line 15, Payments under Oroville-Thermalito Power Sale Contract, shows payments from Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas and Electric Company. Those utilities purchased all power generation from Edward Hyatt Powerplant and Thermalito Powerplant before April 1, 1983, according to a power sale contract dated November 29, 1967. The 1952-1994 entry includes amounts of final settlement of payments made according to the contract.

Line 16, Miscellaneous Revenues, includes all other operating revenues not included in Lines 2 through 15.

Line 17, Subtotal, Other Revenues, is the total of Lines 10 through 16.

Line 18, Total Operating Revenues, is the total of Lines 8, 9, and 17.

Line 19, Total Operating Revenues and Capital Resources Revenues, is the total of Lines 1 and 18.

Project Expenses

Project expenses include:

- operations, maintenance, and power costs;
- deposits to replacement reserves;
- deposits to special reserves;
- capital resources expenditures; and
- debt service.

Revenue bond proceeds earmarked for debt service during construction and the first year's operating expenses are deposited in the Central Valley Water Project Construction Fund and disbursed according to resolutions authorizing the issuance of such bonds.

Water contractor revenues associated with power facility operating costs and debt service are deposited in the Central Valley Water Project Revenue Fund for appropriate disbursement. All other operating revenues deposited in the California Water Revenue Fund-Systems Revenue Account are disbursed according to the following four priorities of use as specified in the Burns-Porter Act:

1) SWP operations, maintenance, power, and replacement costs; 2) general obligation bond debt service; 3) repayment of expenditures from the California Water Fund; and 4) deposits to a reserve for future SWP construction.

Project expenses are presented in Lines 20 through 37 of Table 15-2.

Line 20, Project Operations, Maintenance, and Power Costs, shows the OM&P portion of the historical and projected costs presented in Table 15-10. (page 227)

Table 15-10 and Line 20 of Table 15-2 also include amounts of the operations and maintenance costs for the federal share of joint facilities and those OM&P costs allocated to recreation, which are intended to be offset by revenues indicated in Lines 10 and 11.

Allowances for cost escalations are included in OM&P costs through 1997. Allowances for additional long-term price escalations in the future are not included in these estimates because changes in OM&P costs do not substantially affect the overall results of the financial analysis. (For the most part, changes in OM&P costs cause direct offsetting changes in operating revenues.)

Power costs make up the major item of annual operating expense for the SWP. Assumptions about future power sources and costs are discussed in Chapter 11, "Power Resources." Line 20 also includes costs associated with power transactions that result in the sale of power not required for the delivery of water.

Line 21, Deposits to Replacement Reserves, shows funds set aside as required by contract for replacing existing SWP facilities. As of December 31, 1994, $42.6 million had been spent for replacement costs; the balance of the replacement reserve as of that date was $60.7 million. Replacement reserve amounts are also included in Table 15-10.

Line 22, Deposits to Special Reserves Under Revenue Bond Financing, includes two significant components: special reserve deposits related to revenue bonds and capital resources revenue carryover from prior years used for construction in the current year. Special reserve deposits are the net of several income and expenditure items. Income items related to revenue bonds are as follows:

- proceeds set aside to pay bond interest during construction (capitalized interest);
- proceeds set aside for first year operating costs (capitalized operations and maintenance);
- water contractor payments or bond proceeds set aside for debt service reserves;
- water contractor payments for revenue bond cover requirements; and
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements.

The 1952-1994 column also includes advances to the Department's revolving fund for working funds to purchase mobile equipment and to meet day-to-day operating expenses.

The expenditure items related to revenue bonds are as follows:

- debt service cover payments returned to water contractors;
- debt service reserve payments returned to water contractors;
- surplus account funds returned to water contractors or applied to meet expenses;
- total capitalized interest paid out; and

- total capitalized operations and maintenance paid out.

Special reserves, reduced over time as reserved amounts, are used for their respective purposes. The amount indicated each year in Line 22 indicates the change from the previous year. A negative number indicates a withdrawal of special reserves to meet expenses, while a positive number indicates a deposit.

Line 23, Capital Resources Expenditures, includes the amount of capital resources revenues applied to construction that is shown in Line 30 of Table 15-1. In Table 15-2, these expenditures are funded out of withdrawals from the reserves in Line 22 and do not affect net revenues shown in Line 34.

Lines 24 and 25, Payment of Debt Service on Bonds Sold through June 30, 1995, show the total principal and interest payments on bonds sold to date. Table 15-11 (page 228) summarizes payments on general obligation bonds (Series A through W water bonds), power revenue bonds by project, and water system revenue bonds.

The last bonds, sold on March 13, 1995, were the Series N Water System Revenue Bonds. Proceeds from the Series N bonds were used to provide funds for construction, fund the debt service reserve account, and pay bond discount and interest costs.

Since 1978, the bond trustee has been retiring Oroville Revenue Bonds prior to the fixed maturity date as indicated in Table 15-12. On April 1, 1994, all outstanding Oroville bonds were retired. The schedule for service of Oroville Revenue Bonds indicated in Table 15-11 is based on a revised bond maturity schedule that reflects those early bond retirements.

Line 25 also includes over $0.3 million in interest payments to the General Fund for the temporary loan of $46.8 million in 1970. That loan was repaid by proceeds from the sale of Series N Water Bond Anticipation Notes.

Lines 26 and 27, Payments on Projected East Branch Enlargement Bonds, include the projected annual service amounts for future water revenue bonds included on Line 23 of Table 15-1 for the East Branch Enlargement.

TABLE 15-12

Retirement Schedule of Oroville Revenue Bonds 1978 through 1995

Year	Bonds Retired	Cost
1978	$4,045,000	$3,845,099
1979	9,730,000	8,933,093
1980	1,350,000	1,227,600
1981	2,865,000	1,805,862
1982	15,890,000	9,623,312
1983	18,865,000	16,776,000
1984	7,640,000	6,807,020
1985	10,215,000	9,044,000
1986	7,175,000	6,598,000
1987	8,980,000	8,808,104
1988	3,815,000	3,676,482
1989	30,690,000	30,390,215
1990	7,210,000	7,164,817
1991	8,720,000	8,708,098
1992	10,625,000	10,625,000
1993	13,755,000	13,755,000
1994	35,225,000	35,225,000
1995	0	0

Assumptions about the service on these future bonds are as follows:

- Interest costs for the water revenue bonds average 6.0 percent.
- Bonds are to be repaid within 35 years of sale with maturities commencing in the year following the date of sale and with equal annual bond service for the principal repayment period.

Lines 28 and 29, Payments on Projected Future Water Bonds, include amounts of the projected annual service for future water revenue bonds included on Line 25 of Table 15-1 for water system facilities. Assumptions about the service on these future bonds are the same as those indicated for Lines 26 and 27.

Lines 30 and 31, Total Payments of Bond Debt Service, show the total of interest payments indicated on Lines 25, 27, and 29 and the total of principal repayments indicated on Lines 24, 26, and 28.

Line 32, Subtotal, Debt Service, is the total of Lines 30 and 31.

Line 33, Total Operating Expenses and Debt Service, is the total of Lines 20, 21, 22, 23, and 32.

Line 34, Net System Revenues, shows the annual amounts of revenues remaining after the payment of operating costs and bond debt service costs.

Line 35, California Water Fund Repayment, shows repayments according to the Burns-Porter Act, which requires that after operation, maintenance, replacement, and bond service requirements have been satisfied, SWP revenues be transferred to the California Water Fund to reimburse the fund for monies expended for construction of the State Water Resources Development System.

In 1982 and 1983, the Department transferred a total of $70 million toward the repayment of the California Water Fund. The legislature subsequently appropriated all these funds to the State's General Fund. Legislation enacted in 1989 provided for the orderly, scheduled reimbursement of the remaining balance owed to the California Water Fund over a period of 10 years. A portion of this reimbursement is to be offset by the amounts owed to SWP by the State for costs allocated to recreation and fish and wildlife enhancement.

As of December 31, 1994, reimbursements to the California Water Fund totaled $414 million. Of this total approximately $199 million was direct repayments and $215 million was offsets for recreation and fish and wildlife enhancement expenditures to date.

Repayment of the California Water Fund is expected to be completed in 1997.

Line 36, Revenues Used for Capital Expenditures, includes the amounts required annually for financing scheduled capital expenditures. Also included in this line are projected expenditures to support the Bay-Delta Advisory Council and other programs required to comply with the Bay-Delta Agreement signed in December 1994. Revenues not needed for operating costs, debt service, or repayment of the California Water Fund are available for financing SWP capital expenditures.

Line 37, Revenues Available for Capital Expenditures, are revenues in excess of expenses and repayment of the California Water Fund and available beyond present construction requirements. Those funds would be available to fund a portion of future SWP facilities. The amount indicated could be transferred to Line 36 if additional facilities scheduled for construction need to be funded.

Future Costs of Water Service

Estimates of future water costs are useful to SWP contractors in short-range and long-range planning of water needs, operations, and budgets.

Unit water charges shown in Table 15-13 represent both unescalated and escalated costs of water according to service areas for years 1996 and 2000. The unit rates in Table 15-13 include costs of existing and future SWP facili-

TABLE 15-13

Estimated Unit Water Charges for 1996 and 2000, by Service Area

(Dollars per Acre-Foot)

Service Area and Charge	1996 Unescalated	1996 Escalated	2000 Unescalated	2000 Escalated
Feather River Area				
Capital; Operations, Maintenance, and Replacement (OM&R)	58	58	56	57
North Bay Area				
Capital; OM&R	173	173	158	158
Power	10	10	13	13
Total	**183**	**183**	**171**	**171**
South Bay Area				
Capital; OM&R	74	74	72	72
Power	26	26	33	34
Total	**100**	**100**	**105**	**106**
Coastal Area				
Capital; OM&R	981	981	432	432
Power	61	61	59	78
Total	**1,042**	**1,042**	**491**	**510**
San Joaquin Area				
Capital; OM&R	45	45	44	45
Power	12	12	15	15
Total	**57**	**57**	**59**	**60**
Southern California Area				
Capital; OM&R	113	113	108	109
Power	61	61	84	87
Total	**174**	**174**	**192**	**196**

ties accounted for in Tables 15-1 and Table 15-7. The unit charges are based on the assumption that in 1996 and 2000, the SWP will be able to deliver entire amounts of water requested by contractors. The unit water charges included in Table 15-13 are listed both as unescalated 1994 dollars and as escalated rates reflecting assumed future inflation.

The Department's estimates of future capital expenditures include allowances for escalation of construction costs at 5 percent per year for 1995 through 2010. The escalation rates for future power sources vary, depending on the source of energy.

Information for this chapter was provided by the State Water Project Analysis Office in conjunction with the Division of Fiscal Services.

TABLE 15-10

Operations, Maintenance, Power, and Replacement Costs, by Facility, Composition, and Purpose

(Thousands of dollars)

Feature	Calendar year 1962-1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011-2035	Total
Project Facility																				
Feather River facilities	117,783	(319)	(80)	523	1,048	1,091	1,239	1,296	1,178	1,197	1,208	1,272	1,284	1,278	1,275	1,271	1,267	1,264	45,631	180,706
North Bay Aqueduct	12,446	2,056	2,250	2,523	2,386	2,402	2,418	2,484	2,495	2,503	2,514	2,529	2,625	2,633	2,646	2,660	2,673	2,694	72,034	126,971
Delta facilities	174	106	179	197	231	234	0	0	0	0	0	0	0	0	0	0	0	0	0	1,121
Suisun Marsh	6,072	956	952	1,105	1,261	1,286	948	949	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	32,319	58,778
South Bay Aqueduct	109,436	11,555	8,882	9,256	9,746	9,734	9,739	10,121	10,111	10,104	10,109	10,135	10,563	10,554	10,571	10,579	10,597	10,631	274,425	556,848
California Aqueduct																				
Delta to Edmonston	1,239,775	133,332	155,716	169,516	175,483	174,456	177,755	190,866	190,003	189,896	189,997	190,468	205,986	205,633	206,537	206,354	207,697	208,496	5,524,986	9,942,952
Edmonston to Perris	1,036,651	90,180	126,205	143,246	143,203	138,834	145,192	159,353	159,157	159,446	159,898	160,481	179,821	178,436	179,980	179,704	181,699	185,539	4,979,704	8,686,749
West Branch	(7,602)	(421)	(17,086)	(19,150)	(20,445)	(20,138)	(24,871)	(22,858)	(23,106)	(23,067)	(23,045)	(22,982)	(22,118)	(22,108)	(22,072)	(22,040)	(21,957)	(21,915)	(525,633)	(882,614)
Coastal Branch	44,422	5,871	4,954	5,424	6,799	6,739	7,823	8,230	8,213	8,223	8,242	8,277	8,717	8,708	8,736	8,756	8,785	8,838	231,762	407,519
Off-aqueduct power generating facilities	522,292	62,652	49,798	53,655	54,515	51,571	46,642	38,356	36,230	31,041	25,748	21,559	14,180	11,074	6,777	582	(3,610)	(10,193)	(41,564)	971,305
Recreation, planning, and CVP negotiations	0	132	118	123	126	126	126	126	602	602	602	602	602	602	602	602	602	602	15,050	21,947
Water quality monitoring	153,586	22,393	19,721	19,253	17,241	17,472	16,961	16,531	15,351	15,351	15,351	15,351	15,351	15,351	15,351	15,351	15,351	15,351	238,786	675,454
Davis-Grunsky Act program	3,859	273	285	261	229	229	229	229	229	229	229	229	229	229	229	229	229	229	5,736	13,620
Subtotal	3,238,894	328,766	351,894	385,932	391,823	384,036	384,201	405,683	401,756	396,838	392,146	389,214	418,533	413,683	411,925	405,341	404,626	402,829	10,853,236	20,761,356
Payments to/credits from PG&E under Comprehensive Agreement	4,546	(3,352)	(3,213)	(3,074)	(2,935)	(2,797)	(2,658)	(2,519)	(2,380)	(2,241)	(2,102)	(1,963)	(152)	0	0	0	0	0	0	(24,840)
Total OMP&R Costs	**3,243,440**	**325,414**	**348,681**	**382,858**	**388,888**	**381,239**	**381,543**	**403,164**	**399,376**	**394,597**	**390,044**	**387,251**	**418,381**	**413,683**	**411,925**	**405,341**	**404,626**	**402,829**	**10,853,236**	**20,736,516**
Composition																				
Salaries and expenses of headquarters personnel	550,288	69,926	68,886	71,263	73,730	73,644	73,643	72,634	72,314	72,314	72,314	72,314	72,314	72,314	72,314	72,314	72,314	72,314	1,667,452	3,444,606
Salaries and expenses of field personnel	1,101,014	105,404	97,816	96,103	91,642	92,186	91,899	92,476	92,270	92,270	92,268	92,269	92,267	92,268	92,268	92,267	92,267	92,265	2,296,013	4,987,232
Pumping power																				
Used by pumping plants	1,596,070	148,108	231,406	266,854	281,317	271,807	282,223	312,550	311,266	311,250	311,904	313,027	351,220	349,403	352,180	351,532	355,170	360,620	9,725,892	16,483,799
Produced by generation plants	(563,849)	(62,903)	(101,739)	(108,148)	(116,968)	(112,759)	(117,792)	(117,920)	(117,911)	(117,624)	(117,675)	(117,542)	(119,034)	(118,962)	(119,201)	(118,940)	(119,102)	(119,764)	(2,984,225)	(5,472,058)
Payments to/credits from PG&E under Comprehensive Agreement	4,546	(3,352)	(3,213)	(3,074)	(2,935)	(2,797)	(2,658)	(2,519)	(2,380)	(2,241)	(2,102)	(1,963)	(152)	0	0	0	0	0	0	(24,840)
Off-aqueduct power generating facilities requirement	522,292	62,653	49,798	53,655	54,515	51,571	46,642	38,356	36,230	31,041	25,748	21,559	14,180	11,074	6,777	582	(3,610)	(10,193)	(41,565)	971,305
Oroville-Thermalito insurance premiums	8,881	200	210	221	232	232	232	232	232	232	232	232	232	232	232	232	232	232	5,800	18,560
Less portion of costs incurred during construction	(123,810)	(2,198)	(1,838)	(1,371)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(129,217)
Subtotal	3,095,432	317,838	341,326	375,503	381,533	373,884	374,189	395,809	392,021	387,242	382,689	379,896	411,027	406,329	404,570	397,987	397,271	395,474	10,669,367	20,279,387
Deposits to replacement reserves	148,008	7,576	7,355	7,355	7,355	7,355	7,354	7,355	7,355	7,355	7,355	7,355	7,354	7,354	7,355	7,354	7,355	7,355	183,869	457,129
Total OMP&R Costs	**3,243,440**	**325,414**	**348,681**	**382,858**	**388,888**	**381,239**	**381,543**	**403,164**	**399,376**	**394,597**	**390,044**	**387,251**	**418,381**	**413,683**	**411,925**	**405,341**	**404,626**	**402,829**	**10,853,236**	**20,736,516**
Project Purpose																				
Water supply and power generation	3,073,125	309,090	334,087	367,629	373,689	365,797	366,049	387,576	383,728	378,787	374,082	371,141	400,369	395,523	393,757	387,158	386,454	384,537	10,415,581	19,848,159
Payments to/credits from PG&E under Comprehensive Agreement	4,546	(3,352)	(3,213)	(3,074)	(2,935)	(2,797)	(2,658)	(2,519)	(2,380)	(2,241)	(2,102)	(1,963)	(152)	0	0	0	0	0	0	(24,840)
Recreation and fish and wildlife enhancement	57,997	8,441	7,922	8,281	8,071	8,173	8,068	8,021	7,939	7,961	7,974	7,983	8,072	8,068	8,076	8,090	8,079	8,199	185,220	380,635
Flood control	2,063	219	158	196	254	253	254	256	256	257	257	257	259	259	259	260	260	260	6,582	12,819
Miscellaneous purposes																				
Federal share, San Luis and Delta facilities	100,258	10,388	9,214	9,345	9,367	9,371	9,388	9,388	9,391	9,391	9,391	9,391	9,391	9,391	9,391	9,391	9,391	9,391	234,785	495,414
Other (Davis-Grunsky, drainage, City of Los Angeles)	5,451	628	513	481	442	442	442	442	442	442	442	442	442	442	442	442	442	442	11,068	24,329
Total OMP&R Costs	**3,243,440**	**325,414**	**348,681**	**382,858**	**388,888**	**381,239**	**381,543**	**403,164**	**399,376**	**394,597**	**390,044**	**387,251**	**418,381**	**413,683**	**411,925**	**405,341**	**404,626**	**402,829**	**10,853,236**	**20,736,516**

TABLE 15-11

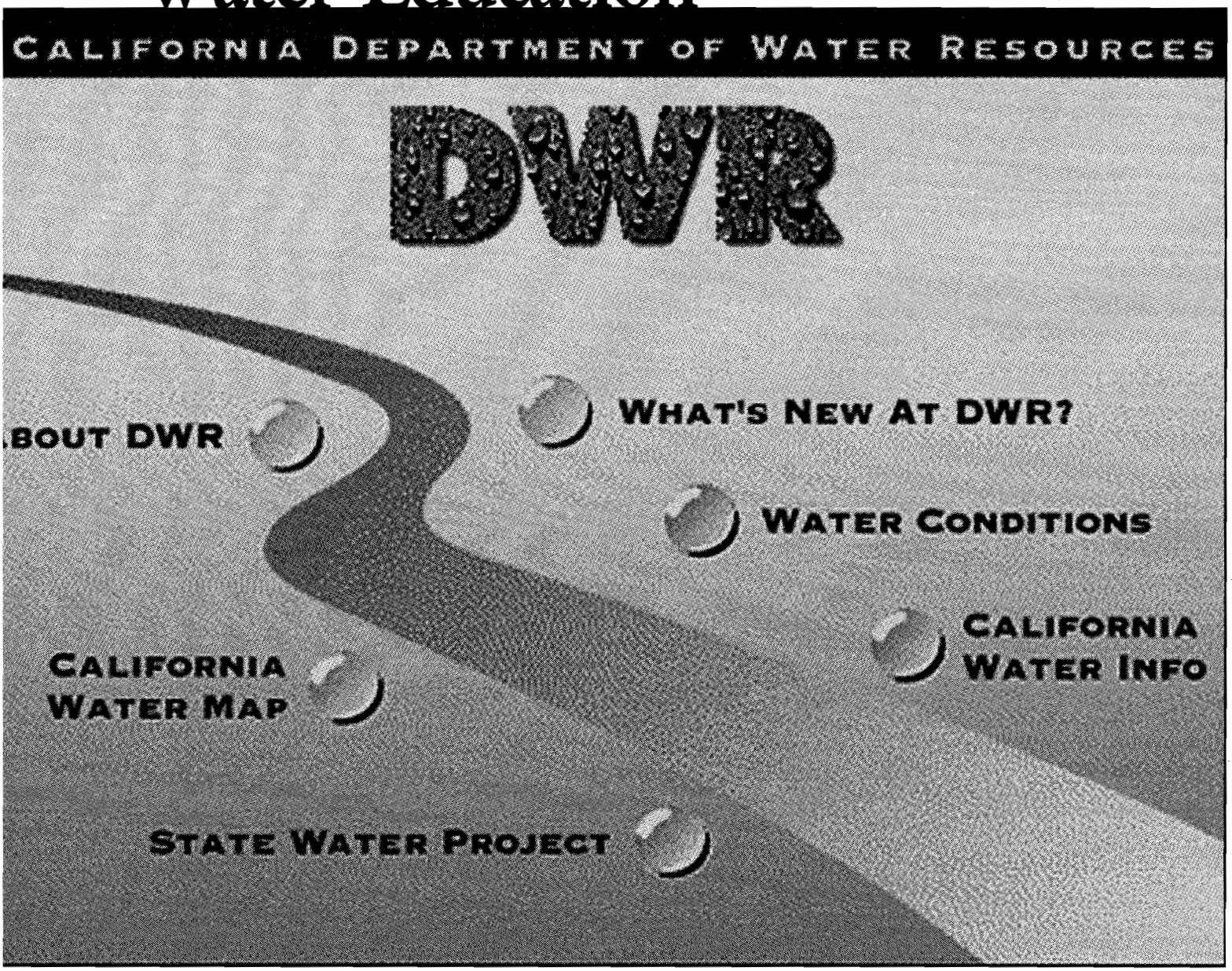
Annual Debt Service on Bonds Sold through June 30, 1995

(Thousands of dollars)

Calendar	Series A through X Water Bonds		Oroville Revenue Bonds (a		Devil Canyon-Castaic Project Revenue Bonds		Pyramid Project Power Facilities Revenue Bonds, Series A and H; Water System Revenue Bonds, Series J		Reid Gardner Project Power Facilities Revenue Bonds, Series B, C, G, and H; Water System Revenue Bonds, Series F and J		South Geysers Project Power Facilities Revenue Bonds, Series D, F, and H; Water System Revenue Bonds, Series D, E, J, and L		Small Hydro Project Power Facilities Revenue Bonds, Series D and H; Water Systems Revenue Bonds, Series J and L		Bottle Rock Project Power Facilities Revenue Bonds, Series E; Water System Revenue Bonds, Series D, E, and J		Alamo Project Power Facilities Revenue Bonds, Series F and H; Water System Revenue Bonds, Series J		East Branch Enlargement Water System Revenue Bonds Series A, D, E, H, I, J, K, L, and M		Water System Facilities Water System Revenue Bonds Series B, C, D, E, G, H, I, J, K, L,and M		Grand Total	
Year	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
1964	0	3,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,333
1965	0	11,114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,114
1966	0	16,742	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,742
1967	0	26,912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,912
1968	0	37,760	0	3,876	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,636
1969	0	47,461	0	10,448	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,909
1970	0	53,291	0	13,145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,436
1971	0	63,035	0	13,145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,180
1972	0	69,148	1,260	13,112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	82,260
1973	1,200	69,348	1,330	13,042	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,098
1974	3,000	69,533	1,400	12,969	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,400	90,210
1975	5,000	69,366	1,475	12,893	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,475	89,967
1976	7,000	69,408	1,555	12,811	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	89,927
1977	10,200	69,323	1,635	12,727	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,758
1978	12,700	69,312	5,775	12,537	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,557
1979	13,650	68,690	11,585	12,275	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,673
1980	16,050	67,968	3,265	11,739	0	7,708	0	7,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,315
1981	18,050	67,109	4,885	11,444	0	7,708	0	7,292	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,865
1982	19,250	66,162	17,920	10,968	0	7,708	0	7,292	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,477
1983	20,520	65,148	21,110	10,147	900	7,708	0	7,292	0	35,719	0	4,777	0	3,727	0	6,017	0	2,449	0	0	0	0	42,530	142,984
1984	21,785	64,068	10,005	9,013	955	7,647	640	7,292	0	35,719	0	5,647	0	3,727	0	10,315	0	4,198	0	0	0	0	33,385	147,626
1985	22,555	63,932	12,700	8,628	1,010	7,583	675	7,238	9,425	27,209	0	5,647	0	3,727	0	10,315	0	4,198	0	0	0	0	46,365	138,477
1986	23,830	61,742	11,435	7,859	1,070	7,515	715	7,377	3,805	32,882	0	5,516	0	3,537	1,240	10,315	0	4,263	0	4,021	0	0	42,095	145,027
1987	25,495	60,492	11,715	7,188	1,135	7,442	790	7,513	4,860	32,605	0	5,386	0	3,348	1,305	10,253	265	4,329	0	9,651	0	4,952	45,565	153,159
1988	26,770	59,165	6,685	6,664	1,205	7,366	830	7,447	5,065	32,295	580	5,521	345	3,348	1,390	10,849	280	4,314	995	9,876	710	11,037	44,855	157,882
1989	28,145	57,825	33,705	5,513	1,275	7,284	875	7,378	7,820	27,557	709	5,646	365	3,328	1,566	11,592	295	4,298	1,078	10,115	1,148	14,368	76,981	154,904
1990	29,385	56,473	10,385	4,301	1,355	7,198	930	7,305	6,675	29,781	761	5,596	405	3,304	1,678	11,491	320	4,279	1,134	10,050	1,227	19,554	54,255	159,332
1991	30,365	55,070	12,055	3,922	1,435	7,107	980	7,227	7,170	29,302	817	5,540	430	3,276	1,792	11,376	335	4,257	1,197	16,856	2,129	27,568	58,705	171,501
1992	31,745	54,233	14,135	2,985	1,520	7,010	2,395	5,307	8,950	27,188	1,934	4,136	960	2,553	4,575	7,942	1,260	3,086	2,583	22,241	5,107	28,410	75,164	165,091
1993	33,390	52,707	13,755	2,237	1,610	6,907	1,525	5,687	8,820	26,953	901	4,280	445	2,759	3,264	8,386	755	3,300	3,039	22,836	4,577	31,080	72,081	167,132
1994	35,075	51,274	35,225	934	1,705	6,799	1,575	5,633	78,457	26,273	1,588	4,072	930	2,735	3,374	8,270	780	3,274	4,567	20,753	5,915	38,224	169,191	168,241
1995	36,210	49,653	0	0	1,810	6,684	1,630	5,569	5,420	19,231	1,695	4,005	1000	2,681	3,521	8,133	805	3,242	4,979	21,879	8,069	41,922	65,139	162,999
1996	37,450	47,980	0	0	1,920	6,561	1,685	5,496	5,775	18,869	1,808	3,930	1085	2,620	3,682	7,974	845	3,207	5,101	22,336	10,834	43,581	70,185	162,554
1997	37,145	46,326	0	0	2,035	6,432	1,760	5,417	11,775	18,478	1,945	3,848	1145	2,552	3,861	7,802	895	3,168	6,082	22,065	10,773	42,902	77,416	158,990
1998	37,225	44,704	0	0	2,155	6,295	1,835	5,332	12,570	17,662	2,065	3,759	1230	2,480	4,030	7,613	930	3,124	6,367	21,744	11,313	42,230	79,720	154,943
1999	38,150	43,103	0	0	2,285	6,160	1,915	5,238	13,455	16,782	2,216	3,658	1335	2,401	4,240	7,412	985	3,077	6,641	21,414	11,809	41,562	83,031	150,807
2000	39,440	41,451	0	0	2,420	6,040	2,000	5,137	14,380	15,828	2,095	3,547	910	2,312	4,470	7,191	1,035	3,025	7,764	21,062	11,976	40,848	86,490	146,441
2001	40,530	39,737	0	0	2,565	5,912	2,100	5,027	15,385	14,798	2,205	3,432	970	2,257	4,720	6,950	1,090	2,969	8,184	20,677	12,676	40,155	90,425	141,914
2002	41,670	37,976	0	0	2,720	5,773	2,200	4,910	16,480	13,685	2,325	3,307	1005	2,197	4,990	6,691	1,155	2,908	8,575	20,054	13,250	39,250	94,370	136,751
2003	43,520	36,159	0	0	2,885	5,626	2,310	4,786	8,175	12,481	2,475	3,173	980	2,134	5,285	6,411	1,220	2,843	9,039	19,606	14,016	38,461	89,905	131,680
2004	45,660	34,249	0	0	3,055	5,470	2,430	4,652	8,755	11,869	2,620	3,029	1080	2,073	5,610	6,110	1,295	2,773	8,408	19,127	15,697	37,622	94,610	126,974
2005	46,950	32,255	0	0	3,240	5,305	2,540	4,509	8,485	11,214	2,750	2,873	1135	2,005	5,950	5,784	1,375	2,697	8,876	18,683	16,584	36,787	97,885	122,112
2006	48,240	30,201	0	0	3,435	5,130	2,675	4,359	9,015	10,696	2,920	2,711	1,180	1,938	6,325	5,433	1,450	2,616	9,387	18,212	17,553	35,895	102,180	117,191
2007	49,730	28,081	0	0	3,640	4,945	2,825	4,199	9,530	10,138	3,100	2,536	1,250	1,867	6,730	5,054	1,540	2,529	9,930	17,715	18,570	34,945	106,845	112,009
2008	51,720	25,895	0	0	3,860	4,749	2,980	4,029	25,100	9,549	3,300	2,350	1,265	1,792	7,160	4,650	1,640	2,437	10,451	17,189	19,469	33,935	126,945	106,575
2009	54,060	23,616	0	0	4,090	4,540	3,150	3,847	26,785	7,802	3,490	2,147	1,280	1,714	7,635	4,212	1,745	2,336	11,063	16,611	20,602	32,863	133,900	99,688
2010	55,750	21,242	0	0	4,335	4,319	3,325	3,654	28,575	5,962	3,720	1,934	1,270	1,636	8,135	3,744	1,865	2,229	11,774	15,999	21,951	31,709	140,700	92,428
2011	57,240	18,792	0	0	4,595	4,085	3,505	3,450	30,495	4,000	3,960	1,706	1,270	1,558	8,675	3,246	1,980	2,115	12,465	15,336	23,190	30,470	147,375	84,758
2012	58,580	16,244	0	0	4,875	3,837	3,720	3,205	32,615	2,068	4,235	1,429	1,285	1,469	9,335	2,638	2,135	1,977	13,200	14,629	24,560	29,108	154,540	76,604
2013	60,420	13,702	0	0	5,165	3,574	3,950	2,944	0	0	4,550	1,132	1,850	1,379	10,040	1,985	2,295	1,827	13,968	13,883	25,992	27,666	128,230	68,092
2014	57,950	11,268	0	0	5,475	3,303	4,160	2,703	0	0	4,830	854	1,920	1,266	10,720	1,370	2,450	1,687	14,788	13,084	27,467	26,190	129,760	61,725
2015	53,740	8,860	0	0	5,805	3,015	4,375	2,453	0	0	5,075	564	1,990	1,151	740	727	2,605	1,540	15,702	12,237	29,153	24,637	119,185	55,184
2016	46,180	6,646	0	0	6,150	2,710	4,600	2,190	0	0	2,180	259	2,165	1,031	790	682	2,775	1,383	16,612	11,346	30,773	22,997	112,225	49,244
2017	38,110	4,630	0	0	6,520	2,388	4,835	1,914	0	0	170	128	2,275	902	840	635	2,955	1,217	17,630	10,401	32,630	21,233	105,965	43,448
2018	25,400	2,990	0	0	6,910	2,045	5,080	1,624	0	0	180	118	2,395	765	890	585	3,155	1,039	18,663	9,394	34,412	19,418	97,085	37,978
2019	16,940	1,788	0	0	7,325	1,682	5,335	1,319	0	0	190	107	2,505	621	950	531	3,360	850	19,801	8,325	36,469	17,474	92,875	32,697
2020	17,370	942	0	0	7,765	1,298	5,610	999	0	0	205	96	2,630	471	1,010	474	3,585	649	21,009	7,192	38,606	15,414	97,790	27,535
2021	8,560	309	0	0	8,230	890	5,890	663	0	0	215	84	2,750	313	1,070	414	3,825	433	22,260	6,032	40,850	13,284	93,650	22,422
2022	1,850	52	0	0	8,725	458	6,160	339	0	0	230	72	2,945	162	1,130	355	4,055	223	23,584	4,805	43,161	11,080	91,840	17,546
2023	50	2	0	0	0	0	0	0	0	0	240	59	0	0	1,200	293	0	0	18,963	3,498	49,812	8,738	70,265	12,590
2024	0	0	0	0	0	0	0	0	0	0	576	46	0	0	2,855	227	0	0	20,640	2,444	43,043	5,637	67,114	8,354
2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,350	1,220	29,575	2975	45,925	4,195
2026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,538	267	14,997	1,341	18,535	1,608
2027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,191	58	11,079	540	12,270	598
Total	1,581,000	2,385,997	244,995	246,522	139,165	283,872	106,510	205,144	423,817	604,254	74,855	118,657	47,980	85,116	156,773	232,447	59,335	106,365	417,578	574,923	791,724	1,068,062	4,043,732	5,911,359

Chapter 16

SWP Information and Water Education



DWR's new homepage on the World Wide Web
Site address: http://wwwdwr.water.ca.gov/

Significant Events

- After opening to the public on November 15, 1993, Vista del Lago Visitors Center, located at Pyramid Lake on Interstate 5, attracted more than 131,080 visitors in 1994, its first full year of operation.

- On January 7, 1995, the world wide web page, "DWR California Water Page," officially went on-line. This water page provides SWP information for a worldwide audience of computer-users. The water page features descriptions of the State Water Project, snow water content in the Sierra Nevada, storage at key reservoirs, river flow projections, and a menu of current and recent news announcements.

- On May 11, 1995, 125 students walked 1.6 miles along the California Aqueduct near Mettler to the A.D. Edmonston Pumping Plant. The "Walk for Water" event was part of the Water Awareness Month celebration to highlight the importance of water and the SWP to the people of California. A similar "Walk for Wellness" event took place at Oroville Dam to commemorate the importance of the reservoir to California's water supply. Local news coverage of both events was extensive.

- About 500 people packed into the Hyatt Pumping-Generating Plant on May 13, 1995, to tour the underground facility. The tour was part of the annual observance of Feather River Fiesta Day in Oroville.

- During rain-drenched January and March of 1995, DWR kept local and national news media informed on flooding and flood fighting efforts by the Department. DWR staff briefed reporters on the storm's impact to the aqueduct and on flood fights along the Sacramento River, at Clear Lake and Lake Elsinore. DWR photographers documented damage and repairs to SWP facilities, as well as local flooding in the Sacramento and Delta regions.

The Department of Water Resources' Office of Water Education conducts public information and education programs to help inform the news media and educate the public about the operations and value of the State Water Project. These programs employ a variety of public outreach methods, including news media relations, publications, web sites on the internet, videos, SWP visitor centers and tours, exhibits, brochures, and special events.

State Water Project Information and Education Programs

Media

To keep the news media informed of SWP developments, the Department publicizes significant events affecting SWP operations and water deliveries. During fiscal year 1994-95, DWR issued 40 news releases, six media advisories and assisted in developing news releases for the Governor and the Resources Secretary. The Department also facilitated news interviews, serviced numerous media information requests, and conducted two media tours of Delta facilities to showcase environmental programs funded by the SWP.

The Department news contacts cover a wide range of topics including water deliveries, water supplies, SWP operations, environmental actions, Delta developments, fishery impacts, fish monitoring, the Monterey Agreement, dam safety and flood control. DWR provided outreach assistance to the CALFED Bay-Delta Program in developing various public information materials.

DWR performs outreach efforts with regional news outlets to publicize recreational opportunities at SWP facilities, including Lake Oroville, Lake Del Valle in Alameda County, and Silverwood Lake in Riverside County.

Media Services During 1995 Floods. During rain-drenched January and March, DWR news media specialists worked at the State-Federal Flood Operations Center, keeping local and national news media informed on flooding and flood fighting efforts by DWR.

During the March storms, the structure of the California Aqueduct itself was imperiled by flash flooding in Arroyo Pasajero, a normally dry watercourse in the southern San Joaquin Valley. DWR staff briefed reporters on the storm's impact to the aqueduct and on flood fights along the Sacramento River, at Clear Lake and Lake Elsinore.

DWR photographers documented damage and repairs to SWP facilities, as well as local flooding in the Sacramento and Delta regions.

Internet Web Site

In January 1995, DWR initiated the "DWR California Water Page" on the Internet. This provides access to SWP information for a worldwide audience of computer-users. The water page (accessed via http://wwwdwr.water.ca.gov) features descriptions of the State Water Project, snow water content in the Sierra Nevada, storage at key reservoirs, river flow projections, and a menu of current and recent news announcements. It also provides connections to other DWR and water-related web sites including the Division of Operations and Maintenance's Operation Control Office home page, which features daily, weekly, and monthly reports about SWP operations.

Publications

DWR publishes two regular publications: DWR People and DWR News.

DWR People. The bimonthly publication, is an internal newsletter for DWR employees. Stories feature various individuals and their accomplishments and milestones. Lead articles during fiscal year 1994-95 included employees' work on DWR's information highway, a new training center at San Joaquin Field Division, and fishery enhancement projects at Lake Oroville.

DWR News. Issued twice a year, DWR News contains in-depth articles on significant DWR programs and projects, such as the role of the research vessel San Carlos as a floating water quality laboratory in the Delta, the work of the State Reclamation Board in revegetating levee berms for habitat, and the development of DWR's Geographic Information System.

Brochures. The Department meets many information needs by publishing a variety of brochures describing SWP facilities. During fiscal year 1994-95, OWE revised and reprinted eight brochures (including an SWP facilities map in English, Spanish, German, and several Asian languages), a guide to Vista del Lago Visitor Center, and the California Water Facts card. During the same period, DWR also reprinted four other publications, including brochures describing Lake Perris and the Harvey O. Banks Delta Pumping Plant.

SWP Calendar. DWR staff produced a 1995 calendar featuring colorful photos of recreational activities at SWP facilities. These calendars are intended primarily for Department visitors, especially those who tour the State Water Project.

Video Programs

DWR completed a number of video productions in 1994-95. Major projects included: SWP construction updates, continued monthly coverage of SWP construction with emphasis on the Coastal Branch, Devil Canyon, and Mojave Siphon; "Balancing Act," a program on the SWP and the environment; a Spanish version of "Surviving Drought in California;" two water conservation TV Public Service Announcements, "Wild, Restless & Sporadic" and "Water Makes California a Cool Place to Live;" aerial emergency flood coverage in January and March 1995; coverage of Arroyo Pasajero flood damage in the Central Valley; and "Notorious Killer," a water-safety-oriented radio PSA.

Visitors Center Program

On February 11, 1992, Director Kennedy authorized the OWE to plan and manage the visitor facilities public education program through the Water Resources Engineering Memorandum No. 19e. The visitors facilities include the three visitors centers at Oroville, San Luis, and Pyramid Lake, as well as the visitor areas at the Edmonston Pumping Plant and Delta Field Division. Visitors centers at Oroville, San Luis, and Pyramid Lake are open daily except for Christmas, New Years, and Thanksgiving; tours at the Edmonston Pumping Plant and the Delta Field Division are by appointment only. Vista del Lago, which overlooks Pyramid Lake, is the largest visitors center, averaging 12,000 visitors monthly.

Use of facilities at SWP recreation areas is measured in terms of visitor-days and recreation-days. A visitor-day is counted when one person enters a visitors center, stops at an overlook, or participates in a guided tour of SWP facilities. (See Chapter 14, "Recreation Programs," for recreation-day definition). SWP facilities received 490,837 visitors for fiscal year 1994-95, a 14-percent increase over the visitor-days recorded in 1993 (Table 16-1).

Activities under this program include providing assistance to guides on water education outreach, producing and renovating exhibits, producing educational and

TABLE 16-1
Visitor-Days Recorded in 1994, by Location

Location	*Visitor-Days*
Project Operation Control Center, Sacramento	400
Oroville Field Division	157,800
Delta Field Division	1,800
San Luis Field Division	188,600
San Joaquin Field Division	4,000
Southern Field Division	
Vista del Lago	138,100
Total	**490,700**

promotional materials, and conducting educational outreach programs. This effort is closely coordinated with O&M field divisions.

Highlights of this program in FY 1994-95 include:

- Approximately 490,000 persons visited the SWP visitors centers and other visitor areas.
- A 3-year community outreach plan was developed, emphasizing the message "The Value of the SWP to the Local Community." Each field division conducts community outreach to reach local media, elementary school children, active adults, and recreationists. Projects conducted by the field divisions to highlight the importance of the SWP included a "Walk for Water" event along the California Aqueduct for school kids. This event was coordinated by the San Joaquin Field Division and included a tour of the Edmonston Pumping Plant facility and a hands-on learning activity on water conservation. Other field divisions conducted similar activities at Oroville Dam and the visitors centers.
- Produced educational materials for schools, recreationists, and the general public. Materials included a SWP recreation display, a SWP school map, and radio spots on water conservation.
- Completed exhibit renovations for the Delta Field Division. Among the new exhibits are a new 6' x 6' map of the Delta region, displays of Skinner Fish Facility and the Suisun Salinity Control Gates, and new exhibits on SWP facilities, the Delta Field Division, SWP operations, and Department fishery and environmental programs.
- At the Edmonston Pumping Plant visitor area, completed installation of a 23' x 24' mural showing a cross section of the Tehachapi Mountain range, the discharge line, the Edmonston Pumping plant, and the plant's four-stage pump.
- Developed promotional material to publicize the visitor facilities. Materials included posters, news releases, video, recreation maps at rest stops along California's highways, newspaper ads, flyers, and television and radio spots.

Water Safety Education

The Department is committed to an active water safety program that promotes safe use of recreational facilities along the State Water Project. During the 1980s, an average of 14 persons lost their lives annually along the SWP. In 1990, a startling 36 fatalities occurred on SWP property. To respond to this tragic toll and to reduce SWP liability, in 1991, the Director requested OWE, in cooperation with the Department's Safety Committee, to develop a formal water safety program. The program has a three-fold purpose: 1) save lives, 2) reduce the liability of the Department

and the State Water Contractors, and 3) provide an opportunity for DWR field division staff to meet the community and enhance rapport with the public.

Since 1991, the Department has conducted an aggressive, multimedia SWP water safety education program. The program targets SWP facility users, especially youth, through a combination of media outreach, in-person safety presentations at schools and community organizations, and DWR staff contact with facility users.

During fiscal year 1994-95, 94 water safety presentations were made to 9,105 people. Such presentations have now been made to more than 50,000 persons since fiscal year 1991-92. These presentations feature an 11-minute film demonstrating "drown-proofing," and education materials presented by safety mascots, "Albert and Einstein," to help children learn safe water practices.

A new radio public service announcement was developed during fiscal year 1994-95 to target communities near SWP lakes and reservoirs. The 60-second PSA was distributed to more than 400 radio stations.

SWP Visits and Tours

In fiscal year 1994-95, more than 490,000 people visited SWP facilities, one of the highest totals on record. Facilities include Banks Pumping Plant, Edmonston Pumping Plant, and the three visitors centers (see "Visitor Center Program").

OWE has been assigned to coordinate the Visitors Program since 1988. In a typical year, DWR coordinates special tours for about 700 dignitaries, foreign officials, and water experts.

Visits vary widely in scale, duration, and sophistication, from half-day field trips by grade school students to in-depth tours for water experts from foreign lands. During 1994-95, DWR welcomed visitors from 47 foreign nations. DWR seeks to match visitors with guides and experts appropriate to their levels of interest.

Typical topics included in visitors' briefings include: water resource management, State Water Project construction, repair and operation, agricultural irrigation and drainage, water banking and transfers, dam safety, Flood Operations Center functions, and Project Operations Center activities.

School Education Program

Water education in the schools is an important priority for the Department. OWE and departmental field divisions and districts have promoted the teaching of water-related concepts to local agencies and educators. The goal of the program is to provide students and educators with a statewide perspective of water issues such as conservation, conveyance systems, and the water cycle. The Department does this by developing and promoting high quality materials that are provided free to schools, educators, and water districts.

Product highlights include:

- Produced "Water Facts & Fun," a catalog of water education materials including an order form and a water cycle poster.
- Developed teacher and student materials for the Vista del Lago Visitors Center (to be printed and distributed in fiscal year 1995-96).
- Developed draft lessons for the Feather River Fish Hatchery (to be completed by June 1996).
- Designed an interactive exhibit for elementary students (to be fabricated by May 1996).
- Hosted and participated in the Department's Water Education Committee to update and share information on water education in the schools with water educators statewide.

Water Awareness Month Activities

Since 1987, more than 250 water agencies have celebrated Water Awareness Month each May. Water Awareness Month was created to promote a better public understanding of the value of water and the role played by water agencies in managing the State's water supply. As a participant, the Department played a lead role in the observance of "Water Awareness Month." Through the field divisions, the Department provided community outreach materials and services on the importance of water and the benefits of the SWP to communities along the SWP. The Department publicized the effort by distributing news releases on departmental activities.

In 1995, the Department conducted seven special events to showcase May as Water Awareness Month. These included: a May Day Fair exhibit at the Merced County Fairground, a "Walk for Water" at A. D. Edmonston Pumping Plant, public tours of the Hyatt Pumping Plant under Oroville Dam, a fishing derby at O'Neill Forebay near San Luis Dam, a "Walk for Wellness" at Oroville Dam, and participation in Lake Del Valle's 25th birthday celebration.

During Water Awareness Month, the Department issued several regional news releases, to help increase public awareness of the SWP's role in providing water to two-thirds of California's population. The Director encouraged public visits during May to SWP recreational facilities and visitors centers.

Summary

Media relations and public outreach continue to be the focus of the Department's Information and Education programs. Press coverage, publications, videos, exhibits, and school/community outreach projects help inform California residents and visitors of the SWP's responsibilities and its programs on water delivery, management, planning, and safety. Such efforts are an essential part of the Department's mission to educate the public about water's vital role in their lives and the need to protect, manage, and conserve the State's water resources.

Information for this chapter was provided by the Office of Water Education.

Appendix B

Data and Computations Used in Determining Water Charges for 1996

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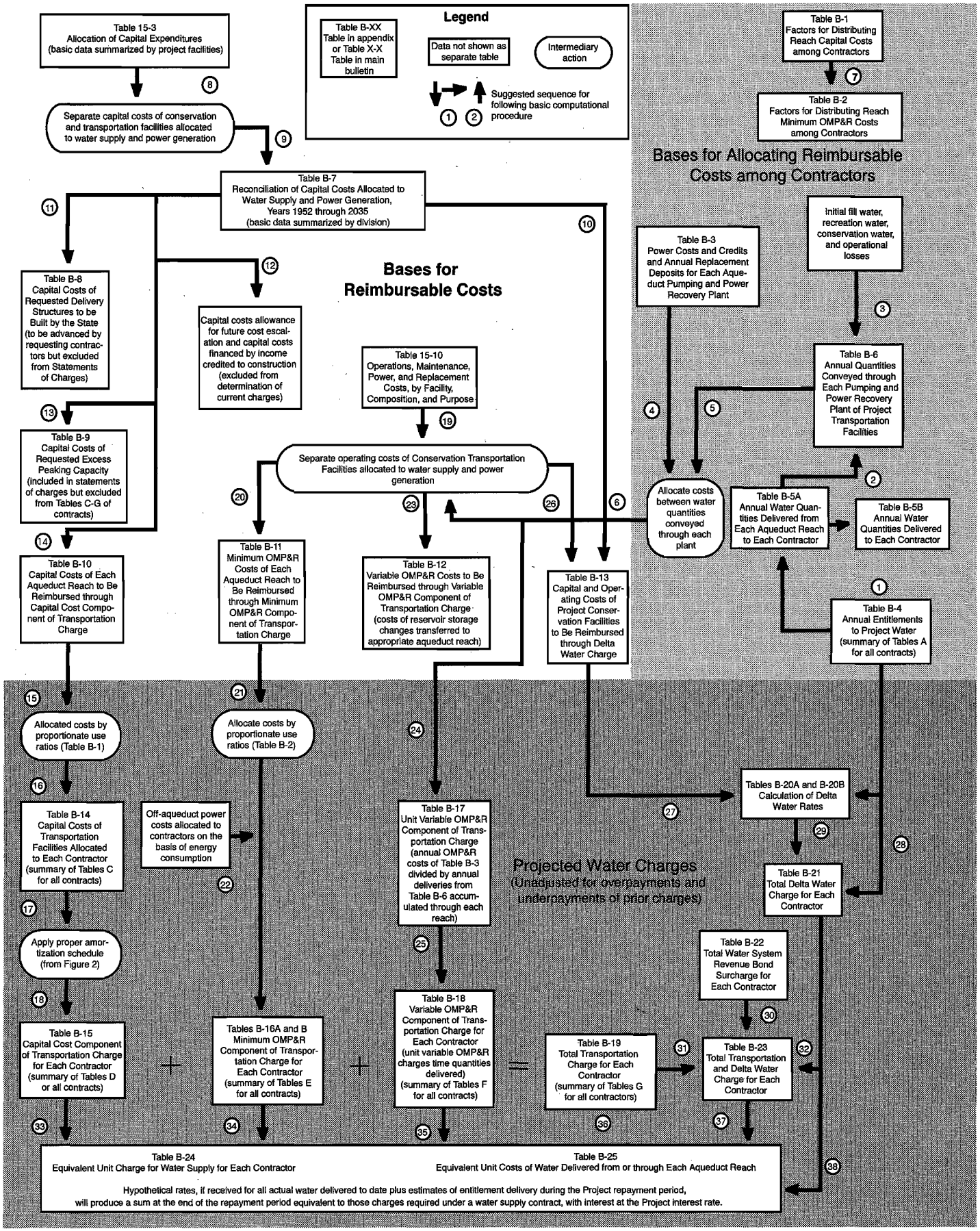


Fig. B-1. Relationships of Data Used to Substantiate Statement of Charges

Appendix B
Data and Computations Used to Determine 1996 Water Charges

The Department of Water Resources annually furnishes Statements of Charges to the 29 long-term State Water Project water supply contractors. Article 29(e) of the *Standard Provisions for Water Supply Contracts*, approved August 3, 1962, describes those statements:

> *All such statements shall be accompanied by the latest revised copies of the document amendatory to Article 22 and of Tables B, C, D, E, F, and G of this contract, together with such other data and computations used by the State in determining the amounts of the above charges as the State deems appropriate.*

To comply with Article 29(e), the Department annually performs a comprehensive review and redetermination of all water supply and financial aspects of the SWP for the entire project repayment period. This annual redetermination is performed in accordance with Article 22(f) and Article 28 of the water contracts, which concern the Delta Water Rate and annual transportation charges, respectively.

Appendix B includes data used to document the redetermination of water charges to be paid by contractors during calendar year 1996. The information is based on established data about the SWP, both known and projected, as of June 30, 1995.

The computational procedures and interrelationships between tabulations in this appendix are outlined in Figure B-1 and Figure B-2. All tables referenced in Figures B-1 and B-2 follow this text. Appendix B also includes information about payments made by contractors according to provisions contained in Article 21, amended, of the standard provisions for surplus water deliveries from the SWP.

Types of Water Charges

Charges to SWP water supply contractors include the costs of facilities for the conservation and development of a water supply and the conveyance of such supply to SWP service areas. These facilities are classified as "Project Conservation Facilities" and "Project Transportation Facilities" in the Standard Provisions for Water Supply Contract. The names of the main facilities in each classification follow.

Project Conservation Facilities

- Antelope Dam and Lake
- Oroville Dam and Lake Oroville
- Oroville power facilities
- Delta facilities
- A portion of the Governor Edmund G. Brown California Aqueduct from the Delta to Dos Amigos Pumping Plant
- B. F. Sisk San Luis Dam, San Luis Reservoir, and William R. Gianelli Pumping-Generating Plant

Project Transportation Facilities

- Grizzly Valley Pipeline
- North Bay Aqueduct
- South Bay Aqueduct, including Del Valle Dam and Lake Del Valle
- Remainder of the California Aqueduct from the Delta to Dos Amigos Pumping Plant and all facilities south, including dams and lakes in Southern California
- Off-Aqueduct Power Facilities (Reid Gardner Unit No. 4, Bottle Rock Powerplant, and South Geysers Powerplant)

The standard provisions provide for a Delta Water Charge and a Transportation Charge for Project water.

The *Delta Water Charge* is a unit charge applied to each acre-foot of SWP water the contractors are entitled to receive according to their contracts. The unit charge, if applied

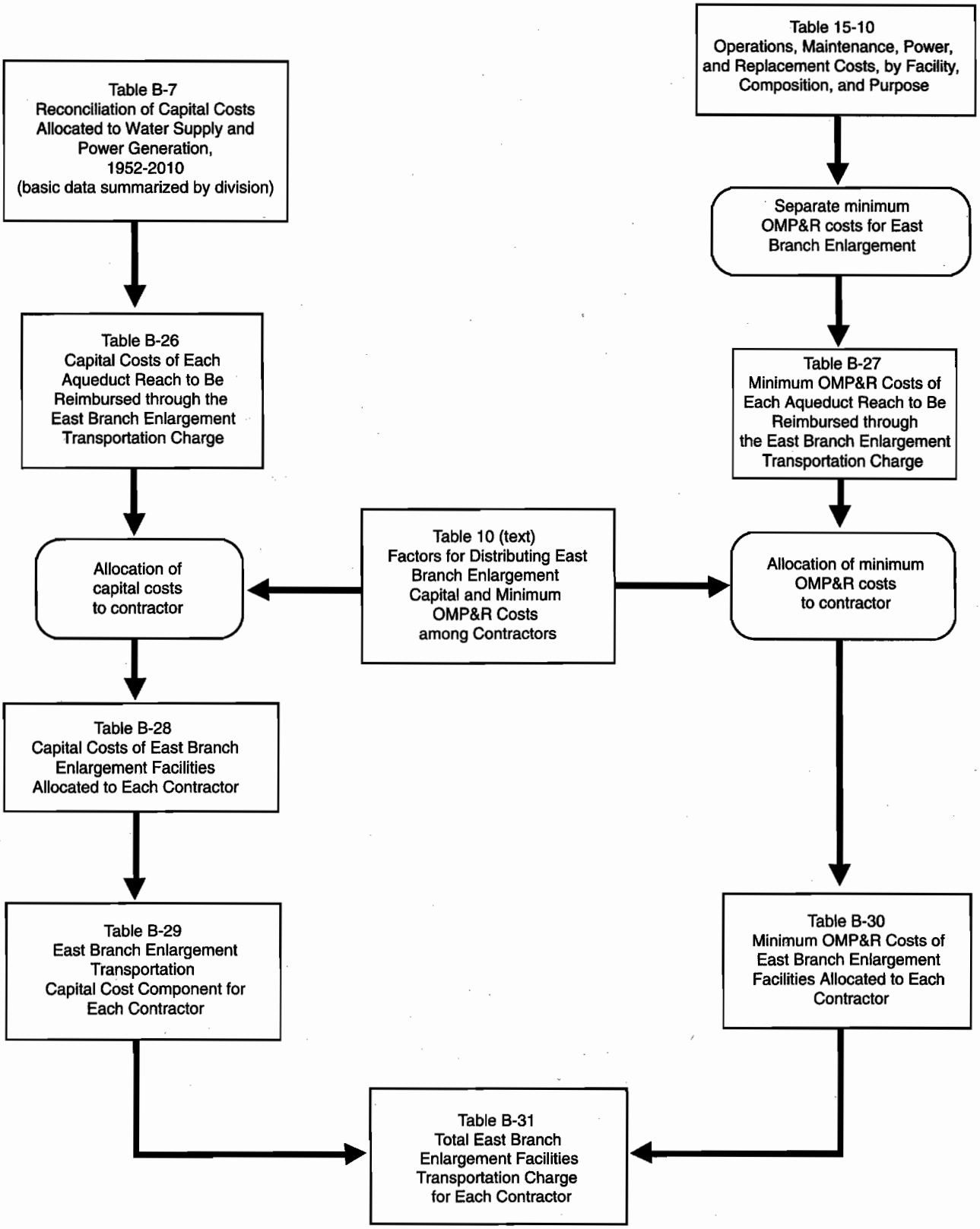


Fig. B-2. Relationships of Data Used to Substantiate East Branch Enlargement Charges

to each acre-foot of all such entitlements for the remainder of the Project repayment period, is calculated to result in repayment of all outstanding reimbursable costs of the Project Conservation Facilities, with appropriate interest, by the end of the repayment period (2035).

The *Transportation Charge* is for use of facilities to transport water to the vicinity of each contractor's turnout. Generally, the annual charge represents each contractor's proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each contractor's allocated share of those reimbursable capital costs is amortized for repayment to the State; and certain variations are allowed in the amortization methods. Essentially, the contractors' shares of reimbursable operating costs are repaid in the year such costs are incurred by the State.

The *East Branch Enlargement Transportation Charge* is paid by the seven Southern California contractors participating in the enlargement. San Bernardino Valley Municipal Water District advanced funds to pay the district's allocated capital costs for the East Branch Enlargement. The remaining six contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each contractor also will pay an allocated share of the minimum operation, maintenance, power, and replacement (OMP&R) costs of the East Branch Enlargement.

Composition and Timing of Water Charges

As shown in Figure B-3, the Delta Water Charge and the Transportation Charge consist of the following three components:

1. Conservation and Transportation capital cost components, which will result in a return to the State of all reimbursable capital costs;
2. Conservation and Transportation minimum OMP&R components, which are designed to return to the State all reimbursable operating costs that do not depend on or vary with quantities of water actually delivered to the contractors; and
3. A Transportation variable OMP&R component, which will return to the State all reimbursable operating costs that depend on, and vary with, quantities of water actually delivered to the contractors.

The formula for computing the Delta Water Rate, Article 22(f) of the Standard Provisions for Water Supply Contract, was designed to ensure that all adjustments for prior overpayments or underpayments of the Delta Water Charge are accounted for in a redetermination of the rate. Since the redetermined rate applies to all future entitlements, such adjustments are amortized during the remainder of theoject repayment period. This appendix includes a redetermination of the Delta Water Rate for 1996.

Article 28 of the standard provisions stipulates that Transportation Charges be redetermined each year. The tables in Appendix B include the numerical data used in this redetermination. Transportation Charges for prior years through 1994 included in those tables do not equal the amounts actually paid by contractors.

As provided under the Water System Revenue Bond Amendment to the water supply contracts, differences between actual payments under the Transportation capital cost component and amounts computed in this redetermination are accumulated with interest and amortized during the remaining years of the contract repayment period. All computations for adjustments are included in the attachments accompanying each contractor's Statement of Charges and are reflected in revised copies of Table C through Table G of the contract, which are also furnished to each long-term water supply contractor in the annual Statements of Charges.

FIGURE B-3

Composition of Delta Water Charge and Transportation Charge

Delta Water Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of conservation facilities
2. Operations and maintenance costs for newly constructed conservation facilities prior to initial operations
3. Activation costs for newly constructed conservation facilities
4. Power costs allocated to initial filling of San Luis Reservoir
5. Capitalized O&M costs (major repair work and so forth) for conservation facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986 (Department of Water Resources—Department of Fish and Game agreement)

Minimum OMP&R Component

1. Direct O&M costs of conservation facilities
   a. Headquarters and field divisions (portion)
   b. Insurance and FERC costs (portion)
2. General O&M costs allocated to conservation facilities
   a. Contractor Accounting Office (portion)
   b. Financial and contract administration (portion)
   c. Water rights
   d. Power planning for SWP facilities (portion)
3. Replacement deposits for SWP control centers (portion)
4. Credits for a portion of Hyatt-Thermalito power generation
5. Power costs and credits related to pumping water to San Luis Reservoir for project operations (storage changes)
6. Value of power used and generated by William R. Gianelli Pumping-Generating Plant
7. Program costs (portion) to offset annual fish losses resulting from pumping at Harvey O. Banks Delta Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

Transportation Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of transportation facilities
2. O&M costs for newly constructed transportation facilities prior to initial operation
3. Activation costs for newly constructed transportation facilities
4. Power costs allocated to initial filling of Southern California reservoirs
5. Capitalized O&M costs (major repair work etc.) for transportation facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986 (Department of Water Resources-Department of Fish and Game agreement)

Minimum OMP&R Component

1. Direct O&M costs of transportation facilities
   a. Headquarters and field divisions (portion)
   b. Insurance and FERC costs (portion)
2. General O&M costs related to transportation facilities
   a. Contractor Accounting Office (portion)
   b. Financial and contract administration (portion)
   c. Power planning for SWP facilities (portion)
3. Power costs and credits related to pumping water to Southern California reservoirs for project operations (storage changes)
4. Power costs for pumping water to replenish losses from transportation facilities
5. Other power costs
   a. Station service at transportation facility power and pumping plants
   b. Transmission service costs related to "backbone" transportation facilities
6. Replacement deposits for SWP control centers (portion)
7. Off-Aqueduct Power Facility costs—bond service, bond cover costs (25 percent of bond service), bond reserves, transmission costs to provide service to "backbone," fuel costs taxes, and O&M-less power sales allocated to off-aqueduct power facilities
8. Program costs (portion) to offset annual fish losses resulting from pumping at Harvey O. Banks Delta Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

Variable OMP&R Component

1. Power purchase costs
   a. Capacity
   b. Energy
   c. Pine Flat bond service, O&M, and transmission costs allocated to aqueduct pumping plants
2. Alamo, Devil Canyon, William E. Warne, and Castaic power generation credited at the power plant reach and charged to aqueduct pumping plants
3. Hyatt-Thermalito Diversion Dam power plant generation charged to aqueduct pumping plants (credits for this generation are reflected in the Delta Water Rate)
4. Replacement deposits for equipment at pumping plants and power plants
5. Credits from sale of excess SWP system power
6. Program costs (portion) to offset annual fish losses resulting from pumping at Harvey O. Banks Delta Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge

These redeterminations exclude four charges associated with water service other than the Delta Water Charge and the Transportation Charge. The excluded charges (and the manner in which such excluded charges are treated in this appendix) are:

1. Advances of funds pursuant to Article 24(d) of the standard provisions for excess capacity constructed by the State at the request of contractors;
2. Advances of funds pursuant to Article 10(d) of the standard provisions for delivery structures (turnouts) constructed by the State at the request of contractors. Partial information concerning actual and projected capital costs of such delivery structures is included in this appendix. Statements concerning these costs and data are furnished to the appropriate contractors at various times and are not part of the annual statements;
3. Payments for sale and service of surplus water to entities other than contractors, pursuant to Article 21 of the standard provisions, are also excluded. Those payments are generally based on the unit rates shown in Table B-25. Net revenues resulting from noncontractor service are applied as indicated on page 24 of Bulletin 132-71; and
4. Payments under the Devil Canyon-Castaic contract for costs of the Devil Canyon-Castaic facilities allocable to power generation. Charges billed as a result of the contract are billed separately from those billed as a result of the water supply contract. Information about the treatment of such charges in relation to redetermined Transportation Charges is included in special attachments to the bills of the six participating contractors.

The time and method of payment for corresponding components of the Delta Water Charge and the Transportation Charge are as follows:

1. The capital cost components of the Delta Water Charge and the Transportation Charge are paid in two semiannual installments, due January 1 and July 1 of each year, based on statements furnished by the State about July 1 of the preceding year;
2. The minimum OMP&R components of the Delta Water Charge and the Transportation Charge are paid in 12 equal installments, due the first of each month and based on statements furnished by the State about July 1 of the preceding year; and
3. The variable OMP&R component of the Transportation Charge is paid in varying monthly amounts and is due the fifteenth day of the second month following actual water delivery. The charges are projected based on a unit charge per acre-foot established about July 1 of the preceding year. Those unit charges may be revised during the year to reflect current power costs and revenues. The unit charges are applied to actual monthly delivery quantities as determined by the State on or before the fifteenth day of the month following actual delivery.

Bases for Allocating Reimbursable Costs Among Contractors

This section describes the procedures for allocating reimbursable costs of Project Transportation Facilities among contractors (see upper right portion of Figure B-1). Those costs do not include annual costs of Off-Aqueduct Power Facilities, which are explained in the section "Project Water Charges."

Capital and Minimum OMP&R Costs

Figure B-4 includes information about the repayment reaches that form the basis for allocating reimbursable costs of the Project Transportation Facilities among contractors.

Allocations of reimbursable capital costs and minimum OMP&R costs of each reach are based on the proportionate maximum use



North Bay Aqueduct

1 Barker Slough through Fairfield/Vacaville Turnout
2 Fairfield/Vacaville Turnout to Cordelia Forebay
3A Cordelia Forebay through Benicia and Vallejo Turnouts
3B Cordelia Forebay through NapaTurnout Reservoir

South Bay Aqueduct

1 Bethany Reservoir through Altamont Turnout
2 Altamont Turnout through Patterson Reservoir
4 Patterson Reservoir to Del Valle Junction
5 Del Valle Junction through Lake Del Valle
6 Del Valle Junction through South Livermore Turnout
7 South Livermore Turnout through Vallecitos Turnout
8 Vallecitos Turnout through Alameda-Bayside Turnout
9 Alameda-Bayside Turnout through Santa Clara Terminal Facilities

California Aqueduct

North San Joaquin Division

1 Delta through Bethany Reservoir
2A Bethany Reservoir to Orestimba Creek
2B Orestimba Creek to O'Neill Forebay

San Luis Division

3A San Luis Dam, Reservoir and Pumping-Generating Plant
3 O'Neill Forebay to Dos Amigos Pumping Plant
4 Dos Amigos Pumping Plant to Panoche Creek
5 Panoche Creek to Five Points
6 Five Points to Arroyo Pasajero
7 Arroyo Pasajero to Kettleman City

South San Joaquin Division

8C Kettleman City through Milham Avenue
8D Milham Avenue through Avenal Gap
9 Avenal Gap through Twisselman Road
10A Twisselman Road through Lost Hills
11B Lost Hills to 7th Standard Road
12D 7th Standard Road through Elk Hills Road
12E Elk Hills Road through Tupman Road
13B Tupman Road to Buena Vista Pumping Plant
14A Buena Vista Pumping Plant through Santiago Creek
14B Santiago Creek through Old River Road
14C Old River Road to John R. Teerink Wheeler Ridge Pumping Plant
15A John R. Teerink Wheeler Ridge Pumping Plant to Ira J. Chrisman Wind Gap Pumping Plant
16A Ira J. Chrisman Wind Gap Pumping Plant to A. D. Edmonston Pumping Plant

Tehachapi Division

17E A. D. Edmonston Pumping Plant to Carley V. Porter Tunnel
17F Carley V. Porter Tunnel to Junction, West Branch, California Aqueduct

California Aqueduct (continued)

Mojave Division

18A Junction, West Branch, California Aqueduct through Alamo Powerplant
19 Alamo Powerplant to Fairmont
19C Buttes Junction through Buttes Reservoir
20A Fairmont through 70th Street West
20B 70th Street West to Palmdale
21 Palmdale to Littlerock Creek
22A Littlerock Creek to Pearblossom Pumping Plant
22B Pearblossom Pumping Plant to West Fork Mojave River
23 West Fork Mojave River to Silverwood Lake
24 Cedar Springs Dam and Silverwood Lake

Santa Ana Division

25 Silverwood Lake to South Portal, San Bernardino Tunnel
26A South Portal, San Bernardino Tunnel through Devil Canyon Powerplant
28G Devil Canyon Powerplant to Barton Road
28H Barton Road to Lake Perris
28J Perris Dam and Lake Perris

West Branch, California Aqueduct

29A Junction, West Branch, California Aqueduct through Oso Pumping Plant
29F Oso Pumping Plant through Quail Embankment
29G Quail Embankment through William E. Warne Powerplant
29H Pyramid Dam and Lake
29J Pyramid Lake through Castaic Powerplant
30 Castaic Dam and Lake

Coastal Branch, California Aqueduct

31A Avenal Gap to Devil's Den Pumping Plant
33A Devil's Den Pumping Plant through San Luis Obispo Powerplant
34 San Luis Obispo Powerplant to Arroyo Grande
35 Arroyo Grande through Santa Maria Terminus

Fig. B-4. Repayment Reaches and Descriptions

of that reach by respective contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors was first reported in Bulletin 132-70. The ratios in Bulletin 132-70 were subsequently revised for the North Bay Aqueduct, the South Bay Aqueduct, the California Aqueduct from the Delta to Castaic Lake, and the Coastal Branch.

All the revisions reported in previous bulletins regarding the derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors were reported in Table B-1 and B-2 of Bulletin 132-91.

Table B-1 presents the reach ratios currently applicable to reimbursable capital costs.

Table B-2 presents corresponding ratios for reimbursable minimum OMP&R costs. Requested excess capacity is omitted when deriving ratios applicable to capital costs because the capital costs for the excess capacity are paid on an incremental-cost basis and not a proportionate-use basis. However, requested excess capacity is accounted for in the ratios applicable to minimum OMP&R costs.

Variable OMP&R Costs

Article 26(a) includes provisions to ensure that the variable OMP&R component of the Transportation Charge will result in a return to the State of those costs that depend on and vary with the amount of SWP water deliveries. (The minimum OMP&R component results in a return of those operating costs that do not vary with deliveries.) Under Article 26(a) all such costs for a reach for a given year will be allocated among contractors in proportion to the actual annual use of that reach by the respective contractors.

Table B-3 summarizes the total variable OMP&R costs for each SWP pumping and power plant. Those variable costs consist of:

- Costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service costs are classified as minimum OMP&R costs);
- Credits for capacity and energy produced at aqueduct power recovery plants (treated as negative costs); and
- Annual payments to sinking fund reserves to finance periodic replacement of major plant machinery components having economic lives shorter than the Project repayment period. Sinking fund payments for 1962 through 1979 were based on a schedule determined in 1970. Sinking fund payments for 1980 through 2035 are based on revised replacement schedules. Those schedules were updated in 1986 and 1991. The Department plans to update the replacement deposit schedules periodically.

Table B-3 excludes plant capacity and energy costs associated with surplus and unscheduled water service after May 1, 1973. Prior to that date, surplus water service was charged the same unit variable OMP&R component as entitlement water service. An amendment to the long-term water supply contracts in 1973 significantly changed the rate structure for surplus water service. Capacity and energy costs for pumping surplus and unscheduled water have been allocated directly to those water contractors receiving surplus and unscheduled water service. A contract amendment in 1991 again revised the rate structure to provide for payment of costs through a melded power rate. These revisions to charges for surplus and unscheduled water are effective from the date of the amendments and are not applied to past charges.

Water Conveyance

The water conveyance quantities that form the basis for allocating costs are presented in Tables B-4, B-5A, B-5B, and B-6.

Table B-4 presents the schedules of annual entitlements as set forth in Table A and Article 6(a) of each water supply contract.

Table B-5A shows amounts of actual and projected entitlement water quantities delivered from each aqueduct reach to each contractor. Projected deliveries for years 1995 through 2035 are based on contractors' requests for future water deliveries. The quantities included in Table B-5A also include nonproject water delivered to contractors and surplus water deliveries prior to May 1, 1973.

Table B-5B presents a summary of actual and projected annual entitlement water quantities delivered or to be delivered to each contractor. The quantities also include amounts of nonproject water and surplus water delivered prior to May 1, 1973.

Table B-6 summarizes the annual entitlement water quantities conveyed or to be conveyed through each aqueduct pumping plant or power plant for each of the following functions:

- *Deliveries—Water Supply.* Water made available to contractors at down-aqueduct delivery structures, including certain hypothetical quantities to facilitate cost allocations, for those years when deliveries are made from net annual storage withdrawals. The net annual amounts of storage withdrawals are hypothetically added to the actual amounts conveyed from the Delta to the reservoirs, since deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were actually conveyed from the Delta in that year. The hypothetical increases in the deliveries made from reservoir storage withdrawals are offset by equal credits to the minimum OMP&R costs of the respective reservoirs. Thus, the variable OMP&R components per acre-foot (Table B-17) may be applied to the total annual quantities delivered either from aqueduct reservoir storage or from the Delta.
- *Initial Fill Water.* Water required for initial filling of down-aqueduct reaches and reservoirs or for repayment of preconsolidation water used during construction.
- *Deliveries—Recreation.* Water delivered to down-aqueduct recreation developments or used for fish and wildlife mitigation or enhancement.
- *Operational Losses.* Water lost through evaporation and seepage from all down-aqueduct reaches.
- *Reservoir Storage Changes.* Water placed in down-aqueduct reservoir storage after initial filling of the reservoirs, including projected net annual storage accretions (positive values) and withdrawals (negative values) for all down-aqueduct reservoirs of the Project Transportation Facilities.

Those variable OMP&R costs (Table B-12) that are allocable to storage accretions are assigned to the minimum OMP&R costs of the respective reservoirs. With one exception, "Reservoir Storage Changes" also includes SWP water placed into Southern California ground water storage from 1978 through 1982 (as positive amounts); and water withdrawn from storage and delivered to contractors in 1979, 1982, 1987, 1988, and 1989 (as negative amounts). The exception is Banks Pumping Plant, where ground water additions and withdrawals are included in "Conservation Water."

Table B-6 also summarizes the following two amounts under the heading "Conservation Water" (Column 25):

1. Net annual water amounts stored and projected to be stored in San Luis Reservoir; and
2. Water lost and projected to be lost through evaporation and seepage from San Luis Reservoir and from the water conservation portion of the California Aqueduct.

"Conservation Water" includes initial fill water, operational losses, and net annual storage changes associated with San Luis Reservoir and the portion of the California

Aqueduct that is allocated to conservation. The same allocation procedure outlined above for Transportation Facilities also applies to Conservation Facilities, except that the hypothetical cost increases are added to the variable OMP&R cost to be reimbursed through the Transportation Charge and deducted from the minimum OMP&R costs to be reimbursed through the Delta Water Charge.

San Luis Reservoir is operated to conserve water for future delivery to downstream contractors. To account for costs associated with reservoir storage, those power and replacement costs of Banks Pumping Plant (a joint Transportation-Conservation Facility) that are allocated to the conveyance of annual conservation water quantities are transferred to the capital costs of San Luis Reservoir (during initial fill) or to the minimum OMP&R costs of San Luis Reservoir (subsequent to initial fill).

In years of net storage withdrawal from San Luis Reservoir, a portion of the minimum OMP&R cost of the reservoir is transferred to the variable OMP&R cost of Banks Pumping Plant. That transfer is equal to the variable OMP&R cost per acre-foot of delivery through Banks Pumping Plant for that year, multiplied by the acre-feet of deliveries derived from San Luis Reservoir storage for that year. Table B-6 also includes amounts of nonproject water and surplus water delivered prior to May 1, 1973.

Bases for Reimbursable Costs

This section describes the methods used to derive the costs allocated by the procedures outlined in the preceding section. A diagram of the cost derivation process is shown in the upper-left quadrant of Figure B-1.

First, the capital and minimum OMP&R costs of all SWP facilities are allocated among the various Project purposes according to the allocation percentages in Figure B-5. Those percentages may be subject to revision in the future.

The redeterminations in this appendix involve only the costs that are allocated to water supply and power generation.

Capital Costs

Capital costs used in the redeterminations in this appendix reflect prices prevailing on December 31, 1994; future cost escalation will be reflected in subsequent bulletins.

Table B-7 presents a reconciliation of estimated total capital costs of each Project Conservation Facility and each Project Transportation Facility. This table shows the relationship of Project Conservation and Transportation costs allocated to contractors (Tables B-8, B-9, B-10, and B-13) to the total SWP capital costs projected by the Department.

Table B-8 shows costs incurred and projected to be incurred by the state in connection with each contractor's turnouts. Costs incurred by the State for both State-constructed and contractor-constructed delivery structures are paid directly by the contractors for which the structures are built. (The State incurs design review and construction inspection costs in connection with contractor-constructed turnouts.)

Table B-9 lists costs and payments for excess capacity built into SWP Transportation Facilities according to amendments to contracts with the Metropolitan Water District of Southern California, San Gabriel Valley Municipal Water District, and Antelope Valley-East Kern Water Agency as follows:

1. Additional costs incurred by the State for requested excess capacity;
2. Advances by water contractors of funds for such costs; and
3. Credits for advances in excess of costs, which were applied to respective contractors' installments of the capital cost

FIGURE B-5
Cost Allocation Factors
(Percentages)

Project Facilities	Water Supply and Power Generation: Capital Costs	Water Supply and Power Generation: OMP&R Costs	All Other Purposes (Nonreimbursable): Capital Costs	All Other Purposes (Nonreimbursable): Minimum OMP&R Costs
Project Conservation Facilities				
Frenchman Dam and Lake	21.5	0.0	78.5	100.0
Antelope Dam and Lake	0.0	0.0	100.0	100.0
Grizzly Valley Dam and Lake Davis	1.0	1.8	99.0	98.2
Oroville Division (a	97.1	99.5	2.9	0.5
California Aqueduct, Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Delta Facilities	86.0	86.0	14.0	14.0
Transportation Facilities				
Grizzly Valley Pipeline	100.0	100.0	0.0	0.0
North Bay Aqueduct	100.0	100.0	0.0	0.0
South Bay Aqueduct:				
Del Valle Dam and Lake Del Valle	25.2	22.0	74.8 (b	78.0 (c
Remainder of South Bay Aqueduct	100.0	100.0	0.0	0.0
California Aqueduct:				
Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Dos Amigos Pumping Plant to termini (excluding Coastal Branch)	94.3	96.9	5.7	3.1
Coastal Branch	100.0	100.0	0.0	0.0

a) Percentages indicated are applicable to the remaining costs of division after excluding costs allocated to flood control that are reimbursed by the federal government (22 percent of capital costs) and excluding specific power costs of Edward Hyatt and Thermalito powerplant and switchyards.
b) Percentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.
c) Percentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

component of the Transportation Charge in 1981.

Under Amendment 2 of MWDSC's contract, 809 cfs of excess capacity originally was constructed in reaches of the West Branch at MWDSC's request. That capacity was reclassified as basic capacity of SWP Transportation Facilities under Amendment 7. MWDSC paid $16.3 million as a prepayment of the capital cost component of the Transportation Charge in lieu of advancing funds for the original requested capacity.

Amendment 5 to MWDSC's contract requires that additional costs for modifications to the Santa Ana Valley Pipeline (required for enlargement of Lake Perris) will be allocated to MWDSC and returned to the State through payments of the Transportation Charge. The additional costs to be repaid through MWDSC's capital cost component for the aqueduct reach from Devil Canyon Powerplant to Barton Road total about $6.7 million (see Bulletin 132-72, page 98).

Table B-10 presents the actual and projected annual capital costs of each aqueduct reach that will eventually be returned to the State, with interest, through contractors' payments of the capital cost component under the Transportation Charge and of debt service under the Devil Canyon-Castaic contracts.

Annual Operating Costs

Annual operating costs allocable to water supply and power generation are returned to the State through the minimum and variable OMP&R components of Delta Water and Transportation Charges and through a portion of the revenues from energy sales. All reimbursable operating costs of Conservation Facilities are included in the minimum

OMP&R component of the Delta Water Charge.

Transportation and Devil Canyon-Castaic Contract Costs

Table B-11 shows the amounts of the actual and projected costs to be reimbursed through payments of the minimum OMP&R component of the Transportation Charge and allocated operating costs under the Devil Canyon-Castaic contract. The table includes the following seven types of operating costs incurred annually that do not vary with water quantities delivered to the contractors:

1. All direct labor charges for field operation and maintenance personnel, including associated indirect costs;
2. A distributed share of general operating costs that cannot be identified solely with one facility or aqueduct reach;
3. Electric power transmission and station service costs allocable to aqueduct pumping and power recovery plants;
4. All costs for equipment, materials, and supplies and for replacement of electronic control systems;
5. Portions of the power and replacement costs of all up-aqueduct pumping and power plants that are allocable to the annual conveyance of water lost to evaporation and seepage from respective aqueduct reaches or placed into storage in respective reservoirs of the Project Transportation Facilities (after initial fill);
6. Credits, which offset those costs in (5) above, for deliveries drawn from reservoir storage; and
7. Escalation of projected operating costs at three percent per year for 1995, 1996, and 1997.

Table B-12 shows the portions of variable OMP&R costs in Table B-3 that are allocable to the water supply delivery quantities included in Table B-6 and reimbursed through payments of the variable OMP&R component of the Transportation Charge.

The following five adjustments are made to the Table B-3 costs to derive the Table B-12 costs:

1. A portion of the variable OMP&R costs of each plant is allocated to recreation. The allocation to recreation is in proportion to the quantity of water conveyed through each plant each year for delivery to on-shore recreational developments.
2. That portion of variable plant costs attributable to the initial fill of aqueduct reaches is allocated to the joint capital costs of respective down-aqueduct reaches and reservoirs.
3. That portion of costs attributable to evaporation and seepage is allocated to the joint minimum OMP&R costs of respective down-aqueduct reaches and reservoirs.
4. Adjustments are made for additions or withdrawals from storage in aqueduct reservoirs. In years when water is added to storage in aqueduct reservoirs, the cost of conveying this water into storage is charged to the minimum OMP&R costs of the corresponding reservoir. The unit cost is equal to the variable OMP&R unit rate for the year the water is conveyed into storage. In years when storage in aqueduct reservoirs is decreased for the purpose of making deliveries, a credit is applied to the minimum OMP&R costs of the reservoir from which the storage is released. This credit is equal to the number of acre-feet of storage reduction times the variable OMP&R unit rate for the year storage is released.
5. That portion of costs attributable to pumping water to replace evaporation and seepage losses and for additions or withdrawals from storage in San Luis Reservoir is charged to the minimum OMP&R component of the Delta Water Rate.

The remaining costs are allocated to Transportation water supply and repaid by the contractors.

Conservation Capital and Operating Costs

Table B-13 is a summary of actual and projected capital and operating costs of the initial Project Conservation Facilities. These costs are reimbursed through payments by contractors under the Delta Water Charge, Oroville power sales, and Gianelli Generating Plant credits. Table B-13 also shows credits applied to the reimbursable capital costs of the Project Conservation Facilities according to negotiated settlements concerning incurred planning costs for the period from 1952 through 1978.

Project Water Charges

This section describes the redetermination of past and projected components of the Transportation Charge for annual revision of Tables C through G of each water supply contract. This section also describes the derivation of the unit Delta Water Rates and the Water System Revenue Bond Surcharge.

A summary of equivalent unit charges for each acre-foot of entitlement water service is also included for each contractor and each aqueduct reach. A diagram of all calculations may be found in the lower half of Figure B-1.

Transportation Charges

The accumulation of allocated costs of each aqueduct reach to each contractor is the basis for the Transportation Charge components.

Table B-14 summarizes each contractor's share of the capital costs of aqueduct reaches presented in Table B-10. Those amounts are determined by applying proportionate-use ratios set forth in Table B-1 to the costs in Table B-10. The resulting allocated costs are set forth in Table C of the respective water supply contracts.

Prepayments of the capital cost component, required under MWDSC's Amendment 7, are included as negative capital costs in Table B-14 and Table C of MWDSC's Statement of Charges for 1996. Solano County Water Agency, Empire West Side Irrigation District, and Castaic Lake Water Agency also prepaid capital costs (see Table B-14 footnotes).

Both Table B-14 and Table C of the six contracts for Project water service below Devil Canyon Powerplant and Castaic Powerplant include the capital costs reimbursable under the Devil Canyon-Castaic contract.

Table B-15 summarizes the capital cost components of the Transportation Charge for each contractor for each year of the Project repayment period, based on the amortization schedules included in Figure B-6 and determined at the current Project Interest Rate of 4.621 percent per annum.

Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table D of the water supply contracts. Costs of excess capacity are billed separately and are not included in Table B-15. Table B-15 includes the debt service payments due from the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant according to terms of the Devil Canyon-Castaic contract.

Table B-16A summarizes the minimum OMP&R components of the Transportation Charge for each year of the Project repayment period. Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table E of the respective contracts.

The total amounts included in Table B-16A are determined by applying the proportionate-use ratios in Table B-2 to the reach costs in Table B-11. Table B-16A excludes charges for Off-Aqueduct Power Facilities, which are included separately in Table B-16B. Both Table B-16A and Table E for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant include the portion of operating costs payable under the Devil Canyon-Castaic contract.

As part of operating agreements with the Department, Kern County Water Agency is

FIGURE B-6

Criteria for Amortizing Capital Costs of Transportation Facilities

Contractor	Year of Initial Payment	(a
Alameda County Flood Control and Water Conservation District, Zone 7	1963	(b
Alameda County Water District	1963	
Antelope Valley-East Kern Water Agency	1963	
Castaic Lake Water Agency	1964	
City of Yuba City		(c
Coachella Valley Water District	1964	
County of Butte		(c
County of Kings	1968	
Crestline-Lake Arrowhead Water Agency	1964	
Desert Water Agency	1963	(d
Dudley Ridge Water District	1968	(e
Empire West Side Irrigation District	1968	(e
Kern County Water Agency		
Agricultural Use	1968	(e
Municipal and Industrial Use	1965	
Littlerock Creek Irrigation District	1964	
Mohave Water Agency	1966	
Napa County Flood Control and Water Conservation District	1966	
Oak Flat Water District	1968	(e
Palmdale Water District	1964	
Plumas County Flood Control and Water Conservation District	1970	
San Bernardino Valley Municipal Water District	1963	
San Gabriel Valley Municipal Water District	1963	(d
San Gorgonio Pass Water Agency	1963	(d
San Luis Obispo County Flood Control and Water Conservation District	1964	(f
Santa Barbara County Flood Control and Water Conservation District	1964	
Santa Clara Valley Water District	1963	
Solano County Water Agency	1973	
The Metropolitan Water District of Southern California	1963	
Tulare Lake Basin Water Conservation District	1968	(e
Ventura County Flood Control District	1964	

a) Allocated capital costs of transportation facilities amortized in equal annual installments unless otherwise noted.
b) Principal payments on each annual capital cost prior to 1971 delayed until calendar year 1972, except payments for 1963.
c) For Yuba City, Butte County, San Gabriel Valley Municipal Water District, and San Gorgonio Pass Water Agency, payments for Delta Water Charge only.
d) Payment deferred for 1963 and added to 1964 payment with accrued interest.
e) For Dudley Ridge Water District, Empire West Side Irrigation District, Kern County Water Agency (agricultural use), Oak Flat Water District, and Tulare Lake Basin Water Conservation District, according to Article 45 of the contracts for supply of agricultural water, capital costs of transportation facilities allocated to agricultural water supply are amortized by using an equivalent unit rate per acre-foot applied to the annual entitlements (Table B-4) through the project repayment period.
f) For San Luis Obispo Flood Control and Water Conservation District and Santa Barbara County Flood Control and Water Conservation District, all principal and interest payments for costs of Coastal Stub deferred until 1976.

billed for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill Pumping Plants by Berrenda Mesa Water Storage District (see Bulletin 132-71, page 7). Under those agreements, a portion of minimum OMP&R costs of Reach 31A are assigned directly to KCWA, with the remaining reach costs allocated by application of the proportionate-use ratios.

Year	Direct Charge	Year	Direct Charge
1969	$46,510	1983	$89,950
1970	$46,302	1984	$106,720
1971	$140,072	1985	$158,854
1972	$95,016	1986	$136,616
1973	$72,452	1987	$125,673
1974	$100,688	1988	$130,941
1975	$127,456	1989	$127,928
1976	$138,500	1990	$136,562
1977	$120,749	1991	$159,263
1978	$157,638	1992	$183,142
1979	$121,207	1993	$211,358
1980	$150,715	1994	$350,197
1981	$74,759	1995	$342,898
1982	$82,774	1996	$320,761
TOTAL			**$4,055,701**

Table B16-B summarizes the annual charges for Off-Aqueduct Power Facilities allocated to each water contractor, adjusted for prior overpayments or underpayments of charges. Those charges are to repay all Off-Aqueduct Power costs, including bond service, deposits for reserves, operation and maintenance costs, fuel costs, taxes, and insurance.

The General Bond Resolution, adopted October 1, 1979, requires that sufficient revenues be collected each year to repay all of those costs. In addition, an amount totaling 25 percent of the annual bond service is collected each year to ensure that sufficient funds are available to cover all annual costs. Any revenues collected and not needed during the year are refunded to the contractors in the next year.

The following tabulation summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 1994.

Facility	Amount
Charges	
Reid Gardner Powerplant	
Bottle Rock Powerplant	
South Geysers Powerplant	
Subtotal	
Credits	
Power sales	
Miscellaneous water	
Solano County Water Agency	
Alameda County, Zone 7	
Santa Clara Valley Water District	
Oak Flat Water District	
Kern County Water Agency	
Tulare Lake Basin Water Storage District	
Mojave Water Agency	
Metropolitan Water District of Southern California	
Westlands Water District (Federal)	
Panoche Water District	
San Luis Water District (Federal)	
Total	
Data Not Available	

The tabulation in the next column shows Project charges for Off-Aqueduct Power Facilities and an amount equal to 25 percent of annual bond service for 1995 and each year thereafter.

The annual charges for Off-Aqueduct Power Facilities are allocated among contractors in proportion to the electrical energy required to pump entitlement water for the year. The initial allocation for the Statements of Charges is based on estimates of energy to pump requested entitlement water deliveries.

An interim adjustment in the allocation of Off-Aqueduct Power costs may be made in May of each year based on updated cost estimates and April revisions in water delivery schedules for annual entitlement. An additional adjustment is made the following year based on actual entitlement water deliveries and actual costs for the year.

The energy required to pump each contractor's entitlement water is calculated using the kilowatt-hour per acre-foot factors for the pumping plants upstream from the delivery turnouts. The amounts include transmission losses.

Year	*Direct Charge Annual Cost*	*25 Percent Bond Service*
1995	93,552,862	10,500,998
1996	95,971,748	10,509,730
1997	107,194,539	11,927,488
1998	108,647,106	11,924,507
1999	108,994,022	11,940,500
2000	109,671,641	11,877,824
2001	105,695,568	11,872,255
2002	100,565,913	11,869,258
2003	84,516,384	9,500,087
2004	80,193,517	9,498,248
2005	74,788,826	9,264,045
2006	69,661,414	9,275,096
2007	65,242,979	9,271,944
2008	78,814,556	13,026,994
2009	73,655,047	13,017,627
2010	69,350,757	13,017,503
2011	64,160,669	13,020,220
2012	60,245,497	13,079,921
2013	19,099,092	4,426,708
2014	23,157,490	4,443,298
2015	9,822,490	1,776,298
2016	4,889,115	977,823
2017	2,216,365	443,273
2018	2,215,615	443,123
2019	2,222,865	444,573
2020	2,231,115	446,223
2021	2,227,490	445,498
2022	2,232,896	446,579
2023	2,239,397	447,880
2024	4,629,222	925,845

Pumping Plant	*kWh per Acre-Foot (a* *At Plant*	*Cumulative from Delta*
Barker Slough	223	223
Cordelia-Benicia	434	657
Cordelia-Vallejo	178	401
Cordelia-Napa	563	786
Harvey O. Banks Delta	296	296
South Bay (including Del Valle)	869	1,165
Dos Amigos	138	434
Las Perillas	77	511
Badger Hill	200	711
Buena Vista	242	676
John R. Teerink Wheeler Ridge	295	971
Ira J. Chrisman Wind Gap	639	1,610
A. D. Edmonston	2,236	3,846
Pearblossom	703	4,549
Oso	280	4,126

a) Includes transmission losses

Table B-17 presents a summary of actual and projected total variable OMP&R costs

for each acre-foot of water conveyed through each aqueduct pumping plant and power plant for each year of the Project repayment period. Those data are derived according to the following procedure specified in Article 26(a) of the Standard Provisions for calculating the variable OMP&R component of the Transportation Charge:

- An annual charge per acre-foot of projected water deliveries to all contractors served from or through each reach is determined so the projected variable OMP&R costs to be incurred for each reach will be returned to the State.
- The total annual variable OMP&R component for any contractor for a given reach is obtained by multiplying the unit charge associated with that reach by the quantity of water actually delivered from or through the reach to the contractor.

The data summarized in Table B-17 are derived by dividing the costs shown in Table B-3 by the quantities of water shown in Table B-6. However, certain costs included in able B-3 for extra peaking service, which would otherwise constitute variable OMP&R costs, are assigned directly to contractors requesting this type of service (see Bulletin 132-71, page 21, and Water Service Contractors Council Memo No. 593, July 10, 1970). Those costs are excluded from the unit charges shown in Table B-17. Peaking charges based on additional capacity ceased in 1983. Since 1984, costs are based on market energy rates. The amounts of extra peaking charges for additional power costs are shown in Figures B-7 and B-8.

The unit rates shown in Table B-17 constitute the rates for the pumping plants and power plants listed. The cumulative rates constitute the total rates, cumulative from the Sacramento-San Joaquin Delta, and are applicable to deliveries from or downstream of the pumping plants and power plants. Extra peaking service costs are excluded.

Table B-18 shows the variable OMP&R components of the Transportation Charge for each contractor for each year of the Project repayment period. Table B-18 is developed from the costs per acre-foot included in Table B-17 and the delivery quantities for each contractor from each reach as indicated in Table B-5A, plus any costs for extra peaking service. Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table F of the respective water supply contracts.

Table B-19 summarizes the annual Transportation Charges for each contractor (the sums of the corresponding amounts included in Tables B-15, B-16A, B-16B, and B-18). Those estimated payments, subsequently adjusted for prior overpayments or underpayments, are set forth in Table G of the respective water supply contracts.

Both Table B-19 and Table G for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant include amounts of debt service and operating cost payments due according to provisions of the Devil Canyon-Castaic contract.

Delta Water Charges

Table B-20A presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 1996 according to the amended Articles 22(e) and 22(g) of all 29 contracts. The Delta Water Rate was calculated at a Project Interest Rate of 4.621 percent based on Conservation Facility costs shown in Table B-13. That Delta Water Rate is used to compute projected Delta Water Charges shown in Table B-21.

Table B-20B shows each component of the 1996 Delta Water Rate from Table B-20A.

Table B-21 summarizes the annual Delta Water Charge for each contractor. The projected charges in Table B-21 are developed by multiplying the total rate per acre-foot, as shown in Table B-20A, by the amount of

FIGURE B-7

Extra Peaking Charges for Additional Power, by Pumping Plant (Dollars)

Year	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Las Perillas and Badger Hill	Buena Vista	Teerink-Wheeler Ridge	Chrisman	Edmonston	Pearblossom	Oso	Total
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	45,145	3,680	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	12,126	0	0	0	0	0	0	0	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,535	3,506	144	0	0	0	0	0	0	11,220
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	0	0	0	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	0	76,878
1986	0	0	0	0	1,881	871	0	291	353	767	2,682	0	0	6,845
1987	0	0	0	606	17,475	7,998	1,161	2,295	1,806	3,460	11,058	0	0	45,859
1988	639	65	287	891	43,469	20,079	1,863	5,790	4,362	8,268	25,885	0	0	111,598
1989	2,491	966	1,483	71	40,249	18,641	1,935	3,398	1,530	2,056	3,794	0	0	76,614
1990	46	0	18	325	18,506	8,571	0	143	136	295	610	0	0	28,650
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	91	0	36	0	5,122	7,050	1,144	134	154	333	0	0	0	14,064
1993	0	0	0	2,594	65,765	30,213	1,849	3,791	3,630	7,535	24,752	7,184	0	147,313
1994	0	537	263	286	9,927	4,579	2,926	222	260	563	1,970	0	19,006	40,539
Total	3,267	1,031	1,824	8,098	304,010	302,060	69,282	31,503	20,206	35,236	97,134	7,184	19,006	880,835

FIGURE B-8

Extra Peaking Charges for Additional Power, by Contractor (Dollars)

Year	Napa	Solano	Alameda Zone 7	ACWD	SCV WD	Dudley Ridge	Empire West Side	Kern County	County of Kings	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella Valley	Desert Water Agency	LCID	Palmdale	SGVM WD	Total
1972	0	0	0	0	0	0	0	35,269	0	0	10	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	0	0	6,891	0	0	0	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	2,035	0	44,484	42	0	0	2,264	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	0	2,821	0	0	0	0	485	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	11,951	0	0	0	0	0	0	0	175	0	0	12,126
1982	0	0	0	0	0	2,173	0	80,945	0	0	0	4,671	1,128	0	0	0	0	422	89,339
1983	0	0	0	0	48	9,448	0	0	1,355	0	0	0	369	0	0	0	0	0	11,220
1984	0	0	0	0	2,874	0	0	144,021	281	809	0	0	2,906	0	0	0	0	0	150,891
1985	0	0	0	2,029	0	0	64	25,664	0	98	0	48,767	256	0	0	0	0	0	76,878
1986	0	0	0	0	0	0	0	0	0	13	2,219	4,613	0	0	0	0	0	0	6,845
1987	0	0	230	0	601	313	84	24,134	0	95	0	18,206	1,383	0	0	813	0	0	45,859
1988	891	99	662	561	0	1,853	1,404	58,539	0	72	2,368	44,523	626	0	0	0	0	0	111,598
1989	3,477	1,463	96	0	0	14	403	55,074	0	239	8,280	0	1,043	0	0	1,035	5,490	0	76,614
1990	64	0	445	0	0	0	0	27,092	0	0	0	0	0	0	0	77	972	0	28,650
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	127	0	0	0	0	0	32	12,120	641	0	0	0	1,144	0	0	0	0	0	14,064
1993	0	0	3,557	0	0	0	3,140	31,088	2,459	0	55,460	0	1,849	17,563	28,925	0	3,272	0	147,313
1994	0	800	392	0	0	0	396	11,297	849	0	0	0	26,725	0	0	80	0	0	40,539
Total	4,559	1,562	4,990	2,590	3,523	15,836	5,127	575,230	4,778	1,326	68,337	123,044	11,189	17,563	28,925	2,100	9,734	422	880,835

ACWD = Alameda County Water Agency
AVEK = Antelope Valley East Kern Water Agency
LCID = Littlerock Creek Irrigation District
SGVMWD = San Gabriel Valley Municipal Water District

entitlement water for each contractor as shown in Table B-4.

Water System Revenue Bond Surcharge

Table B-22 summarizes the Water System Revenue Bond Surcharge to the Delta Water Charge and the Transportation capital cost component of each contractor. The surcharge shown in Table B-22 includes the financing costs of WSRB Series B through N. This surcharge is levied according to an amendment to the water supply contracts for repaying Water System Revenue Bond financing costs. All long-term water supply contractors signed that amendment.

Total Water Charges

Table B-23 summarizes the total annual charges to each contractor (the sum of the Transportation Charge in Table B-19, the Delta Water Charge in Table B-21, and the Water System Revenue Bond Surcharge in Table B-22). The charges do not reflect past payments by contractors and are unadjusted for prior overpayments or underpayments. The total Transportation Charge and Delta Water Charge for each contractor is listed in Tables B-19 and B-21, respectively.

Equivalent Total Water Charges

Table B-24 presents the Transportation Charge and Delta Water Charge in terms of the equivalent unit charge for each acre-foot of entitlement water now projected for delivery to the respective contractors.

These equivalent charges would provide the same principal sum at the end of the Project's repayment period as annual payments to be made as part of the Delta Water Charge and Transportation Charge, plus interest at the Project Interest Rate, if applied to each acre-foot of entitlement water delivered to date; all surplus water delivered prior to May 1, 1973; and all entitlement water now projected to be delivered during the remainder of the Project repayment period (Table B-5B).

The equivalent unit Delta Water Charges included in Table B-24 are greater than those in Table B-20A because current projections of entitlement water service are less for most contractors than the amounts shown in Table A.

Equivalent Water Costs by Reach

Table B-25 presents a summary of the equivalent unit Transportation cost of conveying entitlement water through respective aqueduct reaches of the Project Transportation Facilities.

Those unit costs provide the basis of charges assessed for extra service (such as for delivery of entitlements down-aqueduct from a contractor's turnout) and for wheeling service to entities other than the long-term water supply contractors.

The cumulative unit conveyance costs indicated for reaches in Table B-25 do not necessarily equal the equivalent unit Transportation Charges to contractors served from such reaches. The unit charges in Table B-24 account for the rate of water demand buildup and cost allocation factors of the individual contractors; however, the unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all contractors whose entitlements are conveyed through a given reach. Table B-25 also includes surplus water prior to May 1, 1973.

East Branch Enlargement Facility Charges

Table B-26 reflects the Department's projection of annual capital costs of the East Branch Enlargement Facilities for each aqueduct reach. Those projections will be redetermined in future bulletins to include:

1. A reallocation of costs of constructing the present East Branch facilities between Alamo Powerplant and Silverwood Lake;

2. A reallocation of costs of Silverwood Lake to reflect additional use as a result of East Branch Enlargement operation;
3. Reallocation of costs of San Bernardino Tunnel to reflect redistribution of flow capacities necessary for the East Branch Enlargement Facilities; and
4. Actual construction costs of the enlargement.

These costs will be recovered with interest from the seven Southern California water contractors participating in the enlargement, according to their amended water supply contracts (see Figure B-9).

Table B-27 lists the projected minimum OMP&R costs for each reach of the enlargement to be repaid by the seven contractors participating in the East Branch Enlargement. Currently, this table includes only the amounts of estimated incremental minimum OMP&R costs attributable to the East Branch Enlargement. According to Article 49 (e)(1), the contractors participating in the East Branch Enlargement will also share in the remaining minimum OMP&R costs of the affected reaches according to a formula to be developed by the Department in consultation with the affected contractors. Once the formula is developed, subsequent versions of this table will reflect the transfer of a share of the minimum OMP&R costs now included in Table B-11.

Table B-28 shows each participating contractor's share of the estimated capital costs of the East Branch Enlargement.

Table B-29 shows the amounts of the annual capital cost components of the East Branch Enlargement Transportation Charge for each participating contractor. This component consists of each contractor's allocated share of debt service on bonds sold to finance the enlargement.

Table B-30 shows the minimum OMP&R components of the East Branch Enlargement Transportation Charge for each participating contractor for each year of the Project repayment period.

Table B-31 shows the annual East Branch Enlargement Transportation charges for each participating contractor (the sums of the corresponding amounts included in Table B-29 and B-30).

Short-Term Agreements

The long-term water supply contractors and the Department have executed two short-term agreements that affect the contractors' charges.

A 5-year variable OMP&R agreement provides that for the period from 1994 through 1998 the Department will revise the assumptions used in determining the variable OMP&R unit rates to project reduced water deliveries.

A Municipal Water Quality Investigations agreement for the period 1994 through 1997 allows the Department to bill all costs of this program to the participating M&I contractors under the Transportation minimum OMP&R component.

FIGURE B-9

Determination of Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities Among Participating Contractors

Reach Number	Description
18A	Junction, West Branch, California Aqueduct, through Alamo Powerplant
19	Alamo Powerplant to Fairmont
20A	Fairmont through 70th Street West
20B	70th Street West to Palmdale
21	Palmdale to Littlerock Creek
22A	Littlerock Creek to Pearblossom Pumping Plant
22B	Pearblossom Pumping Plant to West Fork Mojave River
23B	West Fork Mojave River to Silverwood Lake (excluding Mojave Siphon Powerplant facilities)
23C	Mojave Siphon Powerplant facilities
24	Cedar Springs Dam and Silverwood Lake
25	Silverwood Lake to South Portal, San Bernardino Tunnel
26A	South Portal, San Bernardino Tunnel through Devil Canyon Powerplant
26B	Devil Canyon Powerplant Bypass

Share of Enlargement Capacity (cfs)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A		151	13	136	6		1200	1506
19		151	13	136	6		1200	1506
20A	35	151	13	136	6		1200	1541
20B	35	151	13	136	6		1200	1541
21	35	151	13	136			1200	1535
22A	35	151	13	136			1200	1535
22B		151	13	136			1200	1500
23B		184	67	212			1200	1663
23C		184	67				1200	1451
24		190	78				1200	1468
25		193	83			63	1200	1539
26A		193	83			63	1200	1539
26B							300	300

Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities (flow ratios)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
19	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
20A	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
20B	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
21	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22A	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22B	0.00000000	0.10066667	0.00866667	0.09066667	0.00000000	0.00000000	0.79999999	1.00000000
23B	0.00000000	0.11064342	0.04028863	0.12748046	0.00000000	0.00000000	0.72158749	1.00000000
23C	0.00000000	0.12680910	0.04617505	0.00000000	0.00000000	0.00000000	0.82701585	1.00000000
24	0.00000000	0.12942779	0.05313351	0.00000000	0.00000000	0.00000000	0.81743870	1.00000000
25	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26A	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26B	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	1.00000000	1.00000000

Tables B-1 through B-32 follow

TABLE B-1

Factors for Distributing Reach Capital Costs among Contractors

Reach No.	Reach Description	North Bay Area: Napa County FC&WCD	North Bay Area: Solano County Water Agency	South Bay Area: Alameda County FC&WCD, Zone 7	South Bay Area: Alameda County Water District	South Bay Area: Santa Clara Valley Water District	South Bay Area: Future Contractor	Total
NORTH BAY AQUEDUCT								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29667896	0.70332104					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
SOUTH BAY AQUEDUCT								
1	Bethany Reservoir thru Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.22599658	0.20663059	0.49237783	0.07499500	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.19504795	0.21450017	0.51113249	0.07931939	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities				1.00000000		1.00000000	
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	Central Coastal Area: San Luis Obispo County FC&WCD	Central Coastal Area: Santa Barbara County FC&WCD	Southern California Area: Antelope Valley-East Kern Water Agency	Southern California Area: Castaic Lake Water Agency	Southern California Area: Coachella Valley Water District	Southern California Area: Crestline-Lake Arrowhead Water Agency	Southern California Area: Desert Water Agency
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.01285827	0.00528315	0.00133612	0.00871300
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.01343201	0.00552068	0.00139620	0.00910474
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.01345351	0.00552831	0.00139814	0.00911733
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.01345294	0.00552772	0.00139798	0.00911637
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.01345233	0.00552710	0.00139784	0.00911536
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.01345157	0.00552633	0.00139763	0.00911409
6	Five Points to Arroyo Pasajero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasajero to Kettleman City	0.00557189	0.01027949	0.03072428	0.01345006	0.00552480	0.00139723	0.00911154
8C	Kettleman City thru Milham Avenue	0.00557103	0.01027792	0.03071961	0.01344960	0.00552432	0.00139712	0.00911076
8D	Milham Avenue thru Avenal Gap	0.00568611	0.01049020	0.03135418	0.01373353	0.00563986	0.00142632	0.00930130
9	Avenal Gap thru Twisselman Road			0.03426625	0.01356094	0.00616886	0.00156011	0.01017373
10A	Twisselman Road thru Lost Hills			0.03481391	0.01377767	0.00626946	0.00158556	0.01033963
11B	Lost Hills to 7th Standard Road			0.03835043	0.01517717	0.00691699	0.00174933	0.01140749
12D	7th Standard Road thru Elk Hills Road			0.04031661	0.01595523	0.00727790	0.00184059	0.01200265
12E	Elk Hills Road thru Tupman Road			0.04037074	0.01597665	0.00728878	0.00184332	0.01202059
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.01733322	0.00791595	0.00200194	0.01305492
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04599268	0.01820137	0.00831952	0.00210399	0.01372049
14B	Santiago Creek thru Old River Road			0.04682530	0.01853084	0.00847388	0.00214303	0.01397505
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.01941356	0.00888679	0.00224744	0.01465600
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.02014241	0.00922722	0.00233351	0.01521742
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.02109050	0.00967107	0.00244575	0.01594937
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05340725	0.02113537	0.00969176	0.00245098	0.01598349
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112		0.02399391	0.00606795	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Littlerock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04608043
22B	Pearblossom Pumping Plant to West Fork Mojave River					0.02827552	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake					0.00324449	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake					0.01024605	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.				0.03544337			
29F	Oso Pumping Plant thru Quail Embankment				0.03544339			
29G	Quail Embankment thru Warne Powerplant				0.03544339			
29H	Pyramid Dam and Lake				0.02817144			
29J	Pyramid Lake thru Castaic Powerplant				0.03544338			
30	Castaic Dam and Lake				0.02927284			
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503		0.07364766			
33A	Devil's Den Pumping Plant thru San Luis Obispo Powerplant	0.35150791	0.64849209					
34	San Luis Obispo Powerplant to Arroyo Grande	0.24688802	0.75311198					
35	Arroyo Grande thru Santa Maria Terminus	0.18022521	0.81977479					

TABLE B-1

Factors for Distributing Reach Capital Costs among Contractors

Reach No.	San Joaquin Valley Area								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency: Municipal and Industrial	Kern County Water Agency: Agricultural	County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	
	CALIFORNIA AQUEDUCT								
1	0.01707770	0.00088678	0.00254693	0.02741768	0.30629913	0.00090695	0.00167121	0.03504975	
2A	0.01781031	0.00092482	0.00266258	0.02864263	0.31945188	0.00094747	0.00174288	0.03655331	
2B	0.01785838	0.00092731	0.00266550	0.02868743	0.32030556	0.00094896		0.03665201	
3	0.01786337	0.00092757	0.00266499	0.02868589	0.32039254	0.00094892		0.03666225	
4	0.01786863	0.00092785	0.00266446	0.02868428	0.32048398	0.00094886		0.03667303	
5	0.01787517	0.00092819	0.00266380	0.02868227	0.32059816	0.00094879		0.03668649	
6	0.01788508	0.00092870	0.00266279	0.02867923	0.32077093	0.00094868		0.03670685	
7	0.01788826	0.00092887	0.00266246	0.02867825	0.32082633	0.00094864		0.03671338	
8C	0.01789228	0.00092909	0.00266205	0.02867702	0.32089625	0.00094859		0.03672162	
8D	0.01828779		0.00271703	0.02928147	0.32798200			0.01820857	
9				0.03204523	0.32739538				
10A				0.03257442	0.31658608				
11B				0.03597398	0.24684668				
12D				0.03787171	0.20804762				
12E				0.03793198	0.20695175				
13B				0.01458796	0.16600071				
14A				0.00620338	0.13319181				
14B				0.00632023	0.11741558				
14C				0.00651962	0.09039633				
15A				0.00663252	0.07516317				
16A				0.00688973	0.04028829				
17E				0.00212516					
31A			0.05046240		0.57546190				

Reach No.	Southern California Area (continued)								Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Gorgonio Pass Water Agency	Metropolitan Water District of Southern California	Ventura County Flood Control District	
1	0.00049180	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.43929350	0.00429212	1.00000000
2A	0.00051413	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.45921072	0.00448701	1.00000000
2B	0.00051469	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.45973548	0.00449194	1.00000000
3	0.00051461	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.45965407	0.00449108	1.00000000
4	0.00051451	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.45956848	0.00449019	1.00000000
5	0.00051440	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.45946161	0.00448907	1.00000000
6	0.00051419	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.45929991	0.00448738	1.00000000
7	0.00051413	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.45924807	0.00448685	1.00000000
8C	0.00051405	0.01150938	0.00385821	0.02470716	0.00679941	0.00416576	0.45918261	0.00448616	1.00000000
8D	0.00052466	0.01174718	0.00393793	0.02522383	0.00694100	0.00425288	0.46868533	0.00457883	1.00000000
9	0.00057339	0.01283841	0.00430367	0.02758959	0.00758975	0.00465175	0.51227887	0.00500407	1.00000000
10A	0.00058254	0.01304366	0.00437246	0.02803943	0.00771262	0.00472760	0.52049091	0.00508405	1.00000000
11B	0.00064171	0.01436906	0.00481665	0.03093503	0.00850448	0.00521581	0.57349473	0.00560046	1.00000000
12D	0.00067463	0.01510596	0.00506361	0.03254889	0.00894541	0.00548790	0.60297374	0.00588755	1.00000000
12E	0.00067553	0.01512626	0.00507040	0.03259749	0.00895830	0.00549608	0.60379667	0.00589546	1.00000000
13B	0.00073290	0.01641098	0.00550099	0.03540212	0.00972547	0.00596896	0.65516902	0.00639604	1.00000000
14A	0.00076961	0.01723325	0.00577656	0.03720681	0.01021819	0.00627322	0.68807273	0.00671639	1.00000000
14B	0.00078354	0.01754538	0.00588113	0.03789703	0.01040613	0.00638960	0.70057530	0.00683798	1.00000000
14C	0.00080743	0.01808019	0.00606036	0.03907670	0.01072763	0.00658850	0.72199174	0.00704634	1.00000000
15A	0.00082089	0.01838154	0.00616135	0.03974336	0.01090913	0.00670088	0.73406357	0.00716371	1.00000000
16A	0.00085171	0.01907194	0.00639271	0.04126559	0.01132404	0.00695754	0.76170731	0.00743264	1.00000000
17E	0.00089182	0.01997003	0.00669365	0.04325018	0.01186455	0.00729213	0.79767940	0.00778251	1.00000000
17F	0.00089372	0.02001251	0.00670788	0.04334270	0.01188988	0.00730773	0.79937767	0.00779906	1.00000000
18A	0.00221525	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192	0.57469530		1.00000000
19	0.00221522	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230	0.57469556		1.00000000
19C									
20A	0.00237800	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666	0.61700971		1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045	0.64729087		1.00000000
21	0.00254199		0.05692053	0.12319480	0.03380324	0.02077093	0.65963498		1.00000000
22A			0.05773082	0.12495766	0.03428605	0.02106816	0.66905054		1.00000000
22B		0.05842136		0.12645207	0.03469614	0.02132008	0.67705256		1.00000000
23				0.14467451	0.03969010	0.02439237	0.77446614		1.00000000
24				0.22243002	0.04339444	0.02843498	0.66607404		1.00000000
25				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
26A				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
28G				0.05126137			0.94873863		1.00000000
28H							1.00000000		1.00000000
28J							1.00000000		1.00000000
29A							0.95147783	0.01307880	1.00000000
29F							0.95147785	0.01307876	1.00000000
29G							0.95147785	0.01307876	1.00000000
29H							0.96278381	0.00904475	1.00000000
29J							0.95147787	0.01307875	1.00000000
30							0.96212388	0.00860328	1.00000000
31A									1.00000000
33A									1.00000000
34									1.00000000
35									1.00000000

TABLE B-2

Factors for Distributing Reach Minimum OMP&R Costs among Contractors

Reach No.	Reach Description	North Bay Area: Napa County FC&WCD	North Bay Area: Solano County Water Agency	South Bay Area: Alameda County FC&WCD, Zone 7	South Bay Area: Alameda County Water District	South Bay Area: Santa Clara Valley Water District	South Bay Area: Future Contractor	Total
	NORTH BAY AQUEDUCT							
1	Barker Slough thru Fairfield/Vacaville Turnout	0.27960541	0.72039459					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
	SOUTH BAY AQUEDUCT							
1	Bethany Reservoir thru Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.22599658	0.20663059	0.49237783	0.07499500	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.19504795	0.21450017	0.51113249	0.07931939	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities				1.00000000		1.00000000	
	CALIFORNIA AQUEDUCT							
1	Delta thru Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	Central Coastal Area: San Luis Obispo County FC&WCD	Central Coastal Area: Santa Barbara County FC&WCD	Southern California Area: Antelope Valley-East Kern Water Agency	Southern California Area: Castaic Lake Water Agency	Southern California Area: Coachella Valley Water District	Southern California Area: Crestline-Lake Arrowhead Water Agency	Southern California Area: Desert Water Agency
	CALIFORNIA AQUEDUCT							
1	Delta thru Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.01285827	0.00528315	0.00133612	0.00871300
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.01343201	0.00552068	0.00139620	0.00910474
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.01345351	0.00552831	0.00139814	0.00911733
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.01345294	0.00552772	0.00139798	0.00911637
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.01345233	0.00552710	0.00139784	0.00911536
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.01345157	0.00552633	0.00139763	0.00911409
6	Five Points to Arroyo Pasajero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasajero to Kettleman City	0.00557189	0.01027949	0.03072428	0.01345006	0.00552480	0.00139723	0.00911154
8C	Kettleman City thru Milham Avenue	0.00551596	0.01017632	0.03041581	0.01329997	0.00546583	0.00138232	0.00901430
8D	Milham Avenue thru Avenal Gap	0.00562824	0.01038343	0.03103491	0.01357628	0.00557838	0.00141078	0.00919992
9	Avenal Gap thru Twisselman Road			0.03387464	0.01340600	0.00609344	0.00154104	0.01004936
10A	Twisselman Road thru Lost Hills			0.03440598	0.01361627	0.00619088	0.00156569	0.01021004
11B	Lost Hills to 7th Standard Road			0.03783014	0.01497132	0.00681674	0.00172398	0.01124216
12D	7th Standard Road thru Elk Hills Road			0.03972579	0.01572148	0.00716403	0.00181179	0.01181489
12E	Elk Hills Road thru Tupman Road			0.03977669	0.01574162	0.00717426	0.00181437	0.01183175
13B	Tupman Road to Buena Vista Pumping Plant			0.04307711	0.01704769	0.00777681	0.00196675	0.01282547
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04517714	0.01787870	0.00816225	0.00206423	0.01346114
14B	Santiago Creek thru Old River Road			0.04596983	0.01819238	0.00830887	0.00210130	0.01370294
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04732690	0.01872938	0.00855917	0.00216459	0.01411577
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04808935	0.01903108	0.00870025	0.00220027	0.01434839
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.04983435	0.01972161	0.00902198	0.00228161	0.01487897
17E	Edmonston Pumping Plant to Porter Tunnel			0.05209597	0.02061656	0.00943985	0.00238729	0.01556809
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05220390	0.02065927	0.00945949	0.00239225	0.01560048
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112		0.02399391	0.00606795	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Littlerock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04608043
22B	Pearblossom Pumping Plant to West Fork Mojave River					0.02827552	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake					0.00324449	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake					0.01024605	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.			0.00302472	0.03533617			
29F	Oso Pumping Plant thru Quail Embankment			0.00302551	0.03533615			
29G	Quail Embankment thru Warne Powerplant				0.03544339			
29H	Pyramid Dam and Lake				0.02817144			
29J	Pyramid Lake thru Castaic Powerplant				0.03544338			
30	Castaic Dam and Lake				0.02927284			
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503		0.07364766			
33A	Devil's Den Pumping Plant thru San Luis Obispo Powerplant	0.35150791	0.64849209					
34	San Luis Obispo Powerplant to Arroyo Grande	0.24688802	0.75311198					
35	Arroyo Grande thru Santa Maria Terminus	0.18022521	0.81977479					

TABLE B-2

Factors for Distributing Reach Minimum OMP&R Costs among Contractors

Reach No.	San Joaquin Valley Area							
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency: Municipal and Industrial	Kern County Water Agency: Agricultural	County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
	CALIFORNIA AQUEDUCT							
1	0.01707770	0.00088678	0.00254693	0.02741768	0.30629913	0.00090695	0.00167121	0.03504975
2A	0.01781031	0.00092482	0.00266258	0.02864263	0.31945188	0.00094747	0.00174288	0.03655331
2B	0.01785838	0.00092731	0.00266550	0.02868743	0.32030556	0.00094896		0.03665201
3	0.01786337	0.00092757	0.00266499	0.02868589	0.32039254	0.00094892		0.03666225
4	0.01786863	0.00092785	0.00266446	0.02868428	0.32048398	0.00094886		0.03667303
5	0.01787517	0.00092819	0.00266380	0.02868227	0.32059816	0.00094879		0.03668649
6	0.01788508	0.00092870	0.00266279	0.02867923	0.32077093	0.00094868		0.03670685
7	0.01788826	0.00092887	0.00266246	0.02867825	0.32082633	0.00094864		0.03671338
8C	0.01764479	0.00091624	0.00263575	0.02836054	0.31647868	0.00093812		0.03621361
8D	0.01802770		0.00268939	0.02894888	0.32333939			0.01794960
9				0.03163713	0.32219659			
10A				0.03214916	0.31143611			
11B				0.03543138	0.24223373			
12D				0.03725540	0.20386623			
12E				0.03731203	0.20277371			
13B				0.01432141	0.16226809			
14A				0.00608155	0.12998083			
14B				0.00619239	0.11450333			
14C				0.00638131	0.08804967			
15A				0.00648796	0.07316084			
16A				0.00673069	0.03915469			
17E				0.00207245				
31A			0.05046240		0.57546190			

Reach No.	Southern California Area (continued)								Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Gorgonio Pass Water Agency	Metropolitan Water District of Southern California	Ventura County Flood Control District	
1	0.00049180	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.43929350	0.00429212	1.00000000
2A	0.00051413	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.45921072	0.00448701	1.00000000
2B	0.00051469	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.45973548	0.00449194	1.00000000
3	0.00051461	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.45965407	0.00449108	1.00000000
4	0.00051451	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.45956848	0.00449019	1.00000000
5	0.00051440	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.45946161	0.00448907	1.00000000
6	0.00051419	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.45929991	0.00448738	1.00000000
7	0.00051413	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.45924807	0.00448685	1.00000000
8C	0.00050897	0.01139543	0.00382005	0.02444566	0.00672913	0.00412167	0.46607904	0.00444181	1.00000000
8D	0.00051932	0.01162742	0.00389782	0.02494901	0.00686714	0.00420655	0.47563362	0.00453222	1.00000000
9	0.00056683	0.01269152	0.00425448	0.02725243	0.00749914	0.00459491	0.51939559	0.00494690	1.00000000
10A	0.00057571	0.01289064	0.00432121	0.02768814	0.00761823	0.00466838	0.52763907	0.00502449	1.00000000
11B	0.00063300	0.01417390	0.00475129	0.03048687	0.00838406	0.00514026	0.58065667	0.00552450	1.00000000
12D	0.00066474	0.01488434	0.00498939	0.03203990	0.00880866	0.00540209	0.61004998	0.00580129	1.00000000
12E	0.00066559	0.01490343	0.00499577	0.03208558	0.00882077	0.00540978	0.61088592	0.00580873	1.00000000
13B	0.00072082	0.01614026	0.00541032	0.03478013	0.00955838	0.00586410	0.66195198	0.00629068	1.00000000
14A	0.00075596	0.01692733	0.00567410	0.03650376	0.01002933	0.00615469	0.69455166	0.00659733	1.00000000
14B	0.00076922	0.01722449	0.00577366	0.03715939	0.01020799	0.00626523	0.70691589	0.00671309	1.00000000
14C	0.00079194	0.01773312	0.00594412	0.03827874	0.01051330	0.00645397	0.72804676	0.00691126	1.00000000
15A	0.00080471	0.01801891	0.00603990	0.03890949	0.01068518	0.00656030	0.73994080	0.00702257	1.00000000
16A	0.00083391	0.01867297	0.00625909	0.04034814	0.01107764	0.00680287	0.76710412	0.00727736	1.00000000
17E	0.00087177	0.01952067	0.00654315	0.04221660	0.01158699	0.00711787	0.80235512	0.00760762	1.00000000
17F	0.00087358	0.01956112	0.00655671	0.04230442	0.01161106	0.00713268	0.80402166	0.00762338	1.00000000
18A	0.00221525	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192	0.57469530		1.00000000
19	0.00221522	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230	0.57469556		1.00000000
19C									1.00000000
20A	0.00237800	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666	0.61700971		1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045	0.64729087		1.00000000
21	0.00254199	0.05692053		0.12319480	0.03380324	0.02077093	0.65963498		1.00000000
22A		0.05773082		0.12495766	0.03428605	0.02106816	0.66905054		1.00000000
22B		0.05842136		0.12645207	0.03469614	0.02132008	0.67705256		1.00000000
23				0.14467451	0.03969010	0.02439237	0.77446614		1.00000000
24				0.22243002	0.04339444	0.02843498	0.66607404		1.00000000
25				0.11825184	0.03722720	0.01993915	0.82458181		1.00000000
26A				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
28G				0.05126137			0.94873863		1.00000000
28H							1.00000000		1.00000000
28J							1.00000000		1.00000000
29A							0.94859988	0.01303923	1.00000000
29F							0.94859915	0.01303919	1.00000000
29G							0.95147785	0.01307876	1.00000000
29H							0.96278381	0.00904475	1.00000000
29J							0.95147787	0.01307875	1.00000000
30							0.96212388	0.00860328	1.00000000
31A									1.00000000
33A									1.00000000
34									1.00000000
35									1.00000000

Table B-3

Power Costs and Credits and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant

(Dollars)

	North Bay Aqueduct			South Bay Aqueduct	California Aqueduct					
	Reach 1	Reach 3A	Reach 3B	Reach 1(b	Reach 1	Reach 4	Reach 14A	Reach 15A	Reach 16A	Reach 17E
Calendar Year	Barker Slough Pumping Plant (1)	Cordelia Pumping Plant Solano (2)	Cordelia Pumping Plant Napa (a (3)	South Bay & Del Valle Pumping Plants (4)	Banks Pumping Plant (5)	Dos Amigos Pumping Plant (6)	Buena Vista Pumping Plant (7)	Teerink Pumping Plant (8)	Chrisman Pumping Plant (9)	Edmonston Pumping Plant (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	38,130	0	0	0	0	0	0
1963	0	0	0	58,871	0	0	0	0	0	0
1964	0	0	0	75,239	0	0	0	0	0	0
1965	0	0	0	146,297	0	0	0	0	0	0
1966	0	0	0	198,643	0	0	0	0	0	0
1967	0	0	0	229,629	26,982	0	0	0	0	0
1968	0	0	7,128	342,761	1,324,777	239,505	0	0	0	0
1969	0	0	8,557	279,751	855,304	143,403	0	0	0	0
1970	0	0	13,666	448,383	368,508	217,820	2,940	0	0	0
1971	0	0	10,626	422,057	597,946	229,306	156,540	23,021	18,577	29,067
1972	0	0	14,430	623,564	1,110,833	575,291	348,668	187,825	385,935	1,263,087
1973	0	0	14,453	485,534	918,234	493,776	511,904	514,487	883,725	3,139,297
1974	0	0	17,508	510,873	997,269	560,461	556,968	595,585	1,048,196	3,700,573
1975	0	0	14,801	382,106	1,353,916	561,089	650,781	707,038	1,394,918	4,853,538
1976	0	0	20,867	589,007	916,728	596,426	701,061	687,677	1,414,902	4,917,776
1977	0	0	22,640	541,803	653,304	191,906	170,689	173,496	337,890	1,130,422
1978	0	0	21,670	568,381	3,871,011	723,989	1,009,556	968,744	1,782,668	6,281,786
1979	0	0	16,240	622,517	3,431,278	1,019,021	848,639	830,839	1,666,505	5,741,609
1980	0	0	19,936	523,445	2,267,876	1,097,085	1,007,198	997,877	2,018,282	6,671,880
1981	0	0	23,859	630,690	2,553,431	1,984,530	1,392,248	1,390,323	3,001,888	9,863,443
1982	0	0	12,080	410,901	3,829,918	1,468,821	1,342,384	1,393,867	2,801,427	9,792,760
1983	0	0	2,333	82,872	1,374,743	412,432	431,809	421,742	764,599	2,310,080
1984	0	0	4,854	282,748	1,834,751	949,018	801,848	747,345	1,412,330	4,379,455
1985	0	0	10,211	454,973	3,271,195	1,702,552	1,565,835	1,600,549	3,250,144	10,857,355
1986	0	0	15,455	845,875	7,373,656	2,718,997	2,573,965	2,632,451	5,465,227	18,526,707
1987	0	0	27,222	912,939	4,912,306	2,601,119	2,288,359	2,320,323	4,583,116	15,035,581
1988	17,867	38,092	23,987	914,733	5,331,215	2,690,449	2,646,118	2,679,795	5,329,296	17,534,056
1989	26,415	94,620	6,676	1,113,546	10,765,364	4,083,582	4,102,531	4,177,761	8,772,301	29,234,292
1990	58,934	137,678	43,103	1,894,433	9,510,873	4,744,072	5,987,082	6,324,928	14,247,432	50,123,578
1991	19,100	78,434	5,838	572,271	1,874,664	551,270	812,426	822,141	2,147,792	7,784,824
1992	24,477	76,310	11,616	332,439	2,817,775	1,250,969	1,390,199	1,460,151	2,941,153	9,848,032
1993	(20,948)	26,972	(6,296)	(166,964)	995,091	340,845	(85,737)	(83,547)	(552,265)	(2,294,702)
1994	55,565	114,892	32,408	825,817	4,236,597	2,526,486	2,650,027	2,702,512	5,688,039	19,429,122
1995	108,263	70,983	63,558	1,714,084	15,018,828	6,245,030	6,190,408	7,009,863	14,228,602	48,997,193
1996	139,534	84,979	76,090	2,107,354	18,498,504	8,346,247	9,330,919	10,824,938	22,363,568	77,782,703
1997	158,144	97,756	88,018	2,313,320	21,309,385	9,249,711	10,401,499	12,091,826	25,083,804	87,417,46
1998	148,196	96,338	96,938	2,817,160	21,857,638	10,186,439	11,655,356	13,550,743	28,198,782	98,488,652
1999	162,185	110,128	108,407	2,973,555	24,973,104	10,692,082	12,270,210	14,267,745	29,728,204	103,896,636
2000	171,973	116,408	123,215	3,027,399	25,142,349	10,921,943	12,577,833	14,631,304	30,507,330	106,660,085
2001	176,459	122,723	125,140	3,074,709	25,782,986	11,068,242	12,752,141	14,834,030	30,939,276	108,186,310
2002	181,593	129,710	127,401	3,130,271	26,106,028	11,205,793	12,895,730	14,997,458	31,284,780	109,401,334
2003	186,726	136,889	129,722	3,187,283	26,543,673	11,407,849	13,151,690	15,297,669	31,926,397	111,672,935
2004	192,072	144,005	132,117	3,246,123	27,095,896	11,594,324	13,376,523	15,559,542	32,484,564	113,646,373
2005	180,425	134,194	123,116	3,024,977	25,363,104	10,881,577	12,510,234	14,549,420	30,330,249	106,028,699
2006	181,253	135,586	124,392	3,056,340	25,738,082	11,005,569	12,673,924	14,742,491	30,743,802	107,494,606
2007	183,172	136,853	125,555	3,084,904	25,912,572	11,054,718	12,709,353	14,779,762	30,820,003	107,757,151
2008	186,078	138,853	127,390	3,129,991	26,248,841	11,236,589	12,950,937	15,064,900	31,430,976	109,923,354
2009	188,357	140,409	128,818	3,165,072	26,453,442	11,341,643	13,074,113	15,207,671	31,734,884	110,996,785
2010	191,074	142,260	130,516	3,206,799	26,693,575	11,465,552	13,218,527	15,375,107	32,091,130	112,254,604
2011	193,893	144,211	132,306	3,250,772	27,320,255	11,626,344	13,424,706	15,617,265	32,609,071	114,089,290
2012	196,046	145,634	133,611	3,282,845	27,384,650	11,725,301	13,542,643	15,754,333	32,901,028	115,120,858
2013	201,687	149,642	137,288	3,373,186	27,767,837	12,003,516	13,873,585	16,138,865	33,720,389	118,015,834
2014	205,763	152,479	139,891	3,437,149	28,294,359	12,116,372	13,957,546	16,227,971	33,903,398	118,647,972
2015	206,577	152,896	140,273	3,446,538	28,463,132	12,194,552	14,080,164	16,375,535	34,221,708	119,781,317
2016	206,622	153,678	140,992	3,464,190	28,969,354	12,319,777	14,270,830	16,604,265	34,714,662	121,535,286
2017	206,367	153,489	140,818	3,459,922	28,610,992	12,298,444	14,240,481	16,568,138	34,637,067	121,259,794
2018	206,359	153,483	140,813	3,459,788	28,689,411	12,296,939	14,238,040	16,565,252	34,630,749	121,237,276
2019	206,404	153,517	140,843	3,460,535	28,704,747	12,299,727	14,241,665	16,569,532	34,639,933	121,269,682
2020	202,066	150,291	137,883	3,387,810	28,014,144	12,067,842	13,961,235	16,242,811	33,943,243	118,806,754
2021	202,409	150,545	138,117	3,393,559	28,354,250	12,108,300	14,022,748	16,316,633	34,102,307	119,372,790
2022	201,483	149,856	137,485	3,378,027	27,918,344	11,989,620	13,839,645	16,096,626	33,627,979	117,684,399
2023	201,804	150,095	137,704	3,383,419	28,107,062	12,043,669	13,926,060	16,200,835	33,853,073	118,486,047
2024	201,914	150,177	137,779	3,385,261	28,327,944	12,041,421	13,918,760	16,191,495	33,832,439	118,411,865
2025	201,931	150,190	137,791	3,385,537	28,175,420	12,074,122	13,976,574	16,261,949	33,985,129	118,956,991
2026	199,934	148,704	136,428	3,352,055	27,852,595	11,933,779	13,787,725	16,038,741	33,506,521	117,259,500
2027	200,238	148,931	136,636	3,357,159	27,966,732	11,981,527	13,863,502	16,129,986	33,703,544	117,961,227
2028	199,980	148,739	136,460	3,352,839	27,887,390	11,937,737	13,793,270	16,045,285	33,520,740	117,309,787
2029	200,166	148,876	136,586	3,355,945	27,919,841	11,970,506	13,846,027	16,108,977	33,658,188	117,799,753
2030	199,942	148,711	136,434	3,352,199	27,645,596	11,951,320	13,818,747	16,076,413	33,588,266	117,551,079
2031	200,248	148,938	136,643	3,357,332	28,027,281	11,978,526	13,857,636	16,122,821	33,688,031	117,905,591
2032	200,263	148,950	136,653	3,357,580	27,846,678	11,991,743	13,880,909	16,151,145	33,749,351	118,124,400
2033	199,769	148,582	136,316	3,349,302	27,897,744	11,923,090	13,773,982	16,022,536	33,471,849	117,136,479
2034	199,741	148,561	136,296	3,348,822	27,838,188	11,919,871	13,769,145	16,016,714	33,459,486	117,092,603
2035	200,152	148,867	136,577	3,355,710	28,789,454	11,941,466	13,794,963	16,046,840	33,523,465	117,318,712
TOTAL	7,958,672	6,253,114	5,684,884	146,941,086	1,170,886,952	503,313,039	573,304,023	661,552,362	1,379,892,044	4,818,893,788

a) Power costs for the period 1968 through 1987 are for an interim facility.
b) The costs of Del Valle Pumping Plant are combined with those of South Bay Pumping Plant to simplify the cost allocations.

TABLE B-3

Power Costs and Credits and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant

(Dollars)

	California Aqueduct (continued)									
	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 29A	Reach 29G	Reach 29J	Reach 31A	Reach 33A	
Calendar Year	Alamo Powerplant (11)	Pearblossom Pumping Plant (12)	Mojave Siphon Powerplant (13)	Devil Canyon Powerplant (14)	Oso Pumping Plant (15)	Warne Powerplant (16)	Castaic Powerplant (17)	Las Perillas and Badger Hill Pumping Plants (18)	Devil's Den, Bluestone, and Polonio PPs and San Luis Obispo Pwp. (19)	Grand Total (20)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	38,130
1963	0	0	0	0	0	0	0	0	0	58,871
1964	0	0	0	0	0	0	0	0	0	75,239
1965	0	0	0	0	0	0	0	0	0	146,297
1966	0	0	0	0	0	0	0	0	0	198,643
1967	0	0	0	0	0	0	0	6,517	0	263,128
1968	0	0	0	0	0	0	0	120,278	0	2,034,449
1969	0	0	0	0	0	0	0	79,620	0	1,366,635
1970	0	0	0	0	0	0	0	137,449	0	1,188,766
1971	0	64,807	0	0	1,696	0	0	171,389	0	1,725,032
1972	0	103,584	0	(3,112)	180,005	0	(385,696)	240,651	0	4,645,065
1973	0	615,309	0	(931,697)	274,450	0	(1,193,216)	128,730	0	5,854,986
1974	0	595,646	0	(939,072)	322,440	0	(1,823,397)	129,345	0	6,272,395
1975	0	616,327	0	(1,101,445)	457,487	0	(2,835,302)	101,109	0	7,156,363
1976	0	914,440	0	(1,520,412)	314,669	0	(2,512,021)	151,211	0	7,192,331
1977	0	318,880	0	(1,216,060)	53,119	0	(1,701,284)	85,538	0	762,343
1978	0	1,801,373	0	(3,298,247)	251,373	0	(2,361,377)	197,217	0	11,818,144
1979	0	1,813,744	0	(3,335,069)	157,934	0	(2,749,296)	209,088	0	10,273,049
1980	0	1,866,161	0	(3,508,195)	170,688	0	(2,721,871)	182,996	0	10,593,358
1981	0	2,187,538	0	(3,769,972)	514,832	0	(3,248,819)	186,954	0	16,710,945
1982	0	1,686,620	0	(3,172,286)	625,731	(973,898)	(3,476,126)	182,343	0	15,924,542
1983	0	385,049	0	(5,776,899)	234,998	(1,373,756)	(4,112,979)	18,778	0	(4,824,199)
1984	0	673,007	0	(7,751,311)	435,350	(2,269,583)	1,601,424	116,056	0	3,217,292
1985	0	1,249,530	0	(10,518,533)	1,048,791	(8,489,604)	(19,846,283)	154,762	0	(13,688,523)
1986	(1,066,189)	2,618,876	0	(12,055,463)	1,388,243	(6,276,296)	(11,466,466)	318,097	0	13,613,135
1987	(1,015,186)	1,893,233	0	(10,586,823)	1,390,585	(6,703,320)	(11,630,565)	270,952	0	6,299,841
1988	(767,246)	2,426,127	0	(14,655,710)	1,490,282	(7,385,651)	(12,678,838)	235,508	0	5,870,080
1989	(778,167)	4,369,096	0	(19,092,290)	2,148,429	(8,720,204)	(14,653,369)	311,766	0	25,962,349
1990	(845,641)	6,814,855	0	(21,336,948)	3,031,111	(11,692,826)	(19,863,014)	466,612	0	49,646,262
1991	(448,649)	740,332	0	(7,863,433)	465,425	(6,735,957)	(11,401,801)	(141,479)	0	(10,716,802)
1992	(974,183)	1,283,884	0	(9,773,109)	780,542	(5,667,748)	(9,522,877)	85,868	0	(3,634,502)
1993	(60,517)	(351,788)	0	(7,861,479)	124,991	(4,988,529)	(10,262,109)	(44,642)	0	(25,291,624)
1994	(64,484)	2,620,870	0	(12,005,935)	1,218,217	(6,187,244)	(10,732,387)	236,246	0	13,346,748
1995	(1,242,684)	7,003,353	(4,440,300)	(21,195,176)	3,151,318	(10,809,229)	(19,131,100)	349,917	0	53,332,911
1996	(2,177,984)	11,368,823	(6,133,200)	(29,830,176)	4,862,681	(15,094,229)	(26,483,600)	512,484	594,528	87,174,163
1997	(2,177,984)	13,217,525	(6,526,500)	(29,327,676)	5,249,332	(15,019,229)	(26,321,500)	665,502	1,418,104	109,388,501
1998	(5,436,306)	13,807,206	(5,600,193)	(30,582,726)	6,255,268	(17,998,729)	(29,027,850)	751,721	1,742,415	121,007,048
1999	(5,442,510)	14,566,149	(5,663,634)	(30,409,576)	6,573,100	(18,025,254)	(29,151,750)	793,463	1,839,168	134,261,412
2000	(5,532,985)	15,083,606	(5,919,792)	(30,277,951)	6,690,867	(18,035,304)	(29,180,650)	808,135	1,873,179	139,388,944
2001	(5,512,587)	15,258,580	(5,794,221)	(30,106,726)	6,795,318	(18,049,429)	(29,218,000)	820,765	1,902,450	143,158,166
2002	(5,428,974)	15,316,008	(5,537,037)	(30,403,426)	6,905,990	(18,046,504)	(29,202,150)	835,596	1,936,830	145,836,431
2003	(5,455,529)	15,681,038	(5,772,789)	(30,168,726)	7,023,564	(18,055,104)	(29,210,900)	850,815	1,972,104	150,505,306
2004	(5,431,371)	15,961,655	(5,723,142)	(30,172,076)	7,137,523	(18,032,754)	(29,186,500)	866,522	2,008,512	154,899,908
2005	(5,417,506)	14,906,144	(5,832,069)	(30,235,951)	6,684,742	(18,034,404)	(29,168,150)	807,489	1,871,679	138,707,969
2006	(5,451,628)	15,113,057	(5,860,854)	(30,173,976)	6,773,515	(18,094,879)	(29,282,100)	815,861	1,891,086	141,626,127
2007	(5,403,124)	15,136,937	(5,772,447)	(30,238,351)	6,788,151	(17,981,979)	(29,081,950)	823,486	1,908,759	142,743,525
2008	(5,474,752)	15,433,946	(5,774,613)	(30,193,551)	6,923,197	(18,094,029)	(29,276,950)	835,521	1,936,656	146,753,334
2009	(5,462,438)	15,591,386	(5,827,908)	(30,238,676)	6,982,442	(18,062,429)	(29,223,600)	844,886	1,958,361	148,993,218
2010	(5,470,851)	15,782,109	(5,757,513)	(30,324,551)	7,049,202	(18,030,829)	(29,147,400)	856,024	1,984,182	151,709,517
2011	(5,480,016)	16,025,218	(5,891,862)	(30,176,226)	7,165,294	(18,088,004)	(29,261,650)	867,763	2,011,389	155,580,019
2012	(5,495,056)	16,212,314	(5,823,690)	(30,188,576)	7,208,389	(18,045,204)	(29,169,550)	876,325	2,031,234	157,793,135
2013	(5,472,402)	16,606,535	(5,752,611)	(30,204,376)	7,381,457	(18,003,604)	(29,125,750)	900,440	2,087,130	163,798,648
2014	(5,310,393)	16,350,725	(5,602,416)	(30,179,551)	7,542,970	(18,084,004)	(29,256,450)	917,514	2,126,709	165,588,004
2015	(5,386,345)	16,678,325	(5,597,457)	(30,262,201)	7,549,014	(18,058,854)	(29,204,500)	920,020	2,132,517	167,833,211
2016	(5,503,610)	17,125,427	(5,997,312)	(30,123,551)	7,581,417	(18,050,654)	(29,190,350)	924,733	2,143,440	171,289,196
2017	(5,449,372)	17,051,912	(5,993,379)	(30,253,926)	7,578,009	(18,049,379)	(29,209,850)	923,593	2,140,797	170,313,917
2018	(5,446,505)	17,038,934	(5,948,349)	(30,112,951)	7,580,480	(18,068,079)	(29,222,500)	923,558	2,140,716	170,503,414
2019	(5,452,474)	17,046,846	(5,996,628)	(30,131,026)	7,581,110	(18,066,204)	(29,218,950)	923,757	2,141,178	170,514,194
2020	(5,458,396)	16,753,306	(5,979,585)	(30,137,926)	7,415,985	(18,031,929)	(29,148,400)	904,343	2,096,178	165,327,655
2021	(5,522,504)	16,834,734	(5,867,067)	(30,190,376)	7,451,513	(18,078,729)	(29,244,750)	905,878	2,099,736	166,550,093
2022	(5,383,713)	16,485,935	(5,772,561)	(30,157,351)	7,387,425	(18,010,879)	(29,112,300)	901,732	2,090,127	163,451,879
2023	(5,428,645)	16,630,905	(5,895,453)	(30,131,226)	7,426,617	(18,041,454)	(29,223,550)	903,172	2,093,463	164,823,597
2024	(5,431,982)	16,665,867	(5,998,167)	(30,151,501)	7,403,149	(18,012,579)	(29,116,250)	903,663	2,094,603	164,955,858
2025	(5,456,516)	16,708,626	(5,919,564)	(30,320,801)	7,452,849	(18,110,754)	(29,316,250)	903,737	2,094,774	165,341,735
2026	(5,436,588)	16,519,283	(6,045,762)	(29,982,851)	7,329,296	(17,996,954)	(29,088,900)	894,799	2,074,056	162,482,361
2027	(5,458,678)	16,572,199	(5,896,422)	(30,332,501)	7,392,964	(18,106,679)	(29,307,600)	896,162	2,077,215	163,286,142
2028	(5,435,084)	16,498,743	(6,062,292)	(29,947,476)	7,343,385	(18,025,554)	(29,140,750)	895,008	2,074,542	162,532,749
2029	(5,465,164)	16,593,454	(5,937,063)	(30,193,201)	7,365,010	(18,054,129)	(29,203,100)	895,838	2,076,462	163,222,972
2030	(5,446,552)	16,530,868	(5,962,428)	(30,140,826)	7,360,432	(18,055,754)	(29,214,750)	894,838	2,074,146	162,508,681
2031	(5,468,830)	16,613,996	(5,931,078)	(30,205,626)	7,369,441	(18,050,104)	(29,208,650)	896,208	2,077,323	163,515,727
2032	(5,528,896)	16,686,621	(5,802,543)	(30,273,551)	7,367,263	(18,051,679)	(29,198,650)	896,274	2,077,476	163,759,987
2033	(5,468,783)	16,445,717	(5,606,919)	(30,161,801)	7,344,222	(18,044,929)	(29,174,050)	894,064	2,072,352	162,359,522
2034	(5,473,436)	16,458,365	(5,636,958)	(30,417,076)	7,333,945	(18,007,779)	(29,133,300)	893,936	2,072,055	162,019,179
2035	(5,433,862)	16,415,207	(5,778,489)	(29,901,426)	7,376,904	(18,084,104)	(29,254,700)	895,775	2,076,318	163,567,829
TOTAL	(218,833,277)	682,085,084	(238,632,267)	(1,390,230,691)	304,216,138	(804,206,905)	(1,340,817,319)	39,130,276	79,113,949	6,386,504,952

TABLE B-4

Annual Entitlements to Project Water

(Acre-Feet)

Calendar Year	North Bay Area			South Bay Area (a				Central Coastal Area		
	Napa County FC&WCD (b (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	507	5,248	5,783	11,538	0	0	0
1968	0	0	0	6,900	15,000	88,000	109,900	0	0	0
1969	0	0	0	8,200	15,500	75,000	98,700	0	0	0
1970	0	0	0	10,000	16,200	88,000	114,200	0	0	0
1971	0	0	0	11,200	17,000	88,000	116,200	0	0	0
1972	0	0	0	12,400	17,900	88,000	118,300	0	0	0
1973	0	0	0	13,600	18,800	88,000	120,400	0	0	0
1974	0	0	0	14,800	19,600	88,000	122,400	0	0	0
1975	0	0	0	16,000	20,500	88,000	124,500	0	0	0
1976	0	0	0	17,200	21,300	88,000	126,500	0	0	0
1977	0	0	0	18,400	22,200	88,000	128,600	0	0	0
1978	0	0	0	19,600	23,100	88,000	130,700	0	0	0
1979	0	0	0	20,800	23,900	88,000	132,700	0	0	0
1980	0	500	500	22,000	24,800	88,000	134,800	1,000	946	1,946
1981	0	650	650	23,000	26,000	88,000	137,000	1,000	1,813	2,813
1982	0	800	800	24,000	27,200	88,000	139,200	2,000	3,626	5,626
1983	0	950	950	25,000	28,400	88,000	141,400	3,000	5,439	8,439
1984	0	1,100	1,100	26,000	29,600	88,000	143,600	4,500	8,198	12,698
1985	0	1,250	1,250	27,000	30,800	88,000	145,800	7,500	13,638	21,138
1986	0	1,400	1,400	28,000	32,100	88,000	148,100	10,000	18,210	28,210
1987	0	1,550	1,550	29,000	33,300	88,000	150,300	12,500	22,704	35,204
1988	5,745	9,726	15,471	30,000	34,500	88,000	152,500	15,500	28,222	43,722
1989	6,195	18,420	24,615	31,000	35,700	90,000	156,700	20,000	36,342	56,342
1990	6,940	21,250	28,190	32,000	36,900	92,000	160,900	25,000	45,486	70,486
1991	7,290	22,300	29,590	34,000	38,400	94,000	166,400	25,000	45,486	70,486
1992	7,840	24,170	32,010	36,000	39,900	96,000	171,900	25,000	45,486	70,486
1993	8,490	26,130	34,620	38,000	41,400	98,000	177,400	25,000	45,486	70,486
1994	9,135	28,080	37,215	40,000	42,000	100,000	182,000	25,000	45,486	70,486
1995	9,780	34,250	44,030	42,000	42,000	100,000	184,000	25,000	45,486	70,486
1996	10,425	37,800	48,225	44,000	42,000	100,000	186,000	25,000	45,486	70,486
1997	11,065	38,250	49,315	46,000	42,000	100,000	188,000	25,000	45,486	70,486
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	25,000	45,486	70,486
1999	12,330	39,170	51,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2000	13,050	39,620	52,670	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2001	13,665	40,080	53,745	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2002	14,185	40,540	54,725	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2003	14,800	41,000	55,800	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2004	15,400	41,450	56,850	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2005	16,000	41,500	57,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2006	16,450	41,550	58,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2007	17,000	41,600	58,600	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2008	17,650	41,650	59,300	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2009	18,200	41,700	59,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2010	18,750	41,750	60,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2011	19,400	41,800	61,200	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2012	19,950	41,850	61,800	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2013	20,600	41,900	62,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2014	21,250	41,950	63,200	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2015	21,900	42,000	63,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2016	22,500	42,000	64,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2017	23,100	42,000	65,100	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2018	23,700	42,000	65,700	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2019	24,300	42,000	66,300	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2020	24,900	42,000	66,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2021	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2022	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2023	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2024	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2025	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2026	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2027	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2028	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2029	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2030	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2031	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2032	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2033	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2034	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2035	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
TOTAL	878,695	1,848,396	2,727,091	2,494,607	2,459,248	6,510,783	11,464,638	1,227,000	2,231,494	3,458,494

a) Entitlements for the South Bay area were supplied by non-Project water for the period June 1962 through November 1967. Actual delivery quantities for 1967.
b) District's Table A quantities exclude amounts during the period 1968 through 1987 that are assumed to be supplied by non-Project water.

TABLE B-4

Annual Entitlements to Project Water

(Acre-Feet)

Calendar Year	San Joaquin Valley Area								
			Kern County Water Agency						
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Municipal and Industrial (13)	Agricultural (14)	Total (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	14,300	1,000	0	46,600	46,600	900	2,300	12,250	77,350
1969	14,325	3,000	0	95,700	95,700	1,200	2,500	46,350	163,075
1970	15,700	3,000	28,700	116,400	145,100	1,300	2,600	34,300	202,000
1971	17,900	3,000	35,700	154,600	190,300	1,300	2,800	36,500	251,800
1972	20,000	3,000	39,200	231,500	270,700	1,400	5,366	112,600	413,066
1973	22,000	3,000	43,500	267,000	310,500	1,500	3,100	43,552	383,652
1974	33,390	3,000	48,000	299,000	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	52,700	358,120	410,820	1,600	3,576	86,258	545,809
1976	30,921	3,000	56,100	386,050	442,150	1,600	4,039	61,707	543,417
1977	30,400	3,000	60,600	423,000	483,600	1,700	3,700	59,000	581,400
1978	32,500	0	64,100	470,200	534,300	1,900	3,900	63,300	635,900
1979	38,544	3,000	67,600	516,300	583,900	2,000	4,000	71,241	702,685
1980	41,000	3,000	71,100	563,400	634,500	2,200	5,700	71,700	758,100
1981	41,000	3,000	74,800	616,600	691,400	2,300	4,300	76,000	818,000
1982	41,000	3,000	79,600	665,700	745,300	2,500	4,500	80,200	876,500
1983	42,900	3,000	83,500	721,600	805,100	2,800	4,600	9,548	867,948
1984	45,100	3,000	103,600	757,000	860,600	3,100	4,800	62,611	979,211
1985	47,200	3,000	108,900	806,100	915,000	3,400	4,900	45,549	1,019,049
1986	49,300	3,000	113,400	854,800	968,200	3,700	5,100	97,200	1,126,500
1987	51,400	3,000	119,100	904,400	1,023,500	4,000	5,200	101,400	1,188,500
1988	53,500	3,000	123,900	950,700	1,074,600	4,000	5,400	105,600	1,246,100
1989	55,600	3,000	128,200	984,100	1,112,300	4,000	5,600	109,900	1,290,400
1990	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1991	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1992	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1993	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1994	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1995	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1996	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1997	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1998	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1999	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2000	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2001	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2002	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2003	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2004	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2005	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2006	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2007	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2008	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2009	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2010	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2011	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2012	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2013	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2014	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2015	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2016	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2017	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2018	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2019	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2020	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2021	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2022	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2023	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2024	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2025	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2026	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2027	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2028	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2029	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2030	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2031	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2032	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2033	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2034	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2035	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
TOTAL	3,432,735	199,000	7,693,900	58,053,670	65,747,570	233,900	353,652	6,910,055	76,876,912

TABLE B-4

Annual Entitlements to Project Water

(Acre-Feet)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	*Castaic Lake Water Agency (21)*	*Coachella Valley Water District (22)*	*Crestline-Lake Arrowhead Water Agency (23)*	*Desert Water Agency (24)*	*Littlerock Creek Irrigation District (25)*	*Mojave Water Agency (26)*	*Palmdale Water District (27)*	*San Bernardino Valley Municipal Water District (28)*	*San Gabriel Valley Municipal Water District (29)*
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	3,700	0	0	0	0	0	0	0	0
1969	0	5,000	0	0	0	0	0	0	0	0
1970	0	5,700	0	0	0	0	0	0	0	0
1971	0	6,700	0	0	0	0	0	0	0	0
1972	20,000	8,936	5,200	526	8,000	170	8,400	1,620	1,677	122
1973	25,000	12,400	5,800	870	9,000	290	10,700	2,940	48,000	11,500
1974	30,000	15,400	6,400	1,160	10,000	400	13,100	4,260	50,000	12,300
1975	35,000	18,200	7,000	1,450	11,000	520	15,400	5,580	52,500	13,100
1976	44,000	21,200	7,600	1,740	12,000	640	17,800	6,900	55,000	14,000
1977	50,000	24,100	8,421	2,030	13,000	730	20,200	8,220	57,500	14,800
1978	57,000	24,762	9,242	2,320	14,000	920	0	9,340	60,000	15,700
1979	63,000	28,000	10,063	2,610	15,000	1,040	24,900	10,260	62,500	16,600
1980	69,200	30,400	10,884	2,900	17,000	1,150	27,200	11,180	65,500	17,400
1981	75,000	32,800	12,105	3,190	19,000	1,270	23,100	11,700	68,500	18,300
1982	81,300	34,800	13,326	3,480	21,000	1,380	22,843	12,320	71,500	19,100
1983	87,700	37,300	14,547	3,770	23,000	1,500	34,300	12,940	74,500	19,900
1984	35,000	39,600	15,768	4,060	25,000	1,610	36,700	13,560	78,000	20,700
1985	40,000	41,800	16,989	4,350	27,000	1,730	39,000	14,180	81,500	21,800
1986	42,000	43,600	18,210	4,640	29,000	1,840	41,400	14,800	85,000	23,200
1987	44,000	45,600	19,431	4,930	31,500	1,960	43,700	15,420	89,000	24,600
1988	46,000	48,000	20,652	5,220	34,000	2,070	46,000	16,040	93,000	26,000
1989	125,700	50,100	21,873	5,510	36,500	2,190	48,500	16,660	97,000	27,400
1990	132,100	52,000	23,100	5,800	38,100	2,300	50,800	17,300	101,500	28,800
1991	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1992	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1993	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1994	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1995	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1996	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1997	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1998	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1999	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2000	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2001	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2002	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2003	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2004	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2005	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2006	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2007	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2008	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2009	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2010	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2011	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2012	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2013	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2014	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2015	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2016	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2017	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2018	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2019	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2020	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2021	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2022	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2023	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2024	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2025	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2026	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2027	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2028	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2029	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2030	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2031	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2032	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2033	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2034	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2035	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
TOTAL	7,330,000	3,069,098	1,286,111	321,556	2,107,600	127,210	2,810,043	983,720	5,909,177	1,641,322

TABLE B-4

Annual Entitlements to Project Water

(Acre-Feet)

Calendar Year	Southern California Area: San Gorgonio Pass Water Agency (30)	Southern California Area: Metropolitan Water District of Southern California (31)	Southern California Area: Ventura County Flood Control District (32)	Southern California Area: Total (33)	Feather River Area: City of Yuba City (34)	Feather River Area: County of Butte (35)	Feather River Area: Plumas County FC&WCD (36)	Feather River Area: Total (37)	South Bay Area Future Contractor (38)	Grand Total (39)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	11,538
1968	0	0	0	3,700	0	300	250	550	0	191,500
1969	0	0	0	5,000	0	350	270	620	0	267,395
1970	0	0	0	5,700	0	400	300	700	0	322,600
1971	0	0	0	6,700	0	450	440	890	0	375,590
1972	0	154,772	0	209,423	0	500	470	970	0	741,759
1973	0	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	0	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	0	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	0	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	0	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	0	856,300	0	1,049,584	0	1,200	650	1,850	0	1,818,034
1979	0	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	6,800	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	7,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	8,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	9,800	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,994
1984	10,800	1,458,300	5,000	1,744,098	1,600	1,200	830	3,630	0	2,884,337
1985	11,800	1,558,700	6,000	1,864,849	1,700	1,200	860	3,760	0	3,055,846
1986	12,900	1,659,300	8,000	1,983,890	2,100	1,200	890	4,190	0	3,292,290
1987	14,000	1,759,800	10,000	2,103,941	2,500	1,200	920	4,620	0	3,484,115
1988	15,100	1,860,400	13,000	2,225,482	2,900	1,200	960	5,060	0	3,688,335
1989	16,200	1,961,000	16,000	2,424,633	3,300	1,200	1,000	5,500	0	3,958,190
1990	17,300	2,011,500	20,000	2,500,600	3,800	1,200	1,040	6,040	0	4,108,516
1991	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,130,856
1992	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,120	11,920	0	4,138,816
1993	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,160	11,960	0	4,146,966
1994	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,200	12,000	0	4,154,201
1995	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,250	12,050	0	4,163,066
1996	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,300	12,100	0	4,169,311
1997	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,350	12,150	0	4,172,451
1998	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,400	12,200	0	4,173,606
1999	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,450	12,250	0	4,174,736
2000	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,510	12,310	0	4,175,966
2001	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,570	38,670	0	4,203,401
2002	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,630	38,730	0	4,204,441
2003	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,690	38,790	0	4,205,576
2004	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,750	38,850	0	4,206,686
2005	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,810	38,910	0	4,207,396
2006	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,880	38,980	0	4,207,966
2007	17,300	2,011,500	20,000	2,510,200	9,600	27,500	1,950	39,050	0	4,208,636
2008	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,020	39,120	0	4,209,406
2009	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,090	39,190	0	4,210,076
2010	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,160	39,260	0	4,210,746
2011	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,240	39,340	0	4,211,526
2012	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,320	39,420	0	4,212,206
2013	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,410	39,510	0	4,212,996
2014	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,500	39,600	0	4,213,786
2015	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,600	39,700	0	4,214,586
2016	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,215,286
2017	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,215,886
2018	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,216,486
2019	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,086
2020	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,686
2021	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2022	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2023	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2024	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2025	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2026	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2027	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2028	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2029	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2030	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2031	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2032	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2033	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2034	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2035	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
TOTAL	909,800	112,360,272	988,000	139,843,909	449,900	997,800	112,820	1,560,520	0	235,931,564

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

Calendar Year	Grizzly Valley Pipeline PC FC&WCD (1)	North Bay Aqueduct Reach 1 SCWA (2)	North Bay Aqueduct Reach 3A SCWA (3)	North Bay Aqueduct Reach 3B NC FC&WCD (a (4)	North Bay Aqueduct Total (5)	South Bay Aqueduct Reach 1 ACWD (6)	South Bay Aqueduct Reach 1 AC FC&WCD (7)	South Bay Aqueduct Reach 2 AC FC&WCD (8)	South Bay Aqueduct Reach 4 AC FC&WCD (9)	South Bay Aqueduct Reach 5 ACWD (10)	South Bay Aqueduct Reach 5 AC FC&WCD (11)
1962	0	0	0	0	0	8,412	141	353	0	0	0
1963	0	0	0	0	0	10,914	814	917	0	0	0
1964	0	0	0	0	0	19,238	248	1,425	0	0	0
1965	0	0	0	0	0	15,280	637	1,830	138	0	0
1966	0	0	0	0	0	0	2,475	2,537	499	0	0
1967	0	0	0	0	0	0	1,527	2,391	862	0	0
1968	0	0	0	1,214	1,214	0	1,608	3,799	721	0	5
1969	0	0	0	2,687	2,687	0	1,165	3,459	1,851	0	160
1970	70	0	0	3,618	3,618	0	1,345	4,558	3,182	0	164
1971	64	0	0	2,521	2,521	0	546	1,908	2,403	0	160
1972	505	0	0	3,647	3,647	0	1,066	4,605	2,041	1,489	2,777
1973	679	0	0	3,792	3,792	0	430	1,123	1,193	0	229
1974	648	0	0	4,870	4,870	0	177	0	975	0	162
1975	405	0	0	6,840	6,840	0	137	1,783	1,864	0	120
1976	382	0	0	7,122	7,122	0	265	7,204	3,384	0	817
1977	303	0	0	8,226	8,226	0	210	4,491	2,213	0	524
1978	278	0	0	6,034	6,034	0	422	2,426	3,754	0	2,034
1979	329	0	0	6,561	6,561	0	197	4,283	5,567	0	3,937
1980	295	0	0	6,707	6,707	0	77	3,883	6,686	1,508	0
1981	355	0	0	9,001	9,001	0	1,250	4,648	5,273	5,752	1,157
1982	305	0	0	1,213	1,213	0	473	3,043	4,406	0	630
1983	262	0	0	2,287	2,287	0	179	2,712	1,714	0	50
1984	272	0	0	2,923	2,923	0	165	4,219	2,219	0	55
1985	254	0	0	4,039	4,039	0	213	5,199	2,060	0	63
1986	317	1,400	0	3,519	4,919	0	200	6,052	2,062	0	212
1987	452	1,550	0	7,693	9,243	0	218	7,538	2,372	0	285
1988	523	0	9,725	5,392	15,117	0	222	8,302	4,681	0	189
1989	486	10	17,246	6,195	23,451	0	222	8,051	6,562	0	418
1990	548	3,275	15,856	6,940	26,071	0	256	8,160	8,347	0	593
1991	420	3,117	3,855	1,380	8,352	0	162	3,676	3,269	0	359
1992	485	5,553	9,220	4,001	18,774	0	217	5,177	2,188	0	154
1993	444	14,709	14,471	5,286	34,466	0	190	5,843	8,430	1,650	5,964
1994	484	10,341	15,376	6,792	32,509	0	132	4,418	5,427	0	758
1995	1,250	17,810	16,440	9,780	44,030	0	280	9,776	14,935	0	1,340
1996	1,300	20,950	16,440	9,780	47,170	0	241	10,026	15,078	0	1,480
1997	1,350	21,900	16,350	11,065	49,315	0	221	10,228	15,563	0	1,780
1998	1,400	21,950	16,760	11,710	50,420	0	221	10,230	15,962	0	1,780
1999	1,450	21,428	17,737	12,330	51,495	0	221	10,241	16,346	0	1,780
2000	1,569	21,288	18,332	13,050	52,670	0	221	10,241	16,346	0	1,780
2001	1,577	21,388	18,232	13,665	53,285	0	221	10,241	16,346	0	1,780
2002	1,632	21,488	18,132	14,185	53,805	0	221	10,241	16,346	0	1,780
2003	1,690	21,588	18,032	14,800	54,420	0	221	10,241	16,346	0	1,780
2004	1,766	21,688	17,932	15,400	55,020	0	221	10,241	16,346	0	1,780
2005	1,827	22,388	19,060	16,000	57,448	0	221	10,241	16,346	0	1,780
2006	1,890	21,888	19,612	16,450	57,950	0	221	10,241	16,346	0	1,780
2007	1,954	21,988	19,512	17,000	58,500	0	221	10,241	16,346	0	1,780
2008	2,020	22,088	19,412	17,650	59,150	0	221	10,241	16,346	0	1,780
2009	2,112	22,188	19,312	18,200	59,700	0	221	10,241	16,346	0	1,780
2010	2,183	21,156	20,344	18,750	60,250	0	221	10,241	16,346	0	1,780
2011	2,256	21,256	20,244	19,400	60,900	0	221	10,241	16,346	0	1,780
2012	2,332	21,356	20,144	19,950	61,450	0	221	10,241	16,346	0	1,780
2013	2,410	21,456	20,044	20,600	62,100	0	221	10,241	16,346	0	1,780
2014	2,449	21,556	19,944	21,250	62,750	0	221	10,241	16,346	0	1,780
2015	2,515	22,676	19,324	21,900	63,900	0	221	10,241	16,346	0	1,780
2016	2,580	22,276	19,724	22,500	64,500	0	221	10,241	16,346	0	1,780
2017	2,642	22,276	19,724	23,100	65,100	0	221	10,241	16,346	0	1,780
2018	2,700	22,276	19,724	23,700	65,700	0	221	10,241	16,346	0	1,780
2019	2,700	22,276	19,724	24,300	66,300	0	221	10,241	16,346	0	1,780
2020	2,700	22,276	19,724	24,900	66,900	0	221	10,241	16,346	0	1,780
2021	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2022	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2023	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2024	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2025	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2026	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2027	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2028	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2029	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2030	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2031	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2032	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2033	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2034	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
2035	2,700	22,276	19,724	25,000	67,000	0	221	10,241	16,346	0	1,780
TOTAL	102,319	936,949	871,568	956,915	2,765,432	53,844	26,726	549,190	762,683	10,399	94,216

a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	South Bay Aqueduct (continued) (b					California Aqueduct								
						North San Joaquin Division			San Luis Division					
	Reach 6	Reach 7	Reach 8	Reach 9		Reach 2A			Reach 3	Reach 4			Reach 5	
Calendar Year	AC FC&WCD (12)	ACWD (13)	ACWD (14)	SCVWD (15)	Total (16)	OFWD (c (17)	TLBWSD (18)	SCVWD (19)	DRWD (20)	KCWA (Ag) (21)	DRWD (22)	TLBWSD (23)	CLWA (24)	TLBWSD (25)
1962	0	0	0	0	8,906	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	12,645	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	20,911	0	0	0	0	0	0	0	0	0
1965	0	1,127	0	15,014	34,026	0	0	0	0	0	0	0	0	0
1966	0	14,864	0	34,538	54,913	0	0	0	0	0	0	0	0	0
1967	0	12,882	0	39,101	56,763	0	0	0	0	0	0	0	0	0
1968	0	24,817	0	70,105	101,050	3,084	0	0	0	0	0	0	0	0
1969	0	813	0	62,264	69,552	3,016	0	0	0	0	0	0	0	0
1970	0	0	0	80,311	89,396	5,911	0	0	0	0	0	0	0	0
1971	0	5,961	0	87,606	98,424	7,212	0	0	0	0	0	0	0	0
1972	0	26,182	0	100,266	135,649	8,166	0	0	0	0	0	0	0	0
1973	0	2,521	0	88,582	93,849	3,214	0	0	0	0	0	0	0	0
1974	0	0	4	88,000	89,156	3,471	0	0	0	0	0	0	0	0
1975	714	393	593	88,000	93,484	3,576	0	0	0	0	0	0	0	0
1976	5,461	13,774	7,526	88,000	125,614	4,112	0	0	0	0	0	0	0	0
1977	5,206	11,284	7,556	76,220	107,180	1,472	0	0	0	0	0	0	0	0
1978	2,348	854	5,009	95,727	110,540	3,906	0	0	0	0	0	0	0	0
1979	5,341	3,430	7,444	91,991	118,253	6,149	0	0	0	0	0	0	0	0
1980	6,144	2,824	6,702	88,000	115,824	5,700	0	0	0	0	0	0	0	0
1981	7,262	7,595	8,570	88,000	128,350	4,300	0	0	0	0	0	0	0	0
1982	4,571	1,776	4,540	87,261	106,070	3,838	0	0	0	0	0	0	0	0
1983	111	0	3,157	86,733	94,606	3,822	0	0	0	0	0	0	0	0
1984	126	0	3,338	88,000	98,067	5,700	0	0	0	0	0	0	0	0
1985	7,537	11,203	7,813	88,000	122,025	5,433	0	0	0	0	0	0	0	0
1986	2,083	5,311	7,068	88,000	110,776	5,107	0	0	0	0	0	0	0	0
1987	12,993	15,488	9,902	88,000	136,511	5,625	0	0	0	0	0	0	0	0
1988	12,436	24,259	9,205	87,961	147,066	4,412	0	0	0	0	0	0	0	0
1989	10,974	17,340	8,702	90,000	141,851	6,091	300	0	602	12,647	1,898	0	0	0
1990	15,678	22,149	9,554	91,800	155,944	2,922	0	200	0	0	0	1,500	0	0
1991	1,945	9,155	3,493	28,200	49,900	141	0	0	0	0	0	0	0	0
1992	6,933	12,621	6,532	42,839	76,507	2,239	0	0	0	0	0	0	0	0
1993	13,208	1,792	6,829	62,065	100,007	2,858	0	0	0	0	0	0	5,095	1,624
1994	9,679	3,379	19,532	56,915	99,482	3,071	0	0	0	0	0	0	0	0
1995	15,669	19,376	22,624	100,000	182,660	5,700	0	0	0	0	0	0	0	0
1996	17,175	21,985	20,015	100,000	184,520	5,700	0	0	0	0	0	0	0	0
1997	18,208	26,317	15,683	100,000	186,220	5,700	0	0	0	0	0	0	0	0
1998	17,807	13,661	28,339	100,000	186,220	5,700	0	0	0	0	0	0	0	0
1999	17,412	13,661	28,339	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2000	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2001	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2002	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2003	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2004	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2005	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2006	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2007	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2008	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2009	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2010	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2011	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2012	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2013	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2014	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2015	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2016	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2017	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2018	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2019	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2020	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2021	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2022	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2023	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2024	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2025	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2026	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2027	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2028	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2029	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2030	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2031	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2032	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2033	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2034	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
2035	17,412	9,737	32,263	100,000	186,220	5,700	0	0	0	0	0	0	0	0
TOTAL	843,853	699,326	1,419,537	6,367,499	10,733,057	348,248	300	200	602	12,647	1,898	1,500	5,095	1,624

b) From June 1962 through November 1967, deliveries were supplied by non-SWP water.
c) Includes 425 AF of 1988 advance entitlement and 141 AF of 1992 advance entitlement.

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

Calendar Year	California Aqueduct (continued)												
	San Luis Division (continued)					South San Joaquin Division							
	Reach 5		Reach 6		Reach 7	Reach 8C			Reach 8D				
	KCWA (Ag) (26)	DRWD (27)	OFWD (28)	KCWA (Ag) (29)	KCWA (Ag) (30)	KCWA (M&I) (31)	CLWA (32)	DRWD (33)	TLBWSD (34)	EWSID (35)	CK (36)	KCWA (Ag) (37)	DRWD (38)
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	25,100	1,978	900	0	26,360
1969	0	0	0	0	0	0	0	0	7,081	56	100	0	31,375
1970	0	0	0	0	0	0	0	0	0	3,942	0	0	40,407
1971	0	0	0	0	0	0	0	0	80,906	5,990	3,700	0	41,053
1972	0	0	0	0	0	0	0	0	144,843	5,795	1,400	0	42,443
1973	0	0	0	0	0	0	0	0	26,317	3,000	1,500	1,500	22,057
1974	0	0	0	0	0	0	0	0	32,603	3,000	1,500	0	33,390
1975	0	0	0	0	0	0	0	0	41,536	3,000	1,600	0	40,555
1976	0	0	0	0	0	0	0	0	26,595	3,000	1,600	0	41,421
1977	0	0	0	0	0	0	0	0	12,984	738	1,530	0	11,153
1978	0	0	0	0	0	0	0	0	3,934	454	2,070	0	51,747
1979	0	0	0	0	0	0	0	0	74,758	1,739	2,000	0	38,544
1980	0	0	0	0	0	0	0	0	35,140	894	2,200	0	41,000
1981	0	0	0	0	0	0	0	0	50,888	5,859	2,300	0	41,000
1982	0	0	0	0	0	0	0	0	4,405	361	1,536	0	41,000
1983	0	0	0	0	0	0	0	0	1,001	0	3,550	0	42,900
1984	0	0	0	0	0	0	0	0	3,677	0	3,100	0	45,100
1985	0	0	0	0	0	0	0	0	68,638	5,197	3,400	0	46,251
1986	0	0	0	0	0	0	0	0	40,017	1,170	3,700	0	50,249
1987	0	0	0	0	0	0	0	0	30,359	2,525	4,000	0	46,288
1988	0	0	0	0	0	0	0	0	47,831	3,775	4,000	0	47,994
1989	18,831	0	0	8,260	5,262	0	0	2,391	63,703	3,000	4,000	0	52,158
1990	0	0	0	0	0	0	0	0	23,504	1,279	2,000	161	36,296
1991	0	0	0	0	0	0	0	0	1,697	221	0	0	927
1992	0	10,823	0	0	0	0	0	280	15,982	1,354	1,806	0	12,667
1993	28,200	27,200	2,000	31,200	10,043	18,157	0	0	57,112	2,741	4,000	0	23,221
1994	0	0	0	0	0	0	2,100	0	21,511	1,666	2,116	1,726	28,793
1995	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
1996	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
1997	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
1998	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
1999	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2000	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2001	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2002	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2003	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2004	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2005	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2006	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2007	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2008	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2009	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2010	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2011	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2012	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2013	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2014	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2015	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2016	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2017	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2018	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2019	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2020	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2021	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2022	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2023	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2024	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2025	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2026	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2027	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2028	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2029	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2030	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2031	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2032	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2033	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2034	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
2035	0	0	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700
TOTAL	47,031	38,023	2,000	39,460	15,305	18,157	2,100	2,671	2,885,522	185,734	223,608	3,387	3,342,049

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)									
	South San Joaquin Division									
	Reach 8D (cont.)		Reach 9				Reach 10A			
Calendar Year	CK (39)	TLBWSD (40)	DRWD (41)	KCWA (M&I) (42)	KCWA (Ag) (43)	TLBWSD (44)	MWDSC (45)	KCWA (M&I) (46)	KCWA (Ag) (47)	TLBWSD (48)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	30,951	0	0	0	0	0
1969	0	0	0	0	24,489	0	0	0	0	2,842
1970	0	3,408	0	0	46,114	1,855	0	0	158	4,315
1971	0	41,579	0	0	58,356	0	0	0	9,973	0
1972	0	113,550	0	0	75,464	0	0	0	5,876	0
1973	0	24,147	0	0	54,583	0	0	0	22,948	0
1974	0	39,686	0	0	63,814	0	0	10,019	22,719	0
1975	0	44,722	0	0	50,021	0	0	2,791	72,121	0
1976	0	32,216	0	0	53,465	0	0	74	50,444	0
1977	0	5,097	0	0	24,668	0	0	201	34,451	0
1978	0	8,119	0	0	72,231	0	0	0	161,889	0
1979	0	80,363	0	0	74,524	0	0	285	153,245	0
1980	0	34,104	0	0	79,946	0	0	3,780	131,836	0
1981	0	32,550	0	0	76,508	0	0	341	133,500	0
1982	214	14,146	0	0	76,877	0	0	4,700	164,832	0
1983	0	5	0	2,217	84,573	0	0	0	146,493	0
1984	0	2,066	0	4,100	85,732	0	0	6,910	150,302	0
1985	0	41,153	0	0	67,696	0	0	6,495	153,473	0
1986	0	39,338	0	0	79,943	0	0	5,065	198,099	0
1987	0	62,725	0	0	97,732	0	0	900	226,521	0
1988	0	48,035	0	1,100	83,858	0	0	8,229	213,795	0
1989	0	63,947	0	0	91,134	0	0	21,038	251,979	0
1990	0	32,066	0	0	83,108	0	0	25,189	47,472	0
1991	0	483	0	13,683	601	0	0	1,142	6,820	0
1992	0	30,746	0	28	40,183	0	0	3,685	89,390	0
1993	0	65,732	197	0	59,542	0	44,496	775	233,862	0
1994	0	40,852	0	0	45,168	0	0	5,227	126,792	0
1995	0	71,100	0	0	97,970	0	0	1,500	256,128	0
1996	0	71,100	0	0	97,970	0	0	1,500	280,234	0
1997	0	71,100	0	0	97,970	0	0	1,500	280,234	0
1998	0	71,100	0	0	97,970	0	0	1,500	280,234	0
1999	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2000	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2001	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2002	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2003	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2004	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2005	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2006	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2007	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2008	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2009	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2010	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2011	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2012	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2013	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2014	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2015	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2016	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2017	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2018	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2019	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2020	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2021	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2022	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2023	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2024	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2025	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2026	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2027	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2028	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2029	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2030	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2031	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2032	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2033	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2034	0	71,100	0	0	97,970	0	0	1,500	280,234	0
2035	0	71,100	0	0	97,970	0	0	1,500	280,234	0
TOTAL	214	3,815,935	197	21,128	5,698,051	1,855	44,496	168,346	14,274,478	7,157

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)												
	South San Joaquin Division (continued)												
	Reach 11B		Reach 12E			Reach 13B		Reach 14A		Reach 14B		Reach 14C	
Calendar Year	KCWA (M&I) (49)	KCWA (Ag) (50)	KCWA (M&I) (51)	KCWA (Ag) (52)	MWDSC (53)	KCWA (M&I) (54)	KCWA (Ag) (55)	KCWA (M&I) (56)	KCWA (Ag) (57)	KCWA (M&I) (58)	KCWA (Ag) (59)	KCWA (M&I) (60)	KCWA (Ag) (61)
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	24,776	0	0	0	0	0	0	0	0	0	0	0
1969	0	64,682	0	0	0	0	0	0	0	0	0	0	0
1970	0	72,279	0	9,279	0	0	4,891	0	0	0	3	0	0
1971	0	63,773	0	28,056	0	0	0	0	23,844	0	49,929	0	24,187
1972	0	72,358	0	62,342	0	0	17,388	0	26,621	0	77,034	0	35,016
1973	0	67,544	0	13,082	0	0	9,297	0	15,328	0	47,040	0	19,043
1974	0	87,476	2,651	4,248	0	8,038	4,246	0	7,794	0	32,356	0	12,601
1975	0	85,675	0	10,787	0	8,538	7,059	0	10,306	0	27,736	0	12,783
1976	0	85,067	37,519	20,555	0	5,626	8,855	0	268	0	35,296	0	9,005
1977	3,981	29,603	20,280	1,737	0	0	5,024	0	8,299	0	13,539	0	3,757
1978	0	88,753	47,133	15,011	0	21,773	7,601	0	34,029	0	72,351	0	24,542
1979	484	108,379	50,740	61,567	0	5,663	17,766	3,012	27,356	0	59,413	0	22,372
1980	3,112	103,207	32,039	22,252	0	0	22,515	4,312	16,876	0	40,513	0	19,953
1981	494	104,395	59,917	58,470	0	7,844	14,037	4,511	13,007	8	42,753	7	18,729
1982	798	99,081	36,139	75,587	0	0	25,553	5,373	22,602	184	57,739	0	26,479
1983	2,069	94,117	0	10,950	0	0	3,491	1,168	20,302	0	57,922	0	26,613
1984	2,349	124,819	63,941	39,929	0	12,117	26,178	137	35,369	10	79,179	2	34,996
1985	10,666	118,646	69,839	84,117	0	0	67,711	206	33,103	0	72,855	0	31,758
1986	8,673	124,836	62,109	51,540	0	0	66,551	180	26,384	0	70,864	0	34,566
1987	13,074	111,877	95,297	86,223	0	5,609	40,374	610	30,098	9	67,710	9	31,019
1988	13,509	114,031	86,390	123,249	0	9,298	47,167	604	32,796	4	75,983	0	37,166
1989	9,986	127,058	83,965	146,544	0	5,504	57,114	721	29,292	7	82,201	5	37,800
1990	9,319	104,107	82,164	38,973	0	7,645	20,423	673	26,800	13	81,076	9	34,174
1991	6,099	118	8,842	303	0	0	0	768	0	0	0	0	0
1992	7,419	35,093	47,181	57,048	0	789	17,449	673	16,238	464	41,143	0	18,084
1993	2,250	73,091	84,822	285,554	5,504	12,798	88,157	629	17,832	0	62,493	0	28,103
1994	3,506	71,316	65,011	79,016	0	2,494	33,148	2,513	16,760	3,000	54,158	1,000	22,624
1995	15,000	133,096	89,200	222,756	0	24,200	51,250	800	22,300	0	72,400	0	31,100
1996	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
1997	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
1998	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
1999	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2000	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2001	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2002	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2003	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2004	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2005	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2006	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2007	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2008	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2009	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2010	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2011	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2012	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2013	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2014	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2015	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2016	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2017	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2018	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2019	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2020	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2021	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2022	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2023	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2024	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2025	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2026	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2027	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2028	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2029	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2030	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2031	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2032	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2033	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2034	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
2035	15,000	133,096	89,200	195,650	0	24,200	52,250	800	20,900	0	60,600	0	30,900
TOTAL	712,788	7,713,093	4,693,179	9,435,175	5,504	1,105,936	2,753,245	58,890	1,349,604	3,699	3,797,686	1,032	1,832,470

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)									
	South San Joaquin Division (continued)					Mojave Division				
	Reach 15A		Reach 16A			Reach 18A	Reach 19	Reach 20A		
Calendar Year	KCWA (M&I) (62)	KCWA (Ag) (63)	KCWA (M&I) (64)	KCWA (Ag) (65)	AVEKWA (66)	AVEKWA (67)	AVEKWA (68)	PWD (69)	MWA (70)	AVEKWA (71)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	3,552	0	0	0	0	0	0	0	0
1972	0	6,064	0	4,768	0	0	0	0	0	0
1973	0	19,916	0	1,961	0	0	0	0	0	0
1974	0	18,000	3,000	1,564	0	0	1,223	0	0	0
1975	0	35,420	3,200	9,867	0	0	7,622	0	0	420
1976	0	39,551	3,500	11,667	0	3,808	23,063	0	0	471
1977	0	6,158	3,420	685	0	1,231	8,927	0	0	773
1978	0	31,148	7,989	1,655	0	1,321	36,333	0	0	5,549
1979	0	38,602	2,813	15,808	0	2,098	49,910	0	0	7,555
1980	0	37,817	2,700	16,145	0	2,610	61,534	0	0	7,605
1981	0	39,033	2,636	18,156	0	2,340	65,690	0	0	10,333
1982	0	47,782	1,289	17,209	0	1,669	41,127	0	0	7,313
1983	0	37,426	1,400	17,907	0	43	26,377	0	0	6,253
1984	0	49,848	1,338	24,202	0	90	22,462	0	0	9,558
1985	0	44,078	1,309	16,820	0	8	23,440	1,510	0	11,613
1986	0	42,461	1,213	15,559	0	8	16,898	3,041	0	13,808
1987	0	34,748	1,665	10,170	0	0	15,958	2,389	0	15,493
1988	2	41,992	1,913	8,999	0	0	13,471	366	0	17,117
1989	2	43,239	2,668	8,649	0	0	18,007	381	0	23,481
1990	6	36,347	2,819	8,608	0	0	17,281	282	0	25,843
1991	0	0	2,588	343	2,000	0	728	84	1,391	4,282
1992	0	24,243	2,087	8,275	0	0	7,238	185	1,310	18,518
1993	0	27,997	2,494	9,167	0	0	13,340	164	1,514	23,662
1994	0	29,511	3,011	13,877	0	0	19,122	299	1,399	25,250
1995	0	29,400	3,900	13,400	0	154	102,162	0	0	31,289
1996	0	39,400	3,900	18,800	0	144	100,547	0	0	32,739
1997	0	39,400	3,900	18,800	0	144	100,547	0	0	32,524
1998	0	39,400	3,900	18,800	0	144	94,722	0	0	36,099
1999	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2000	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2001	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2002	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2003	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2004	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2005	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2006	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2007	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2008	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2009	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2010	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2011	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2012	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2013	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2014	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2015	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2016	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2017	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2018	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2019	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2020	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2021	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2022	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2023	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2024	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2025	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2026	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2027	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2028	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2029	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2030	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2031	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2032	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2033	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2034	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
2035	0	39,400	3,900	18,800	0	144	91,877	0	0	38,379
TOTAL	10	2,340,333	214,952	1,007,461	2,000	21,140	4,287,178	8,701	5,614	1,787,571

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

Calendar Year	California Aqueduct (continued)									
	Mojave Division (continued)									
	Reach 20B		Reach 21		Reach 22A	Reach 22B				
	PWD (72)	AVEKWA (73)	LCID (74)	PWD (75)	AVEKWA (76)	MWDSC (d (77)	CVWD (d (78)	AVEKWA (e (79)	DWA (d (80)	MWA (81)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	338	0	0	0	0	0	0	55
1973	0	0	290	0	0	(14,800)	5,800	0	9,000	0
1974	0	0	400	0	0	(16,400)	6,400	0	10,000	0
1975	0	0	520	0	0	(18,000)	7,000	0	11,000	0
1976	0	416	589	0	0	(19,600)	7,600	0	12,000	0
1977	0	271	111	0	0	0	0	0	0	22
1978	0	934	208	0	0	(25,384)	10,084	0	15,300	0
1979	0	930	133	0	0	(25,063)	10,063	0	15,000	4,000
1980	0	655	191	0	3	(27,884)	10,884	0	17,000	4,000
1981	0	966	1,270	0	46	(31,105)	12,105	0	19,000	4,000
1982	0	8	0	0	174	(34,326)	13,326	0	21,000	10,500
1983	0	20	38	0	268	(37,547)	14,547	0	23,000	0
1984	0	2	1	0	550	(40,768)	15,768	0	25,000	0
1985	32	217	0	16	1,786	(43,989)	16,989	0	27,000	0
1986	45	0	163	10	1,735	(47,210)	18,210	0	29,000	0
1987	1,624	151	1,080	1,366	2,278	(50,931)	19,431	214	31,500	17
1988	1,261	281	419	143	3,210	(54,652)	20,652	0	34,000	9
1989	7,848	112	971	780	3,591	(58,373)	21,873	89	36,500	0
1990	8,292	84	1,747	34	3,988	(61,200)	23,100	10	38,100	0
1991	3,830	131	522	0	2,427	(18,360)	6,930	0	11,430	0
1992	3,850	650	251	0	3,859	(27,624)	10,427	0	17,197	72
1993	7,597	996	734	0	5,098	0	0	0	0	0
1994	8,119	124	1,098	0	4,657	0	0	0		014,634
1995	17,300	0	2,300	0	4,795	0	0	0	0	0
1996	17,280	0	2,300	0	4,970	0	0	0	0	0
1997	17,300	0	2,300	0	5,185	0	0	0	0	0
1998	17,300	2,025	2,300	0	5,410	0	0	0	0	0
1999	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2000	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2001	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2002	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2003	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2004	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2005	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2006	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2007	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2008	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2009	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2010	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2011	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2012	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2013	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2014	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2015	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2016	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2017	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2018	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2019	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2020	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2021	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2022	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2023	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2024	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2025	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2026	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2027	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2028	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2029	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2030	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2031	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2032	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2033	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2034	17,300	2,355	2,300	0	5,645	0	0	0	0	0
2035	17,300	2,355	2,300	0	5,645	0	0	0	0	0
TOTAL	751,778	96,108	105,374	2,349	262,895	(653,216)	251,189	313	402,027	37,309

d) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B.The adjustment in deliveries in Reach 22B complies with provisions for the repayment of costs under the agreement. In 1993 and after, the exchange takes place in Reach 26A.

e) 1988 advance entitlement.

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)									
	Mojave Division (continued)			Santa Ana Division						
	Reach 23	Reach 24		Reach 26A						Reach 28G
Calendar Year	MWA (82)	CLAWA (83)	MWA (84)	MWDSC (f (85)	SBVMWD (g (86)	SGVMWD (87)	SGPWA (88)	CVWD (f (89)	DWA (f (90)	MWDSC (91)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	464	0	0	1,275	0	0	0	0	0
1973	0	389	0	444	32,426	0	0	0	0	18,942
1974	14	627	0	84,981	16,605	612	0	0	0	0
1975	0	825	0	169,960	13,865	5,450	0	0	0	0
1976	0	1,002	0	215,312	12,273	6,071	0	0	0	0
1977	58	1,109	0	64,823	24,833	8,996	0	0	0	0
1978	0	1,209	0	297,708	4,055	7,771	0	0	0	0
1979	0	1,260	0	260,903	18	290	0	0	0	0
1980	0	1,239	0	300,345	0	1,085	0	0	0	0
1981	0	1,485	0	395,678	16,021	3,619	0	0	0	0
1982	0	1,238	0	214,566	8,409	12,599	0	0	0	0
1983	0	911	0	175,288	5,994	734	0	0	0	0
1984	0	1,128	0	122,311	5,556	7,656	0	0	0	0
1985	0	1,422	0	147,599	7,390	5,028	0	0	0	0
1986	0	1,506	0	215,265	6,421	9,454	0	0	0	0
1987	0	1,849	0	175,012	8,751	10,630	0	0	0	0
1988	0	2,006	0	247,101	12,637	8,948	0	0	0	0
1989	200	2,170	0	326,217	20,782	12,839	0	0	0	0
1990	0	1,827	0	399,387	18,831	16,649	0	0	0	0
1991	0	852	2,032	107,182	3,661	5,399	0	0	0	0
1992	0	264	9,304	219,524	3,358	7,908	0	0	0	0
1993	0	302	10,000	96,121	4,361	14,397	0	23,100	38,100	0
1994	0	446	819	192,979	9,135	15,230	0	14,102	23,257	0
1995	0	5,800	50,800	310,829	102,600	28,800	0	23,100	38,100	0
1996	0	2,050	50,800	546,900	56,000	13,000	0	23,100	38,100	0
1997	0	2,150	50,800	521,900	64,000	28,800	7,200	23,100	38,100	0
1998	0	2,250	50,800	496,900	59,000	28,800	7,200	23,100	38,100	0
1999	0	2,400	50,800	471,900	59,000	28,800	5,570	23,100	38,100	0
2000	0	5,800	50,800	471,900	60,000	28,800	6,350	23,100	38,100	0
2001	0	5,800	50,800	471,900	60,000	28,800	6,350	23,100	38,100	0
2002	0	5,800	50,800	471,900	60,000	28,800	6,350	23,100	38,100	0
2003	0	5,800	50,800	471,900	60,000	28,800	6,350	23,100	38,100	0
2004	0	5,800	50,800	471,900	60,000	28,800	6,350	23,100	38,100	0
2005	0	5,800	50,800	471,900	90,000	28,800	8,450	23,100	38,100	0
2006	0	5,800	50,800	471,900	90,000	28,800	8,450	23,100	38,100	0
2007	0	5,800	50,800	471,900	90,000	28,800	8,450	23,100	38,100	0
2008	0	5,800	50,800	471,900	90,000	28,800	8,450	23,100	38,100	0
2009	0	5,800	50,800	471,900	90,000	28,800	8,450	23,100	38,100	0
2010	0	5,800	50,800	471,900	102,600	28,800	10,550	23,100	38,100	0
2011	0	5,800	50,800	471,900	102,600	28,800	10,550	23,100	38,100	0
2012	0	5,800	50,800	471,900	102,600	28,800	10,550	23,100	38,100	0
2013	0	5,800	50,800	471,900	102,600	28,800	10,550	23,100	38,100	0
2014	0	5,800	50,800	471,900	102,600	28,800	10,550	23,100	38,100	0
2015	0	5,800	50,800	471,900	102,600	28,800	13,550	23,100	38,100	0
2016	0	5,800	50,800	471,900	102,600	28,800	13,550	23,100	38,100	0
2017	0	5,800	50,800	471,900	102,600	28,800	13,550	23,100	38,100	0
2018	0	5,800	50,800	471,900	102,600	28,800	13,550	23,100	38,100	0
2019	0	5,800	50,800	471,900	102,600	28,800	13,550	23,100	38,100	0
2020	0	5,800	50,800	471,900	102,600	28,800	16,650	23,100	38,100	0
2021	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2022	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2023	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2024	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2025	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2026	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2027	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2028	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2029	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2030	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2031	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2032	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2033	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2034	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
2035	0	5,800	50,800	471,900	102,600	28,800	17,300	23,100	38,100	0
TOTAL	272	248,980	2,104,955	23,765,535	3,994,857	1,326,365	490,620	984,302	1,623,457	18,942

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)							
	Santa Ana Division (continued)		West Branch					
	Reach 28H	Reach 28J	Reach 29F	Reach 29H	Reach 30			
Calendar Year	MWDSC (92)	MWDSC (93)	AVEKWA (94)	VCFCD (95)	MWDSC (h (96)	VCFCD (97)	CLWA (98)	SBCFC&WCD (99)
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	53	0	71,938	0	0	0
1973	0	0	20	0	155,297	0	0	0
1974	0	0	36	0	209,136	0	0	0
1975	0	251	26	0	374,280	0	0	0
1976	55	2,000	24	0	420,684	0	0	0
1977	43	2,442	0	0	122,447	0	0	0
1978	48	64,054	0	0	171,139	0	0	0
1979	1,290	94,353	0	0	145,591	0	7	0
1980	3,013	91,532	0	0	164,721	0	1,210	0
1981	4,365	149,405	0	0	277,503	0	5,761	0
1982	3,961	155,629	0	0	351,362	0	9,516	0
1983	6,645	41,616	0	0	157,519	0	9,476	0
1984	109,743	5,672	0	0	260,624	0	11,477	0
1985	182,781	6,538	0	0	390,696	0	12,401	0
1986	131,439	30,071	0	0	379,275	0	13,928	0
1987	144,743	26,315	0	0	417,285	0	16,167	0
1988	199,641	22,209	0	0	488,265	0	18,904	0
1989	247,430	51,462	0	0	589,962	0	21,719	0
1990	257,796	36,060	0	4,836	764,380	0	22,139	0
1991	38,832	5,958	0	988	257,835	0	3,846	1,240
1992	85,341	12,223	0	0	420,849	0	14,812	0
1993	63,887	4,712	6	0	437,470	0	13,787	0
1994	134,262	4,725	0	0	475,900	0	14,919	0
1995	217,049	19,032	0	5,000	553,090	15,000	41,500	0
1996	396,900	34,800	0	5,000	1,032,900	15,000	31,562	0
1997	396,900	34,800	0	5,000	1,057,900	15,000	31,100	0
1998	396,900	34,800	0	5,000	1,082,900	15,000	33,100	0
1999	396,900	34,800	0	5,000	1,107,900	15,000	40,401	0
2000	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2001	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2002	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2003	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2004	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2005	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2006	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2007	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2008	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2009	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2010	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2011	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2012	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2013	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2014	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2015	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2016	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2017	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2018	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2019	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2020	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2021	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2022	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2023	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2024	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2025	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2026	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2027	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2028	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2029	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2030	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2031	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2032	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2033	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2034	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
2035	396,900	34,800	0	5,000	1,107,900	15,000	41,500	0
TOTAL	17,708,364	2,218,259	165	210,824	52,223,248	615,000	1,861,732	1,240

h) Deliveries exclude 6,171 AF of 1982 exchange water.

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

Calendar Year	California Aqueduct (continued)								
	Coastal Branch								
	Reach 31A			Reach 33A	Reach 34	Reach 35			
	KCWA (M&I) (100)	KCWA (Ag) (101)	CLWA (102)	SLOCFC &WCD (103)	SLOCFC &WCD (104)	SLOCFC &WCD (105)	SBCFC &WCD (106)	Total (107)	Grand Total (108)
1962	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	56,763
1968	0	71,657	7,382	0	0	0	0	106,899	209,163
1969	0	52,094	9,970	0	0	0	0	129,762	202,001
1970	0	71,910	11,739	0	0	0	0	179,420	272,504
1971	0	98,481	12,490	0	0	0	0	328,916	429,925
1972	0	107,850	13,905	0	0	0	0	510,848	650,649
1973	0	69,227	9,418	0	0	0	0	266,497	364,817
1974	0	68,474	9,700	0	0	0	0	361,549	456,223
1975	0	74,516	10,700	0	0	0	0	493,280	594,009
1976	0	78,358	11,700	0	0	0	0	600,935	734,053
1977	0	35,504	5,075	0	0	0	0	218,889	334,598
1978	0	81,242	11,362	0	0	0	0	808,503	925,355
1979	0	104,017	19,138	0	0	0	0	987,084	1,112,227
1980	0	97,497	13,882	0	0	0	0	885,909	1,008,735
1981	0	97,054	12,700	0	0	0	0	1,102,005	1,239,711
1982	0	83,076	12,700	0	0	0	0	887,356	994,944
1983	0	87,859	12,659	0	0	0	0	564,756	661,911
1984	0	119,098	12,741	0	0	0	0	820,212	921,474
1985	0	110,124	12,099	0	0	0	0	1,008,009	1,134,327
1986	0	118,298	13,301	0	0	0	0	996,344	1,112,356
1987	0	116,259	11,821	0	0	0	0	1,013,339	1,159,545
1988	0	109,435	11,534	0	0	0	0	1,164,443	1,327,149
1989	0	102,156	14,645	0	0	0	0	1,416,857	1,582,645
1990	0	103,362	6,440	0	0	0	0	1,229,259	1,411,822
1991	0	780	716	0	0	0	0	167,315	225,987
1992	0	73,748	5,887	0	0	0	0	696,425	792,191
1993	0	90,764	4,157	0	0	0	0	1,137,729	1,272,646
1994	200	77,536	9,422	0	0	0	0	874,753	1,007,228
1995	0	89,000	12,700	0	0	0	0	1,586,423	1,814,363
1996	0	89,000	12,700	1,827	796	0	19,375	2,010,985	2,243,975
1997	0	89,000	12,700	2,436	2,388	0	42,986	2,012,132	2,249,017
1998	0	89,000	12,700	2,436	2,388	0	42,986	1,983,657	2,221,697
1999	0	89,000	12,700	2,436	2,388	10,000	45,486	1,969,027	2,208,192
2000	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,223,062
2001	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,223,685
2002	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,224,260
2003	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,224,933
2004	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,225,609
2005	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,228,098
2006	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,228,663
2007	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,229,277
2008	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,229,993
2009	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,230,635
2010	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,231,256
2011	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,231,979
2012	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,232,605
2013	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,233,333
2014	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,234,022
2015	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,235,238
2016	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,235,903
2017	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,236,565
2018	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,237,223
2019	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,237,823
2020	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,423
2021	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2022	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2023	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2024	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2025	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2026	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2027	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2028	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2029	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2030	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2031	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2032	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2033	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2034	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
2035	0	89,000	12,700	10,000	5,000	10,000	45,486	1,982,603	2,238,523
TOTAL	200	5,949,376	807,983	369,135	187,960	370,000	1,788,329	99,893,225	113,494,033

TABLE B-5B

Annual Water Quantities Delivered to Each Contractor

(Acre-Feet)

Calendar Year	North Bay Area			South Bay Area (b				Central Coastal Area		
	Napa County FC&WCD (a (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1962	0	0	0	494	8,412	0	8,906	0	0	0
1963	0	0	0	1,731	10,914	0	12,645	0	0	0
1964	0	0	0	1,673	19,238	0	20,911	0	0	0
1965	0	0	0	2,605	16,407	15,014	34,026	0	0	0
1966	0	0	0	5,511	14,864	34,538	54,913	0	0	0
1967	0	0	0	4,780	12,882	39,101	56,763	0	0	0
1968	1,214	0	1,214	6,133	24,817	70,105	101,055	0	0	0
1969	2,687	0	2,687	6,635	813	62,264	69,712	0	0	0
1970	3,618	0	3,618	9,249	0	80,311	89,560	0	0	0
1971	2,521	0	2,521	5,017	5,961	87,606	98,584	0	0	0
1972	3,647	0	3,647	10,489	27,671	100,266	138,426	0	0	0
1973	3,792	0	3,792	2,975	2,521	88,582	94,078	0	0	0
1974	4,870	0	4,870	1,314	4	88,000	89,318	0	0	0
1975	6,840	0	6,840	4,618	986	88,000	93,604	0	0	0
1976	7,122	0	7,122	17,131	21,300	88,000	126,431	0	0	0
1977	8,226	0	8,226	12,644	18,840	76,220	107,704	0	0	0
1978	6,034	0	6,034	10,984	5,863	95,727	112,574	0	0	0
1979	6,561	0	6,561	19,325	10,874	91,991	122,190	0	0	0
1980	6,707	0	6,707	16,790	11,034	88,000	115,824	0	0	0
1981	9,001	0	9,001	19,590	21,917	88,000	129,507	0	0	0
1982	1,213	0	1,213	13,123	6,316	87,261	106,700	0	0	0
1983	2,287	0	2,287	4,766	3,157	86,733	94,656	0	0	0
1984	2,923	0	2,923	6,784	3,338	88,000	98,122	0	0	0
1985	4,039	0	4,039	15,072	19,016	88,000	122,088	0	0	0
1986	3,519	1,400	4,919	10,609	12,379	88,000	110,988	0	0	0
1987	7,693	1,550	9,243	23,406	25,390	88,000	136,796	0	0	0
1988	5,392	9,725	15,117	25,830	33,464	87,961	147,255	0	0	0
1989	6,195	17,256	23,451	26,227	26,042	90,000	142,269	0	0	0
1990	6,940	19,131	26,071	33,034	31,703	92,000	156,737	0	0	0
1991	1,380	6,972	8,352	9,411	12,648	28,200	50,259	0	1,240	1,240
1992	4,001	14,773	18,774	14,669	19,153	42,839	76,661	0	0	0
1993	5,286	29,180	34,466	33,635	10,271	62,065	105,971	0	0	0
1994	6,792	25,717	32,509	20,414	22,911	56,915	100,240	0	0	0
1995	9,780	34,250	44,030	42,000	42,000	100,000	184,000	0	0	0
1996	9,780	37,390	47,170	44,000	42,000	100,000	186,000	2,623	19,375	21,998
1997	11,065	38,250	49,315	46,000	42,000	100,000	188,000	4,824	42,986	47,810
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	4,824	42,986	47,810
1999	12,330	39,165	51,495	46,000	42,000	100,000	188,000	14,824	45,486	60,310
2000	13,050	39,620	52,670	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2001	13,665	39,620	53,285	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2002	14,185	39,620	53,805	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2003	14,800	39,620	54,420	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2004	15,400	39,620	55,020	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2005	16,000	41,448	57,448	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2006	16,450	41,500	57,950	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2007	17,000	41,500	58,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2008	17,650	41,500	59,150	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2009	18,200	41,500	59,700	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2010	18,750	41,500	60,250	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2011	19,400	41,500	60,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2012	19,950	41,500	61,450	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2013	20,600	41,500	62,100	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2014	21,250	41,500	62,750	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2015	21,900	42,000	63,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2016	22,500	42,000	64,500	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2017	23,100	42,000	65,100	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2018	23,700	42,000	65,700	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2019	24,300	42,000	66,300	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2020	24,900	42,000	66,900	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2021	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2022	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2023	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2024	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2025	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2026	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2027	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2028	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2029	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2030	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2031	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2032	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2033	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2034	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2035	25,000	42,000	67,000	46,000	42,000	100,000	188,000	25,000	45,486	70,486
TOTAL	956,915	1,808,518	2,763,057	2,276,668	2,183,106	6,367,699	10,827,473	927,095	1,789,569	2,716,664

a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.
b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

TABLE B-5B

Annual Water Quantities Delivered to Each Contractor

(Acre-Feet)

	San Joaquin Valley Area								
			Kern County Water Agency						
Calendar Year	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Municipal and Industrial (13)	Agricultural (14)	Total (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	26,360	1,978	0	127,384	127,384	900	3,084	25,100	184,806
1969	31,375	56	0	141,265	141,265	100	3,016	9,923	185,735
1970	40,407	3,942	0	204,634	204,634	0	5,911	9,578	264,472
1971	41,053	5,990	0	360,151	360,151	3,700	7,212	122,485	540,591
1972	42,443	5,795	0	490,781	490,781	1,400	8,166	258,393	806,978
1973	22,057	3,000	0	341,469	341,469	1,500	3,214	50,464	421,704
1974	33,390	3,000	23,708	323,292	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	14,529	396,291	410,820	1,600	3,576	86,258	545,809
1976	41,421	3,000	46,719	392,531	439,250	1,600	4,112	58,811	548,194
1977	11,153	738	27,882	163,425	191,307	1,530	1,472	18,081	224,281
1978	51,747	454	76,895	590,452	667,347	2,070	3,906	12,053	737,577
1979	38,544	1,739	62,997	683,049	746,046	2,000	6,149	155,121	949,599
1980	41,000	894	45,943	588,557	634,500	2,200	5,700	69,244	753,538
1981	41,000	5,859	75,758	615,642	691,400	2,300	4,300	83,438	828,297
1982	41,000	361	48,483	696,817	745,300	1,750	3,838	18,551	810,800
1983	42,900	0	6,854	587,653	594,507	3,550	3,822	1,006	645,785
1984	45,100	0	90,904	769,652	860,556	3,100	5,700	5,743	920,199
1985	46,251	5,197	88,515	800,381	888,896	3,400	5,433	109,791	1,058,968
1986	50,249	1,170	77,240	829,101	906,341	3,700	5,107	79,355	1,045,922
1987	46,288	2,525	117,173	852,731	969,904	4,000	5,625	93,084	1,121,426
1988	47,994	3,775	121,049	888,471	1,009,520	4,000	4,412	95,866	1,165,567
1989	57,049	3,000	123,896	1,022,166	1,146,062	4,000	6,091	127,950	1,344,152
1990	36,296	1,279	127,837	584,611	712,448	2,000	2,922	57,070	812,015
1991	927	221	33,122	8,965	42,087	0	141	2,180	45,556
1992	23,770	1,354	62,326	420,894	483,220	1,806	2,239	46,728	559,117
1993	50,618	2,741	121,925	1,046,005	1,167,930	4,000	4,858	124,468	1,354,615
1994	28,793	1,666	85,962	571,632	657,594	2,116	3,071	62,363	755,603
1995	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1996	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1997	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1998	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1999	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2000	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2001	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2002	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2003	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2004	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2005	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2006	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2007	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2008	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2009	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2010	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2011	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2012	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2013	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2014	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2015	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2016	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2017	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2018	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2019	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2020	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2021	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2022	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2023	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2024	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2025	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2026	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2027	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2028	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2029	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2030	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2031	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2032	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2033	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2034	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
2035	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
TOTAL	3,385,440	185,734	6,998,317	56,268,802	63,267,119	223,822	350,248	6,713,893	74,126,256

TABLE B-5B

Annual Water Quantities Delivered to Each Contractor

(Acre-Feet)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (c (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	7,382	0	0	0	0	0	0	0	0
1969	0	9,970	0	0	0	0	0	0	0	0
1970	0	11,739	0	0	0	0	0	0	0	0
1971	0	12,490	0	0	0	0	0	0	0	0
1972	53	13,905	0	464	0	338	55	0	1,275	0
1973	20	9,418	5,800	389	9,000	290	0	0	32,426	0
1974	1,259	9,700	6,400	627	10,000	400	14	0	16,605	612
1975	8,068	10,700	7,000	825	11,000	520	0	0	13,865	5,450
1976	27,782	11,700	7,600	1,002	12,000	589	0	0	12,273	6,071
1977	11,202	5,075	0	1,109	0	111	80	0	24,833	8,996
1978	44,137	11,362	10,084	1,209	15,300	208	0	0	4,055	7,771
1979	60,493	19,145	10,063	1,260	15,000	133	4,000	0	18	290
1980	72,407	15,092	10,884	1,239	17,000	191	4,000	0	0	1,085
1981	79,375	18,461	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619
1982	50,291	22,216	13,326	1,238	21,000	0	10,500	0	8,409	12,599
1983	32,961	22,135	14,547	911	23,000	38	0	0	5,994	734
1984	32,662	24,218	15,768	1,128	25,000	1	0	0	5,556	7,656
1985	37,064	24,500	16,989	1,422	27,000	0	0	1,558	7,390	5,028
1986	32,449	27,229	18,210	1,506	29,000	163	0	3,096	6,421	9,454
1987	34,094	27,988	19,431	1,849	31,500	1,080	17	5,379	8,751	10,630
1988	34,079	30,438	20,652	2,006	34,000	419	9	1,770	12,637	8,948
1989	45,280	36,364	21,873	2,170	36,500	971	200	9,009	20,782	12,839
1990	47,206	28,579	23,100	1,827	38,100	1,747	0	8,608	18,831	16,649
1991	9,568	4,562	6,930	852	11,430	522	3,423	3,914	3,661	5,399
1992	30,265	20,699	10,427	264	17,197	251	10,686	4,035	3,358	7,908
1993	43,102	23,039	23,100	302	38,100	734	11,514	7,761	4,361	14,397
1994	49,153	26,441	14,102	446	23,257	1,098	16,852	8,418	9,135	15,230
1995	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1996	138,400	44,262	23,100	2,050	38,100	2,300	50,800	17,280	56,000	13,000
1997	138,400	43,800	23,100	2,150	38,100	2,300	50,800	17,300	64,000	28,800
1998	138,400	45,800	23,100	2,250	38,100	2,300	50,800	17,300	59,000	28,800
1999	138,400	53,101	23,100	2,400	38,100	2,300	50,800	17,300	59,000	28,800
2000	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	60,000	28,800
2001	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	60,000	28,800
2002	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	60,000	28,800
2003	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	60,000	28,800
2004	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	60,000	28,800
2005	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	90,000	28,800
2006	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	90,000	28,800
2007	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	90,000	28,800
2008	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	90,000	28,800
2009	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	90,000	28,800
2010	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2011	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2012	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2013	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2014	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2015	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2016	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2017	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2018	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2019	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2020	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2021	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2022	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2023	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2024	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2025	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2026	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2027	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2028	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2029	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2030	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2031	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2032	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2033	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2034	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
2035	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
TOTAL	6,457,370	2,676,910	1,235,491	248,980	2,025,484	105,374	2,148,150	762,828	3,994,857	1,326,365

c) Devil's Den Water District merged with Castaic Lake Water Agency effective January 1, 1992.

TABLE B-5B

Annual Water Quantities Delivered to Each Contractor

(Acre-Feet)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)		
1962	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	0	7,382	0	0	0	0	0	294,457
1969	0	0	0	9,970	0	0	0	0	0	268,104
1970	0	0	0	11,739	0	0	70	70	0	369,459
1971	0	0	0	12,490	0	192	64	256	0	654,442
1972	0	71,938	0	88,028	0	186	505	691	0	1,037,770
1973	0	159,883	0	217,226	0	53	679	732	0	737,532
1974	0	277,717	0	323,334	0	127	648	775	0	878,947
1975	0	526,491	0	583,919	0	253	405	658	0	1,230,830
1976	0	618,451	0	697,468	0	527	382	909	0	1,380,124
1977	0	189,755	0	241,161	0	706	303	1,009	0	582,381
1978	0	507,565	0	601,691	0	579	278	857	0	1,458,733
1979	0	477,074	0	587,476	0	302	329	631	0	1,666,457
1980	0	531,727	0	653,625	0	267	295	562	0	1,530,256
1981	0	795,846	0	951,182	0	221	355	576	0	1,918,563
1982	0	691,192	0	830,771	0	334	305	639	0	1,750,123
1983	0	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	0	457,582	0	569,571	108	177	272	557	0	1,591,372
1985	0	683,625	0	804,576	62	308	254	624	0	1,990,295
1986	0	708,840	0	836,368	328	313	317	958	0	1,999,155
1987	0	712,424	0	853,143	88	459	452	999	0	2,121,607
1988	0	902,564	0	1,047,522	303	385	523	1,211	0	2,376,672
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	0	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	0	391,447	988	442,696	265	328	420	1,013	0	549,116
1992	0	710,313	0	815,403	642	117	485	1,244	0	1,471,199
1993	0	652,190	0	818,600	746	256	444	1,446	0	2,315,098
1994	0	807,866	0	971,998	1,035	329	484	1,848	0	1,862,198
1995	0	1,100,000	20,000	1,581,400	3,450	800	1,250	5,500	0	3,157,230
1996	0	2,011,500	20,000	2,416,792	3,450	758	1,300	5,508	0	4,019,768
1997	7,200	2,011,500	20,000	2,447,450	3,450	787	1,350	5,587	0	4,080,462
1998	7,200	2,011,500	20,000	2,444,550	3,450	790	1,400	5,640	0	4,078,720
1999	5,570	2,011,500	20,000	2,450,371	3,450	790	1,450	5,690	0	4,098,166
2000	6,350	2,011,500	20,000	2,456,650	3,450	790	1,569	5,809	0	4,115,915
2001	6,350	2,011,500	20,000	2,456,650	9,600	27,500	1,577	38,677	0	4,149,398
2002	6,350	2,011,500	20,000	2,456,650	9,600	27,500	1,632	38,732	0	4,149,973
2003	6,350	2,011,500	20,000	2,456,650	9,600	27,500	1,690	38,790	0	4,150,646
2004	6,350	2,011,500	20,000	2,456,650	9,600	27,500	1,766	38,866	0	4,151,322
2005	8,450	2,011,500	20,000	2,488,750	9,600	27,500	1,827	38,927	0	4,185,911
2006	8,450	2,011,500	20,000	2,488,750	9,600	27,500	1,890	38,990	0	4,186,476
2007	8,450	2,011,500	20,000	2,488,750	9,600	27,500	1,954	39,054	0	4,187,090
2008	8,450	2,011,500	20,000	2,488,750	9,600	27,500	2,020	39,120	0	4,187,806
2009	8,450	2,011,500	20,000	2,488,750	9,600	27,500	2,112	39,212	0	4,188,448
2010	10,550	2,011,500	20,000	2,503,450	9,600	27,500	2,183	39,283	0	4,203,769
2011	10,550	2,011,500	20,000	2,503,450	9,600	27,500	2,256	39,356	0	4,204,492
2012	10,550	2,011,500	20,000	2,503,450	9,600	27,500	2,332	39,432	0	4,205,118
2013	10,550	2,011,500	20,000	2,503,450	9,600	27,500	2,410	39,510	0	4,205,846
2014	10,550	2,011,500	20,000	2,503,450	9,600	27,500	2,449	39,549	0	4,206,535
2015	13,550	2,011,500	20,000	2,506,450	9,600	27,500	2,515	39,615	0	4,210,751
2016	13,550	2,011,500	20,000	2,506,450	9,600	27,500	2,580	39,680	0	4,211,416
2017	13,550	2,011,500	20,000	2,506,450	9,600	27,500	2,642	39,742	0	4,212,078
2018	13,550	2,011,500	20,000	2,506,450	9,600	27,500	2,700	39,800	0	4,212,736
2019	13,550	2,011,500	20,000	2,506,450	9,600	27,500	2,700	39,800	0	4,213,336
2020	16,650	2,011,500	20,000	2,509,550	9,600	27,500	2,700	39,800	0	4,217,036
2021	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2022	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2023	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2024	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2025	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2026	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2027	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2028	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2029	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2030	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2031	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2032	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2033	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2034	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
2035	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
TOTAL	490,620	95,331,132	825,824	117,629,385	361,174	974,639	102,319	1,438,132	0	209,503,342

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	North Bay Aqueduct											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano County Water Agency				Cordelia Pumping Plant Napa County FC&WCD			
	Initial Fill Water (1)	Operational Losses (2)	Water Supply Delivery (3)	Total (4)	Initial Fill Water (5)	Operational Losses (6)	Water Supply Delivery (7)	Total (8)	Initial Fill Water (9)	Operational Losses (10)	Water Supply Delivery (a (11)	Total (12)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	24	(10)	1,214	1,228
1969	0	0	0	0	0	0	0	0	0	2	2,687	2,689
1970	0	0	0	0	0	0	0	0	0	18	3,618	3,636
1971	0	0	0	0	0	0	0	0	0	4	2,521	2,525
1972	0	0	0	0	0	0	0	0	0	(10)	3,647	3,637
1973	0	0	0	0	0	0	0	0	0	1	3,792	3,793
1974	0	0	0	0	0	0	0	0	0	10	4,870	4,880
1975	0	0	0	0	0	0	0	0	0	10	6,840	6,850
1976	0	0	0	0	0	0	0	0	0	4	7,122	7,126
1977	0	0	0	0	0	0	0	0	0	2	8,226	8,228
1978	0	0	0	0	0	0	0	0	0	(6)	6,034	6,028
1979	0	0	0	0	0	0	0	0	0	1	6,561	6,562
1980	0	0	0	0	0	0	0	0	0	(3)	6,707	6,704
1981	0	0	0	0	0	0	0	0	0	8	9,001	9,009
1982	0	0	0	0	0	0	0	0	0	(8)	1,213	1,205
1983	0	0	0	0	0	0	0	0	0	(12)	2,287	2,275
1984	0	0	0	0	0	0	0	0	0	(15)	2,923	2,908
1985	0	0	0	0	0	0	0	0	0	13	4,039	4,052
1986	0	0	0	0	0	0	0	0	0	(4)	3,515	3,511
1987	0	0	0	0	0	0	0	0	0	0	7,693	7,693
1988	0	273	15,118	15,391	0	(6)	9,725	9,719	0	(4)	5,392	5,388
1989	0	758	23,451	24,209	0	0	17,246	17,246	0	(4)	6,195	6,191
1990	0	637	26,071	26,708	0	0	15,856	15,856	0	3	6,940	6,943
1991	0	661	8,352	9,013	0	124	3,855	3,979	0	192	1,380	1,572
1992	0	1,640	18,774	20,414	0	0	9,220	9,220	0	(3)	4,001	3,998
1993	0	1,154	34,466	35,620	0	0	14,471	14,471	0	1	5,286	5,287
1994	0	786	32,509	33,295	0	0	15,376	15,376	0	0	6,792	6,792
1995	0	51	44,030	44,081	0	5	16,440	16,445	0	5	9,780	9,785
1996	0	51	47,170	47,221	0	5	16,440	16,445	0	5	9,780	9,785
1997	0	51	49,315	49,366	0	5	16,350	16,355	0	5	11,065	11,070
1998	0	51	50,420	50,471	0	5	16,760	16,765	0	5	11,710	11,715
1999	0	51	51,495	51,546	0	5	17,737	17,742	0	5	12,330	12,335
2000	0	51	52,670	52,721	0	5	18,332	18,337	0	5	13,050	13,055
2001	0	51	53,285	53,336	0	5	18,232	18,237	0	5	13,665	13,670
2002	0	51	53,805	53,856	0	5	18,132	18,137	0	5	14,185	14,190
2003	0	51	54,420	54,471	0	5	18,032	18,037	0	5	14,800	14,805
2004	0	51	55,020	55,071	0	5	17,932	17,937	0	5	15,400	15,405
2005	0	51	57,448	57,499	0	5	19,060	19,065	0	5	16,000	16,005
2006	0	51	57,950	58,001	0	5	19,612	19,617	0	5	16,450	16,455
2007	0	51	58,500	58,551	0	5	19,512	19,517	0	5	17,000	17,005
2008	0	51	59,150	59,201	0	5	19,412	19,417	0	5	17,650	17,655
2009	0	51	59,700	59,751	0	5	19,312	19,317	0	5	18,200	18,205
2010	0	51	60,250	60,301	0	5	20,344	20,349	0	5	18,750	18,755
2011	0	51	60,900	60,951	0	5	20,244	20,249	0	5	19,400	19,405
2012	0	51	61,450	61,501	0	5	20,144	20,149	0	5	19,950	19,955
2013	0	51	62,100	62,151	0	5	20,044	20,049	0	5	20,600	20,605
2014	0	51	62,750	62,801	0	5	19,944	19,949	0	5	21,250	21,255
2015	0	51	63,900	63,951	0	5	19,324	19,329	0	5	21,900	21,905
2016	0	51	64,500	64,551	0	5	19,724	19,729	0	5	22,500	22,505
2017	0	51	65,100	65,151	0	5	19,724	19,729	0	5	23,100	23,105
2018	0	51	65,700	65,751	0	5	19,724	19,729	0	5	23,700	23,705
2019	0	51	66,300	66,351	0	5	19,724	19,729	0	5	24,300	24,305
2020	0	51	66,900	66,951	0	5	19,724	19,729	0	5	24,900	24,905
2021	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2022	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2023	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2024	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2025	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2026	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2027	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2028	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2029	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2030	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2031	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2032	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2033	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2034	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005
2035	0	51	67,000	67,051	0	5	19,724	19,729	0	5	25,000	25,005

a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

	South Bay Aqueduct						California Aqueduct							
							North San Joaquin Division							
	South Bay Pumping Plant						Banks Pumping Plant							
							Transportation Water							
				Deliveries						Deliveries				
Calendar Year	Initial Fill Water (13)	Operational Losses (14)	Reservoir Storage Changes (15)	Water Supply (b (16)	Recreation (17)	Total (18)	Initial Fill Water (19)	Operational Losses (20)	Reservoir Storage Changes (21)	Water Supply (22)	Recreation (23)	Total (24)	Conservation Water (25)	Total (26)
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	9	272	0	8,906	0	9,187	0	0	0	0	0	0	0	0
1963	71	185	0	12,645	0	12,901	0	0	0	0	0	0	0	0
1964	171	152	0	20,911	0	21,234	0	0	0	0	0	0	0	0
1965	93	729	0	34,026	0	34,848	0	0	0	0	0	0	0	0
1966	0	1,746	0	54,913	0	56,659	0	0	0	0	0	0	0	0
1967	0	1,677	0	56,763	0	58,440	5,746	1,183	0	11,538	0	18,467	2,957	21,424
1968	0	1,847	0	101,055	0	102,902	11,079	74,464	0	293,243	0	378,786	531,275	910,061
1969	3,449	2,668	0	69,712	0	75,829	7,336	44,287	0	265,417	0	317,040	531,185	848,225
1970	16,279	1,086	(5,355)	89,560	0	101,570	23,947	20,767	(5,355)	365,771	0	405,130	(12,995)	392,135
1971	0	1,815	8,854	98,584	0	109,253	23,207	(10,754)	8,854	651,665	8	672,980	7,708	680,688
1972	0	3,557	2,273	138,426	0	144,256	145,066	9,057	(4,285)	1,033,432	6,489	1,189,759	48,300	1,238,059
1973	0	(33)	(1,510)	94,078	0	92,535	214,941	(4,951)	2,902	733,008	1,155	947,055	55,846	1,002,901
1974	0	1,287	(10,056)	89,318	0	80,549	247,894	(11,526)	(32,510)	873,302	2,118	1,079,278	54,683	1,133,961
1975	0	320	8,550	93,604	0	102,474	110,149	(8,092)	16,101	1,223,332	3,377	1,344,867	(102,625)	1,242,242
1976	0	2,431	1,391	126,431	141	130,394	67,834	5,443	(244,124)	1,372,093	1,745	1,202,991	(442,348)	760,643
1977	0	2,866	2,685	107,704	112	113,367	0	39,897	(157,543)	573,146	1,111	456,611	(13,507)	443,104
1978	0	2,165	(11,249)	112,574	126	103,616	67,457	(36,898)	35,129	1,451,842	1,177	1,518,707	752,075	2,270,782
1979	0	2,401	1,069	122,190	89	125,749	17,397	60,958	(32,307)	1,659,265	1,398	1,706,711	(112,053)	1,594,658
1980	0	1,758	(6,563)	115,824	123	111,142	3,159	58,484	(275,538)	1,529,187	2,131	1,317,423	186,601	1,504,024
1981	0	2,627	13,742	129,507	121	145,997	46,060	85,350	40,536	1,908,986	4,974	2,085,906	(931,878)	1,154,028
1982	0	2,344	(23,928)	107,439	129	85,984	5,979	61,556	99,897	1,743,145	4,646	1,915,223	347,983	2,263,206
1983	0	2,151	(22,886)	94,656	132	74,053	6,071	47,022	(310,477)	1,184,282	7,853	934,751	835,771	1,770,522
1984	0	2,088	8,442	98,122	158	108,810	38,649	97,143	(108,548)	1,587,936	5,874	1,621,054	21,875	1,642,929
1985	0	2,817	(1,607)	122,088	152	123,450	0	110,469	137,783	1,985,632	5,452	2,239,336	(110,569)	2,128,767
1986	0	2,217	319	110,988	130	113,654	0	82,958	37,865	1,993,278	3,865	2,117,966	205,399	2,323,365
1987	0	2,625	(584)	136,796	137	138,974	0	89,721	(19,167)	2,118,867	7,672	2,197,093	(458,725)	1,738,368
1988	0	2,884	724	147,255	142	151,005	0	134,229	(339,023)	2,360,044	4,889	2,160,139	(301,121)	1,859,018
1989	0	2,673	3,296	142,269	152	148,390	0	170,723	317,292	2,829,107	8,135	3,325,257	409,832	3,735,089
1990	0	894	1,041	156,537	168	158,640	0	136,842	(423,258)	2,554,658	9,262	2,277,504	(368,904)	1,908,600
1991	0	2,637	(4,532)	50,259	150	48,514	0	108,791	283,937	539,751	4,912	937,391	215,999	1,153,390
1992	0	2,925	927	76,661	147	80,660	0	98,462	(56,244)	1,391,008	2,605	1,435,831	(157,239)	1,278,592
1993	0	1,940	(20,051)	105,971	143	88,003	0	149,372	(273,652)	2,279,186	2,609	2,157,515	849,249	3,006,764
1994	0	2,722	811	100,240	168	103,941	0	169,860	(116,788)	1,827,841	3,788	1,884,701	(417,876)	1,466,825
1995	0	5,896	(9,209)	184,000	400	181,087	0	111,761	(114,572)	3,107,700	8,849	3,113,738	(691,898)	2,421,840
1996	0	5,943	(9,953)	186,000	400	182,390	0	111,535	56,132	3,967,090	8,849	4,143,606	(186,992)	3,956,614
1997	0	3,114	1	188,000	400	191,515	0	82,127	(56,138)	4,025,560	9,405	4,060,954	19,868	4,080,822
1998	0	3,222	0	188,000	400	191,622	0	108,625	(818)	4,022,660	9,475	4,139,942	(338,995)	3,800,947
1999	0	3,225	0	188,000	400	191,625	0	109,103	(7,991)	4,040,981	9,515	4,151,608	11,981	4,163,589
2000	0	3,262	0	188,000	400	191,662	0	109,231	11,423	4,057,436	9,575	4,187,665	(51,392)	4,136,273
2001	0	3,262	0	188,000	400	191,662	0	109,135	8,823	4,057,436	9,575	4,184,969	(185)	4,184,784
2002	0	3,262	0	188,000	400	191,662	0	109,144	(7,597)	4,057,436	9,575	4,168,558	554	4,169,112
2003	0	3,262	0	188,000	400	191,662	0	109,015	(589)	4,057,436	9,575	4,175,437	(4,672)	4,170,765
2004	0	3,262	0	188,000	400	191,662	0	109,042	(1,989)	4,057,436	9,575	4,174,064	14,368	4,188,432
2005	0	3,262	0	188,000	400	191,662	0	108,966	(2,053)	4,089,536	9,575	4,206,024	44	4,206,068
2006	0	3,262	0	188,000	400	191,662	0	109,081	6,717	4,089,536	9,575	4,214,909	14,572	4,229,481
2007	0	3,262	0	188,000	400	191,662	0	109,017	(10,307)	4,089,536	9,575	4,197,821	24,689	4,222,510
2008	0	3,262	0	188,000	400	191,662	0	109,065	3,662	4,089,536	9,575	4,211,838	10,030	4,221,868
2009	0	3,262	0	188,000	400	191,662	0	108,997	396	4,089,536	9,575	4,208,504	3,528	4,212,032
2010	0	3,262	0	188,000	400	191,662	0	109,077	(3,969)	4,104,236	9,575	4,218,919	(5,104)	4,213,815
2011	0	3,262	0	188,000	400	191,662	0	109,096	2,983	4,104,236	9,575	4,225,890	35,164	4,261,054
2012	0	3,262	0	188,000	400	191,662	0	109,139	1,175	4,104,236	9,575	4,224,125	8,688	4,232,813
2013	0	3,262	0	188,000	400	191,662	0	109,069	(3,712)	4,104,236	9,575	4,219,168	(31,918)	4,187,250
2014	0	3,262	0	188,000	400	191,662	0	109,063	14,296	4,104,236	9,414	4,237,009	5,387	4,242,396
2015	0	3,262	0	188,000	400	191,662	0	109,136	(19,896)	4,107,236	9,575	4,206,051	6,348	4,212,399
2016	0	3,262	0	188,000	400	191,662	0	109,049	3,938	4,107,236	9,575	4,229,798	38,630	4,268,428
2017	0	3,262	0	188,000	400	191,662	0	109,015	1,210	4,107,236	9,575	4,227,036	(7,621)	4,219,415
2018	0	3,262	0	188,000	400	191,662	0	109,032	722	4,107,236	9,575	4,226,565	4,690	4,231,255
2019	0	3,262	0	188,000	400	191,662	0	109,021	787	4,107,236	9,575	4,226,619	6,004	4,232,623
2020	0	3,262	0	188,000	400	191,662	0	108,986	1,742	4,110,336	9,575	4,230,639	(17,307)	4,213,332
2021	0	3,262	0	188,000	400	191,662	0	109,097	9,402	4,110,986	9,575	4,239,060	20,248	4,259,308
2022	0	3,262	0	188,000	400	191,662	0	109,001	(15,100)	4,110,986	9,575	4,214,462	(4,096)	4,210,366
2023	0	3,262	0	188,000	400	191,662	0	109,014	(2,006)	4,110,986	9,575	4,227,569	5,500	4,233,069
2024	0	3,262	0	188,000	400	191,662	0	108,942	(4,911)	4,110,986	9,575	4,224,592	40,146	4,264,738
2025	0	3,262	0	188,000	400	191,662	0	109,065	6,284	4,110,986	9,575	4,235,910	5,099	4,241,009
2026	0	3,262	0	188,000	400	191,662	0	108,953	(5,190)	4,110,986	9,575	4,224,324	5,674	4,229,998
2027	0	3,262	0	188,000	400	191,662	0	109,072	5,938	4,110,986	9,575	4,235,571	6,119	4,241,690
2028	0	3,262	0	188,000	400	191,662	0	108,957	(4,723)	4,110,986	9,575	4,224,795	9,643	4,234,438
2029	0	3,262	0	188,000	400	191,662	0	109,053	3,356	4,110,986	9,575	4,232,970	2,858	4,235,828
2030	0	3,262	0	188,000	400	191,662	0	108,967	832	4,110,986	9,575	4,230,360	(32,592)	4,197,768
2031	0	3,262	0	188,000	400	191,662	0	109,098	7,957	4,110,986	9,575	4,237,616	16,341	4,253,957
2032	0	3,262	0	188,000	400	191,662	0	109,091	12,430	4,110,986	9,575	4,242,082	(16,288)	4,225,794
2033	0	3,262	0	188,000	400	191,662	0	109,079	(2,625)	4,110,986	9,575	4,227,015	16,274	4,243,289
2034	0	3,262	0	188,000	400	191,662	0	109,118	(3,198)	4,110,986	9,575	4,226,481	8,146	4,234,627

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	California Aqueduct (continued)											
	San Luis Division						South San Joaquin Division					
	Dos Amigos Pumping Plant						Buena Vista Pumping Plant					
				Deliveries						Deliveries		
	Initial Fill Water (27)	Operational Losses (28)	Reservoir Storage Changes (29)	Water Supply (30)	Recreation (31)	Total (32)	Initial Fill Water (33)	Operational Losses (34)	Reservoir Storage Changes (35)	Water Supply (36)	Recreation (37)	Total (38)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	11,079	25,126	0	189,104	0	225,309	0	0	0	0	0	0
1969	3,887	9,922	0	192,689	0	206,498	0	0	0	0	0	0
1970	7,668	1,901	0	270,300	0	279,869	4,779	1,012	0	3	0	5,794
1971	23,207	(12,030)	0	545,869	0	557,046	7,853	8,399	0	101,512	0	117,764
1972	145,066	(6,635)	(6,558)	886,840	6,481	1,025,194	100,274	20,044	(6,558)	223,626	6,481	343,867
1973	214,941	(6,778)	1,329	635,716	1,147	846,355	204,638	35,695	1,329	311,096	1,147	553,905
1974	247,894	(16,765)	(15,295)	780,513	2,108	998,455	237,554	19,672	(15,295)	388,949	2,108	632,988
1975	110,149	(12,144)	(693)	1,126,152	3,358	1,226,822	103,352	26,342	(693)	672,531	3,358	804,890
1976	67,834	(456)	(152,171)	1,241,550	1,581	1,158,338	61,122	29,428	(152,171)	785,055	1,581	725,015
1977	0	26,359	(116,219)	463,970	737	374,847	0	25,173	(116,219)	271,944	560	181,458
1978	67,457	1,905	79,308	1,335,362	680	1,484,712	65,027	17,751	121,904	762,043	674	967,399
1979	17,397	33,884	(51,299)	1,530,926	685	1,531,593	12,302	46,157	(51,299)	737,714	502	745,376
1980	3,159	34,391	(272,825)	1,407,663	1,514	1,173,902	0	49,025	(134,009)	778,059	1,262	694,337
1981	46,060	36,962	23,359	1,775,179	4,348	1,885,908	0	38,942	23,359	1,077,322	4,112	1,143,735
1982	5,979	57,146	116,086	1,631,868	4,205	1,815,284	0	29,059	117,174	990,863	4,045	1,141,141
1983	6,071	63,583	(101,155)	1,085,804	7,475	1,061,778	0	40,205	(101,155)	593,920	7,291	540,261
1984	38,649	109,263	(112,744)	1,484,114	5,391	1,524,673	0	38,487	(114,984)	781,955	5,244	710,702
1985	0	86,772	138,898	1,858,111	4,936	2,088,717	0	42,838	139,689	992,606	4,804	1,179,937
1986	0	49,378	37,546	1,877,183	3,426	1,967,533	0	45,343	37,546	1,014,294	3,285	1,100,468
1987	0	63,289	(23,086)	1,976,446	7,121	2,023,770	0	28,829	(22,959)	1,017,361	6,937	1,030,168
1988	0	72,680	(25,372)	2,208,377	4,490	2,260,175	0	38,804	(25,372)	1,235,447	4,360	1,253,239
1989	0	90,090	(61,544)	2,679,845	7,652	2,716,043	0	29,594	(61,544)	1,532,625	7,490	1,508,165
1990	0	115,074	(14,836)	2,394,999	8,922	2,504,159	0	46,865	(14,836)	1,769,991	8,879	1,810,899
1991	0	92,224	107,302	489,351	4,638	693,515	0	39,274	107,302	453,703	4,593	604,872
1992	0	107,084	(57,784)	1,312,108	2,079	1,363,487	0	31,178	(57,784)	917,721	1,995	893,110
1993	0	136,432	(220,400)	2,170,357	1,864	2,088,253	0	14,186	(128,226)	908,063	1,676	795,699
1994	0	157,133	(100,477)	1,724,530	3,083	1,784,269	0	38,493	(100,407)	1,106,930	2,903	1,047,919
1995	0	92,804	(105,363)	2,918,000	7,210	2,912,651	0	70,908	(105,363)	1,742,000	7,010	1,714,555
1996	0	92,531	66,085	3,775,390	7,210	3,941,216	0	70,635	66,085	2,579,392	7,010	2,723,122
1997	0	65,952	(56,139)	3,831,860	7,210	3,848,883	0	44,056	(56,139)	2,610,050	7,010	2,604,977
1998	0	63,195	(818)	3,828,960	7,210	3,898,547	0	41,299	(818)	2,607,150	7,010	2,654,641
1999	0	63,357	(7,991)	3,847,281	7,210	3,909,857	0	41,461	(7,991)	2,612,971	7,010	2,653,451
2000	0	63,357	11,423	3,863,736	7,210	3,945,726	0	41,461	11,423	2,619,250	7,010	2,679,144
2001	0	63,338	8,823	3,863,736	7,210	3,943,107	0	41,442	8,823	2,619,250	7,010	2,676,525
2002	0	63,348	(7,597)	3,863,736	7,210	3,926,697	0	41,452	(7,597)	2,619,250	7,010	2,660,115
2003	0	63,230	(589)	3,863,736	7,210	3,933,587	0	41,334	(589)	2,619,250	7,010	2,667,005
2004	0	63,265	(1,989)	3,863,736	7,210	3,932,222	0	41,369	(1,989)	2,619,250	7,010	2,665,640
2005	0	63,168	(2,053)	3,895,836	7,210	3,964,161	0	41,272	(2,053)	2,651,350	7,010	2,697,579
2006	0	63,285	6,717	3,895,836	7,210	3,973,048	0	41,389	6,717	2,651,350	7,010	2,706,466
2007	0	63,208	(10,307)	3,895,836	7,210	3,955,947	0	41,312	(10,307)	2,651,350	7,010	2,689,365
2008	0	63,257	3,662	3,895,836	7,210	3,969,965	0	41,361	3,662	2,651,350	7,010	2,703,383
2009	0	63,199	396	3,895,836	7,210	3,966,641	0	41,303	396	2,651,350	7,010	2,700,059
2010	0	63,304	(3,969)	3,910,536	7,210	3,977,081	0	41,408	(3,969)	2,666,050	7,010	2,710,499
2011	0	63,306	2,983	3,910,536	7,210	3,984,035	0	41,410	2,983	2,666,050	7,010	2,717,453
2012	0	63,306	1,175	3,910,536	7,210	3,982,227	0	41,410	1,175	2,666,050	7,010	2,715,645
2013	0	63,307	(3,712)	3,910,536	7,210	3,977,341	0	41,411	(3,712)	2,666,050	7,010	2,710,759
2014	0	63,239	14,296	3,910,536	7,049	3,995,120	0	41,343	14,296	2,666,050	6,849	2,728,538
2015	0	63,320	(19,896)	3,913,536	7,210	3,964,170	0	41,424	(19,896)	2,669,050	7,010	2,697,588
2016	0	63,280	3,938	3,913,536	7,210	3,987,964	0	41,384	3,938	2,669,050	7,010	2,721,382
2017	0	63,255	1,210	3,913,536	7,210	3,985,211	0	41,359	1,210	2,669,050	7,010	2,718,629
2018	0	63,283	722	3,913,536	7,210	3,984,751	0	41,387	722	2,669,050	7,010	2,718,169
2019	0	63,262	787	3,913,536	7,210	3,984,795	0	41,366	787	2,669,050	7,010	2,718,213
2020	0	63,221	1,742	3,916,636	7,210	3,988,809	0	41,325	1,742	2,672,150	7,010	2,722,227
2021	0	63,303	9,402	3,917,286	7,210	3,997,201	0	41,407	9,402	2,672,800	7,010	2,730,619
2022	0	63,253	(15,100)	3,917,286	7,210	3,972,649	0	41,357	(15,100)	2,672,800	7,010	2,706,067
2023	0	63,221	(2,006)	3,917,286	7,210	3,985,711	0	41,325	(2,006)	2,672,800	7,010	2,719,129
2024	0	63,152	(4,911)	3,917,286	7,210	3,982,737	0	41,256	(4,911)	2,672,800	7,010	2,716,155
2025	0	63,286	6,284	3,917,286	7,210	3,994,066	0	41,390	6,284	2,672,800	7,010	2,727,484
2026	0	63,170	(5,190)	3,917,286	7,210	3,982,476	0	41,274	(5,190)	2,672,800	7,010	2,715,894
2027	0	63,293	5,938	3,917,286	7,210	3,993,727	0	41,397	5,938	2,672,800	7,010	2,727,145
2028	0	63,164	(4,723)	3,917,286	7,210	3,982,937	0	41,268	(4,723)	2,672,800	7,010	2,716,355
2029	0	63,274	3,356	3,917,286	7,210	3,991,126	0	41,378	3,356	2,672,800	7,010	2,724,544
2030	0	63,222	832	3,917,286	7,210	3,988,550	0	41,326	832	2,672,800	7,010	2,721,968
2031	0	63,291	7,957	3,917,286	7,210	3,995,744	0	41,395	7,957	2,672,800	7,010	2,729,162
2032	0	63,330	12,430	3,917,286	7,210	4,000,256	0	41,434	12,430	2,672,800	7,010	2,733,674
2033	0	63,321	(2,625)	3,917,286	7,210	3,985,192	0	41,425	(2,625)	2,672,800	7,010	2,718,610
2034	0	63,306	(3,198)	3,917,286	7,210	3,984,604	0	41,410	(3,198)	2,672,800	7,010	2,718,022
2035	0	63,263	(3,392)	3,917,286	7,210	3,984,367	0	41,367	(3,392)	2,672,800	7,010	2,717,785

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	California Aqueduct (continued) / South San Joaquin Division (continued) / Teerink Pumping Plant						Chrisman Pumping Plant					
				Deliveries						Deliveries		
	Initial Fill Water (39)	Operational Losses (40)	Reservoir Storage Changes (41)	Water Supply (42)	Recreation (43)	Total (44)	Initial Fill Water (45)	Operational Losses (46)	Reservoir Storage Changes (47)	Water Supply (48)	Recreation (49)	Total (50)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	198	2	0	0	0	200	0	0	0	0	0	0
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	0	0	0	7,207
1972	100,274	12,765	(6,558)	84,955	6,481	197,917	100,274	13,160	(6,558)	78,891	6,481	192,248
1973	204,638	21,543	1,329	229,685	1,147	458,342	204,638	32,414	1,329	209,769	1,147	449,297
1974	237,554	11,843	(15,295)	336,198	2,108	572,408	237,554	17,655	(15,295)	318,198	2,108	560,220
1975	103,352	19,763	(693)	621,706	3,358	747,486	103,352	25,326	(693)	586,286	3,358	717,629
1976	61,122	18,552	(152,171)	740,486	1,581	669,570	61,122	21,468	(152,171)	700,935	1,581	632,935
1977	0	16,415	(116,219)	246,349	560	147,105	0	15,698	(116,219)	240,191	560	140,230
1978	65,027	28,820	121,904	631,121	674	847,546	65,027	26,705	121,904	599,973	674	814,283
1979	12,302	50,663	(51,299)	625,561	502	637,729	12,302	50,580	(51,299)	586,959	502	599,044
1980	0	48,825	(134,009)	696,405	1,262	612,483	0	58,085	(134,009)	658,588	1,262	583,926
1981	0	51,600	23,359	998,307	4,112	1,077,378	0	48,844	23,359	959,274	4,112	1,035,589
1982	0	44,353	117,332	878,486	4,045	1,044,216	0	33,541	117,277	830,704	4,045	985,567
1983	0	43,961	(101,155)	487,915	7,291	438,012	0	34,698	(101,155)	450,489	7,291	391,323
1984	0	45,999	(115,088)	632,262	5,244	568,417	0	33,132	(115,092)	582,414	5,244	505,698
1985	0	50,106	139,973	854,684	4,804	1,049,567	0	54,831	139,954	810,606	4,804	1,010,195
1986	0	47,369	37,546	882,300	3,285	970,500	0	50,047	37,546	839,839	3,285	930,717
1987	0	46,445	(23,255)	887,905	6,937	918,032	0	31,888	23,318	853,157	6,937	915,300
1988	0	53,815	(25,372)	1,088,894	4,360	1,121,697	0	39,775	(25,372)	1,046,900	4,360	1,065,663
1989	0	49,088	(61,544)	1,382,599	7,490	1,377,633	0	42,307	(61,544)	1,339,358	7,490	1,327,611
1990	0	66,868	(14,836)	1,627,246	8,879	1,688,157	0	56,663	(14,836)	1,590,893	8,879	1,641,599
1991	0	40,564	107,302	447,935	4,593	600,394	0	34,016	107,302	446,443	4,593	592,354
1992	0	34,860	(57,784)	841,119	1,995	820,190	0	37,517	(57,784)	816,876	1,995	798,604
1993	0	27,158	(127,601)	799,006	1,676	700,239	0	28,614	(127,601)	771,009	1,676	673,698
1994	0	54,821	(100,389)	1,006,875	2,903	964,210	0	60,961	(100,258)	977,364	2,903	940,970
1995	0	67,278	(105,363)	1,615,400	7,010	1,584,325	0	67,028	(105,363)	1,586,000	7,010	1,554,675
1996	0	67,005	66,085	2,466,192	7,010	2,606,292	0	66,755	66,085	2,426,792	7,010	2,566,642
1997	0	40,426	(56,139)	2,496,850	7,010	2,488,147	0	40,176	(56,139)	2,457,450	7,010	2,448,497
1998	0	37,669	(818)	2,493,950	7,010	2,537,811	0	37,419	(818)	2,454,550	7,010	2,498,161
1999	0	37,831	(7,991)	2,499,771	7,010	2,536,621	0	37,581	(7,991)	2,460,371	7,010	2,496,971
2000	0	37,831	11,423	2,506,050	7,010	2,562,314	0	37,581	11,423	2,466,650	7,010	2,522,664
2001	0	37,812	8,823	2,506,050	7,010	2,559,695	0	37,562	8,823	2,466,650	7,010	2,520,045
2002	0	37,822	(7,597)	2,506,050	7,010	2,543,285	0	37,572	(7,597)	2,466,650	7,010	2,503,635
2003	0	37,704	(589)	2,506,050	7,010	2,550,175	0	37,454	(589)	2,466,650	7,010	2,510,525
2004	0	37,739	(1,989)	2,506,050	7,010	2,548,810	0	37,489	(1,989)	2,466,650	7,010	2,509,160
2005	0	37,642	(2,053)	2,538,150	7,010	2,580,749	0	37,392	(2,053)	2,498,750	7,010	2,541,099
2006	0	37,759	6,717	2,538,150	7,010	2,589,636	0	37,509	6,717	2,498,750	7,010	2,549,986
2007	0	37,682	(10,307)	2,538,150	7,010	2,572,535	0	37,432	(10,307)	2,498,750	7,010	2,532,885
2008	0	37,731	3,662	2,538,150	7,010	2,586,553	0	37,481	3,662	2,498,750	7,010	2,546,903
2009	0	37,673	396	2,538,150	7,010	2,583,229	0	37,423	396	2,498,750	7,010	2,543,579
2010	0	37,778	(3,969)	2,552,850	7,010	2,593,669	0	37,528	(3,969)	2,513,450	7,010	2,554,019
2011	0	37,780	2,983	2,552,850	7,010	2,600,623	0	37,530	2,983	2,513,450	7,010	2,560,973
2012	0	37,780	1,175	2,552,850	7,010	2,598,815	0	37,530	1,175	2,513,450	7,010	2,559,165
2013	0	37,781	(3,712)	2,552,850	7,010	2,593,929	0	37,531	(3,712)	2,513,450	7,010	2,554,279
2014	0	37,713	14,296	2,552,850	6,849	2,611,708	0	37,463	14,296	2,513,450	6,849	2,572,058
2015	0	37,794	(19,896)	2,555,850	7,010	2,580,758	0	37,544	(19,896)	2,516,450	7,010	2,541,108
2016	0	37,754	3,938	2,555,850	7,010	2,604,552	0	37,504	3,938	2,516,450	7,010	2,564,902
2017	0	37,729	1,210	2,555,850	7,010	2,601,799	0	37,479	1,210	2,516,450	7,010	2,562,149
2018	0	37,757	722	2,555,850	7,010	2,601,339	0	37,507	722	2,516,450	7,010	2,561,689
2019	0	37,736	787	2,555,850	7,010	2,601,383	0	37,486	787	2,516,450	7,010	2,561,733
2020	0	37,695	1,742	2,558,950	7,010	2,605,397	0	37,445	1,742	2,519,550	7,010	2,565,747
2021	0	37,777	9,402	2,559,600	7,010	2,613,789	0	37,527	9,402	2,520,200	7,010	2,574,139
2022	0	37,727	(15,100)	2,559,600	7,010	2,589,237	0	37,477	(15,100)	2,520,200	7,010	2,549,587
2023	0	37,695	(2,006)	2,559,600	7,010	2,602,299	0	37,445	(2,006)	2,520,200	7,010	2,562,649
2024	0	37,626	(4,911)	2,559,600	7,010	2,599,325	0	37,376	(4,911)	2,520,200	7,010	2,559,675
2025	0	37,760	6,284	2,559,600	7,010	2,610,654	0	37,510	6,284	2,520,200	7,010	2,571,004
2026	0	37,644	(5,190)	2,559,600	7,010	2,599,064	0	37,394	(5,190)	2,520,200	7,010	2,559,414
2027	0	37,767	5,938	2,559,600	7,010	2,610,315	0	37,517	5,938	2,520,200	7,010	2,570,665
2028	0	37,638	(4,723)	2,559,600	7,010	2,599,525	0	37,388	(4,723)	2,520,200	7,010	2,559,875
2029	0	37,748	3,356	2,559,600	7,010	2,607,714	0	37,498	3,356	2,520,200	7,010	2,568,064
2030	0	37,696	832	2,559,600	7,010	2,605,138	0	37,446	832	2,520,200	7,010	2,565,488
2031	0	37,765	7,957	2,559,600	7,010	2,612,332	0	37,515	7,957	2,520,200	7,010	2,572,682
2032	0	37,804	12,430	2,559,600	7,010	2,616,844	0	37,554	12,430	2,520,200	7,010	2,577,194
2033	0	37,795	(2,625)	2,559,600	7,010	2,601,780	0	37,545	(2,625)	2,520,200	7,010	2,562,130
2034	0	37,780	(3,198)	2,559,600	7,010	2,601,192	0	37,530	(3,198)	2,520,200	7,010	2,561,542

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	California Aqueduct (continued)											
	Tehachapi Division						Mojave Division					
	Edmonston Pumping Plant						Alamo Powerplant					
	Initial Fill Water (51)	Operational Losses (52)	Reservoir Storage Changes (53)	Deliveries: Water Supply (54)	Deliveries: Recreation (55)	Total (56)	Initial Fill Water (57)	Operational Losses (58)	Reservoir Storage Changes (59)	Deliveries: Water Supply (60)	Deliveries: Recreation (61)	Total (62)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	5,446	8	0	0	0	5,454	0	0	0	0	0	0
1972	100,274	16,067	(6,558)	74,123	6,481	190,387	0	0	0	0	0	0
1973	204,638	34,051	1,329	207,808	1,147	448,973	0	0	0	0	0	0
1974	237,554	18,181	(15,295)	313,634	2,108	556,182	0	0	0	0	0	0
1975	103,352	20,183	(693)	573,219	3,358	699,419	0	0	0	0	0	0
1976	61,122	21,096	(152,171)	685,768	1,581	617,396	0	0	0	0	0	0
1977	0	18,424	(116,219)	236,086	560	138,851	0	0	0	0	0	0
1978	65,027	20,887	121,904	590,329	674	798,821	0	0	0	0	0	0
1979	12,302	46,332	(51,299)	568,338	502	576,175	0	0	0	0	0	0
1980	0	52,967	(134,009)	639,743	1,262	559,963	0	0	0	0	0	0
1981	0	40,602	23,359	938,482	4,112	1,006,555	0	0	0	0	0	0
1982	0	37,244	117,296	812,206	4,045	970,791	0	0	0	0	0	0
1983	0	40,690	(101,155)	431,182	7,291	378,008	0	0	0	0	0	0
1984	0	42,112	(115,214)	556,830	5,244	488,972	0	0	0	0	0	0
1985	0	45,265	139,988	792,477	4,804	982,534	0	0	0	0	0	0
1986	0	38,514	37,546	823,067	3,285	902,412	0	14,898	12,258	429,864	1,508	458,528
1987	0	28,213	(23,258)	841,322	6,937	853,214	0	11,365	(13,727)	407,870	1,239	406,747
1988	0	42,017	(25,372)	1,035,988	4,360	1,056,993	0	21,696	5,568	528,819	971	557,054
1989	0	32,270	(61,544)	1,328,041	7,490	1,306,257	0	4,686	(20,826)	716,360	1,407	701,627
1990	0	42,198	(14,836)	1,579,466	8,879	1,615,707	0	8,898	(6,089)	788,111	1,388	792,308
1991	0	33,999	107,302	441,220	4,593	587,114	0	17,908	35,455	177,311	394	231,068
1992	0	26,161	(57,784)	806,514	1,995	776,886	0	17,913	(15,862)	370,853	423	373,327
1993	0	11,946	(127,601)	759,348	1,676	645,369	0	9,304	(3,318)	308,085	443	314,514
1994	0	44,704	(100,361)	960,476	2,903	907,722	0	20,460	798	469,657	421	491,336
1995	0	65,478	(105,363)	1,568,700	7,010	1,535,825	0	35,255	(9,277)	954,110	1,630	981,718
1996	0	65,205	66,085	2,404,092	7,010	2,542,392	0	35,249	84,634	1,319,630	1,630	1,441,143
1997	0	38,626	(56,139)	2,434,750	7,010	2,424,247	0	21,874	(61,956)	1,325,750	1,630	1,287,298
1998	0	35,869	(818)	2,431,850	7,010	2,473,911	0	20,931	(27,163)	1,295,850	1,630	1,291,248
1999	0	36,031	(7,991)	2,437,671	7,010	2,472,721	0	20,937	(6,567)	1,269,370	1,630	1,285,370
2000	0	36,031	11,423	2,443,950	7,010	2,498,414	0	20,947	12,682	1,274,550	1,630	1,309,809
2001	0	36,012	8,823	2,443,950	7,010	2,495,795	0	20,939	8,449	1,274,550	1,630	1,305,568
2002	0	36,022	(7,597)	2,443,950	7,010	2,479,385	0	20,948	(7,581)	1,274,550	1,630	1,289,547
2003	0	35,904	(589)	2,443,950	7,010	2,486,275	0	20,846	(931)	1,274,550	1,630	1,296,095
2004	0	35,939	(1,989)	2,443,950	7,010	2,484,910	0	20,862	(1,334)	1,274,550	1,630	1,295,708
2005	0	35,842	(2,053)	2,476,050	7,010	2,516,849	0	20,785	(576)	1,306,650	1,630	1,328,489
2006	0	35,959	6,717	2,476,050	7,010	2,525,736	0	20,870	3,391	1,306,650	1,630	1,332,541
2007	0	35,882	(10,307)	2,476,050	7,010	2,508,635	0	20,838	(5,431)	1,306,650	1,630	1,323,687
2008	0	35,931	3,662	2,476,050	7,010	2,522,653	0	20,868	337	1,306,650	1,630	1,329,485
2009	0	35,873	396	2,476,050	7,010	2,519,329	0	20,805	(677)	1,306,650	1,630	1,328,408
2010	0	35,978	(3,969)	2,490,750	7,010	2,529,769	0	20,920	(1,770)	1,321,350	1,630	1,342,130
2011	0	35,980	2,983	2,490,750	7,010	2,536,723	0	20,889	345	1,321,350	1,630	1,344,214
2012	0	35,980	1,175	2,490,750	7,010	2,534,915	0	20,907	2,458	1,321,350	1,630	1,346,345
2013	0	35,981	(3,712)	2,490,750	7,010	2,530,029	0	20,915	(692)	1,321,350	1,630	1,343,203
2014	0	35,913	14,296	2,490,750	6,849	2,547,808	0	20,866	11,830	1,321,350	1,469	1,355,515
2015	0	35,994	(19,896)	2,493,750	7,010	2,516,858	0	20,910	(20,111)	1,324,350	1,630	1,326,779
2016	0	35,954	3,938	2,493,750	7,010	2,540,652	0	20,863	4,322	1,324,350	1,630	1,351,165
2017	0	35,929	1,210	2,493,750	7,010	2,537,899	0	20,852	686	1,324,350	1,630	1,347,518
2018	0	35,957	722	2,493,750	7,010	2,537,439	0	20,862	(245)	1,324,350	1,630	1,346,597
2019	0	35,936	787	2,493,750	7,010	2,537,483	0	20,842	(32)	1,324,350	1,630	1,346,790
2020	0	35,895	1,742	2,496,850	7,010	2,541,497	0	20,812	3,926	1,327,450	1,630	1,353,818
2021	0	35,977	9,402	2,497,500	7,010	2,549,889	0	20,887	7,479	1,328,100	1,630	1,358,096
2022	0	35,927	(15,100)	2,497,500	7,010	2,525,337	0	20,853	(11,408)	1,328,100	1,630	1,339,175
2023	0	35,895	(2,006)	2,497,500	7,010	2,538,399	0	20,837	(3,221)	1,328,100	1,630	1,347,346
2024	0	35,826	(4,911)	2,497,500	7,010	2,535,425	0	20,787	(1,427)	1,328,100	1,630	1,349,090
2025	0	35,960	6,284	2,497,500	7,010	2,546,754	0	20,900	1,267	1,328,100	1,630	1,351,897
2026	0	35,844	(5,190)	2,497,500	7,010	2,535,164	0	20,797	(538)	1,328,100	1,630	1,349,989
2027	0	35,967	5,938	2,497,500	7,010	2,546,415	0	20,907	1,291	1,328,100	1,630	1,351,928
2028	0	35,838	(4,723)	2,497,500	7,010	2,535,625	0	20,777	(2,252)	1,328,100	1,630	1,348,255
2029	0	35,948	3,356	2,497,500	7,010	2,543,814	0	20,897	3,148	1,328,100	1,630	1,353,775
2030	0	35,896	832	2,497,500	7,010	2,541,238	0	20,823	116	1,328,100	1,630	1,350,669
2031	0	35,965	7,957	2,497,500	7,010	2,548,432	0	20,895	7,488	1,328,100	1,630	1,358,113
2032	0	36,004	12,430	2,497,500	7,010	2,552,944	0	20,926	12,429	1,328,100	1,630	1,363,085
2033	0	35,995	(2,625)	2,497,500	7,010	2,537,880	0	20,915	(1,536)	1,328,100	1,630	1,349,109
2034	0	35,980	(3,198)	2,497,500	7,010	2,537,292	0	20,935	(512)	1,328,100	1,630	1,350,153

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

	California Aqueduct (continued)											
	Mojave Division (continued)											
	Pearblossom Pumping Plant						Mojave Siphon Powerplant					
				Deliveries						Deliveries		
Calendar Year	Initial Fill Water (63)	Operational Losses (64)	Reservoir Storage Changes (65)	Water Supply (66)	Recreation (67)	Total (68)	Initial Fill Water (69)	Operational Losses (70)	Reservoir Storage Changes (71)	Water Supply (72)	Recreation (73)	Total (74)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	21	0	0	0	0	21	0	0	0	0	0	0
1972	35,243	5,282	(153)	1,794	0	42,166	0	0	0	0	0	0
1973	80,177	21,522	(2,700)	52,201	72	151,272	0	0	0	0	0	0
1974	76,694	10,847	(11,149)	102,839	44	179,275	0	0	0	0	0	0
1975	10,000	2,364	(8,397)	190,351	70	194,388	0	0	0	0	0	0
1976	4,168	7,040	(16,055)	236,713	152	232,018	0	0	0	0	0	0
1977	0	11,398	(17,534)	102,326	580	96,770	0	0	0	0	0	0
1978	19,922	5,696	69,130	374,845	498	470,091	0	0	0	0	0	0
1979	12,302	6,836	(32,518)	362,114	502	349,236	0	0	0	0	0	0
1980	0	16,200	6,159	401,214	781	424,354	0	0	0	0	0	0
1981	0	4,992	(36,278)	574,573	933	544,220	0	0	0	0	0	0
1982	0	5,251	55,232	401,037	1,919	463,439	0	0	0	0	0	0
1983	0	11,745	(26,847)	231,188	1,180	217,266	0	0	0	0	0	0
1984	0	18,228	23,230	252,066	1,494	295,018	0	0	0	0	0	0
1985	0	25,292	(2,815)	350,758	1,076	374,311	0	0	0	0	0	0
1986	0	31,039	12,258	394,156	1,508	438,961	0	0	0	0	0	0
1987	0	27,319	(14,928)	367,531	1,239	381,161	0	0	0	0	0	0
1988	0	32,209	5,568	492,551	971	531,299	0	0	0	0	0	0
1989	0	31,500	(20,826)	661,189	1,407	673,270	0	0	0	0	0	0
1990	0	32,672	(6,089)	730,560	1,388	758,531	0	0	0	0	0	0
1991	0	15,209	35,455	163,916	394	214,974	0	0	0	0	0	0
1992	0	17,029	(15,862)	334,992	423	336,582	0	0	0	0	0	0
1993	0	9,779	(3,318)	254,980	443	261,884	0	0	0	0	0	0
1994	0	392	(85)	409,589	421	410,317	0	0	0	0	0	0
1995	0	29,905	(9,277)	796,110	1,430	818,168	0	26,435	(9,277)	796,110	1,430	814,698
1996	0	29,899	84,634	1,161,650	1,430	1,277,613	0	26,429	84,634	1,161,650	1,430	1,274,143
1997	0	16,524	(61,956)	1,167,750	1,430	1,123,748	0	13,054	(61,956)	1,167,750	1,430	1,120,278
1998	0	15,581	(27,163)	1,137,850	1,430	1,127,698	0	12,111	(27,163)	1,137,850	1,430	1,124,228
1999	0	15,587	(6,567)	1,111,370	1,430	1,121,820	0	12,117	(6,567)	1,111,370	1,430	1,118,350
2000	0	15,597	12,682	1,116,550	1,430	1,146,259	0	12,127	12,682	1,116,550	1,430	1,142,789
2001	0	15,589	8,449	1,116,550	1,430	1,142,018	0	12,119	8,449	1,116,550	1,430	1,138,548
2002	0	15,598	(7,581)	1,116,550	1,430	1,125,997	0	12,128	(7,581)	1,116,550	1,430	1,122,527
2003	0	15,496	(931)	1,116,550	1,430	1,132,545	0	12,026	(931)	1,116,550	1,430	1,129,075
2004	0	15,512	(1,334)	1,116,550	1,430	1,132,158	0	12,042	(1,334)	1,116,550	1,430	1,128,688
2005	0	15,435	(576)	1,148,650	1,430	1,164,939	0	11,965	(576)	1,148,650	1,430	1,161,469
2006	0	15,520	3,391	1,148,650	1,430	1,168,991	0	12,050	3,391	1,148,650	1,430	1,165,521
2007	0	15,488	(5,431)	1,148,650	1,430	1,160,137	0	12,018	(5,431)	1,148,650	1,430	1,156,667
2008	0	15,518	337	1,148,650	1,430	1,165,935	0	12,048	337	1,148,650	1,430	1,162,465
2009	0	15,455	(677)	1,148,650	1,430	1,164,858	0	11,985	(677)	1,148,650	1,430	1,161,388
2010	0	15,570	(1,770)	1,163,350	1,430	1,178,580	0	12,100	(1,770)	1,163,350	1,430	1,175,110
2011	0	15,539	345	1,163,350	1,430	1,180,664	0	12,069	345	1,163,350	1,430	1,177,194
2012	0	15,557	2,458	1,163,350	1,430	1,182,795	0	12,087	2,458	1,163,350	1,430	1,179,325
2013	0	15,565	(692)	1,163,350	1,430	1,179,653	0	12,095	(692)	1,163,350	1,430	1,176,183
2014	0	15,516	11,830	1,163,350	1,269	1,191,965	0	12,046	11,830	1,163,350	1,269	1,188,495
2015	0	15,560	(20,111)	1,166,350	1,430	1,163,229	0	12,090	(20,111)	1,166,350	1,430	1,159,759
2016	0	15,513	4,322	1,166,350	1,430	1,187,615	0	12,043	4,322	1,166,350	1,430	1,184,145
2017	0	15,502	686	1,166,350	1,430	1,183,968	0	12,032	686	1,166,350	1,430	1,180,498
2018	0	15,512	(245)	1,166,350	1,430	1,183,047	0	12,042	(245)	1,166,350	1,430	1,179,577
2019	0	15,492	(32)	1,166,350	1,430	1,183,240	0	12,022	(32)	1,166,350	1,430	1,179,770
2020	0	15,462	3,926	1,169,450	1,430	1,190,268	0	11,992	3,926	1,169,450	1,430	1,186,798
2021	0	15,537	7,479	1,170,100	1,430	1,194,546	0	12,067	7,479	1,170,100	1,430	1,191,076
2022	0	15,503	(11,408)	1,170,100	1,430	1,175,625	0	12,033	(11,408)	1,170,100	1,430	1,172,155
2023	0	15,487	(3,221)	1,170,100	1,430	1,183,796	0	12,017	(3,221)	1,170,100	1,430	1,180,326
2024	0	15,437	(1,427)	1,170,100	1,430	1,185,540	0	11,967	(1,427)	1,170,100	1,430	1,182,070
2025	0	15,550	1,267	1,170,100	1,430	1,188,347	0	12,080	1,267	1,170,100	1,430	1,184,877
2026	0	15,447	(538)	1,170,100	1,430	1,186,439	0	11,977	(538)	1,170,100	1,430	1,182,969
2027	0	15,557	1,291	1,170,100	1,430	1,188,378	0	12,087	1,291	1,170,100	1,430	1,184,908
2028	0	15,427	(2,252)	1,170,100	1,430	1,184,705	0	11,957	(2,252)	1,170,100	1,430	1,181,235
2029	0	15,547	3,148	1,170,100	1,430	1,190,225	0	12,077	3,148	1,170,100	1,430	1,186,755
2030	0	15,473	116	1,170,100	1,430	1,187,119	0	12,003	116	1,170,100	1,430	1,183,649
2031	0	15,545	7,488	1,170,100	1,430	1,194,563	0	12,075	7,488	1,170,100	1,430	1,191,093
2032	0	15,576	12,429	1,170,100	1,430	1,199,535	0	12,106	12,429	1,170,100	1,430	1,196,065
2033	0	15,565	(1,536)	1,170,100	1,430	1,185,559	0	12,095	(1,536)	1,170,100	1,430	1,182,089
2034	0	15,585	(512)	1,170,100	1,430	1,186,603	0	12,115	(512)	1,170,100	1,430	1,183,133

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	California Aqueduct (continued)											
	Santa Ana Division						West Branch, California Aqueduct					
	Devil Canyon Powerplant						Oso Pumping Plant					
	Initial Fill Water (75)	Operational Losses (76)	Reservoir Storage Changes (77)	Deliveries: Water Supply (78)	Deliveries: Recreation (79)	Total (80)	Initial Fill Water (81)	Operational Losses (82)	Reservoir Storage Changes (83)	Deliveries: Water Supply (84)	Deliveries: Recreation (85)	Total (86)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	2,444	133	0	0	0	2,577
1972	37	0	0	1,275	0	1,312	63,883	6,557	(6,405)	71,991	6,481	142,507
1973	40,848	14,745	0	51,812	0	107,405	124,461	16,995	4,029	155,317	1,075	301,877
1974	74,666	8,367	(4,925)	102,198	0	180,306	160,860	12,702	(4,146)	209,172	2,064	380,652
1975	10,000	1,995	(6,719)	189,526	0	194,802	93,352	23,008	7,704	374,306	3,288	501,658
1976	4,168	5,180	(9,182)	235,711	23	235,900	56,954	15,845	(136,116)	420,708	1,429	358,820
1977	0	8,082	(5,235)	101,137	469	104,453	0	4,407	(98,685)	122,447	(20)	28,149
1978	14,820	3,754	21,686	373,636	481	414,377	45,105	9,061	52,774	171,139	176	278,255
1979	12,302	5,620	(27,107)	356,854	485	348,154	0	25,355	(18,781)	145,598	0	152,172
1980	0	9,468	12,714	395,975	742	418,899	0	24,576	(140,168)	165,931	481	50,820
1981	0	8,401	(23,448)	569,088	807	554,848	0	15,254	59,637	283,264	3,179	361,334
1982	0	6,012	44,469	399,799	1,798	452,078	0	23,824	61,685	360,878	2,126	448,513
1983	0	8,597	5,188	230,277	1,078	245,140	0	23,601	(74,308)	166,995	6,111	122,399
1984	0	12,861	(850)	250,938	1,414	264,363	0	12,461	(138,146)	272,101	3,750	150,166
1985	0	14,325	(8,791)	349,336	956	355,826	0	28,257	142,219	403,097	3,728	577,301
1986	0	9,646	8,339	392,650	1,378	412,013	0	23,816	25,288	393,203	1,777	444,084
1987	0	7,919	(11,331)	365,451	1,118	363,157	0	18,952	(9,490)	433,452	5,698	448,612
1988	0	11,090	2,238	490,536	861	504,725	0	20,461	(30,940)	507,169	3,389	500,079
1989	0	13,116	(5,487)	658,730	1,301	667,660	0	27,914	(40,718)	611,681	6,083	604,960
1990	0	13,439	(4,622)	728,723	1,281	738,821	0	33,666	(8,747)	791,355	7,491	823,765
1991	0	10,836	18,430	161,032	340	190,638	0	16,460	71,847	263,909	4,199	356,415
1992	0	12,197	(9,051)	325,352	371	328,869	0	8,200	(41,922)	435,661	1,572	403,511
1993	0	5,602	5,593	244,678	364	256,237	0	2,668	(124,283)	451,263	1,233	330,881
1994	0	10,921	(11,051)	393,690	348	393,908	0	23,972	(101,160)	490,819	2,482	416,113
1995	0	19,300	(15,348)	739,510	1,250	744,712	0	30,173	(96,086)	614,590	5,380	554,057
1996	0	19,478	(1,304)	1,108,800	1,250	1,128,224	0	29,906	(18,549)	1,084,462	5,380	1,101,199
1997	0	9,895	1,044	1,114,800	1,250	1,126,989	0	16,702	5,817	1,109,000	5,380	1,136,899
1998	0	8,462	(8,021)	1,084,800	1,250	1,086,491	0	14,888	26,345	1,136,000	5,380	1,182,613
1999	0	8,449	5,058	1,058,170	1,250	1,072,927	0	15,044	(1,424)	1,168,301	5,380	1,187,301
2000	0	8,466	2,822	1,059,950	1,250	1,072,488	0	15,034	(1,259)	1,169,400	5,380	1,188,555
2001	0	8,450	(4,368)	1,059,950	1,250	1,065,282	0	15,023	374	1,169,400	5,380	1,190,177
2002	0	8,454	3,100	1,059,950	1,250	1,072,754	0	15,024	(16)	1,169,400	5,380	1,189,788
2003	0	8,447	(1,857)	1,059,950	1,250	1,067,790	0	15,008	342	1,169,400	5,380	1,190,130
2004	0	8,414	(2,416)	1,059,950	1,250	1,067,198	0	15,027	(655)	1,169,400	5,380	1,189,152
2005	0	8,405	1,383	1,092,050	1,250	1,103,088	0	15,007	(1,477)	1,169,400	5,380	1,188,310
2006	0	8,442	(720)	1,092,050	1,250	1,101,022	0	15,039	3,326	1,169,400	5,380	1,193,145
2007	0	8,455	780	1,092,050	1,250	1,102,535	0	14,994	(4,876)	1,169,400	5,380	1,184,898
2008	0	8,439	(1,138)	1,092,050	1,250	1,100,601	0	15,013	3,325	1,169,400	5,380	1,193,118
2009	0	8,450	1,198	1,092,050	1,250	1,102,948	0	15,018	1,073	1,169,400	5,380	1,190,871
2010	0	8,451	3,214	1,106,750	1,250	1,119,665	0	15,008	(2,199)	1,169,400	5,380	1,187,589
2011	0	8,458	(36)	1,106,750	1,250	1,116,422	0	15,041	2,638	1,169,400	5,380	1,192,459
2012	0	8,452	(804)	1,106,750	1,250	1,115,648	0	15,023	(1,283)	1,169,400	5,380	1,188,520
2013	0	8,451	(1,026)	1,106,750	1,250	1,115,425	0	15,016	(3,020)	1,169,400	5,380	1,186,776
2014	0	8,451	(1,549)	1,106,750	1,250	1,114,902	0	14,997	2,466	1,169,400	5,380	1,192,243
2015	0	8,455	(85)	1,109,750	1,250	1,119,370	0	15,034	215	1,169,400	5,380	1,190,029
2016	0	8,458	(755)	1,109,750	1,250	1,118,703	0	15,041	(384)	1,169,400	5,380	1,189,437
2017	0	8,455	3,937	1,109,750	1,250	1,123,392	0	15,027	524	1,169,400	5,380	1,190,331
2018	0	8,451	(1,395)	1,109,750	1,250	1,118,056	0	15,045	967	1,169,400	5,380	1,190,792
2019	0	8,440	(126)	1,109,750	1,250	1,119,314	0	15,044	819	1,169,400	5,380	1,190,643
2020	0	8,432	(416)	1,112,850	1,250	1,122,116	0	15,033	(2,184)	1,169,400	5,380	1,187,629
2021	0	8,452	(626)	1,113,500	1,250	1,122,576	0	15,040	1,923	1,169,400	5,380	1,191,743
2022	0	8,455	(1,556)	1,113,500	1,250	1,121,649	0	15,024	(3,692)	1,169,400	5,380	1,186,112
2023	0	8,448	(1,203)	1,113,500	1,250	1,121,995	0	15,008	1,215	1,169,400	5,380	1,191,003
2024	0	8,445	749	1,113,500	1,250	1,123,944	0	14,989	(3,484)	1,169,400	5,380	1,186,285
2025	0	8,453	5,142	1,113,500	1,250	1,128,345	0	15,010	5,017	1,169,400	5,380	1,194,807
2026	0	8,454	(4,415)	1,113,500	1,250	1,118,789	0	14,997	(4,652)	1,169,400	5,380	1,185,125
2027	0	8,456	5,166	1,113,500	1,250	1,128,372	0	15,010	4,647	1,169,400	5,380	1,194,437
2028	0	8,444	(5,237)	1,113,500	1,250	1,117,957	0	15,011	(2,471)	1,169,400	5,380	1,187,320
2029	0	8,451	910	1,113,500	1,250	1,124,111	0	15,001	208	1,169,400	5,380	1,189,989
2030	0	8,444	(263)	1,113,500	1,250	1,122,931	0	15,023	716	1,169,400	5,380	1,190,519
2031	0	8,449	1,018	1,113,500	1,250	1,124,217	0	15,020	469	1,169,400	5,380	1,190,269
2032	0	8,458	1,066	1,113,500	1,250	1,124,274	0	15,028	1	1,169,400	5,380	1,189,809
2033	0	8,436	(4,450)	1,113,500	1,250	1,118,736	0	15,030	(1,089)	1,169,400	5,380	1,188,721
2034	0	8,453	4,285	1,113,500	1,250	1,127,488	0	14,995	(2,686)	1,169,400	5,380	1,187,089

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

	California Aqueduct (continued)											
	West Branch, California Aqueduct (continued)											
	Warne Powerplant						Castaic Powerplant					
				Deliveries						Deliveries		
Calendar Year	Initial Fill Water (87)	Operational Losses (88)	Reservoir Storage Changes (89)	Water Supply (90)	Recreation (91)	Total (92)	Initial Fill Water (93)	Operational Losses (94)	Reservoir Storage Changes (95)	Water Supply (96)	Recreation (97)	Total (98)
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	57,364	1,788	(6,162)	71,938	6,481	131,409
1973	0	0	0	0	0	0	37,198	6,430	4,542	155,297	1,075	204,542
1974	0	0	0	0	0	0	82,364	1,772	(950)	209,136	541	292,863
1975	0	0	0	0	0	0	90,460	5,002	(1,534)	374,280	1,563	469,771
1976	0	0	0	0	0	0	55,990	(7,695)	(132,036)	420,684	1,429	338,372
1977	0	0	0	0	0	0	0	(1,485)	(102,532)	122,447	(20)	18,410
1978	0	0	0	0	0	0	45,105	(2,264)	129,523	171,139	176	343,679
1979	0	0	0	0	0	0	0	(2,339)	(20,400)	145,598	0	122,859
1980	0	0	0	0	0	0	0	991	(118,026)	165,931	481	49,377
1981	0	0	0	0	0	0	0	(44,416)	47,244	283,264	2,704	288,796
1982	0	24,468	61,169	360,878	2,126	448,641	0	(60,135)	59,069	360,878	1,187	360,999
1983	0	20,780	(74,308)	166,995	6,111	119,578	0	(33,418)	(46,904)	166,995	2,618	89,291
1984	0	13,572	(139,219)	275,212	2,208	151,773	0	(29,618)	(139,545)	275,212	2,201	108,250
1985	0	29,286	141,492	403,097	874	574,749	0	(4,622)	135,007	403,097	844	534,326
1986	0	23,008	25,288	393,203	1,777	443,276	0	(5,440)	25,120	393,203	1,777	414,660
1987	0	22,871	(9,464)	433,452	5,698	452,557	0	1,467	(6,069)	433,452	2,734	431,584
1988	0	23,253	(31,545)	507,169	3,389	502,266	0	12,650	(28,590)	507,169	1,359	492,588
1989	0	27,131	(40,718)	611,681	6,083	604,177	0	634	(40,214)	611,681	3,161	575,262
1990	0	34,208	(8,747)	791,355	7,491	824,307	0	(14,012)	(15,110)	786,519	3,419	760,816
1991	0	16,908	71,847	263,909	4,199	356,863	0	(871)	91,055	262,921	2,283	355,388
1992	0	9,638	(41,922)	435,661	1,572	404,949	0	(609)	(58,862)	435,661	1,543	377,733
1993	0	1,922	(124,283)	451,257	1,233	330,129	0	21,959	(77,428)	451,257	1,211	396,999
1994	0	24,122	(96,817)	490,819	2,482	420,606	0	6,176	(96,023)	490,819	2,459	403,431
1995	0	28,263	(96,086)	614,590	5,380	552,147	0	17,135	(90,591)	609,590	2,330	538,464
1996	0	27,996	(18,549)	1,084,462	5,380	1,099,289	0	16,864	(18,549)	1,079,462	2,330	1,080,107
1997	0	14,792	5,817	1,109,000	5,380	1,134,989	0	9,067	5,817	1,104,000	2,330	1,121,214
1998	0	12,978	26,345	1,136,000	5,380	1,180,703	0	6,690	21,443	1,131,000	2,330	1,161,463
1999	0	13,134	(1,424)	1,168,301	5,380	1,185,391	0	6,849	(1,424)	1,163,301	2,330	1,171,056
2000	0	13,124	(1,259)	1,169,400	5,380	1,186,645	0	6,839	(1,259)	1,164,400	2,330	1,172,310
2001	0	13,113	374	1,169,400	5,380	1,188,267	0	6,828	374	1,164,400	2,330	1,173,932
2002	0	13,114	(16)	1,169,400	5,380	1,187,878	0	6,829	(16)	1,164,400	2,330	1,173,543
2003	0	13,098	342	1,169,400	5,380	1,188,220	0	6,813	342	1,164,400	2,330	1,173,885
2004	0	13,117	(655)	1,169,400	5,380	1,187,242	0	6,832	(655)	1,164,400	2,330	1,172,907
2005	0	13,097	(1,477)	1,169,400	5,380	1,186,400	0	6,812	(1,477)	1,164,400	2,330	1,172,065
2006	0	13,129	3,326	1,169,400	5,380	1,191,235	0	6,844	3,326	1,164,400	2,330	1,176,900
2007	0	13,084	(4,876)	1,169,400	5,380	1,182,988	0	6,799	(4,876)	1,164,400	2,330	1,168,653
2008	0	13,103	3,325	1,169,400	5,380	1,191,208	0	6,818	3,325	1,164,400	2,330	1,176,873
2009	0	13,108	1,073	1,169,400	5,380	1,188,961	0	6,823	1,073	1,164,400	2,330	1,174,626
2010	0	13,098	(2,199)	1,169,400	5,380	1,185,679	0	6,813	(2,199)	1,164,400	2,330	1,171,344
2011	0	13,131	2,638	1,169,400	5,380	1,190,549	0	6,846	2,638	1,164,400	2,330	1,176,214
2012	0	13,113	(1,283)	1,169,400	5,380	1,186,610	0	6,828	(1,283)	1,164,400	2,330	1,172,275
2013	0	13,106	(3,020)	1,169,400	5,380	1,184,866	0	6,821	(3,020)	1,164,400	2,330	1,170,531
2014	0	13,087	2,466	1,169,400	5,380	1,190,333	0	6,802	2,466	1,164,400	2,330	1,175,998
2015	0	13,124	215	1,169,400	5,380	1,188,119	0	6,839	215	1,164,400	2,330	1,173,784
2016	0	13,131	(384)	1,169,400	5,380	1,187,527	0	6,846	(384)	1,164,400	2,330	1,173,192
2017	0	13,117	524	1,169,400	5,380	1,188,421	0	6,832	524	1,164,400	2,330	1,174,086
2018	0	13,135	967	1,169,400	5,380	1,188,882	0	6,850	967	1,164,400	2,330	1,174,547
2019	0	13,134	819	1,169,400	5,380	1,188,733	0	6,849	819	1,164,400	2,330	1,174,398
2020	0	13,123	(2,184)	1,169,400	5,380	1,185,719	0	6,838	(2,184)	1,164,400	2,330	1,171,384
2021	0	13,130	1,923	1,169,400	5,380	1,189,833	0	6,845	1,923	1,164,400	2,330	1,175,498
2022	0	13,114	(3,692)	1,169,400	5,380	1,184,202	0	6,829	(3,692)	1,164,400	2,330	1,169,867
2023	0	13,098	1,215	1,169,400	5,380	1,189,093	0	6,813	1,215	1,164,400	2,330	1,174,758
2024	0	13,079	(3,484)	1,169,400	5,380	1,184,375	0	6,794	(3,484)	1,164,400	2,330	1,170,040
2025	0	13,100	5,017	1,169,400	5,380	1,192,897	0	6,815	5,017	1,164,400	2,330	1,178,562
2026	0	13,087	(4,652)	1,169,400	5,380	1,183,215	0	6,802	(4,652)	1,164,400	2,330	1,168,880
2027	0	13,100	4,647	1,169,400	5,380	1,192,527	0	6,815	4,647	1,164,400	2,330	1,178,192
2028	0	13,101	(2,471)	1,169,400	5,380	1,185,410	0	6,816	(2,471)	1,164,400	2,330	1,171,075
2029	0	13,091	208	1,169,400	5,380	1,188,079	0	6,806	208	1,164,400	2,330	1,173,744
2030	0	13,113	716	1,169,400	5,380	1,188,609	0	6,828	716	1,164,400	2,330	1,174,274
2031	0	13,110	469	1,169,400	5,380	1,188,359	0	6,825	469	1,164,400	2,330	1,174,024
2032	0	13,118	1	1,169,400	5,380	1,187,899	0	6,833	1	1,164,400	2,330	1,173,564
2033	0	13,120	(1,089)	1,169,400	5,380	1,186,811	0	6,835	(1,089)	1,164,400	2,330	1,172,476
2034	0	13,085	(2,686)	1,169,400	5,380	1,185,179	0	6,800	(2,686)	1,164,400	2,330	1,170,844

TABLE B-6

Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(Acre-Feet)

Calendar Year	California Aqueduct (continued)						
	Coastal Branch, California Aqueduct						
	Las Perillas and Badger Hill Pumping Plants				Devil's Den, Bluestone, and Polonio Pass Pumping Plants and San Luis Obispo Powerplant		
	Initial Fill Water (99)	Operational Losses (100)	Water Supply Delivery (101)	Total (102)	Operational Losses (103)	Water Supply Delivery (104)	Total (105)
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	210	873	79,039	80,122	0	0	0
1969	0	1,042	62,064	63,106	0	0	0
1970	0	638	83,649	84,287	0	0	0
1971	0	3,455	110,971	114,426	0	0	0
1972	0	1,745	121,755	123,500	0	0	0
1973	0	5,479	78,645	84,124	0	0	0
1974	0	7,344	78,174	85,518	0	0	0
1975	0	5,819	85,216	91,035	0	0	0
1976	0	6,562	90,058	96,620	0	0	0
1977	0	5,777	40,579	46,356	0	0	0
1978	0	9,085	92,604	101,689	0	0	0
1979	0	10,896	123,155	134,051	0	0	0
1980	0	9,449	111,379	120,828	0	0	0
1981	0	13,232	109,754	122,986	0	0	0
1982	0	7,984	95,776	103,760	0	0	0
1983	0	5,710	100,518	106,228	0	0	0
1984	0	5,740	126,387	132,127	0	0	0
1985	0	7,563	120,823	128,386	0	0	0
1986	0	8,562	131,599	140,161	0	0	0
1987	0	11,363	128,080	139,443	0	0	0
1988	0	12,831	120,969	133,800	0	0	0
1989	0	11,454	116,801	128,255	0	0	0
1990	0	13,022	109,802	122,824	0	0	0
1991	0	5,802	1,496	7,298	0	0	0
1992	0	7,893	79,635	87,528	0	0	0
1993	0	9,282	94,921	104,203	0	0	0
1994	0	8,414	87,158	95,572	0	0	0
1995	0	802	101,700	102,502	0	0	0
1996	0	802	123,698	124,500	212	21,998	22,210
1997	0	802	149,510	150,312	212	47,810	48,022
1998	0	802	149,510	150,312	212	47,810	48,022
1999	0	802	162,010	162,812	212	60,310	60,522
2000	0	802	172,186	172,988	212	70,486	70,698
2001	0	802	172,186	172,988	212	70,486	70,698
2002	0	802	172,186	172,988	212	70,486	70,698
2003	0	802	172,186	172,988	212	70,486	70,698
2004	0	802	172,186	172,988	212	70,486	70,698
2005	0	802	172,186	172,988	212	70,486	70,698
2006	0	802	172,186	172,988	212	70,486	70,698
2007	0	802	172,186	172,988	212	70,486	70,698
2008	0	802	172,186	172,988	212	70,486	70,698
2009	0	802	172,186	172,988	212	70,486	70,698
2010	0	802	172,186	172,988	212	70,486	70,698
2011	0	802	172,186	172,988	212	70,486	70,698
2012	0	802	172,186	172,988	212	70,486	70,698
2013	0	802	172,186	172,988	212	70,486	70,698
2014	0	802	172,186	172,988	212	70,486	70,698
2015	0	802	172,186	172,988	212	70,486	70,698
2016	0	802	172,186	172,988	212	70,486	70,698
2017	0	802	172,186	172,988	212	70,486	70,698
2018	0	802	172,186	172,988	212	70,486	70,698
2019	0	802	172,186	172,988	212	70,486	70,698
2020	0	802	172,186	172,988	212	70,486	70,698
2021	0	802	172,186	172,988	212	70,486	70,698
2022	0	802	172,186	172,988	212	70,486	70,698
2023	0	802	172,186	172,988	212	70,486	70,698
2024	0	802	172,186	172,988	212	70,486	70,698
2025	0	802	172,186	172,988	212	70,486	70,698
2026	0	802	172,186	172,988	212	70,486	70,698
2027	0	802	172,186	172,988	212	70,486	70,698
2028	0	802	172,186	172,988	212	70,486	70,698
2029	0	802	172,186	172,988	212	70,486	70,698
2030	0	802	172,186	172,988	212	70,486	70,698
2031	0	802	172,186	172,988	212	70,486	70,698
2032	0	802	172,186	172,988	212	70,486	70,698
2033	0	802	172,186	172,988	212	70,486	70,698
2034	0	802	172,186	172,988	212	70,486	70,698
2035	0	802	172,186	172,988	212	70,486	70,698

TABLE B-7

Reconciliation of Capital Costs Allocated to Water Supply and Power Generation

(Thousands of Dollars)

Item	Project Costs Allocated to Water Supply and Power Generation: Miscellaneous Income Credited to Construction (a (1)	Allowance for Future Price Escalation (b (2)	Costs of Construction of Delivery Structures (c (3)	Costs of Requested Excess Capacity and Future Enlargement (d (4)	Capital Cost Component of Delta Water Charge (e (f (5)	Capital Cost Component of Transportation Water Charge (g (6)	Water Supply and Power Total (7)	Capital Costs Allocated to Other Purposes (8)	Total State Water Project Capital Cost (9)
CONSERVATION FACILITIES									
Upper Feather Division									
Frenchman Dam & Lake	173	0.0	0.0	0.0	601	0.0	774	2,880	3,654
Grizzly Valley Dam & Lake Davis	28	0	0	0	39	0	67	7,364	7,431
Antelope Dam & Lake	0	0	0	0	0.0	0	0	5,523	5,523
Abbey Bridge Dam & Reservoir	0	0.0	0	0	0.0	0	0	519	519
Dixie Refuge Dam & Reservoir	0	0	0	0	0.0	0	0	235	235
Total, Upper Feather Division	201	0	0	0	640	0	841	16,521	17,362
Oroville Division									
Multipurpose Facilities	2,377	21	0	0	366,274	0	368,672	88,547	457,219
Specific Power Facilities	228	8	0	0	106,321	0	106,557	766	107,323
Total, Oroville Division	2,605	29	0	0	472,595	0	475,229	89,313	564,542
California Aqueduct									
North San Joaquin Division	172	10	0	0	78,374	0	78,556	2,867	81,423
San Luis Division	7,798	12	0	0	102,215	0	110,025	4,540	114,565
Total, California Aqueduct	7,970	22	0	0	180,589	0	188,581	7,407	195,988
Delta Facilities	46,816	4,950	0	0	287,105	0.0	338,871	74,299	413,170
Planning and Preoperation	18,939	9,737	0	0	165,660	0	194,336	0	194,336
TOTAL, CONSERVATION FACILIITES	76,531	14,738	0	0	1,106,589	0	1,197,858	187,540	1,385,398
TRANSPORTATION FACILITIES									
Upper Feather Division									
Grizzly Valley Pipeline	(180)	0	180	0	0	341	341	0	341
North Bay Aqueduct	44	17	676	0	0	95,663	96,398	0	96,398
South Bay Aqueduct	1,609	171	1,574	0	0	52,021	55,375	21,668	77,043
California Aqueduct									
North San Joaquin Division	350	29	53	0	0	174,536	174,968	6,380	181,348
San Luis Division	3,305	12	23	0	0	111,005	114,343	6,993	121,336
South San Joaquin Division	83	14	3,318	2,093	0	270,706	276,186	16,694	292,880
Tehachapi Division	25	9	4	5,230	0	294,192	299,124	18,081	317,205
Mojave Division	565	177	732	0	0	357,766	359,240	(7,164)	352,076
Santa Ana Division	507	43	3,317	5,331	0	209,490	239,369	14,459	253,828
West Branch	35,229	60	2,952	37	0	465,093	506,511	30,616	537,127
Coastal Branch	17	2,536	607	0	0	427,772	430,154	0	430,154
Total, California Aqueduct	40,081	2,880	11,006	12,691	0	2,310,560	2,399,895	86,059	2,485,954
TOTAL TRANSPORTATION FACILITIES	41,554	3,068	13,436	12,691	0	2,458,585	2,552,009	107,727	2,659,736
EAST BRANCH ENLARGEMENT	(74)	74	0	0	0	427,833	427,833	0	427,833
SAN JOAQUIN DRAINAGE FACILITIES	(92,124)	0	0	0	0	92,124	0	92,124	92,124
OFF-AQUEDUCT POWER GENERATION FACILITIES	0	0	0	0	0	438,032	438,032	0	438,032
SMALL HYDRO POWER GENERATION FACILITIES	0	0	0	0	0	87,106	87,106	0	87,106
LAND PURCHASE-KERN WATER BANK	0	0	0	0	34,686	0	34,686	0	34,686
UNASSIGNED AND DAVIS-GRUNSKY	5	0	0	0	0	0	5	131,096	131,101
TOTAL THROUGH 2010	25,892	17,880	13,436	12,691	1,141,275	3,503,680	4,737,529	518,487	5,256,016

a) Miscellaneous project receipts that are applied for accounting purposes to reduce the capital costs of the particular facilities.
b) These allowances are included for planning the future financial program, but not for determining current water charges. The costs shown in this appendix are based on prices prevailing on December 31, 1994.
c) See Table B-8.
d) See Table B-9.
e) See Table B-13. A portion of these costs will be offset by power generation sales and credits. The Delta Facilities costs include $36,534,000 not included in Table 15-3.
f) The planning and preoperation costs of conservation facilities include $71,375,000 not included in Table 15-3.
g) See Table B-10.

TABLE B-8

State Water Project Capital Costs of Requested Delivery Structures

(Dollars)

Project Service Area and Water Supply Contractor	Calendar Year Capital Costs (a						Total
	1952–1992 (1)	1993 (2)	1994 (3)	1995 (4)	1996 (5)	1997 (6)	(7)
FEATHER RIVER AREA							
County of Butte	112,444	15,768	6,807	300	0	0	135,319
Plumas County Flood Control and Water Conservation District	0	0	645	0	0	0	645
Thermalito Irrigation District (b	43,939	0	0	0	0	0	43,939
Subtotal	156,383	15,768	7,452	300	0	0	179,903
NORTH BAY AREA							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	655,069	5,244	1,800	0	0	0	662,113
Subtotal	668,659	5,244	1,800	0	0	0	675,703
SOUTH BAY AREA							
Alameda County Flood Control and Water Conservation District, Zone 7	227,925	10,820	9,584	5,000	0	0	253,329
Alameda County Water District	219,288	12,423	773	0	0	0	232,484
Santa Clara Valley Water District	4,005	10,072	360	0	0	0	14,437
San Francisco Water Department(b	1,039,475	3,787	15,307	15,000	0	0	1,073,569
Subtotal	1,490,693	37,102	26,024	20,000	0	0	1,573,819
CENTRAL COASTAL AREA							
San Luis Obispo County Flood Control and Water Conservation District	0	0	7,000	7,000	370,000	0	384,000
Santa Barbara County Flood Control and Water Conservation District	0	35,222	65,000	15,000	30,000	0	145,222
Subtotal	0	35,222	72,000	22,000	400,000	0	529,222
SAN JOAQUIN VALLEY AREA							
Castaic Lake Water Agency	77,557	5,010	3,000	15,000	0	0	100,567
Dudley Ridge Water District	289,412	0	0	5,000	0	0	294,412
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District (c	5,292	0	0	0	0	0	5,292
Kern County Water Agency	2,709,182	0	29,152	10,000	0	0	2,748,334
Oak Flat Water District	45,436	1,446	0	0	0	0	46,882
Tracy Golf and Country Club (c	1,028	0	0	0	0	0	1,028
Tulare Lake Basin Water Storage District	277,483	0	0	0	0	0	277,483
Veterans Administration Cemetery (b	3,342	0	0	0	0	0	3,342
Subtotal	3,415,090	6,456	32,152	30,000	0	0	3,483,698
SOUTHERN CALIFORNIA AREA							
Antelope Valley-East Kern Water Agency	374,141	182	0	0	30,000	0	404,323
Castaic Lake Water Agency	351,745	0	0	0	0	0	351,745
Coachella Valley Water District	14,206	0	0	0	0	0	14,206
Crestline-Lake Arrowhead Water Agency	12,097	0	0	0	0	0	12,097
Desert Water Agency	23,438	0	0	0	0	0	23,438
Littlerock Creek Irrigation District	23,732	0	0	0	0	0	23,732
Mojave Water Agency	114,919	24,748	2,331	40,000	40,000	0	221,998
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	792,582	9,087	0	0	0	0	801,669
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Gorgonio Pass Water Agency	66,530	0	0	0	0	0	66,530
The Metropolitan Water District of Southern California	4,779,958	0	8,536	10,000	30,000	0	4,828,494
Ventura County Flood Control District	79,699	0	0	0	0	0	79,699
Subtotal	6,798,272	34,017	10,867	50,000	100,000	0	6,993,156
TOTAL	12,529,097	98,587	78,295	100,300	100,000	0	13,435,501

a) Approximate only, not to beconstued as invoice amounts.
b) Not a SWP water supply contractor.
c) Not a SWP water supply contractor, but has contracted for water.

TABLE B-9

Capital Costs of Requested Excess Peaking Capacity

Calendar Year	Total Advance Payments and Credits for Excess Capacity (Dollars) (1)	Total Incremental Costs for Excess Capacity (Dollars) (2)	Overpayment (+) or Underpayment (-) (Dollars) (a (3)	Annual Surplus Money Investment Fund Interest Rate (b January–June (4)	Annual Surplus Money Investment Fund Interest Rate (b July–December (5)	Net Overpayment or Underpayment with Interest (c (6)
			Metropolitan Water District of Southern California			
1965	0.0	158,000	(158,000)	3.968%	4.184%	(163,412)
1966	8,056,000	435,800	7,620,200	4.540%	5.057%	7,701,103
1967	9,094,963	1,878,270	7,216,693	4.815%	4.744%	15,524,533
1968	1,523,252	2,887,351	(1,364,099)	5.330%	5.540%	14,959,187
1969	8,310,651	3,059,310	5,251,341	5.946%	6.389%	21,369,973
1970	3,426,736	2,397,102	1,029,634	7.071%	7.125%	23,986,083
1971	1,086,045	1,146,648	(60,603)	5.154%	5.580%	25,238,017
1972	(4,244,807)	487,394	(4,732,201)	4.477%	4.977%	21,532,965
1973	(15,913,829)	25,041	(15,938,870)	6.023%	8.717%	6,014,116
1974	0	37,775	(37,775)	9.222%	10.351%	6,576,393
1975	0	2,085	(2,085)	7.089%	6.791%	7,038,515
1976	0	0	0	6.048%	6.021%	7,469,662
1977	0	0	0	5.788%	6.182%	7,923,403
1978	0	0	0	7.171%	8.096%	8,539,736
1979	0	0	0	8.979%	9.671%	9,354,605
1980	0	0	0	11.500%	11.500%	10,461,314
Total	11,339,011	12,514,776	(1,175,765)	-	-	10,461,314
			San Gabriel Valley Municipal Water District			
1967	0	25,730	(25,730)	4.815%	4.744%	(26,611)
1968	184,422	44,053	140,369	5.330%	5.540%	117,587
1969	49,052	38,075	10,977	5.946%	6.389%	136,751
1970	44,911	17,959	26,952	7.071%	7.125%	175,186
1971	61,588	5,900	55,688	5.154%	5.580%	242,927
1972	(20,263)	6,835	(27,098)	4.477%	4.977%	226,230
1973	(180,465)	0	(180,465)	6.023%	8.717%	49,198
1974	0	0	0	9.222%	10.351%	54,130
1975	0	0	0	7.089%	6.791%	57,952
1976	0	0	0	6.048%	6.021%	61,501
1977	0	0	0	5.788%	6.182%	65,237
1978	0	0	0	7.171%	8.096%	70,312
1979	0	0	0	8.979%	9.671%	77,021
1980	0	0	0	11.500%	11.500%	86,133
Total	139,245	138,552	693	-	-	86,133
			Antelope Valley-East Kern Water Agency			
1968	85,495	1,645	83,850	5.330%	5.540%	86,962
1969	52,625	6,326	46,299	5.946%	6.389%	140,964
1970	101,648	15,076	86,572	7.071%	7.125%	243,222
1971	34,062	11,748	22,314	5.154%	5.580%	279,673
1972	(12,794)	2,018	(14,812)	4.477%	4.977%	277,552
1973	(205,354)	308	(205,662)	6.023%	8.717%	77,288
1974	0	96	(96)	9.222%	10.351%	84,933
1975	0	0	0	7.089%	6.791%	90,929
1976	0	190	(190)	6.048%	6.021%	96,300
1977	0	0	0	5.788%	6.182%	102,150
1978	0	0	0	7.171%	8.096%	110,096
1979	0	0	0	8.979%	9.671%	120,601
1980	0	0	0	11.500%	11.500%	134,869
Total	55,682	37,407	18,275	-	-	134,869

a) Overpayment or underpayment for each calendar year - column (1) minus column (2).
b) Interest rates shown are annual rates. Interest is credited daily at applicable rates on funds deposited in the State's Surplus Money Investment Fund.
c) Amounts shown are end-of-year balances. Interest on overpayments is credited at applicable Surplus Money Investment Fund Interest Rates shown in columns (4) and (5). Interest on underpayments is charged at the 1980 Project Interest Rate of 4.584 percent.

TABLE B-9

Capital Costs of Requested Excess Peaking Capacity

(Dollars)

Reach Number	Annual Required Advance of Funds — Incremental Costs and Advance Payments by Calendar Year: 1965 (7)	1966 (8)	1967 (9)	1968 (10)	1969 (11)	1970 (12)	1971 (13)	1972 (14)	1973 (15)	1974 (16)	1975 (17)	1976 (18)	1981 (19)	Reach Total (20)
Metropolitan Water District of Southern California														
Incremental Costs														
8C		1,000	1,000											2,000
8D		43,500	43,500											87,000
9		27,000	27,000	13,500										67,500
10A		29,700	29,700	14,800										74,200
11B	10,100	18,300	18,300	9,200										55,900
12D	1,800		19,300	25,800	12,900									59,800
12E	1,800		12,400	18,800	10,800									43,800
13B			12,600	37,800	31,600									82,000
14A	2,500	500	11,100	80,216	107,504	124,069	37,519	6,413	381	87				370,289
14B	1,200	1,800		19,100	19,100	12,800								54,000
14C	1,800	900		13,500	13,500	9,000								38,700
15A	700		14,000	66,947	133,357	128,099	54,821	5,327	946	2,076				406,273
16A	700		18,900	137,894	182,000	211,608	133,927	26,203	5,767	6,156				723,155
17E		51,500	444,600	537,247	860,024	998,985	699,281	193,286	17,947	29,456	2,085			3,834,411
17F	109,100	261,600	261,600	261,600	261,600	239,500								1,395,000
25			964,270	1,650,947	1,426,925	673,041	221,100	256,165						5,192,448
28J		304,612	13,706	296,668	65,966	230,169	1,209,586	2,017,134	235,900	4,900				4,378,641
Total	129,700	740,412	1,891,976	3,184,019	3,125,276	2,627,271	2,356,234	2,504,528	260,941	42,675	2,085			16,865,117
8C through 25	1. Advance Payments Applied to Incremental Costs Amendment 2 (d — *Current Adjustment*													
	0	8,056,000	9,094,963	1,523,252	8,310,651	3,426,736	1,086,045	(4,244,807)	(14,381,396)				(356,668)	12,514,776
	2. Interest Credits-Amendment 2 (e													
28J								(1,532,433)			(10,104,646)			(11,637,079)
	3. Advance Payments Applied to Incremental Costs Amendment 5 (f													
	0	1,240,000	1,483,180	2,469,325	(927,035)	1,729,160	3,215,258	2,967,475	1,690,000	(9,488,722)				4,378,641
	4. Interest Credits-Amendment 5 (g													
										(2,721,803)				(2,721,803)
	5. Net Required Advance of Funds													
	0	9,296,000	10,578,143	3,992,577	7,383,616	5,155,896	4,301,303	(1,277,332)	(14,233,829)	(12,210,525)			(10,461,314)	2,524,535
San Gabriel Valley Municipal Water District														
Incremental Costs														
25			25,730	44,053	38,075	17,959	5,900	6,835						138,552
	Total Unadjusted Incremental Costs for Past Payments													
			25,730	44,053	38,075	17,959	5,900	6,835						138,552
	Current Adjustments													
	1. Advance Payments Applied to Incremental Costs (d													
			0	184,422	49,052	44,911	61,588	(20,263)	(174,133)				(7,025)	138,552
	2. Interest Credit													
									(6,332)				(79,108)	(85,440)
	3. Net Required Advance of Funds												(h	
			0	184,422	49,052	44,911	61,588	(20,263)	(180,465)				(86,133)	53,112
Antelope Valley-East Kern Water Agency														
Incremental Costs														
29A				1,645	6,326	13,376	10,048	2,018	308	96	190			34,007
29F						1,700	1,700							3,400
	Total Unadjusted Incremental Costs for Past Payments													
				1,645	6,326	15,076	11,748	2,018	308	96	190			37,407
	Current Adjustment													
	1. Advance Payments Applied to Incremental Costs (d													
				85,495	52,625	101,648	34,062	(12,794)	(189,120)	0	0		(34,509)	37,407
	2. Interest Credit													
									(16,234)				(100,360)	(116,594)
	3. Net Required Advance of Funds												(h	
				85,495	52,625	101,648	34,062	(12,794)	(205,354)	0	0		(134,869)	(79,187)

d) Actual payments are shown for 1965 through 1976, with 1981 adjusted to reflect overpayments and underpayments without interest for prior years.
e) Interest for overpayments and underpayments under provisions of Amendment 2 of the contract.
f) Actual payments are shown for 1965 through 1973 with 1974 adjusted to reflect overpayments and underpayments without interest for prior years.
g) Interest for overpayments and underpayments under provisions of Amendment 5 of the contract.
h) Amounts in excess of incremental costs, under the provisions of the contract, reduce the Transportation Charge capital cost component of the agency's Statement of Charges for January 1981.

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

Calendar Year	Upper Feather Division (1)	North Bay Aqueduct					South Bay Aqueduct			
		Reach 1 (2)	Reach 2 (3)	Reach 3A (4)	Reach 3B (5)	Total (6)	Reach 1 (7)	Reach 2 (8)	Reach 4 (9)	Reach 5 (10)
1952	0	0	0	0	0	0	97	34	30	57
1953	0	0	0	0	0	0	477	166	144	297
1954	0	0	0	0	0	0	1,466	508	437	959
1955	0	0	0	0	0	0	1,944	674	560	1,266
1956	0	0	0	0	0	0	18,789	6,515	5,090	12,545
1957	0	13,290	3,391	0	9,953	26,634	45,090	15,639	12,285	33,218
1958	2	19,202	5,011	0	25,798	50,011	195,985	80,961	7,714	21,930
1959	14	7,517	2,118	0	17,653	27,288	496,140	148,516	24,945	17,118
1960	28	8,797	4,292	0	4,838	17,927	1,130,378	67,351	71,779	68,028
1961	10	1,551	10,318	0	2,526	14,395	3,273,247	180,596	307,885	74,398
1962	32	217	(1,751)	0	414	(1,120)	1,548,884	203,535	695,446	35,102
1963	51	2,510	(1,063)	0	983	2,430	480,716	69,182	2,284,291	206,587
1964	7,791	39,879	12,046	0	21,934	73,859	2,549,118	15,903	181,900	264,410
1965	3,139	72,793	17,900	0	170,361	261,054	807,505	153,454	85,425	447,830
1966	(48)	59,615	12,972	0	438,949	511,536	898,074	149,529	142,096	1,690,200
1967	47	47,257	11,597	0	1,551,023	1,609,877	607,614	50,423	293,304	3,496,284
1968	51,573	70,586	19,560	0	831,158	921,304	965,119	19,543	89,300	2,931,101
1969	234,232	63,650	23,628	0	46,428	133,706	455,173	9,618	3,860	896,727
1970	16,227	59,090	42,733	0	9,415	111,238	52,481	3,380	10,517	154,358
1971	27,204	20,819	31,516	0	8,480	60,815	24,505	4,645	5,035	20,395
1972	9	15,538	12,952	0	10,058	38,548	26,918	825	2,945	26,090
1973	25	18,488	29,018	0	39,878	87,384	24,468	4,010	6,016	12,708
1974	45	67,352	29,978	0	134,332	231,662	17,108	1,192	1,765	65,587
1975	21	62,855	73,112	0	45,091	181,058	57,619	561	1,165	7,291
1976	51	52,419	75,611	218	13,168	141,416	104,242	2,846	8,915	12,701
1977	28	53,274	65,662	2,240	23,138	144,314	176,062	3,625	3,225	16,158
1978	38	61,936	57,158	2,955	28,987	151,036	264,581	4,494	3,668	14,028
1979	23	316,620	91,367	3,953	62,240	474,180	111,106	17,151	8,515	31,725
1980	26	422,804	111,600	19,910	96,125	650,439	368,942	17,708	8,249	38,045
1981	34	430,992	147,295	(10,752)	43,150	610,685	(145,493)	3,589	6,520	12,431
1982	11	934,812	357,720	(7,165)	132,143	1,417,510	(58,449)	17,110	4,427	36,036
1983	19	1,091,091	1,076,627	2,628	517,214	2,687,560	419,518	73,118	34,721	71,032
1984	26	1,875,968	2,317,661	3,290	1,068,363	5,265,282	506,945	36,354	9,609	92,846
1985	29	2,248,491	7,849,886	27,815	3,415,897	13,542,089	29,707	2,168	4,018	26,751
1986	31	16,420,238	10,020,277	1,309,599	1,819,348	29,569,462	85,723	14,714	17,142	13,981
1987	32	11,873,772	7,214,307	1,628,901	1,670,596	22,387,576	124,608	15,693	27,881	32,931
1988	55	3,287,177	1,647,963	1,013,271	686,742	6,635,153	284,881	35,007	50,823	23,930
1989	45	1,056,595	950,991	273,706	374,811	2,656,103	122,336	15,226	34,618	11,545
1990	63	487,782	534,408	212,823	66,802	1,301,815	94,967	18,394	77,462	32,148
1991	54	76,870	17,202	87,258	69,072	250,402	74,343	9,992	18,242	10,505
1992	42	57,850	7,146	74,946	37,129	177,071	111,911	7,038	9,971	23,605
1993	30	104,887	24,906	80,078	72,667	282,538	162,335	18,739	27,952	16,330
1994	12	62,847	13,954	91,035	42,654	210,490	123,183	22,684	25,661	12,611
1995	0	734,000	3,000	0	76,000	813,000	19,000	6,000	6,000	4,788
1996	0	933,000	4,000	0	183,000	1,120,000	19,000	6,000	7,000	4,788
1997	0	799,000	4,000	0	5,000	808,000	19,000	6,000	7,000	4,788
1998	0	4,000	1,000	0	2,000	7,000	16,000	2,000	4,000	1,260
1999	0	0	0	0	0	0	6,000	1,000	1,000	504
2000	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
TOTAL	341,051	44,037,431	32,933,069	4,816,709	13,875,518	95,662,727	16,719,363	1,543,410	4,640,553	11,029,953

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

	South Bay Aqueduct (continued)					California Aqueduct North San Joaquin Division			
Calendar Year	Reach 6 (11)	Reach 7 (12)	Reach 8 (13)	Reach 9 (14)	Total (15)	Reach 1 (16)	Reach 2A (17)	Reach 2B (18)	Subtotal (19)
1952	8	66	72	132	496	4,012	3,279	1,499	8,790
1953	38	327	336	640	2,425	10,559	8,589	3,964	23,112
1954	123	1,005	1,003	1,954	7,455	13,796	11,163	5,179	30,138
1955	160	1,293	1,149	2,454	9,500	7,370	5,952	2,760	16,082
1956	1,559	11,959	11,043	28,372	95,872	9,880	5,020	2,398	17,298
1957	3,659	28,675	27,385	563,114	729,065	11,953	5,456	2,612	20,021
1958	2,243	17,872	17,385	560,904	904,994	18,585	17,191	7,994	43,770
1959	357	3,200	3,568	149,874	843,718	123,170	100,306	45,510	268,986
1960	1,102	2,944	4,498	359,749	1,705,829	191,408	102,136	48,968	342,512
1961	4,726	18,325	22,765	(1,367)	3,880,575	153,765	195,947	42,843	392,555
1962	17,295	160,939	178,242	209,042	3,048,485	612,258	491,225	168,218	1,271,701
1963	265,414	1,250,386	939,832	129,902	5,626,310	1,993,284	1,525,734	684,095	4,203,113
1964	100,603	1,716,371	2,327,770	2,947,522	10,103,597	4,674,280	2,369,858	700,074	7,744,212
1965	42,345	368,476	637,266	1,921,844	4,464,145	5,877,189	6,873,699	2,975,719	15,726,607
1966	17,663	34,915	140,350	777,887	3,850,714	8,553,362	14,112,820	5,677,099	28,343,281
1967	(41,567)	137,856	147,183	379,764	5,070,861	9,678,607	10,672,113	6,646,739	26,997,459
1968	84,553	2,130	68,057	253,152	4,412,955	6,392,664	891,681	1,303,186	8,587,531
1969	4,279	11,572	162,300	32,000	1,575,529	3,542,767	792,259	443,924	4,778,950
1970	2,487	6,820	20,086	(15,718)	234,411	2,236,607	149,692	115,578	2,501,877
1971	4,350	6,923	17,750	39,084	122,687	98,138	215,512	69,410	383,060
1972	1,084	203	4,800	32,199	95,064	159,608	43,721	7,744	211,073
1973	288	989	7,449	9,693	65,621	105,581	25,496	22,418	153,495
1974	527	6,020	30,628	11,433	134,260	177,700	16,627	45,707	240,034
1975	126	679	1,086	3,464	71,991	239,144	14,680	169,676	423,500
1976	701	3,529	8,362	26,186	167,482	641,860	45,533	65,943	753,336
1977	270	1,310	8,651	24,938	234,239	274,381	20,283	22,568	317,232
1978	231	1,204	1,631	17,123	306,960	801,265	36,221	9,714	847,200
1979	1,367	1,721	2,134	7,322	181,041	1,051,792	59,695	26,106	1,137,593
1980	1,321	1,718	2,182	7,102	445,267	4,173,603	96,760	38,789	4,309,152
1981	308	1,461	1,397	5,070	(114,717)	(503,122)	1,487,444	38,432	1,022,754
1982	670	1,286	1,352	3,701	6,133	665,311	38,356	19,274	722,941
1983	377	5,233	7,446	21,341	632,786	679,002	77,066	209,166	965,234
1984	269	1,853	1,667	13,299	662,842	1,559,528	41,349	48,477	1,649,354
1985	376	1,547	2,028	6,158	72,753	666,207	22,058	17,871	706,136
1986	1,119	2,744	3,313	12,233	150,969	398,765	63,825	35,417	498,007
1987	1,496	3,081	3,560	21,842	231,092	799,672	88,945	41,659	930,276
1988	5,699	6,657	7,578	32,796	447,371	2,889,124	(128,397)	(60,190)	2,700,537
1989	2,640	3,839	4,728	13,640	208,572	6,888,853	346,351	170,539	7,405,743
1990	4,230	18,753	35,409	77,450	358,813	13,113,857	79,097	2,384,255	15,577,209
1991	1,845	4,681	7,067	17,474	144,149	13,545,751	103,893	67,895	13,717,539
1992	1,219	2,024	2,470	6,724	164,962	6,023,365	74,104	39,410	6,136,879
1993	3,144	3,830	6,995	14,591	253,916	2,200,174	157,129	86,875	2,444,178
1994	2,704	5,810	5,395	13,895	211,943	1,413,675	117,777	54,589	1,586,041
1995	1,000	2,000	4,000	7,000	49,788	1,139,783	25,995	9,998	1,175,776
1996	1,000	2,000	5,000	9,000	53,788	2,764,141	29,328	10,665	2,804,134
1997	1,000	2,000	5,000	9,000	53,788	2,832,128	29,328	10,665	2,872,121
1998	1,000	1,000	2,000	4,000	31,260	942,487	17,997	7,332	967,816
1999	0	0	0	1,000	9,504	553,228	4,666	2,000	559,894
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	547,408	3,869,226	4,901,368	8,769,979	52,021,260	110,400,517	41,584,959	22,550,763	174,536,239

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	San Luis Division						South San Joaquin Division		
	Reach 3 (20)	Reach 4 (21)	Reach 5 (22)	Reach 6 (23)	Reach 7 (24)	Subtotal (25)	Reach 8C (26)	Reach 8D (27)	Reach 9 (28)
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036
1966	2,312,372	8,527,843	5,765,798	4,230,221	7,708,334	28,544,568	201,274	5,197,322	2,539,278
1967	(44,527)	2,062,305	6,942,522	222,885	6,675,398	15,858,583	212,285	4,982,844	3,363,650
1968	119,884	395,689	973,956	179,917	461,031	2,130,477	64,234	611,192	940,074
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088
1972	15,990	90,852	17,053	14,621	281,343	419,859	10,818	13,349	16,603
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952
1978	8,539	428,395	7,006	3,536	6,994	454,470	7,584	40,453	17,395
1979	(35,394)	543,225	19,463	9,485	(242,253)	294,526	10,474	6,181	6,227
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706
1981	28,457	(2,244,255)	(44,045)	(15,467)	918,848	(1,356,462)	1,145	9,667	9,527
1982	94,395	(1,643,302)	14,950	8,110	3,500,765	1,974,918	1,678	4,945	4,208
1983	71,291	18,149	6,672	5,030	1,795,142	1,896,284	7,532	10,483	9,149
1984	31,746	87,076	26,710	12,753	3,053,656	3,211,941	26,489	10,111	6,267
1985	51,216	47,166	11,616	6,115	578,825	694,938	6,891	8,583	6,720
1986	73,975	201,490	50,664	19,222	1,282,460	1,627,811	8,901	25,022	20,501
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042
1988	(151,539)	213,399	(409,022)	(138,242)	921,231	435,827	9,810	(119,928)	(61,698)
1989	37,631	582,094	230,436	79,301	573,875	1,503,337	5,272	91,327	277,135
1990	3,486	62,885	42,552	15,802	414,358	539,083	2,736	27,132	1,997,627
1991	4,893,093	178,773	56,165	21,229	472,982	5,622,242	3,698	35,375	25,921
1992	(820,973)	283,290	58,271	24,263	293,000	(162,149)	3,160	25,827	18,520
1993	38,631	378,569	114,840	45,928	629,947	1,207,915	8,803	66,794	45,365
1994	1,354,275	368,914	73,049	30,804	991,425	2,818,467	5,087	34,993	26,339
1995	14,104	51,865	22,632	8,487	12,259	109,347	1,886	11,316	9,430
1996	14,809	51,865	26,404	9,430	14,145	116,653	1,886	12,259	10,373
1997	15,514	51,865	26,404	9,430	14,145	117,358	1,886	12,259	10,373
1998	9,873	43,378	15,088	5,658	8,487	82,484	1,886	8,487	6,601
1999	2,821	15,088	2,829	943	1,886	23,567	943	1,886	1,886
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	20,342,226	28,836,983	21,931,674	5,655,731	34,238,438	111,005,052	807,021	12,701,878	10,737,029

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	South San Joaquin Division (continued)								
	Reach 10A (29)	Reach 11B (30)	Reach 12D (31)	Reach 12E (32)	Reach 13B (33)	Reach 14A (34)	Reach 14B (35)	Reach 14C (36)	Reach 15A (37)
1952	695	1,279	1,980	995	1,663	794	212	212	1,911
1953	2,569	4,790	7,480	3,745	6,236	2,599	733	741	7,016
1954	2,821	4,855	7,565	3,792	6,319	2,880	810	817	7,073
1955	1,097	1,557	2,404	1,211	2,025	1,183	325	327	2,253
1956	4,428	6,223	9,233	4,737	8,054	7,026	1,638	1,584	9,939
1957	13,269	18,772	29,082	14,615	24,411	15,651	3,834	3,864	26,871
1958	25,086	48,191	78,564	39,087	61,715	33,726	12,330	11,813	49,499
1959	25,787	67,246	107,781	53,836	86,478	64,824	22,102	21,828	70,838
1960	47,492	66,317	77,936	39,867	63,517	84,363	23,260	22,305	73,305
1961	68,505	46,073	88,274	51,457	28,015	242,753	91,290	65,565	150,205
1962	57,705	56,056	69,189	44,851	49,179	208,180	61,489	47,608	133,653
1963	52,585	91,914	173,985	86,405	67,733	425,626	104,436	77,970	102,072
1964	124,014	333,621	291,013	174,469	86,271	1,093,795	684,005	485,033	571,173
1965	622,257	1,053,029	1,524,848	1,044,851	196,487	3,385,205	1,655,024	1,436,258	476,830
1966	2,800,056	3,709,779	673,429	466,228	418,141	4,916,319	974,862	724,354	1,829,852
1967	3,652,342	4,636,627	1,881,333	1,244,265	1,238,428	2,788,299	525,653	400,183	1,721,304
1968	1,025,969	1,323,302	4,726,074	3,145,775	8,343,706	10,210,266	1,330,361	1,405,117	7,522,015
1969	145,111	229,185	706,272	529,080	3,704,065	15,112,041	1,223,457	1,134,395	9,523,012
1970	74,366	85,151	70,725	72,798	320,797	11,031,255	987,213	738,955	8,836,897
1971	15,595	45,006	43,988	42,624	339,078	2,925,191	193,255	36,514	3,275,227
1972	19,736	32,657	43,939	24,748	81,937	1,388,348	101,784	20,165	1,003,380
1973	14,283	16,448	9,980	16,320	25,090	680,834	19,584	13,469	798,805
1974	22,111	14,951	19,555	32,240	29,582	524,504	30,735	16,333	778,696
1975	15,865	13,479	10,793	13,678	25,827	269,197	25,164	21,048	370,265
1976	76,202	54,217	37,464	59,842	105,332	507,519	59,753	42,776	434,574
1977	75,628	52,919	22,826	54,444	81,293	301,515	49,972	30,152	235,514
1978	48,754	16,469	(2,816)	27,331	43,126	348,674	(653)	1,500	297,817
1979	241	6,906	13,401	14,229	25,411	293,786	9,846	7,856	245,590
1980	18,165	18,813	15,608	27,498	34,190	1,676,267	29,169	23,023	1,719,775
1981	10,290	15,324	28,246	21,872	25,503	(1,074,674)	28,974	34,604	(1,142,444)
1982	4,998	4,720	6,062	5,698	13,728	(765,028)	7,425	28,895	(824,455)
1983	11,779	8,644	13,203	11,327	33,879	405,748	15,572	23,066	101,962
1984	7,532	29,138	93,958	52,372	22,731	60,227	80,334	66,263	64,853
1985	7,985	6,247	4,730	7,000	7,987	(57,078)	8,523	5,030	47,775
1986	22,333	16,795	16,539	25,298	20,481	141,117	26,382	14,189	154,189
1987	16,704	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047
1988	(159,958)	(74,208)	(151,581)	(52,462)	(120,202)	148,471	(75,859)	(75,375)	134,425
1989	69,672	64,740	62,911	119,991	72,967	2,764,379	119,085	36,653	2,940,093
1990	19,505	17,290	16,256	28,464	21,539	305,061	28,084	7,290	267,222
1991	25,099	21,950	20,362	35,458	27,731	178,772	35,111	9,961	145,986
1992	19,228	16,301	14,624	25,260	21,583	240,909	25,343	8,445	203,150
1993	47,600	37,344	33,497	60,286	52,390	319,445	59,859	23,099	274,567
1994	26,203	20,726	19,380	35,215	30,553	148,892	34,113	13,585	130,477
1995	10,373	6,601	6,601	6,601	7,544	33,948	7,544	5,658	26,404
1996	12,259	6,601	8,487	7,544	8,487	33,948	8,487	6,601	25,461
1997	12,259	7,544	8,487	7,544	8,487	33,948	8,487	6,601	25,461
1998	7,544	4,715	3,772	4,715	4,715	29,233	5,658	4,715	23,575
1999	1,886	943	943	943	943	10,373	1,886	943	9,430
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	9,226,025	12,280,759	10,960,751	7,758,167	15,780,587	61,601,764	8,667,062	7,020,569	43,110,539

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

	California Aqueduct (continued)								
	South San Joaquin (continued)		Tehachapi Division			Mojave Division			
Calendar Year	Reach 16A (38)	Subtotal (39)	Reach 17E (40)	Reach 17F (41)	Subtotal (42)	Reach 18A (43)	Reach 19 (44)	Reach 19C (45)	Reach 20A (46)
1952	4,440	16,030	9,703	4,072	13,775	4,090	1,520	0	2,561
1953	16,513	59,323	31,337	13,284	44,621	12,610	4,685	0	7,246
1954	16,601	60,328	46,243	20,010	66,253	16,642	6,184	0	9,506
1955	5,223	19,612	25,880	11,362	37,242	5,612	2,086	0	2,529
1956	21,754	82,940	47,487	17,609	65,096	6,038	2,244	0	2,440
1957	62,657	237,073	119,673	49,130	168,803	22,348	8,304	0	9,035
1958	133,083	537,575	164,056	72,091	236,147	37,917	14,166	123	15,391
1959	205,748	773,179	151,389	57,883	209,272	38,620	23,450	1,102	23,605
1960	204,788	774,678	203,222	45,323	248,545	21,356	26,093	5,318	40,523
1961	206,305	1,148,969	387,819	85,558	473,377	35,664	32,281	2,262	34,918
1962	171,396	1,127,293	353,119	82,610	435,729	68,508	266,284	1,841	10,323
1963	481,941	1,913,123	1,191,633	124,757	1,316,390	37,379	435,881	4,137	39,706
1964	1,778,952	5,834,889	1,866,000	775,005	2,641,005	95,693	706,369	8,564	43,342
1965	1,268,176	13,733,092	2,574,824	2,284,869	4,859,693	121,060	716,092	9,156	108,519
1966	2,896,274	27,347,168	5,537,412	9,323,517	14,860,929	366,116	1,644,699	13,373	159,282
1967	3,442,021	30,089,234	26,239,390	12,398,708	38,638,098	1,312,022	903,880	24,103	645,078
1968	7,578,498	48,226,583	33,363,479	7,416,464	40,779,943	136,804	7,109,653	71,388	1,889,601
1969	13,136,056	45,702,910	40,368,425	6,883,206	47,251,631	213,805	2,465,641	7,423	5,939,151
1970	13,890,751	36,322,845	35,446,706	6,786,231	42,232,937	2,211,077	1,210,665	6,217	3,652,478
1971	7,903,937	14,885,415	20,141,395	6,835,303	26,976,698	1,496,843	284,738	6,994	1,074,759
1972	3,025,555	5,783,019	10,002,935	34,791	10,037,726	129,417	409,903	3,620	471,963
1973	1,472,313	3,096,609	3,090,140	36,207	3,126,347	23,931	75,638	2,539	88,416
1974	1,031,843	2,546,984	4,798,348	152,494	4,950,842	28,399	205,581	2,703	138,673
1975	489,545	1,289,211	2,144,178	411,404	2,555,582	44,774	70,652	5,066	68,157
1976	618,049	2,154,103	1,124,357	174,629	1,298,986	121,043	84,593	6,786	59,967
1977	580,209	1,673,525	655,047	31,512	686,559	261,400	133,767	7,521	117,878
1978	582,775	1,428,409	1,900,843	27,956	1,928,799	553,014	57,150	5,872	51,615
1979	542,554	1,182,702	2,099,385	61,381	2,160,766	633,284	339,536	10,831	37,085
1980	3,772,498	7,372,362	17,433,610	6,046	17,439,656	1,141,829	1,073,430	3,604	308,188
1981	(2,526,266)	(4,558,232)	(3,848,472)	6,903	(3,841,569)	1,226,508	845,669	4,498	48,603
1982	1,880,867)	(3,387,993)	11,316,570	5,317	11,321,887	7,050,992	741,321	3,920	30,521
1983	145,221	797,565	8,827,377	7,322	8,834,699	11,037,158	61,202	2,596	37,390
1984	123,142	643,417	3,227,923	31,701	3,259,624	8,382,266	309,489	3,124	17,504
1985	71,830	132,223	1,909,966	10,029	1,919,995	5,268,796	251,089	3,885	71,428
1986	186,654	678,401	1,381,923	33,787	1,415,710	2,093,798	2,324,849	4,261	2,510,913
1987	194,936	718,184	671,183	13,807	684,990	1,348,349	54,431	4,684	623,872
1988	249,617	(348,948)	1,391,936	(49,791)	1,342,145	847,278	(91,247)	5,800	(64,261)
1989	5,940,754	12,564,979	484,130	64,615	548,745	376,579	223,073	43,794	150,133
1990	417,279	3,155,485	476,609	22,259	498,868	131,080	(415,802)	10,596	(602,148)
1991	523,050	1,088,474	413,022	27,721	440,743	157,488	(130,941)	13,214	(257,075)
1992	280,293	902,643	508,097	21,464	529,561	475,510	220,384	9,920	147,932
1993	411,477	1,440,526	702,683	26,775	729,458	1,049,046	92,567	9,351	56,446
1994	198,311	723,874	496,442	15,113	511,555	973,957	58,261	12,138	43,617
1995	42,435	176,341	58,466	2,829	61,295	2,829	10,373	0	8,487
1996	42,435	184,828	56,580	3,772	60,352	2,829	11,316	0	10,373
1997	42,435	185,771	54,694	3,772	58,466	1,886	12,259	0	10,373
1998	36,777	142,393	50,922	1,886	52,808	943	5,658	0	5,658
1999	14,145	47,150	20,746	0	20,746	0	943	0	943
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	70,054,113	270,706,264	239,718,832	54,472,693	294,191,525	49,624,587	22,900,059	342,324	17,902,644

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	Mojave Division (continued)							Santa Ana Division	
	Reach 20B (47)	Reach 21 (48)	Reach 22A (49)	Reach 22B (50)	Reach 23 (51)	Reach 24 (52)	Subtotal (53)	Reach 25 (54)	Reach 26A (55)
1952	892	5,788	35	2,013	2,074	2,413	21,386	3,334	5,599
1953	3,402	17,846	71	5,752	6,886	7,438	65,936	10,275	17,264
1954	4,548	23,558	369	8,560	7,849	9,820	87,036	13,566	22,790
1955	2,213	7,947	178	2,754	2,725	3,313	29,357	4,575	7,687
1956	2,655	8,542	216	2,905	2,961	3,561	31,562	4,917	8,264
1957	9,826	31,616	800	10,757	10,962	13,177	116,825	18,205	30,586
1958	16,752	53,569	1,397	18,717	18,578	22,627	199,237	31,001	52,019
1959	18,604	56,724	1,844	25,421	20,372	45,646	255,388	39,325	58,137
1960	37,179	43,893	11,029	136,751	17,152	109,816	449,110	65,655	93,700
1961	37,102	21,532	14,517	215,859	9,546	373,473	777,154	26,979	56,734
1962	10,730	8,197	4,186	164,168	4,336	279,421	817,994	9,964	36,235
1963	40,865	26,670	17,081	237,695	7,228	358,503	1,205,145	31,013	112,271
1964	71,116	33,912	22,793	262,996	6,863	244,003	1,495,651	69,669	202,642
1965	343,506	91,095	65,689	827,655	11,836	621,566	2,916,174	279,237	206,356
1966	1,311,628	160,388	178,538	1,746,245	31,078	1,018,628	6,629,975	415,066	364,004
1967	1,718,942	498,257	367,961	3,146,128	62,135	2,331,106	11,009,612	3,184,296	638,539
1968	2,291,691	1,141,929	1,145,768	4,588,850	102,207	2,600,293	21,078,184	8,264,126	1,268,194
1969	5,626,284	2,358,737	1,515,147	7,750,478	260,659	11,131,406	37,268,731	6,807,783	1,768,456
1970	5,304,372	3,232,911	2,081,810	23,451,612	1,240,798	16,885,193	59,277,133	2,169,051	7,229,429
1971	1,091,123	825,070	432,464	16,772,680	1,922,115	5,385,721	29,292,507	1,135,248	9,811,736
1972	635,507	484,772	324,865	3,788,894	48,049	788,479	7,085,469	1,095,740	5,528,987
1973	83,840	63,774	36,179	1,623,274	24,333	4,225,877	6,247,801	136,994	1,810,729
1974	118,639	103,545	54,198	5,699,605	130,567	766,562	7,248,472	68,180	1,922,999
1975	169,294	167,240	19,453	4,793,580	19,467	373,783	5,731,466	166,653	3,787,797
1976	102,909	44,896	24,732	3,103,916	84,188	204,705	3,837,735	475,176	1,494,750
1977	120,160	71,389	49,445	1,654,122	60,112	232,230	2,708,024	76,255	776,085
1978	68,838	32,855	18,183	677,448	36,484	210,198	1,711,657	57,463	131,076
1979	36,225	18,948	10,675	560,506	10,634	103,615	1,761,339	29,960	80,482
1980	284,545	133,526	121,171	2,239,224	64,447	559,963	5,929,927	31,462	181,638
1981	32,194	13,211	6,458	(774,817)	160,853	203,929	1,767,106	5,861	68,934
1982	74,087	10,928	12,990	395,921	434,572	73,079	8,828,331	8,887	139,927
1983	55,818	23,930	9,098	424,785	2,198,900	51,334	13,902,211	4,155	514,813
1984	35,377	845,422	6,052	(38,450)	1,369,400	34,762	10,964,946	3,850	270,448
1985	(202,609)	(432,829)	1,984,973	655,739	973,830	49,530	8,623,832	5,265	91,233
1986	(1,918,886)	(1,245,543)	3,328,850	1,210,528	235,586	51,990	8,596,346	9,926	233,108
1987	(306,867)	78,262	66,943	4,585,196	161,155	91,223	6,707,248	4,908	262,960
1988	(58,405)	43,822	353,725	1,325,045	600,173	197,437	3,159,367	7,353	673,117
1989	175,456	171,867	538,113	4,807,090	1,575,833	432,913	8,494,851	8,093	152,164
1990	(442,430)	(604,203)	(94,610)	9,565,467	1,558,619	324,122	9,430,691	176,251	76,465
1991	(176,951)	(249,210)	(42,789)	8,794,665	3,978,623	133,442	12,220,466	202,339	272,776
1992	163,996	(371,862)	48,707	4,767,405	9,256,483	128,069	14,846,544	334,509	(951,731)
1993	51,021	71,662	27,944	1,698,862	17,423,687	119,458	20,600,044	1,498,060	5,349,176
1994	44,828	50,322	25,498	139,811	8,673,590	76,928	10,098,950	2,166,342	3,588,655
1995	7,544	5,658	3,772	307,418	3,342,935	11,316	3,700,332	7,859,905	22,632
1996	8,487	6,601	4,715	249,895	3,772	11,316	309,304	18,578,986	21,689
1997	8,487	6,601	4,715	61,295	3,772	11,316	120,704	4,265,189	20,746
1998	4,715	3,772	2,829	46,207	2,829	10,373	82,984	943	19,803
1999	943	943	943	16,031	943	3,772	25,461	0	7,544
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	17,120,192	8,198,480	12,809,720	121,756,658	56,182,196	50,928,845	357,765,705	59,861,990	48,539,644

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

	California Aqueduct (continued)								
	Santa Ana Division (continued)				West Branch				
Calendar Year	Reach 28G (a (56)	Reach 28H (57)	Reach 28J (58)	Subtotal (59)	Reach 29A (60)	Reach 29F (61)	Reach 29G (62)	Reach 29H (63)	Reach 29J (64)
1952	4,785	4,055	3,020	20,793	2,924	136	175	459	553
1953	15,580	11,511	9,476	64,106	9,093	344	237	1,754	1,683
1954	18,015	18,100	12,160	84,631	7,389	1,201	2,229	2,350	4,162
1955	6,052	6,081	4,151	28,546	1,019	585	1,086	1,147	2,029
1956	6,496	6,525	4,480	30,682	490	698	1,297	1,366	2,420
1957	24,044	24,156	16,585	113,576	1,809	2,583	4,792	5,057	8,952
1958	40,844	41,033	28,470	193,367	3,256	4,516	8,714	8,878	15,847
1959	45,746	45,946	44,331	233,485	7,953	9,150	19,414	18,243	35,583
1960	59,102	58,548	118,969	395,974	21,753	14,990	34,447	29,764	69,752
1961	32,226	34,382	674,787	825,108	22,442	12,775	21,559	20,086	39,761
1962	21,383	20,530	47,484	135,596	40,237	28,729	86,938	58,215	108,962
1963	43,884	41,698	1,506,440	1,735,306	91,959	69,162	163,347	110,015	211,592
1964	89,710	45,762	98,569	506,352	150,670	66,420	207,977	143,340	291,404
1965	96,956	76,899	146,095	805,543	361,811	77,914	403,115	127,430	589,638
1966	170,878	308,756	589,107	1,847,811	489,512	203,497	1,233,640	348,918	3,231,797
1967	233,968	283,126	987,832	5,327,761	1,589,715	882,096	1,117,243	891,607	31,088,491
1968	871,337	266,295	780,587	11,450,539	3,899,363	300,921	396,190	1,104,832	36,157,768
1969	1,117,873	1,444,654	756,442	11,895,208	6,592,580	336,480	693,348	1,184,454	9,655,871
1970	1,843,621	1,013,468	2,829,523	15,085,092	7,986,733	6,089,401	2,624,747	3,002,968	8,463,475
1971	16,095,702	6,401,303	12,111,623	45,555,612	4,247,037	3,768,699	1,120,231	8,244,651	5,844,024
1972	1,537,880	11,960,791	21,542,747	41,666,145	1,871,831	426,932	985,512	18,787,722	(23,015,734)
1973	209,664	247,769	3,673,344	6,078,500	775,824	168,064	399,856	9,408,706	1,821,206
1974	162,178	101,638	1,980,991	4,235,986	560,657	168,878	169,717	3,901,261	(3,454,239)
1975	157,365	124,399	1,626,274	5,862,488	353,670	421,176	925,693	664,113	609,891
1976	178,287	118,748	1,497,465	3,764,426	396,809	650,417	1,274,484	706,244	650,209
1977	127,106	89,036	323,091	1,391,573	390,637	3,018,637	2,152,961	196,012	1,135,148
1978	147,112	153,867	347,482	837,000	1,427,190	2,219,135	6,694,615	57,817	149,932
1979	29,723	19,225	225,947	385,337	940,013	2,168,382	19,813,742	597,858	331,313
1980	137,833	154,821	1,077,900	1,583,654	1,276,793	4,108,143	24,537,814	550,337	204,751
1981	28,804	22,647	61,323	187,569	(711,886)	2,699,859	19,806,507	94,795	28,838
1982	13,697	57,386	37,860	257,757	(488,157)	348,325	17,953,359	188,981	40,158
1983	16,051	88,515	(269,781)	353,753	85,883	179,938	6,749,466	215,277	21,801
1984	14,461	12,258	49,544	350,561	71,753	68,930	2,870,253	335,941	17,284
1985	17,008	10,954	49,394	173,854	133,991	24,204	2,124,995	95,971	21,231
1986	31,563	25,036	86,784	386,417	133,898	62,292	274,657	142,014	36,148
1987	17,141	8,005	45,528	338,542	13,936	453,949	711,773	192,643	27,931
1988	41,735	21,046	90,494	833,745	426,579	106,846	1,655,310	203,023	95,851
1989	28,541	12,570	51,421	252,789	206,308	417,317	576,157	241,814	97,403
1990	19,913	8,189	30,816	311,634	69,138	264,610	275,615	768,561	43,568
1991	139,815	14,458	51,797	681,185	111,903	89,215	324,435	1,070,264	55,515
1992	33,966	13,774	65,192	(504,290)	188,904	67,256	361,066	4,365,674	49,880
1993	28,514	17,057	74,080	6,966,887	234,408	83,950	484,172	3,218,908	59,885
1994	12,307	9,299	33,451	5,810,054	115,696	52,578	227,729	272,842	30,831
1995	7,544	7,544	20,746	7,918,371	27,347	6,601	144,279	17,917	6,601
1996	9,430	8,487	20,746	18,639,338	25,461	7,544	9,546,932	17,917	6,601
1997	9,430	9,430	20,746	4,325,541	25,461	7,544	8,487	17,917	6,601
1998	4,715	3,772	19,803	49,036	24,518	4,715	5,658	16,974	3,772
1999	943	943	7,544	16,974	10,373	1,886	1,886	6,601	943
2000	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	24,000,928	23,474,492	53,612,860	209,489,914	34,226,683	30,167,620	129,197,856	61,659,638	74,907,083

a) Includes excess capacity costs (not shown in Table B-9) allocated to MWDSC in the following years and repaid under Article 24(c) of its contract: 1970 - $362,000; 1971 - $6,198,000; 1972 - $139,000.

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								Grand Total (73)
	West Branch (continued)		Coastal Branch					Total (72)	
	Reach 30 (65)	Subtotal (66)	Reach 31A (67)	Reach 33A (68)	Reach 34 (69)	Reach 35 (70)	Subtotal (71)		
1952	1,408	5,655	0	0	0	0	0	98,857	99,353
1953	4,346	17,457	0	0	0	0	0	309,387	311,812
1954	5,743	23,074	0	0	0	0	0	394,688	402,143
1955	1,943	7,809	0	0	0	0	0	159,842	169,342
1956	2,077	8,348	0	0	0	0	0	255,679	351,551
1957	7,684	30,877	0	0	0	0	0	708,753	1,464,452
1958	13,931	55,142	0	0	0	0	0	1,331,616	2,286,623
1959	44,384	134,727	28,046	49,114	0	7,441	84,601	2,088,156	2,959,176
1960	84,703	255,409	34,404	70,450	0	8,507	113,361	2,922,784	4,646,568
1961	123,330	239,953	13,801	17,868	0	1,501	33,170	4,646,333	8,541,313
1962	348,366	671,447	10,121	7,798	0	524	18,443	5,826,085	8,873,482
1963	521,491	1,167,566	20,470	14,299	0	880	35,649	18,978,544	24,607,335
1964	1,372,464	2,232,275	315,418	26,963	0	1,687	344,068	31,545,174	41,730,421
1965	3,383,950	4,943,858	747,023	36,178	0	2,118	785,319	57,929,345	62,657,683
1966	9,364,753	14,872,117	2,258,915	35,864	0	1,736	2,296,515	124,742,364	129,104,566
1967	17,618,827	53,187,979	6,310,419	38,331	0	1,891	6,350,641	187,459,367	194,140,152
1968	15,736,691	57,595,765	2,707,580	30,784	0	1,324	2,739,688	192,588,710	197,974,542
1969	16,228,175	34,690,908	423,797	26,549	0	907	451,253	182,527,118	184,470,585
1970	22,330,328	50,497,652	269,194	24,368	0	851	294,413	206,717,987	207,079,863
1971	16,890,503	40,115,145	164,446	32,230	0	1,315	197,991	158,410,229	158,620,935
1972	3,818,001	2,874,264	131,332	17,601	0	522	149,455	68,227,010	68,360,631
1973	13,426,222	25,999,878	182,493	16,154	0	542	199,189	45,109,065	45,262,095
1974	2,988,318	4,334,592	190,866	18,799	0	463	210,128	24,034,794	24,400,761
1975	1,808,235	4,782,778	64,582	36,012	0	2,255	102,849	21,059,112	21,312,182
1976	1,253,067	4,931,230	198,266	68,898	0	5,088	272,252	17,168,973	17,477,922
1977	345,023	7,238,418	918,473	81,305	0	1,834	1,001,612	15,160,414	15,538,995
1978	763,445	11,312,134	52,994	83,300	0	1,302	137,596	18,657,265	19,115,299
1979	282,145	24,133,453	38,182	108,951	0	1,505	148,638	31,204,354	31,859,598
1980	2,055,206	32,733,044	189,070	337,328	0	1,029	527,427	73,864,439	74,960,171
1981	275,379	22,193,492	19,817	(214,426)	0	1,254	(193,355)	15,221,303	15,717,305
1982	338,464	18,381,130	(28,703)	(167,229)	0	442	(195,490)	37,903,481	39,327,135
1983	556,120	7,808,485	75,849	9,225	0	654	85,728	34,643,959	37,964,324
1984	1,118,950	4,483,111	28,564	6,794	0	570	35,928	24,598,882	30,527,032
1985	276,457	2,676,849	31,438	16,371	0	1,452	49,261	14,977,088	28,591,959
1986	213,432	862,441	82,347	150,211	0	13,472	246,030	14,311,163	44,031,625
1987	158,406	1,558,638	53,817	975,376	0	87,488	1,116,681	12,737,302	35,356,002
1988	221,672	2,709,281	179,157	1,053,987	0	94,543	1,327,687	12,159,641	19,242,220
1989	148,417	1,687,416	80,360	817,950	0	73,372	971,682	33,429,542	36,294,262
1990	81,010	1,502,502	55,719	997,688	0	89,486	1,142,893	32,158,365	33,819,056
1991	164,656	1,815,988	87,423	1,522,318	0	117,805	1,727,546	37,314,183	37,708,788
1992	170,350	5,203,130	101,206	2,915,019	6,347	162,404	3,184,976	30,137,294	30,479,369
1993	126,523	4,207,846	167,472	10,557,441	966,213	1,081,505	12,772,631	50,369,485	50,905,969
1994	133,721	833,397	88,828	43,858,921	3,897,064	4,242,892	52,087,705	74,470,043	74,892,488
1995	32,062	234,807	77,000	129,180,543	65,405,970	21,898,759	216,562,272	229,938,541	230,801,329
1996	32,062	9,636,517	88,000	26,064,009	54,445,647	35,572,181	116,169,837	147,920,963	149,094,751
1997	32,062	98,072	88,000	1,562,083	323,002	330,915	2,304,000	10,082,033	10,943,821
1998	20,746	76,383	82,000	786,950	70,300	204,750	1,144,000	2,597,904	2,636,164
1999	8,487	30,176	38,000	332,550	29,700	87,750	488,000	1,211,968	1,221,472
2000	0	0	0	110,850	9,900	29,250	150,000	150,000	150,000
2001	0	0	0	73,900	6,600	19,500	100,000	100,000	100,000
2002	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0
TOTAL	134,933,735	465,092,615	16,666,186	221,789,675	125,160,743	64,155,666	427,772,270	2,310,559,584	2,458,584,622

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	Upper Feather Division (1)	North Bay Aqueduct					South Bay Aqueduct			
		Reach 1 (2)	Reach 2 (3)	Reach 3A (4)	Reach 3B (5)	Total (6)	Reach 1 (7)	Reach 2 (8)	Reach 4 (9)	Reach 5 (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	37,396	5,522	0	0
1963	0	0	0	0	0	0	147,719	20,639	0	0
1964	0	0	0	0	0	0	149,750	15,574	19,405	0
1965	0	0	0	0	0	0	259,939	45,718	46,485	0
1966	0	0	0	0	0	0	270,890	23,799	63,921	0
1967	0	0	0	0	0	0	438,050	32,798	108,127	0
1968	0	0	0	0	130	130	410,919	44,277	66,973	706
1969	0	0	0	0	80,875	80,875	487,377	48,339	75,644	706
1970	0	0	0	0	94,872	94,872	381,734	44,852	64,833	71,376
1971	54	0	0	0	45,579	45,579	357,850	25,666	50,344	38,735
1972	40	0	0	0	37,895	37,895	347,941	30,606	56,800	100,106
1973	1	0	0	0	32,993	32,993	386,897	36,172	58,288	28,810
1974	143	0	0	0	46,498	46,498	456,381	57,081	83,120	61,623
1975	1,069	0	0	0	37,707	37,707	624,989	46,111	81,361	36,682
1976	139	0	0	0	60,786	60,786	614,362	47,862	123,838	91,096
1977	892	0	0	0	78,400	78,400	511,065	48,926	104,280	102,083
1978	39	0	0	0	56,318	56,318	671,195	125,224	176,855	50,289
1979	3,235	0	0	0	73,852	73,852	650,826	76,849	212,826	91,380
1980	416	0	0	0	81,770	81,770	1,128,863	212,974	242,118	110,792
1981	3,847	0	0	0	100,779	100,779	882,727	130,127	167,121	204,787
1982	10,956	0	0	0	191,985	191,985	1,156,559	141,702	249,398	116,675
1983	(422)	0	0	0	80,218	80,218	1,258,227	84,370	373,905	151,861
1984	643	0	0	0	139,082	139,082	1,998,456	113,797	340,347	34,457
1985	2,599	0	0	0	259,561	259,561	2,044,693	207,479	427,930	247,387
1986	2,595	0	0	0	229,424	229,424	1,833,723	285,914	305,164	158,996
1987	2,595	0	0	0	309,138	309,138	2,099,148	163,715	400,551	282,148
1988	2,600	0	0	0	329,867	329,867	2,072,069	186,319	299,992	369,490
1989	2,672	467,483	178,186	233,909	371,179	1,250,757	2,160,354	163,549	320,836	495,064
1990	2,687	548,678	244,901	120,244	423,365	1,337,188	2,212,247	251,426	354,998	565,877
1991	2,730	645,865	302,481	203,513	425,682	1,577,541	1,788,127	152,492	95,772	91,631
1992	2,774	439,878	189,362	262,949	277,487	1,169,676	2,512,482	450,697	505,645	505,401
1993	2,529	447,483	230,184	215,788	290,885	1,184,340	3,974,570	627,654	502,808	435,501
1994	3,058	433,876	208,519	208,488	348,864	1,199,747	4,555,898	382,962	419,379	416,906
1995	3,210	818,002	240,819	372,572	332,673	1,764,066	3,886,268	389,586	562,674	445,350
1996	3,370	833,469	243,516	383,887	337,942	1,798,814	3,818,315	401,974	598,249	450,590
1997	3,538	834,478	226,877	393,270	335,899	1,790,524	3,755,304	403,733	611,694	497,466
1998	3,538	836,521	233,193	404,408	344,516	1,818,638	3,443,033	415,273	629,897	520,051
1999	3,538	839,032	233,801	405,951	345,362	1,824,146	3,451,789	416,529	631,626	523,703
2000	3,538	839,255	233,804	406,067	345,424	1,824,550	3,451,979	416,547	631,676	524,126
2001	3,538	839,447	233,805	406,167	345,475	1,824,894	3,452,144	416,563	631,723	524,354
2002	3,538	839,671	233,806	406,284	345,535	1,825,296	3,452,337	416,583	631,778	524,625
2003	3,538	839,900	233,807	406,404	345,597	1,825,708	3,452,537	416,602	631,833	524,901
2004	3,538	840,138	233,809	406,528	345,659	1,826,134	3,452,742	416,623	631,891	525,187
2005	3,538	839,243	233,801	406,062	345,415	1,824,521	3,451,969	416,544	631,668	524,085
2006	3,538	839,368	233,801	406,128	345,447	1,824,744	3,452,078	416,554	631,699	524,237
2007	3,538	839,483	233,801	406,188	345,477	1,824,949	3,452,178	416,565	631,726	524,376
2008	3,538	839,664	233,801	406,283	345,525	1,825,273	3,452,335	416,581	631,770	524,595
2009	3,538	839,805	233,801	406,357	345,561	1,825,524	3,452,458	416,593	631,805	524,763
2010	3,538	839,973	233,802	406,445	345,604	1,825,824	3,452,601	416,607	631,843	524,952
2011	3,538	840,149	233,802	406,538	345,650	1,826,139	3,452,754	416,622	631,887	525,164
2012	3,538	840,279	233,802	406,606	345,683	1,826,370	3,452,867	416,632	631,918	525,322
2013	3,538	840,642	233,804	406,796	345,779	1,827,021	3,453,182	416,665	632,006	525,759
2014	3,538	840,899	233,804	406,931	345,848	1,827,482	3,453,402	416,683	632,059	526,019
2015	3,538	840,936	233,803	406,951	345,859	1,827,549	3,453,437	416,690	632,078	526,111
2016	3,538	841,006	233,802	406,988	345,875	1,827,671	3,453,498	416,696	632,094	526,197
2017	3,538	840,988	233,802	406,979	345,870	1,827,639	3,453,484	416,695	632,090	526,176
2018	3,538	840,986	233,801	406,979	345,870	1,827,636	3,453,483	416,695	632,090	526,175
2019	3,538	840,989	233,801	406,980	345,868	1,827,638	3,453,486	416,695	632,091	526,180
2020	3,538	840,695	233,798	406,827	345,791	1,827,111	3,453,233	416,669	632,020	525,825
2021	3,538	840,718	233,798	406,839	345,797	1,827,152	3,453,252	416,671	632,025	525,850
2022	3,538	840,655	233,798	406,806	345,778	1,827,037	3,453,198	416,666	632,009	525,778
2023	3,538	840,677	233,798	406,818	345,785	1,827,078	3,453,218	416,668	632,015	525,803
2024	3,538	840,684	233,798	406,822	345,788	1,827,092	3,453,224	416,668	632,017	525,812
2025	3,538	840,685	233,798	406,822	345,788	1,827,093	3,453,225	416,668	632,017	525,814
2026	3,538	840,551	233,798	406,752	345,750	1,826,851	3,453,108	416,656	631,984	525,651
2027	3,538	840,572	233,798	406,762	345,755	1,826,887	3,453,126	416,659	631,989	525,675
2028	3,538	840,554	233,798	406,753	345,751	1,826,856	3,453,111	416,657	631,985	525,655
2029	3,538	840,567	233,798	406,760	345,754	1,826,879	3,453,122	416,658	631,988	525,671
2030	3,538	840,552	233,798	406,752	345,750	1,826,852	3,453,109	416,657	631,985	525,652
2031	3,538	840,572	233,798	406,763	345,756	1,826,889	3,453,127	416,658	631,988	525,672
2032	3,538	840,573	233,798	406,763	345,756	1,826,890	3,453,128	416,658	631,990	525,675
2033	3,538	840,540	233,798	406,746	345,747	1,826,831	3,453,098	416,656	631,981	525,634
2034	3,538	840,538	233,798	406,745	345,747	1,826,828	3,453,097	416,656	631,980	525,633
2035	3,538	840,566	233,798	406,759	345,754	1,826,877	3,453,120	416,657	631,987	525,664
TOTAL	192,453	37,397,285	10,948,666	17,844,129	18,646,851	84,836,931	181,543,579	21,357,304	32,182,889	26,212,493

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	South Bay Aqueduct (continued)					California Aqueduct			
						North San Joaquin Division			
	Reach 6 (11)	Reach 7 (12)	Reach 8 (13)	Reach 9 (14)	Total (15)	Reach 1 (16)	Reach 2A (17)	Reach 2B (18)	Subtotal (19)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	42,918	0	0	0	0
1963	0	0	0	0	168,358	0	0	0	0
1964	0	0	0	0	184,729	0	0	0	0
1965	2,634	6,490	4,704	12,904	378,874	0	0	0	0
1966	4,707	10,328	9,233	25,519	408,397	0	0	0	0
1967	2,712	7,659	10,812	34,347	634,505	0	0	0	0
1968	3,109	7,960	10,166	40,372	584,482	1,001,998	228,359	103,116	1,333,473
1969	3,944	5,975	8,795	38,566	669,346	933,116	301,596	188,194	1,422,906
1970	2,464	(1,991)	6,870	28,210	598,348	971,602	306,198	151,539	1,429,339
1971	3,116	9,394	9,895	31,068	526,068	1,103,021	254,786	113,694	1,471,501
1972	5,125	10,247	12,054	44,699	607,578	1,107,855	230,906	110,109	1,448,870
1973	4,178	7,500	4,890	43,816	570,551	1,150,864	221,445	100,221	1,472,530
1974	7,812	7,564	5,523	48,054	727,158	1,272,034	231,383	117,156	1,620,573
1975	18,120	14,683	18,325	68,377	908,648	1,434,736	455,110	201,075	2,090,921
1976	10,873	5,557	19,920	49,921	963,429	1,519,801	217,348	453,400	2,190,549
1977	(240)	2,228	8,391	89,579	866,312	1,913,643	292,380	196,564	2,402,587
1978	(1,404)	16,766	(5,313)	104,078	1,137,690	1,860,456	306,503	188,214	2,355,173
1979	1,269	29,294	7,351	106,835	1,176,630	1,848,109	231,339	145,205	2,224,653
1980	3,621	24,270	17,404	110,852	1,850,894	2,365,408	472,660	247,608	3,085,676
1981	4,038	20,109	17,586	98,143	1,524,638	2,651,688	435,371	154,231	3,241,290
1982	2,236	22,870	21,919	202,590	1,913,949	3,192,562	599,785	244,662	4,037,009
1983	(2,047)	48,781	45,573	216,434	2,177,104	4,245,307	802,903	273,079	5,321,289
1984	4,449	44,017	23,563	455,058	3,014,144	4,374,183	810,669	291,622	5,476,474
1985	13,097	74,565	57,920	238,066	3,311,137	5,135,068	811,987	278,258	6,225,313
1986	11,614	31,084	46,864	363,357	3,036,716	5,372,138	995,477	391,402	6,759,017
1987	15,273	25,182	37,949	416,375	3,440,341	5,348,434	997,739	380,314	6,726,487
1988	30,214	41,042	49,157	335,467	3,383,750	5,337,594	825,814	362,210	6,525,618
1989	9,740	54,861	114,259	179,358	3,498,021	5,745,425	851,350	910,301	7,507,076
1990	31,158	69,389	119,277	247,718	3,852,090	6,749,796	1,072,864	887,671	8,710,331
1991	22,422	(18,756)	99,510	261,978	2,493,176	6,832,177	1,098,917	599,800	8,530,894
1992	37,850	385,253	102,807	186,640	4,686,775	9,516,686	1,446,968	686,009	11,649,663
1993	27,559	192,521	93,299	316,935	6,170,847	10,507,943	1,435,011	931,583	12,874,537
1994	30,420	116,799	89,188	387,337	6,398,889	9,077,982	1,524,693	893,325	11,496,000
1995	68,851	62,501	75,500	326,396	5,817,126	10,472,725	1,881,663	835,138	13,189,526
1996	71,550	65,442	79,617	348,090	5,833,827	10,752,633	2,062,725	619,668	13,435,026
1997	74,013	68,831	83,542	365,264	5,859,847	10,919,670	2,150,340	641,839	13,711,849
1998	76,233	70,765	85,585	375,479	5,616,316	11,001,443	2,033,370	659,563	13,694,376
1999	76,319	70,834	85,536	376,226	5,632,562	11,030,353	2,038,752	660,896	13,730,001
2000	76,319	70,834	85,536	376,226	5,633,243	11,031,312	2,039,173	661,025	13,731,510
2001	76,319	70,834	85,536	376,226	5,633,699	11,032,140	2,039,607	661,158	13,732,905
2002	76,319	70,834	85,536	376,226	5,634,238	11,033,116	2,040,134	661,319	13,734,569
2003	76,319	70,834	85,536	376,226	5,634,788	11,034,115	2,040,671	661,482	13,736,268
2004	76,319	70,834	85,536	376,226	5,635,358	11,035,145	2,041,220	661,650	13,738,015
2005	76,319	70,834	85,536	376,226	5,633,181	11,031,260	2,038,920	660,947	13,731,127
2006	76,319	70,834	85,536	376,226	5,633,483	11,031,808	2,039,211	661,036	13,732,055
2007	76,319	70,834	85,536	376,226	5,633,760	11,032,308	2,039,480	661,119	13,732,907
2008	76,319	70,834	85,536	376,226	5,634,196	11,033,099	2,039,900	661,248	13,734,247
2009	76,319	70,834	85,536	376,226	5,634,534	11,033,715	2,040,230	661,348	13,735,293
2010	76,319	70,834	85,536	376,226	5,634,918	11,034,441	2,040,516	661,435	13,736,392
2011	76,319	70,834	85,536	376,226	5,635,342	11,035,212	2,040,918	661,557	13,737,687
2012	76,319	70,834	85,536	376,226	5,635,654	11,035,772	2,041,221	661,651	13,738,644
2013	76,319	70,834	85,536	376,226	5,636,527	11,037,358	2,042,069	661,911	13,741,338
2014	76,319	70,834	85,536	376,226	5,637,078	11,038,458	2,042,269	661,972	13,742,699
2015	76,319	70,834	85,536	376,226	5,637,231	11,038,642	2,042,728	662,112	13,743,482
2016	76,319	70,834	85,536	376,226	5,637,400	11,038,949	2,042,884	662,159	13,743,992
2017	76,319	70,834	85,536	376,226	5,637,360	11,038,877	2,042,852	662,149	13,743,878
2018	76,319	70,834	85,536	376,226	5,637,358	11,038,875	2,042,849	662,148	13,743,872
2019	76,319	70,834	85,536	376,226	5,637,367	11,038,888	2,042,858	662,151	13,743,897
2020	76,319	70,834	85,536	376,226	5,636,662	11,037,611	2,042,162	661,938	13,741,711
2021	76,319	70,834	85,536	376,226	5,636,713	11,037,712	2,042,203	661,952	13,741,867
2022	76,319	70,834	85,536	376,226	5,636,566	11,037,440	2,042,067	661,910	13,741,417
2023	76,319	70,834	85,536	376,226	5,636,619	11,037,534	2,042,114	661,925	13,741,573
2024	76,319	70,834	85,536	376,226	5,636,636	11,037,565	2,042,128	661,928	13,741,621
2025	76,319	70,834	85,536	376,226	5,636,639	11,037,570	2,042,134	661,929	13,741,633
2026	76,319	70,834	85,536	376,226	5,636,314	11,036,985	2,041,825	661,835	13,740,645
2027	76,319	70,834	85,536	376,226	5,636,364	11,037,073	2,041,870	661,847	13,740,790
2028	76,319	70,834	85,536	376,226	5,636,323	11,036,998	2,041,832	661,837	13,740,667
2029	76,319	70,834	85,536	376,226	5,636,354	11,037,052	2,041,860	661,845	13,740,757
2030	76,319	70,834	85,536	376,226	5,636,318	11,036,987	2,041,832	661,837	13,740,656
2031	76,319	70,834	85,536	376,226	5,636,360	11,037,075	2,041,845	661,842	13,740,762
2032	76,319	70,834	85,536	376,226	5,636,366	11,037,079	2,041,851	661,844	13,740,774
2033	76,319	70,834	85,536	376,226	5,636,284	11,036,934	2,041,773	661,819	13,740,526
2034	76,319	70,834	85,536	376,226	5,636,281	11,036,927	2,041,769	661,818	13,740,514
2035	76,319	70,834	85,536	376,226	5,636,343	11,037,046	2,041,814	661,832	13,740,692
TOTAL	3,424,513	4,160,038	4,556,967	20,118,244	293,556,027	554,045,528	101,117,200	36,839,181	692,001,909

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	San Luis Division						South San Joaquin Division		
	Reach 3 (20)	Reach 4 (21)	Reach 5 (22)	Reach 6 (23)	Reach 7 (24)	Subtotal (25)	Reach 8C (26)	Reach 8D (27)	Reach 9 (28)
[1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	120,038	428,308	130,105	44,591	104,033	827,075	0	0	0
1969	90,033	460,907	184,467	35,696	235,322	1,006,425	22,013	134,760	86,103
1970	89,547	484,300	226,002	66,070	192,582	1,058,501	26,207	156,981	128,273
1971	99,917	541,574	175,592	64,193	158,170	1,039,446	32,312	190,753	118,372
1972	116,708	647,979	174,519	73,670	154,783	1,167,659	35,031	187,242	130,396
1973	116,791	611,705	158,145	58,344	153,955	1,098,940	51,150	225,747	127,530
1974	120,309	671,455	150,835	63,905	150,230	1,156,734	34,752	199,127	131,298
1975	133,593	839,285	178,974	81,478	157,586	1,390,916	78,523	250,377	159,006
1976	54,938	883,956	220,832	90,305	174,835	1,424,866	39,348	133,933	123,424
1977	73,331	1,114,465	270,734	98,132	196,311	1,752,973	38,086	121,348	178,078
1978	45,867	898,992	203,261	106,938	203,079	1,458,137	45,552	178,805	129,928
1979	223,973	842,508	144,055	99,670	180,734	1,490,940	69,973	150,679	129,756
1980	243,507	1,176,613	222,942	127,625	281,860	2,052,547	57,726	274,848	185,155
1981	266,787	1,066,979	192,600	90,373	1,611,941	3,228,680	80,124	198,366	144,296
1982	279,263	1,241,069	209,336	114,408	1,433,163	3,277,239	59,425	269,115	233,520
1983	215,365	1,949,285	339,626	131,313	2,143,589	4,779,178	49,448	383,441	223,042
1984	241,183	2,227,654	335,406	163,942	2,111,502	5,079,687	42,186	459,341	301,458
1985	322,373	2,877,575	363,611	177,564	1,607,182	5,348,305	64,900	548,818	254,943
1986	423,121	2,987,599	484,124	255,459	615,928	4,766,231	93,883	502,562	611,010
1987	377,846	3,086,735	443,629	242,128	464,525	4,614,863	115,865	427,804	450,887
1988	361,593	2,952,766	460,320	233,024	640,989	4,648,692	96,961	379,192	417,835
1989	262,540	3,159,270	396,486	334,172	635,140	4,787,608	83,281	387,394	398,675
1990	404,116	3,899,592	508,074	438,645	695,186	5,945,613	111,099	433,824	512,548
1991	272,027	4,331,687	541,775	727,390	764,705	6,637,584	104,376	494,861	464,096
1992	324,029	3,808,666	813,557	365,692	818,301	6,130,245	118,344	511,618	416,202
1993	463,533	4,458,321	1,026,732	549,603	738,130	7,236,319	230,634	753,257	500,440
1994	333,152	4,529,395	945,229	425,807	588,985	6,822,568	153,875	629,666	552,468
1995	724,429	4,495,919	992,907	541,572	493,656	7,248,483	206,271	792,083	646,993
1996	749,466	4,433,070	1,143,155	383,371	527,356	7,236,418	272,020	801,941	661,882
1997	740,444	4,367,839	1,013,197	403,159	560,683	7,085,322	343,385	819,234	683,560
1998	737,908	4,323,049	895,234	418,155	581,484	6,955,830	353,723	844,204	704,367
1999	744,269	4,342,020	898,979	419,869	583,817	6,988,954	354,748	846,553	706,528
2000	744,717	4,344,009	899,407	420,006	583,989	6,992,128	354,752	846,778	706,739
2001	745,176	4,345,781	899,866	420,151	584,173	6,995,147	354,756	847,017	706,964
2002	745,735	4,347,870	900,418	420,329	584,396	6,998,748	354,761	847,310	707,237
2003	746,302	4,350,009	900,977	420,507	584,621	7,002,416	354,768	847,604	707,512
2004	746,885	4,352,218	901,554	420,690	584,853	7,006,200	354,774	847,907	707,796
2005	744,449	4,343,755	899,139	419,921	583,880	6,991,144	354,750	846,636	706,607
2006	744,754	4,344,929	899,442	420,018	584,001	6,993,144	354,752	846,795	706,756
2007	745,040	4,346,003	899,725	420,108	584,117	6,994,993	354,755	846,945	706,896
2008	745,488	4,347,693	900,164	420,247	584,293	6,997,885	354,759	847,175	707,111
2009	745,838	4,349,011	900,508	420,357	584,432	7,000,146	354,762	847,357	707,282
2010	746,140	4,350,500	900,803	420,450	584,549	7,002,442	354,765	847,511	707,425
2011	746,567	4,352,145	901,223	420,585	584,720	7,005,240	354,770	847,733	707,633
2012	746,888	4,353,349	901,539	420,686	584,847	7,007,309	354,774	847,900	707,790
2013	747,788	4,356,738	902,424	420,968	585,203	7,013,121	354,783	848,365	708,224
2014	747,998	4,358,855	902,622	421,032	585,283	7,015,790	354,785	848,469	708,323
2015	748,484	4,359,472	903,114	421,188	585,481	7,017,739	354,790	848,727	708,566
2016	748,651	4,360,127	903,276	421,240	585,545	7,018,839	354,792	848,813	708,644
2017	748,616	4,359,970	903,240	421,229	585,533	7,018,588	354,791	848,794	708,627
2018	748,613	4,359,965	903,238	421,228	585,532	7,018,576	354,791	848,793	708,626
2019	748,621	4,359,994	903,247	421,231	585,535	7,018,628	354,791	848,798	708,630
2020	747,883	4,357,254	902,518	420,998	585,241	7,013,894	354,784	848,415	708,271
2021	747,927	4,357,462	902,562	421,013	585,259	7,014,223	354,784	848,437	708,294
2022	747,784	4,356,886	902,422	420,967	585,202	7,013,261	354,783	848,364	708,223
2023	747,834	4,357,085	902,470	420,983	585,221	7,013,593	354,784	848,388	708,247
2024	747,847	4,357,153	902,486	420,988	585,228	7,013,702	354,784	848,397	708,256
2025	747,854	4,357,164	902,489	420,988	585,229	7,013,724	354,784	848,399	708,257
2026	747,526	4,355,912	902,168	420,887	585,100	7,011,593	354,780	848,229	708,098
2027	747,576	4,356,101	902,213	420,901	585,119	7,011,910	354,781	848,253	708,121
2028	747,533	4,355,941	902,174	420,889	585,103	7,011,640	354,780	848,233	708,103
2029	747,564	4,356,056	902,204	420,898	585,115	7,011,837	354,781	848,248	708,116
2030	747,533	4,355,919	902,171	420,888	585,101	7,011,612	354,780	848,232	708,101
2031	747,549	4,356,089	902,188	420,892	585,108	7,011,826	354,781	848,240	708,108
2032	747,556	4,356,099	902,191	420,893	585,109	7,011,848	354,781	848,241	708,110
2033	747,472	4,355,790	902,112	420,869	585,077	7,011,320	354,780	848,200	708,071
2034	747,468	4,355,773	902,108	420,867	585,076	7,011,292	354,780	848,199	708,070
2035	747,516	4,356,022	902,163	420,885	585,097	7,011,683	354,780	848,227	708,096
TOTAL	36,667,168	230,885,636	46,907,005	22,573,240	41,017,110	378,050,159	16,237,149	43,216,003	35,995,999

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	South San Joaquin Division (continued)								
	Reach 10A (29)	Reach 11B (30)	Reach 12D (31)	Reach 12E (32)	Reach 13B (33)	Reach 14A (34)	Reach 14B (35)	Reach 14C (36)	Reach 15A (37)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	83,706	59,077	0	0	0	0	0	0	0
1970	118,046	85,758	94,171	123,374	152,424	0	0	0	0
1971	129,811	80,282	95,075	91,389	167,142	691,791	151,979	111,623	529,723
1972	117,625	84,287	98,647	115,592	146,096	877,535	124,831	101,479	609,058
1973	117,706	92,257	74,238	114,843	221,385	961,855	120,106	99,429	692,748
1974	141,658	98,103	74,914	193,523	141,540	898,272	143,866	115,649	853,098
1975	207,908	124,105	61,799	117,194	108,154	1,156,757	180,614	119,889	988,045
1976	139,134	69,715	33,655	147,908	134,063	1,124,051	177,086	114,133	1,037,799
1977	194,086	108,644	91,547	175,039	137,975	1,397,006	203,837	119,467	1,339,196
1978	168,634	106,702	72,585	170,578	151,120	1,254,043	139,662	132,224	1,265,813
1979	175,107	85,942	56,331	174,147	150,029	1,490,461	201,935	260,981	1,216,126
1980	284,207	120,896	123,120	167,249	164,749	1,988,704	189,132	238,607	1,437,678
1981	200,043	77,034	33,420	113,272	171,780	1,735,318	163,799	161,086	1,793,185
1982	264,977	158,196	142,657	224,190	224,079	1,793,664	195,002	15,709	1,934,085
1983	308,758	136,321	124,693	203,707	217,278	2,422,112	199,754	181,913	2,550,618
1984	397,252	164,515	109,487	188,738	245,949	3,309,783	329,448	204,173	3,214,112
1985	346,406	252,692	206,439	239,944	360,512	3,465,639	237,078	180,032	3,429,538
1986	438,930	266,509	259,983	362,230	349,110	3,775,789	321,006	360,173	3,568,705
1987	493,834	336,680	328,290	471,676	323,011	3,676,384	464,929	242,486	4,022,862
1988	532,333	291,885	220,957	375,389	316,236	3,453,977	412,218	314,609	3,751,079
1989	730,717	266,577	205,257	594,170	378,460	3,495,819	335,314	221,929	3,736,576
1990	648,517	360,994	221,313	478,100	673,287	3,973,817	442,085	214,470	4,330,320
1991	714,324	327,467	268,144	370,297	431,590	4,267,920	424,779	273,170	4,523,808
1992	581,995	328,870	275,843	401,614	423,997	4,779,301	729,502	571,578	4,326,016
1993	733,042	413,777	278,806	496,953	591,207	5,281,519	664,041	424,389	5,376,781
1994	717,677	375,887	269,252	485,877	467,039	4,134,908	440,975	274,532	3,977,591
1995	817,133	699,296	482,841	696,363	841,486	5,098,497	708,662	423,725	4,698,801
1996	744,642	668,196	565,463	697,575	648,708	5,253,970	639,171	482,272	5,057,793
1997	698,287	631,835	619,204	705,319	557,479	5,212,115	674,138	547,096	5,288,355
1998	719,598	650,935	637,851	726,480	574,341	5,348,561	694,814	563,824	5,162,267
1999	721,699	652,821	640,079	728,632	576,152	5,362,903	697,143	565,536	5,175,462
2000	721,925	652,946	640,282	728,762	576,337	5,363,853	697,362	565,696	5,176,041
2001	722,166	653,079	640,497	728,900	576,534	5,364,718	697,589	565,863	5,176,546
2002	722,460	653,241	640,758	729,069	576,772	5,365,745	697,864	566,064	5,177,142
2003	722,756	653,403	641,022	729,239	577,013	5,366,789	698,140	566,266	5,177,757
2004	723,061	653,571	641,295	729,414	577,261	5,367,869	698,428	566,477	5,178,388
2005	721,784	652,868	640,154	728,680	576,221	5,363,635	697,207	565,584	5,175,967
2006	721,943	652,955	640,297	728,772	576,352	5,364,207	697,357	565,694	5,176,305
2007	722,093	653,039	640,431	728,858	576,473	5,364,736	697,499	565,797	5,176,608
2008	722,325	653,166	640,638	728,991	576,662	5,365,559	697,714	565,956	5,177,095
2009	722,507	653,267	640,801	729,096	576,811	5,366,203	697,887	566,080	5,177,470
2010	722,662	653,352	640,940	729,186	576,937	5,366,883	698,020	566,179	5,177,897
2011	722,886	653,475	641,137	729,314	577,118	5,367,684	698,230	566,331	5,178,366
2012	723,053	653,567	641,287	729,409	577,255	5,368,273	698,387	566,446	5,178,711
2013	723,521	653,825	641,706	729,679	577,637	5,369,928	698,823	566,765	5,179,679
2014	723,624	653,882	641,799	729,740	577,722	5,370,794	698,882	566,809	5,180,284
2015	723,886	654,025	642,031	729,889	577,933	5,371,251	699,163	567,014	5,180,462
2016	723,971	654,073	642,107	729,939	578,003	5,371,569	699,243	567,074	5,180,649
2017	723,952	654,062	642,090	729,927	577,988	5,371,495	699,224	567,060	5,180,604
2018	723,951	654,062	642,089	729,927	577,987	5,371,493	699,224	567,059	5,180,602
2019	723,956	654,064	642,094	729,930	577,991	5,371,506	699,228	567,063	5,180,610
2020	723,569	653,852	641,750	729,708	577,676	5,370,160	698,864	566,797	5,179,827
2021	723,593	653,865	641,769	729,720	577,695	5,370,259	698,886	566,812	5,179,888
2022	723,519	653,824	641,704	729,678	577,636	5,369,981	698,818	566,762	5,179,724
2023	723,545	653,838	641,727	729,693	577,656	5,370,077	698,842	566,780	5,179,779
2024	723,553	653,842	641,734	729,698	577,662	5,370,111	698,851	566,786	5,179,801
2025	723,554	653,843	641,736	729,698	577,664	5,370,115	698,852	566,787	5,179,804
2026	723,385	653,750	641,584	729,601	577,525	5,369,507	698,692	566,669	5,179,445
2027	723,408	653,763	641,606	729,615	577,546	5,369,597	698,716	566,686	5,179,499
2028	723,388	653,752	641,587	729,603	577,528	5,369,521	698,697	566,671	5,179,451
2029	723,403	653,760	641,601	729,612	577,542	5,369,577	698,710	566,682	5,179,485
2030	723,387	653,751	641,585	729,602	577,527	5,369,510	698,694	566,670	5,179,445
2031	723,394	653,756	641,593	729,606	577,534	5,369,581	698,699	566,675	5,179,494
2032	723,397	653,756	641,595	729,608	577,536	5,369,587	698,701	566,676	5,179,497
2033	723,355	653,734	641,557	729,585	577,502	5,369,436	698,663	566,650	5,179,410
2034	723,354	653,733	641,555	729,584	577,500	5,369,427	698,661	566,648	5,179,403
2035	723,382	653,748	641,582	729,600	577,523	5,369,549	698,689	566,666	5,179,477
TOTAL	38,721,460	31,706,744	29,855,781	36,412,294	30,830,637	280,952,656	35,552,412	28,030,877	272,327,850

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

	California Aqueduct (continued)								
	South San Joaquin Division (continued)		Tehachapi Division			Mojave Division			
Calendar Year	Reach 16A (38)	Subtotal (39)	Reach 17E (40)	Reach 17F (41)	Subtotal (42)	Reach 18A (43)	Reach 19 (44)	Reach 19C (45)	Reach 20A (46)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	385,659	0	0	0	0	0	0	0
1970	0	885,234	0	0	0	0	0	0	0
1971	10,291	2,400,543	3,471	0	3,471	0	0	0	0
1972	1,106,884	3,734,703	1,424,782	28,127	1,452,909	36,699	135,675	0	130,711
1973	1,243,941	4,142,935	1,777,260	49,949	1,827,209	36,207	146,739	0	161,838
1974	1,343,972	4,369,772	2,298,091	16,259	2,314,350	30,525	90,404	0	115,571
1975	1,537,862	5,090,233	2,403,430	35,193	2,438,623	40,588	122,584	0	137,684
1976	1,727,428	5,001,677	2,776,194	126,653	2,902,847	118,610	201,215	0	182,927
1977	1,961,081	6,065,390	3,845,464	83,936	3,929,400	93,565	226,906	0	180,884
1978	1,922,950	5,738,596	2,954,313	42,637	2,996,950	91,815	200,759	0	215,673
1979	1,798,566	5,960,033	3,539,402	45,997	3,585,399	99,670	307,386	0	261,205
1980	2,231,541	7,463,612	4,749,456	54,806	4,804,262	116,487	446,175	0	290,719
1981	2,747,281	7,619,004	5,469,195	64,906	5,534,101	316,675	585,358	0	325,381
1982	2,961,054	8,475,673	6,348,809	56,016	6,404,825	447,834	639,020	0	276,072
1983	4,302,525	11,303,610	14,152,909	96,401	14,249,310	345,246	564,768	0	368,192
1984	5,072,902	14,039,344	18,425,400	77,216	18,502,616	267,573	563,523	0	413,690
1985	5,688,501	15,275,442	18,160,112	137,928	18,298,040	298,927	475,002	0	450,422
1986	5,769,321	16,679,211	19,232,233	109,932	19,342,165	706,338	350,750	0	347,575
1987	5,516,057	16,870,765	16,699,386	98,351	16,797,737	1,261,158	558,930	0	818,419
1988	5,171,517	15,734,188	17,842,932	138,306	17,981,238	1,237,098	561,287	0	585,343
1989	5,438,758	16,272,927	17,586,947	88,632	17,675,579	1,052,124	286,303	0	369,351
1990	6,352,699	18,753,073	19,531,129	99,594	19,630,723	1,297,247	231,296	0	471,166
1991	5,733,874	18,398,706	19,510,177	131,215	19,641,392	1,427,968	664,387	0	1,024,781
1992	6,572,948	20,037,828	17,992,328	279,403	18,271,731	1,166,238	738,509	0	666,467
1993	7,816,792	23,561,638	18,757,806	199,435	18,957,241	1,873,552	611,397	0	1,237,005
1994	7,368,175	19,847,922	18,106,341	194,631	18,300,972	1,755,249	769,706	0	1,233,650
1995	7,085,827	23,197,978	20,759,929	513,336	21,273,265	1,695,025	886,037	0	909,223
1996	7,119,928	23,613,561	23,718,604	297,925	24,016,529	1,826,181	970,233	0	1,000,595
1997	7,444,819	24,224,826	23,780,982	248,235	24,029,217	1,942,758	1,034,284	0	1,062,169
1998	7,621,143	24,602,108	20,964,226	255,539	21,219,765	2,001,834	1,067,667	0	1,095,408
1999	7,640,061	24,668,317	20,996,651	256,229	21,252,880	2,009,524	1,076,416	0	1,102,097
2000	7,641,429	24,672,902	20,998,356	256,285	21,254,641	2,009,974	1,078,398	0	1,103,367
2001	7,642,709	24,677,338	20,999,825	256,337	21,256,162	2,010,378	1,080,337	0	1,104,614
2002	7,644,224	24,682,647	21,001,549	256,402	21,257,951	2,010,852	1,082,665	0	1,106,108
2003	7,645,766	24,688,035	21,003,319	256,467	21,259,786	2,011,336	1,085,000	0	1,107,609
2004	7,647,360	24,693,601	21,005,145	256,533	21,261,678	2,011,838	1,087,449	0	1,109,181
2005	7,640,859	24,670,952	20,998,282	256,239	21,254,521	2,009,885	1,077,051	0	1,102,502
2006	7,641,702	24,673,887	20,999,255	256,275	21,255,530	2,010,148	1,078,300	0	1,103,306
2007	7,642,480	24,676,610	21,000,141	256,306	21,256,447	2,010,393	1,079,493	0	1,104,072
2008	7,643,692	24,680,843	21,001,540	256,359	21,257,899	2,010,771	1,081,257	0	1,105,204
2009	7,644,640	24,684,163	21,002,630	256,398	21,259,028	2,011,071	1,082,697	0	1,106,130
2010	7,645,522	24,687,279	21,003,924	256,425	21,260,349	2,011,384	1,083,726	0	1,106,790
2011	7,646,699	24,691,376	21,005,290	256,474	21,261,764	2,011,759	1,085,500	0	1,107,930
2012	7,647,565	24,694,417	21,006,285	256,510	21,262,795	2,012,029	1,086,794	0	1,108,761
2013	7,649,995	24,702,930	21,009,089	256,613	21,265,702	2,012,794	1,090,454	0	1,111,114
2014	7,650,822	24,705,935	21,011,074	256,610	21,267,684	2,013,201	1,090,630	0	1,111,228
2015	7,651,916	24,709,653	21,011,365	256,691	21,268,056	2,013,408	1,093,288	0	1,112,934
2016	7,652,384	24,711,261	21,011,913	256,710	21,268,623	2,013,556	1,093,977	0	1,113,377
2017	7,652,273	24,710,887	21,011,781	256,705	21,268,486	2,013,524	1,093,863	0	1,113,303
2018	7,652,271	24,710,875	21,011,776	256,705	21,268,481	2,013,523	1,093,861	0	1,113,301
2019	7,652,294	24,710,955	21,011,799	256,706	21,268,505	2,013,528	1,093,887	0	1,113,318
2020	7,650,290	24,703,963	21,009,542	256,620	21,266,162	2,012,906	1,090,834	0	1,111,356
2021	7,650,428	24,704,430	21,009,721	256,625	21,266,346	2,012,950	1,090,972	0	1,111,447
2022	7,650,022	24,703,038	21,009,239	256,610	21,265,849	2,012,822	1,090,434	0	1,111,100
2023	7,650,165	24,703,521	21,009,406	256,616	21,266,022	2,012,867	1,090,638	0	1,111,229
2024	7,650,214	24,703,689	21,009,463	256,617	21,266,080	2,012,882	1,090,715	0	1,111,281
2025	7,650,222	24,703,715	21,009,472	256,617	21,266,089	2,012,885	1,090,713	0	1,111,278
2026	7,649,327	24,700,592	21,008,433	256,581	21,265,014	2,012,602	1,089,385	0	1,110,426
2027	7,649,460	24,701,051	21,008,591	256,586	21,265,177	2,012,644	1,089,572	0	1,110,547
2028	7,649,348	24,700,662	21,008,457	256,581	21,265,038	2,012,609	1,089,412	0	1,110,444
2029	7,649,429	24,700,946	21,008,553	256,584	21,265,137	2,012,636	1,089,529	0	1,110,517
2030	7,649,331	24,700,615	21,008,437	256,581	21,265,018	2,012,605	1,089,389	0	1,110,428
2031	7,649,406	24,700,867	21,008,597	256,581	21,265,178	2,012,638	1,089,425	0	1,110,453
2032	7,649,413	24,700,898	21,008,604	256,581	21,265,185	2,012,639	1,089,385	0	1,110,425
2033	7,649,194	24,700,137	21,008,348	256,572	21,264,920	2,012,570	1,089,056	0	1,110,217
2034	7,649,182	24,700,096	21,008,332	256,571	21,264,903	2,012,565	1,089,036	0	1,110,203
2035	7,649,362	24,700,681	21,008,546	256,578	21,265,124	2,012,625	1,089,332	0	1,110,390
TOTAL	403,640,093	1,283,479,955	1,120,054,038	13,062,038	1,133,116,076	96,031,512	53,669,170	0	55,370,108

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	Mojave Division (continued)							Santa Ana Division	
	Reach 20B (47)	Reach 21 (48)	Reach 22A (49)	Reach 22B (50)	Reach 23 (51)	Reach 24 (52)	Subtotal (53)	Reach 25 (54)	Reach 26A (55)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	120,271	75,768	80,436	1,036,831	51,520	362,153	2,030,064	26	578
1973	148,631	60,641	66,539	1,283,816	65,475	353,262	2,323,148	20,541	679,328
1974	88,200	65,007	77,667	1,477,946	96,340	334,302	2,375,962	24,380	799,400
1975	118,898	135,462	77,825	1,630,554	111,141	419,450	2,794,186	29,337	885,021
1976	151,555	106,314	131,007	1,598,071	107,787	304,638	2,902,124	51,356	1,103,139
1977	112,589	98,757	86,279	1,882,080	71,228	48,359	2,800,647	62,584	1,412,740
1978	120,584	109,271	71,763	2,211,965	72,179	637,401	3,731,410	67,186	1,159,950
1979	194,104	203,078	121,586	2,104,832	76,960	202,566	3,571,387	84,462	1,235,189
1980	237,250	156,794	117,274	2,670,471	147,009	688,605	4,870,784	72,651	1,532,581
1981	292,357	181,221	119,724	3,024,706	134,895	45,392	5,025,709	35,662	1,570,900
1982	330,816	186,291	125,561	3,251,159	299,712	624,015	6,180,480	26,852	1,822,263
1983	326,822	219,976	140,547	3,899,533	222,064	382,195	6,469,343	19,017	1,665,570
1984	330,203	267,077	146,984	4,783,318	59,337	1,106,756	7,938,461	11,319	2,325,285
1985	388,307	799,502	125,775	5,333,323	261,135	811,327	8,943,720	17,764	2,708,035
1986	315,442	242,085	178,795	6,186,754	154,339	515,535	8,997,613	31,012	2,776,681
1987	357,917	298,157	236,240	5,662,001	150,089	732,540	10,075,451	19,362	2,847,528
1988	400,282	331,272	149,972	6,910,240	252,077	970,621	11,398,192	36,499	3,081,685
1989	343,693	195,814	137,596	5,941,645	346,362	1,241,087	9,913,975	30,784	3,190,706
1990	204,059	274,744	49,965	6,837,805	435,238	1,887,644	11,689,164	25,302	3,328,924
1991	515,650	478,077	230,851	7,423,051	259,871	1,555,444	13,580,080	31,890	3,844,655
1992	696,885	585,259	168,348	7,067,665	316,518	611,601	12,017,490	55,724	4,043,729
1993	823,333	518,134	210,473	7,811,437	321,715	1,694,326	15,101,372	54,527	3,967,417
1994	971,967	859,217	244,911	8,214,749	1,139,416	1,341,717	16,530,582	52,291	5,125,358
1995	976,373	473,973	450,613	7,470,772	625,352	2,070,605	15,557,973	448,666	4,681,232
1996	1,044,857	538,769	408,022	7,170,382	590,161	6,470,499	20,019,699	422,184	4,113,150
1997	766,007	589,056	457,858	7,324,883	514,814	(2,486,691)	11,205,138	293,094	4,262,474
1998	790,710	607,457	472,154	7,023,217	265,327	356,876	13,680,650	76,890	4,377,207
1999	796,556	611,174	475,110	7,052,459	266,385	854,581	14,244,302	76,984	4,389,148
2000	797,826	611,892	475,673	7,057,737	266,768	2,464,318	15,865,953	76,984	4,389,660
2001	799,073	612,597	476,227	7,062,911	267,099	2,710,368	16,123,604	76,984	4,390,100
2002	800,567	613,440	476,886	7,069,093	267,487	895,553	14,322,651	76,984	4,390,618
2003	802,068	614,290	477,553	7,075,327	267,886	1,804,608	15,245,677	76,984	4,391,149
2004	803,640	615,178	478,250	7,081,834	268,297	1,828,754	15,284,421	76,984	4,391,696
2005	796,961	611,402	475,288	7,053,871	266,752	1,564,281	14,957,993	76,984	4,389,637
2006	797,765	611,857	475,645	7,057,224	266,971	2,025,959	15,427,175	76,984	4,389,930
2007	798,531	612,288	475,985	7,060,378	267,171	1,243,695	14,652,006	76,984	4,390,195
2008	799,663	612,930	476,487	7,065,138	267,486	1,837,899	15,256,835	76,984	4,390,615
2009	800,589	613,453	476,898	7,068,970	267,731	1,574,859	15,002,398	76,984	4,390,942
2010	801,249	613,828	477,188	7,071,633	268,021	1,339,847	14,773,666	76,984	4,391,331
2011	802,389	614,470	477,696	7,076,365	268,329	1,764,151	15,208,589	76,984	4,391,740
2012	803,220	614,941	478,065	7,079,819	268,553	2,002,634	15,454,816	76,984	4,392,038
2013	805,573	616,270	479,106	7,089,564	269,184	1,776,424	15,250,483	76,984	4,392,880
2014	805,687	616,335	479,159	7,089,688	269,631	2,857,446	16,333,005	76,984	4,393,475
2015	807,393	617,301	479,915	7,097,075	269,697	48,875	13,539,886	76,984	4,393,562
2016	807,836	617,548	480,110	7,098,957	269,820	2,184,988	15,680,169	76,984	4,393,727
2017	807,762	617,507	480,079	7,098,608	269,790	1,472,934	14,967,370	76,984	4,393,687
2018	807,760	617,506	480,077	7,098,603	269,789	1,849,786	15,344,206	76,984	4,393,687
2019	807,777	617,516	480,084	7,098,683	269,794	1,758,811	15,253,398	76,984	4,393,693
2020	805,815	616,407	479,216	7,090,519	269,286	2,103,763	15,580,102	76,984	4,393,016
2021	805,906	616,459	479,255	7,090,936	269,327	2,424,383	15,901,635	76,984	4,393,069
2022	805,559	616,262	479,102	7,089,417	269,218	923,199	14,397,113	76,984	4,392,925
2023	805,688	616,336	479,159	7,089,978	269,256	1,574,252	15,049,403	76,984	4,392,975
2024	805,740	616,365	479,184	7,090,191	269,268	1,557,150	15,032,776	76,984	4,392,993
2025	805,737	616,363	479,182	7,090,200	269,270	1,424,458	14,900,086	76,984	4,392,995
2026	804,885	615,882	478,803	7,086,646	269,036	2,054,326	15,521,991	76,984	4,392,683
2027	805,006	615,951	478,858	7,087,160	269,072	1,424,965	14,893,775	76,984	4,392,730
2028	804,903	615,893	478,812	7,086,720	269,042	1,980,050	15,447,885	76,984	4,392,690
2029	804,976	615,933	478,844	7,087,040	269,063	1,929,051	15,397,589	76,984	4,392,719
2030	804,887	615,883	478,803	7,086,660	269,037	1,769,606	15,237,298	76,984	4,392,685
2031	804,912	615,898	478,816	7,086,753	269,073	2,277,634	15,745,602	76,984	4,392,732
2032	804,884	615,884	478,804	7,086,691	269,075	2,684,494	16,152,281	76,984	4,392,735
2033	804,676	615,764	478,710	7,085,794	269,018	1,987,047	15,452,852	76,984	4,392,657
2034	804,662	615,756	478,704	7,085,742	269,014	1,351,578	14,817,260	76,984	4,392,653
2035	804,849	615,861	478,787	7,086,506	269,062	2,132,313	15,599,725	76,984	4,392,718
TOTAL	40,900,732	31,417,793	22,579,285	389,244,096	17,086,819	88,741,265	795,040,780	4,949,770	231,049,210

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								
	Santa Ana Division (continued)				West Branch				
	Reach 28G (56)	Reach 28H (57)	Reach 28J (58)	Subtotal (59)	Reach 29A (60)	Reach 29F (61)	Reach 29G (62)	Reach 29H (63)	Reach 29J (64)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	109	30	0	743	719,255	159,249	199,145	234,196	88,198
1973	136,352	79	0	836,300	779,949	339,363	122,664	264,850	119,743
1974	155,262	34,693	854,637	1,868,372	883,312	158,366	112,458	350,160	(4,525)
1975	110,729	69,082	723,814	1,817,983	1,049,990	176,676	194,724	801,457	75,870
1976	138,575	100,400	635,853	2,029,323	1,220,429	215,588	202,591	624,614	98,268
1977	127,543	92,647	825,880	2,521,394	1,268,813	116,939	218,129	684,679	184
1978	166,919	68,363	835,082	2,297,500	1,174,708	342,479	267,308	415,641	17,764
1979	142,586	92,812	265,525	1,820,574	1,366,942	285,575	284,188	972,584	29,850
1980	158,340	129,897	1,120,131	3,013,600	1,698,257	224,472	455,619	874,259	288,303
1981	160,053	111,722	332,124	2,210,461	1,781,750	123,216	615,045	2,309,557	8,794
1982	205,350	135,463	1,530,845	3,720,773	1,919,982	190,480	702,262	2,223,146	414,230
1983	244,720	124,651	413,556	2,467,514	2,739,940	149,816	889,966	747,372	579,839
1984	240,496	190,924	770,804	3,538,828	3,460,638	80,998	2,356,779	543,274	718,154
1985	451,600	182,242	871,350	4,230,991	3,869,765	295,854	3,049,380	976,380	615,828
1986	439,048	256,526	983,200	4,486,467	3,785,090	457,661	2,897,411	1,481,169	1,029,535
1987	278,094	218,717	1,118,495	4,482,196	3,371,693	213,075	2,898,112	944,762	417,565
1988	271,876	200,794	1,175,970	4,766,824	3,459,796	255,267	3,019,022	883,111	456,842
1989	231,309	281,347	1,131,190	4,865,336	4,013,142	405,507	2,745,613	1,397,385	865,023
1990	437,647	307,979	1,537,629	5,637,481	4,032,760	383,295	3,218,239	3,134,183	751,391
1991	843,089	632,695	1,242,248	6,594,577	3,816,467	304,112	3,572,348	646,078	740,001
1992	281,810	5,636,716	1,102,500	11,120,479	4,263,485	327,618	3,952,488	1,035,830	783,208
1993	382,395	570,172	1,004,462	5,978,973	3,927,933	343,009	4,533,134	1,662,943	693,788
1994	557,709	435,956	1,092,664	7,263,978	3,719,957	233,265	3,630,131	1,813,203	776,386
1995	1,389,423	720,523	1,682,484	8,922,328	4,800,927	675,283	2,620,613	3,735,074	657,087
1996	579,471	789,336	2,246,885	8,151,026	4,946,352	683,595	2,649,771	3,817,522	666,490
1997	506,039	552,966	2,208,926	7,823,499	5,042,888	629,128	2,528,736	2,951,533	684,841
1998	520,321	568,542	1,846,143	7,389,103	5,141,016	632,938	2,569,168	3,348,552	682,532
1999	521,401	569,940	2,462,755	8,020,228	5,153,276	641,063	2,577,449	3,098,207	683,468
2000	521,401	569,940	2,373,355	7,931,340	5,153,734	643,212	2,578,154	3,105,604	683,468
2001	521,401	569,940	2,032,766	7,591,191	5,154,144	645,312	2,578,777	3,112,840	683,468
2002	521,401	569,940	2,420,168	7,979,111	5,154,626	647,806	2,579,504	3,121,366	683,468
2003	521,401	569,940	2,176,733	7,736,207	5,155,121	650,339	2,580,249	3,130,017	683,468
2004	521,401	569,940	2,155,514	7,715,535	5,155,629	652,961	2,581,017	3,139,031	683,468
2005	521,401	569,940	2,299,821	7,857,783	5,153,631	641,588	2,578,045	3,100,031	683,468
2006	521,401	569,940	2,207,292	7,765,547	5,153,899	642,966	2,578,456	3,104,809	683,468
2007	521,401	569,940	2,288,320	7,846,840	5,154,147	644,246	2,578,831	3,109,122	683,468
2008	521,401	569,940	2,201,260	7,760,200	5,154,536	646,220	2,579,423	3,115,955	683,468
2009	521,401	569,940	2,329,042	7,888,309	5,154,840	647,776	2,579,878	3,121,261	683,468
2010	521,401	569,940	2,444,972	8,004,628	5,155,160	648,880	2,580,384	3,124,949	683,468
2011	521,401	569,940	2,283,770	7,843,835	5,155,540	650,801	2,580,962	3,131,612	683,468
2012	521,401	569,940	2,248,974	7,809,337	5,155,817	652,216	2,581,378	3,136,365	683,468
2013	521,401	569,940	2,254,840	7,816,045	5,156,596	656,177	2,582,560	3,149,996	683,468
2014	521,401	569,940	2,224,522	7,786,322	5,156,998	656,265	2,583,258	3,150,321	683,468
2015	521,401	569,940	2,325,000	7,886,887	5,157,219	659,234	2,583,506	3,160,436	683,468
2016	521,401	569,940	2,288,242	7,850,294	5,157,372	660,006	2,583,737	3,163,072	683,468
2017	521,401	569,940	2,565,220	8,127,232	5,157,337	659,826	2,583,682	3,162,531	683,468
2018	521,401	569,940	2,249,398	7,811,410	5,157,336	659,824	2,583,680	3,162,465	683,468
2019	521,401	569,940	2,323,901	7,885,919	5,157,342	659,861	2,583,690	3,162,592	683,468
2020	521,401	569,940	2,290,811	7,852,152	5,156,707	656,529	2,582,735	3,151,127	683,468
2021	521,401	569,940	2,281,234	7,842,628	5,156,755	656,742	2,582,810	3,151,938	683,468
2022	521,401	569,940	2,225,452	7,786,702	5,156,621	656,076	2,582,606	3,149,564	683,468
2023	521,401	569,940	2,245,947	7,807,247	5,156,668	656,306	2,582,679	3,150,583	683,468
2024	521,401	569,940	2,357,536	7,918,854	5,156,683	656,392	2,582,702	3,150,657	683,468
2025	521,401	569,940	2,609,895	8,171,215	5,156,685	656,401	2,582,708	3,150,847	683,468
2026	521,401	569,940	2,058,909	7,619,917	5,156,397	654,951	2,582,268	3,145,710	683,468
2027	521,401	569,940	2,601,372	8,162,427	5,156,440	655,167	2,582,336	3,146,609	683,468
2028	521,401	569,940	2,012,041	7,573,056	5,156,404	654,984	2,582,280	3,145,850	683,468
2029	521,401	569,940	2,360,172	7,921,216	5,156,431	655,119	2,582,320	3,146,369	683,468
2030	521,401	569,940	2,292,602	7,853,612	5,156,400	654,957	2,582,271	3,145,855	683,468
2031	521,401	569,940	2,365,452	7,926,509	5,156,434	655,001	2,582,330	3,146,015	683,468
2032	521,401	569,940	2,369,121	7,930,181	5,156,436	655,014	2,582,331	3,146,011	683,468
2033	521,401	569,940	2,055,785	7,616,767	5,156,365	654,653	2,582,224	3,144,728	683,468
2034	521,401	569,940	2,548,091	8,109,069	5,156,361	654,635	2,582,220	3,144,724	683,468
2035	521,401	569,940	1,716,056	7,277,099	5,156,419	654,926	2,582,308	3,145,722	683,468
TOTAL	28,448,702	33,593,054	112,098,738	410,139,474	269,023,742	32,557,256	146,020,792	154,998,405	37,543,505

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)								Grand Total (73)
	West Branch (continued)		Coastal Branch					Total (72)	
	Reach 30 (65)	Subtotal (66)	Reach 31A (a (67)	Reach 33A (68)	Reach 34 (69)	Reach 35 (70)	Subtotal (71)		
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	42,918
1963	0	0	0	0	0	0	0	0	168,358
1964	0	0	0	0	0	0	0	0	184,729
1965	0	0	0	0	0	0	0	0	378,874
1966	0	0	0	0	0	0	0	0	408,397
1967	0	0	0	0	0	0	0	0	634,505
1968	0	0	0	0	0	0	0	2,160,548	2,745,160
1969	0	0	509,728	0	0	0	509,728	3,324,718	4,074,939
1970	0	0	609,988	0	0	0	609,988	3,983,062	4,676,282
1971	0	0	699,052	0	0	0	699,052	5,614,013	6,185,714
1972	420,789	1,820,832	697,576	0	0	0	697,576	12,353,356	12,998,869
1973	621,431	2,248,000	641,626	0	0	0	641,626	14,590,688	15,194,233
1974	723,949	2,223,720	669,279	0	0	0	669,279	16,598,762	17,372,561
1975	841,991	3,140,708	806,429	0	0	0	806,429	19,569,999	20,517,423
1976	(650,944)	1,710,546	840,927	0	0	0	840,927	19,002,859	20,027,213
1977	634,581	2,923,325	872,169	0	0	0	872,169	23,267,885	24,213,489
1978	3,088,954	5,306,854	934,119	0	0	0	934,119	24,818,739	26,012,786
1979	958,068	3,897,207	871,688	0	0	0	871,688	23,421,881	24,675,598
1980	222,549	3,763,459	1,052,335	0	0	0	1,052,335	30,106,275	32,039,355
1981	1,094,117	5,932,479	1,037,127	0	0	0	1,037,127	33,828,851	35,458,115
1982	978,814	6,428,914	1,020,431	0	0	0	1,020,431	39,545,344	41,662,234
1983	3,124,027	8,230,960	1,151,337	0	0	0	1,151,337	53,972,541	56,229,441
1984	727,530	7,887,373	1,432,019	0	0	0	1,432,019	63,894,802	67,048,671
1985	1,775,929	10,583,136	1,858,499	0	0	0	1,858,499	70,763,446	74,336,743
1986	1,339,162	10,990,028	1,719,082	0	0	0	1,719,082	73,739,814	77,008,549
1987	1,406,317	9,251,524	1,687,984	0	0	0	1,687,984	70,507,007	74,259,081
1988	1,453,666	9,527,704	1,963,083	0	0	0	1,963,083	72,545,539	76,261,756
1989	1,504,914	10,931,584	1,762,751	0	0	0	1,762,751	73,716,836	78,468,286
1990	856,677	12,376,545	2,247,475	0	0	0	2,247,475	84,990,405	90,182,370
1991	(92,016)	8,986,990	2,166,963	0	0	0	2,166,963	84,537,186	88,610,633
1992	2,213,012	12,575,641	2,461,408	0	0	0	2,461,408	94,264,485	100,123,710
1993	1,152,359	12,313,166	2,786,699	0	0	0	2,786,699	98,809,945	106,167,661
1994	1,709,006	11,881,948	3,594,001	0	0	0	3,594,001	95,737,971	103,339,665
1995	681,184	13,170,168	4,282,543	0	0	0	4,282,543	106,842,264	114,426,666
1996	1,364,338	14,128,068	4,018,665	0	0	0	4,018,665	114,618,992	122,255,003
1997	1,917,217	13,754,343	3,886,923	1,089,197	39,898	32,149	5,048,167	106,882,361	114,536,270
1998	2,433,216	14,807,422	3,724,434	1,770,068	50,652	37,974	5,583,128	107,932,382	115,370,874
1999	1,692,793	13,846,256	3,730,113	1,768,219	50,272	36,743	5,585,347	108,336,285	115,796,531
2000	1,705,299	13,869,471	3,730,413	1,768,060	50,121	36,341	5,584,935	109,902,880	117,364,211
2001	1,776,722	13,951,263	3,730,830	1,768,218	50,144	36,404	5,585,596	109,913,206	117,375,337
2002	1,770,531	13,957,301	3,731,324	1,768,406	50,171	36,474	5,586,375	108,519,353	115,982,425
2003	1,794,673	13,993,867	3,731,830	1,768,598	50,199	36,551	5,587,178	109,249,434	116,713,468
2004	1,761,826	13,973,932	3,732,351	1,768,794	50,228	36,626	5,587,999	109,261,381	116,726,411
2005	1,690,980	13,847,743	3,730,353	1,768,047	50,116	36,332	5,584,848	108,896,111	116,357,351
2006	1,882,296	14,045,894	3,730,628	1,768,154	50,132	36,373	5,585,287	109,478,519	116,940,284
2007	1,564,355	13,734,169	3,730,885	1,768,251	50,146	36,409	5,585,691	108,479,663	115,941,910
2008	1,899,500	14,079,102	3,731,283	1,768,402	50,169	36,467	5,586,321	109,353,332	116,816,339
2009	1,815,219	14,002,442	3,731,594	1,768,518	50,187	36,512	5,586,811	109,158,590	116,622,186
2010	1,682,180	13,875,021	3,731,946	1,768,656	50,206	36,565	5,587,373	108,927,150	116,391,430
2011	1,896,765	14,099,148	3,732,334	1,768,803	50,227	36,622	5,587,986	109,435,625	116,900,644
2012	1,731,464	13,940,708	3,732,617	1,768,911	50,243	36,663	5,588,434	109,496,460	116,962,022
2013	1,663,444	13,892,241	3,733,419	1,769,212	50,287	36,783	5,589,701	109,271,561	116,738,647
2014	1,915,454	14,145,764	3,733,918	1,769,420	50,313	36,853	5,590,504	110,587,703	118,055,801
2015	1,824,983	14,068,846	3,734,064	1,769,458	50,322	36,877	5,590,721	107,825,270	115,293,588
2016	1,799,499	14,047,154	3,734,218	1,769,519	50,330	36,899	5,590,966	109,911,298	117,379,907
2017	1,841,891	14,088,735	3,734,182	1,769,504	50,329	36,894	5,590,909	109,516,085	116,984,622
2018	1,863,939	14,110,712	3,734,180	1,769,503	50,329	36,894	5,590,906	109,599,038	117,067,570
2019	1,856,943	14,103,896	3,734,187	1,769,507	50,329	36,895	5,590,918	109,576,116	117,044,659
2020	1,703,523	13,934,089	3,733,540	1,769,262	50,294	36,799	5,589,895	109,681,968	117,149,279
2021	1,894,708	14,126,421	3,733,589	1,769,281	50,296	36,806	5,589,972	110,187,522	117,654,925
2022	1,632,669	13,861,004	3,733,454	1,769,228	50,289	36,787	5,589,758	108,358,142	115,825,283
2023	1,858,697	14,088,401	3,733,500	1,769,249	50,290	36,795	5,589,834	109,259,594	116,726,829
2024	1,641,196	13,871,098	3,733,516	1,769,253	50,292	36,796	5,589,857	109,137,677	116,604,943
2025	2,034,581	14,264,690	3,733,519	1,769,253	50,292	36,797	5,589,861	109,651,013	117,118,283
2026	1,585,993	13,808,787	3,733,223	1,769,141	50,276	36,752	5,589,392	109,257,931	116,724,634
2027	2,009,664	14,233,684	3,733,268	1,769,160	50,279	36,759	5,589,466	109,598,280	117,065,069
2028	1,685,554	13,908,540	3,733,229	1,769,145	50,276	36,754	5,589,404	109,236,892	116,703,609
2029	1,807,154	14,030,861	3,733,257	1,769,156	50,277	36,759	5,589,449	109,657,792	117,124,563
2030	1,830,605	14,053,556	3,733,225	1,769,145	50,276	36,753	5,589,399	109,451,766	116,918,474
2031	1,819,463	14,042,711	3,733,265	1,769,160	50,278	36,758	5,589,461	110,022,916	117,489,703
2032	1,798,587	14,021,847	3,733,268	1,769,160	50,278	36,760	5,589,466	110,412,480	117,879,274
2033	1,748,030	13,969,468	3,733,194	1,769,131	50,274	36,749	5,589,348	109,345,338	116,811,991
2034	1,674,340	13,895,748	3,733,191	1,769,130	50,274	36,748	5,589,343	109,128,225	116,594,872
2035	1,904,999	14,127,842	3,733,249	1,769,153	50,277	36,757	5,589,436	109,312,282	116,779,040
TOTAL	98,561,356	738,705,056	190,116,496	68,310,432	1,949,868	1,427,629	261,804,425	5,692,337,834	6,070,923,245

a) Includes certain costs to be assigned directly to Kern County Water Agency. Refer to Appendix B text discussion of Table B-16A under "Project Water Charges."

TABLE B-12

Variable OMP&R Costs to Be Reimbursed through Variable OMP&R Component of Transportation Charge (a

(Dollars)

Calendar Year	North Bay Aqueduct				South Bay Aqueduct	California Aqueduct			
	Reach 1	Reach 3A	Reach 3B		Reach 1	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping Plant (1)	Cordelia Pumping Plant (Solano) (2)	Cordelia Pumping Plant (Napa) (b (3)	Total (4)	South Bay & Del Valle Pumping Plants (c (5)	Banks Pumping Plant (6)	Dos Amigos Pumping Plant (7)	Buena Vista Pumping Plant (8)	Teerink Pumping Plant (9)
1962	0	0	0	0	36,970	0	0	0	0
1963	0	0	0	0	57,711	0	0	0	0
1964	0	0	0	0	74,134	0	0	0	0
1965	0	0	0	0	142,609	0	0	0	0
1966	0	0	0	0	192,605	0	0	0	0
1967	0	0	0	0	223,117	13,881	0	0	0
1968	0	0	6,989	6,989	336,671	452,630	202,947	0	0
1969	0	0	8,551	8,551	257,579	293,741	135,425	0	0
1970	0	0	13,598	13,598	396,358	346,215	211,198	0	0
1971	0	0	10,609	10,609	381,662	574,015	225,188	138,001	17,664
1972	0	0	14,434	14,434	598,702	927,369	498,482	234,626	89,516
1973	0	0	14,449	14,449	493,490	685,014	379,305	303,105	275,021
1974	0	0	17,473	17,473	565,575	769,839	438,997	344,632	350,558
1975	0	0	14,779	14,779	349,758	1,330,133	514,241	542,726	585,744
1976	0	0	20,856	20,856	571,361	1,456,742	562,537	609,257	600,780
1977	0	0	22,635	22,635	512,996	801,033	211,120	166,598	173,208
1978	0	0	21,692	21,692	586,355	2,215,828	574,813	658,309	578,337
1979	0	0	16,237	16,237	605,136	3,431,968	973,702	760,080	724,534
1980	0	0	19,945	19,945	523,369	1,882,630	1,010,938	853,317	826,802
1981	0	0	23,841	23,841	567,692	3,920,954	1,897,018	1,289,727	1,269,451
1982	0	0	12,159	12,159	531,147	3,060,402	1,360,551	1,196,255	1,208,785
1983	0	0	2,335	2,335	124,260	866,082	372,224	362,477	337,756
1984	0	0	4,866	4,866	274,071	1,726,606	898,132	683,845	604,273
1985	0	0	10,186	10,186	451,019	3,203,309	1,615,438	1,397,512	1,397,110
1986	0	0	15,472	15,472	826,289	6,536,377	2,621,017	2,410,367	2,437,487
1987	0	0	27,222	27,222	895,814	5,788,733	2,523,890	2,240,542	2,223,201
1988	17,867	20,024	23,987	61,878	913,717	5,799,066	2,621,551	2,571,939	2,569,844
1989	26,413	45,485	6,589	78,487	1,083,079	9,160,732	3,990,038	3,980,189	3,990,355
1990	58,623	68,476	43,103	170,202	1,870,528	9,868,622	4,300,006	5,780,222	6,014,887
1991	16,286	14,005	7,042	37,333	444,348	1,773,432	469,508	910,113	1,006,336
1992	22,013	19,889	11,629	53,531	333,713	3,106,327	1,177,551	1,277,761	1,331,964
1993	(21,459)	(12,873)	(6,290)	(40,622)	(161,823)	401,332	363,446	(81,292)	(54,418)
1994	48,547	34,030	32,408	114,985	805,401	5,775,320	2,365,445	2,606,248	2,624,695
1995	108,138	70,961	63,526	242,625	1,741,657	18,581,081	6,017,573	5,887,165	6,654,314
1996	139,383	84,953	76,051	300,387	2,195,598	18,408,130	7,953,039	8,770,393	10,160,591
1997	157,981	97,726	87,978	343,685	2,270,862	20,691,841	9,057,398	10,170,200	11,827,955
1998	148,046	96,309	96,897	341,252	2,763,910	22,976,412	9,933,643	11,327,582	13,171,508
1999	162,025	110,097	108,363	380,485	2,917,304	24,159,436	10,485,274	12,022,679	13,987,078
2000	171,807	116,376	123,168	411,351	2,969,556	24,655,484	10,691,506	12,290,736	14,302,838
2001	176,290	122,689	125,094	424,073	3,015,962	24,971,467	10,833,188	12,458,446	14,497,831
2002	181,421	129,674	127,356	438,451	3,070,462	25,339,757	10,995,591	12,645,768	14,714,809
2003	186,551	136,851	129,678	453,080	3,126,385	25,810,604	11,199,887	12,907,041	15,021,837
2004	191,894	143,965	132,074	467,933	3,184,100	26,228,587	11,383,335	13,128,321	15,279,761
2005	180,265	134,159	123,078	437,502	2,967,180	24,639,683	10,684,595	12,279,909	14,289,890
2006	181,094	135,551	124,354	440,999	2,997,943	24,882,080	10,789,693	12,412,453	14,445,288
2007	183,012	136,818	125,518	445,348	3,025,962	25,028,503	10,855,758	12,477,307	14,518,516
2008	185,918	138,817	127,354	452,089	3,070,188	25,419,010	11,023,553	12,696,214	14,776,358
2009	188,196	140,373	128,783	457,352	3,104,598	25,672,337	11,133,833	12,829,176	14,931,249
2010	190,912	142,225	130,481	463,618	3,145,528	25,953,915	11,253,000	12,966,729	15,090,554
2011	193,731	144,175	132,272	470,178	3,188,661	26,314,566	11,411,752	13,170,588	15,330,162
2012	195,883	145,598	133,578	475,059	3,220,121	26,539,304	11,508,068	13,284,911	15,463,036
2013	201,521	149,605	137,255	488,381	3,308,736	27,190,497	11,789,689	13,624,059	15,858,107
2014	205,596	152,441	139,858	497,895	3,371,477	27,362,580	11,855,148	13,629,971	15,852,628
2015	206,412	152,856	140,241	499,509	3,380,686	27,616,657	11,976,927	13,826,239	16,089,879
2016	206,459	153,639	140,961	501,059	3,398,001	27,867,632	12,086,333	13,990,430	16,286,525
2017	206,205	153,450	140,788	500,443	3,393,815	27,828,286	12,067,221	13,963,752	16,254,834
2018	206,199	153,444	140,783	500,426	3,393,683	27,839,059	12,072,865	13,973,443	16,266,697
2019	206,245	153,478	140,814	500,537	3,394,416	27,853,545	12,079,385	13,983,423	16,278,706
2020	201,912	150,253	137,855	490,020	3,323,081	27,312,044	11,841,623	13,691,075	15,937,038
2021	202,255	150,507	138,089	490,851	3,328,720	27,362,702	11,864,326	13,722,612	15,974,449
2022	201,330	149,818	137,458	488,606	3,313,485	27,159,244	11,776,960	13,592,282	15,818,508
2023	201,651	150,057	137,676	489,384	3,318,774	27,275,059	11,827,175	13,672,288	15,914,957
2024	201,760	150,139	137,751	489,650	3,320,580	27,269,071	11,826,423	13,667,586	15,908,786
2025	201,777	150,152	137,763	489,692	3,320,851	27,285,861	11,830,301	13,676,497	15,919,792
2026	199,782	148,666	136,401	484,849	3,288,009	27,009,254	11,711,263	13,522,920	15,739,258
2027	200,086	148,893	136,609	485,588	3,293,016	27,079,413	11,740,573	13,567,540	15,792,657
2028	199,828	148,701	136,433	484,962	3,288,778	27,023,588	11,717,864	13,532,964	15,751,276
2029	200,014	148,838	136,559	485,411	3,291,824	27,096,964	11,749,040	13,583,066	15,811,756
2030	199,790	148,673	136,407	484,870	3,288,150	27,072,337	11,736,996	13,567,798	15,793,773
2031	200,096	148,900	136,616	485,612	3,293,185	27,085,314	11,743,323	13,571,452	15,797,369
2032	200,111	148,912	136,626	485,649	3,293,429	27,090,127	11,743,020	13,571,807	15,797,836
2033	199,617	148,544	136,289	484,450	3,285,308	26,991,494	11,703,354	13,513,819	15,728,668
2034	199,589	148,523	136,269	484,381	3,284,838	26,976,188	11,696,104	13,502,148	15,714,536
2035	200,000	148,829	136,550	485,379	3,291,594	26,991,941	11,708,929	13,513,297	15,726,872
TOTAL	7,939,072	5,873,671	5,684,450	19,497,193	144,305,826	1,140,079,386	491,870,236	559,422,642	645,662,372

a) Includes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."
b) Costs for the period 1968 through 1987 are for an interim facility.
c) The relatively minor costs of Del Valle Pumping Plant have beenc ombined with those of South Bay Pumping Plant to simplify the allocation procedures.

TABLE B-12

Variable OMP&R Costs to Be Reimbursed through Variable OMP&R Component of Transportation Charge (a

(Dollars)

Calendar Year	California Aqueduct (continued)								
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 24	Reach 26A	Reach 28J	Reach 29A
	Chrisman Pumping Plant (10)	Edmonston Pumping Plant (11)	Alamo Powerplant (12)	Pearblossom Pumping Plant (13)	Mojave Siphon Powerplant (14)	Silverwood Lake (d (15)	Devil Canyon Powerplant (16)	Lake Perris (d (17)	Oso Pumping Plant (18)
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	165,589	494,616	0	23,387	0	4,216	(3,024)	0	93,212
1973	434,834	1,524,488	0	219,421	0	47,861	(436,769)	0	158,063
1974	589,117	2,058,680	0	315,705	0	98,179	(496,517)	52,549	189,479
1975	1,130,256	3,940,915	0	577,509	0	25,950	(1,033,054)	65,938	349,000
1976	1,222,413	4,235,934	0	869,201	0	122,336	(1,459,978)	104,257	245,397
1977	351,987	1,160,085	0	296,678	0	261,704	(1,115,096)	50,523	18,075
1978	1,034,893	3,636,671	0	1,551,015	0	0	(3,038,194)	0	69,043
1979	1,438,690	4,965,847	0	1,712,620	0	122,803	(3,159,826)	355,442	118,995
1980	1,634,049	5,416,333	0	1,733,275	0	154,695	(3,318,152)	0	36,761
1981	2,726,625	8,975,564	0	2,152,072	0	290,518	(3,678,813)	372,857	443,282
1982	2,416,093	8,325,450	0	1,489,997	0	0	(2,734,735)	0	539,246
1983	610,175	1,812,417	0	346,500	0	381,004	(5,478,332)	0	135,164
1984	1,131,707	3,450,038	0	627,100	0	0	(7,325,752)	(10,364)	237,006
1985	2,781,982	9,262,238	0	1,195,775	0	0	(10,477,628)	(57,093)	874,071
1986	5,011,171	16,995,600	(1,013,756)	2,364,991	0	0	(11,484,996)	0	1,271,720
1987	4,455,625	14,683,449	(1,025,854)	1,830,348	0	125,164	(10,805,393)	48,536	1,325,853
1988	5,147,228	16,895,130	(744,374)	2,386,714	0	0	(14,495,967)	0	1,425,495
1989	8,405,372	28,216,023	(766,443)	4,125,465	0	686,048	(18,532,961)	89,740	2,020,134
1990	13,618,589	48,328,629	(834,580)	6,505,724	0	88,531	(20,909,320)	145,463	2,855,157
1991	2,426,398	8,681,263	(361,974)	979,001	0	0	(6,936,633)	0	530,867
1992	2,680,512	8,981,816	(934,191)	1,221,061	0	159,362	(9,489,780)	(57,225)	709,606
1993	(473,208)	(2,244,445)	(57,037)	(261,628)	0	(27,772)	(7,502,549)	0	115,785
1994	5,510,404	19,128,766	(57,148)	2,457,824	0	1,091,054	(11,999,226)	0	1,377,066
1995	13,495,433	46,490,937	(1,188,309)	6,683,164	(4,255,341)	0	(20,610,305)	473,000	2,949,103
1996	20,972,050	72,944,123	(1,992,373)	10,325,324	(5,585,429)	0	(29,282,129)	38,877	4,706,865
1997	24,530,116	85,524,442	(2,136,451)	12,994,070	(6,436,037)	4,222,656	(29,010,481)	0	5,120,516
1998	27,399,897	95,732,782	(5,341,322)	13,598,928	(5,532,741)	1,382,904	(30,309,351)	353,697	6,008,715
1999	29,137,098	101,875,654	(5,325,540)	14,279,518	(5,569,413)	890,362	(29,991,324)	0	6,460,029
2000	29,814,711	104,281,208	(5,384,041)	14,692,665	(5,783,871)	0	(29,923,985)	0	6,575,948
2001	30,230,103	105,749,620	(5,363,175)	14,859,939	(5,660,042)	0	(29,832,587)	222,509	6,676,692
2002	30,688,958	107,365,787	(5,320,870)	15,042,223	(5,454,869)	864,519	(30,040,541)	0	6,787,557
2003	31,344,823	109,688,467	(5,357,025)	15,433,862	(5,699,257)	0	(29,894,752)	100,460	6,901,226
2004	31,894,455	111,632,632	(5,332,552)	15,707,544	(5,649,345)	0	(29,898,853)	134,778	7,015,036
2005	29,783,765	104,165,187	(5,320,459)	14,672,649	(5,757,865)	150,470	(29,933,397)	0	6,570,056
2006	30,117,396	105,349,340	(5,342,758)	14,840,775	(5,772,397)	0	(29,908,362)	36,179	6,638,714
2007	30,269,745	105,881,242	(5,308,229)	14,906,022	(5,701,440)	487,560	(29,950,787)	0	6,671,431
2008	30,822,683	107,843,064	(5,376,033)	15,190,074	(5,700,333)	0	(29,927,746)	59,513	6,785,570
2009	31,152,183	109,007,387	(5,365,258)	15,349,349	(5,754,579)	151,233	(29,939,894)	0	6,856,551
2010	31,491,128	110,204,462	(5,365,831)	15,511,428	(5,675,475)	405,578	(29,974,767)	0	6,928,185
2011	32,003,499	112,020,032	(5,386,659)	15,789,726	(5,822,393)	0	(29,913,824)	1,996	7,026,736
2012	32,286,477	113,020,365	(5,389,758)	15,934,765	(5,740,833)	0	(29,926,047)	45,314	7,084,644
2013	33,127,970	115,994,894	(5,379,189)	16,362,586	(5,684,827)	0	(29,941,684)	60,401	7,254,599
2014	33,110,443	115,918,723	(5,170,479)	15,936,952	(5,476,584)	0	(29,916,952)	91,079	7,398,448
2015	33,618,794	117,724,456	(5,294,839)	16,434,723	(5,532,204)	1,760,459	(29,999,826)	5,174	7,418,153
2016	34,043,472	119,237,184	(5,391,311)	16,807,898	(5,903,363)	0	(29,862,142)	46,221	7,451,254
2017	33,975,325	118,995,041	(5,342,533)	16,751,350	(5,905,045)	286,258	(29,886,534)	0	7,444,756
2018	34,000,316	119,083,191	(5,350,882)	16,778,362	(5,874,614)	0	(29,851,671)	85,308	7,444,300
2019	34,025,909	119,173,603	(5,361,115)	16,801,698	(5,927,775)	0	(29,870,179)	7,706	7,445,850
2020	33,297,689	116,598,110	(5,350,407)	16,454,432	(5,890,082)	0	(29,877,885)	24,611	7,288,519
2021	33,379,428	116,890,898	(5,397,984)	16,481,394	(5,760,659)	0	(29,929,452)	37,141	7,311,811
2022	33,041,214	115,683,472	(5,293,327)	16,248,482	(5,706,260)	845,786	(29,896,417)	91,746	7,260,343
2023	33,249,765	116,426,637	(5,338,123)	16,393,241	(5,828,288)	173,388	(29,870,786)	71,056	7,291,909
2024	33,235,869	116,376,316	(5,338,706)	16,418,229	(5,926,386)	186,912	(29,871,325)	0	7,276,033
2025	33,262,348	116,475,375	(5,344,827)	16,397,582	(5,826,380)	333,158	(29,921,888)	0	7,294,367
2026	32,874,451	115,098,041	(5,330,659)	16,230,317	(5,957,430)	0	(29,722,790)	256,776	7,203,276
2027	32,991,101	115,515,760	(5,346,822)	16,263,270	(5,803,451)	330,238	(29,932,717)	0	7,237,998
2028	32,900,274	115,189,340	(5,332,724)	16,222,415	(5,978,268)	0	(29,687,796)	304,627	7,217,270
2029	33,030,862	115,655,030	(5,361,514)	16,312,882	(5,853,742)	0	(29,908,193)	0	7,237,582
2030	32,991,897	115,515,707	(5,354,483)	16,290,212	(5,892,853)	0	(29,880,627)	15,304	7,229,863
2031	33,000,804	115,549,174	(5,347,974)	16,273,765	(5,826,542)	0	(29,917,680)	0	7,240,232
2032	33,002,992	115,559,012	(5,386,991)	16,277,153	(5,676,577)	0	(29,983,438)	0	7,240,891
2033	32,851,710	115,017,077	(5,365,582)	16,169,545	(5,528,945)	0	(29,900,660)	258,655	7,218,124
2034	32,821,722	114,910,926	(5,364,588)	16,162,931	(5,552,008)	407,991	(30,039,711)	0	7,208,067
2035	32,847,945	115,003,740	(5,323,766)	16,113,692	(5,689,060)	0	(29,640,358)	611,848	7,236,044
TOTAL	1,346,567,321	4,705,293,945	(214,260,825)	667,114,891	(234,553,003)	16,511,125	(1,371,492,538)	4,594,599	296,751,740

d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant,

TABLE B-12

Variable OMP&R Costs to Be Reimbursed through Variable OMP&R Component of Transportation Charge (a

(Dollars)

Calendar Year	California Aqueduct (continued)							
	Reach 29G	Reach 29H	Reach 29J	Reach 30	Reach 31A	Reach 33A		
	Warne Powerplant (19)	Pyramid Lake (d (20)	Castaic Powerplant (21)	Castaic Lake (d (22)	Las Perillas & Badger Hill Pumping Plants (23)	Devil's Den, Bluestone, & Polonio PPs San Luis Obispo Pwp (24)	Total (25)	Grand Total (26)
1962	0	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	0	13,881	236,998
1968	0	0	0	0	118,676	0	774,253	1,117,913
1969	0	0	0	0	78,350	0	507,516	773,646
1970	0	0	0	0	136,429	0	693,842	1,103,798
1971	0	0	0	0	166,296	0	1,121,164	1,513,435
1972	0	3,578	(193,058)	72,639	237,638	0	2,648,786	3,261,922
1973	0	7,344	(1,057,564)	0	120,913	0	2,661,036	3,168,975
1974	0	42,364	(1,540,853)	5,561	118,582	0	3,336,872	3,919,920
1975	0	0	(2,445,397)	10,225	94,848	0	5,689,034	6,053,571
1976	0	60,068	(1,940,099)	1,056,464	141,260	0	7,886,569	8,478,786
1977	0	0	(607,380)	(1,211,050)	71,311	0	628,796	1,164,427
1978	0	1,061,100	(1,542,479)	0	179,925	0	6,979,261	7,587,308
1979	0	0	(2,384,748)	(12,206)	192,126	0	9,240,027	9,861,400
1980	0	456,892	(984,154)	10,716	168,458	0	9,882,560	10,425,874
1981	0	0	(3,201,635)	0	169,178	0	16,626,798	17,218,331
1982	(783,626)	0	(3,463,971)	0	168,390	0	12,782,837	13,326,143
1983	(843,635)	68,779	(4,369,425)	(1,588,849)	17,887	0	(6,969,776)	(6,843,181)
1984	(1,991,601)	0	(1,820,263)	(1,674,550)	113,728	0	(3,350,095)	(3,071,158)
1985	(5,930,176)	0	(16,316,559)	0	147,587	0	(10,906,434)	(10,445,229)
1986	(5,579,301)	0	(11,072,448)	0	298,277	0	10,796,506	11,638,267
1987	(6,304,152)	70,042	(11,562,269)	(39,930)	245,082	0	5,822,867	6,745,903
1988	(6,993,235)	54,279	(12,292,638)	(209,200)	215,561	0	4,951,393	5,926,988
1989	(8,235,085)	14,364	(14,514,469)	124,729	283,590	0	23,037,821	24,199,387
1990	(11,011,065)	0	(20,116,506)	239,506	386,599	0	45,260,464	47,301,194
1991	(4,953,549)	327,899	(9,132,763)	0	2,414	0	(4,277,688)	(3,796,007)
1992	(5,276,177)	0	(9,512,218)	(891,610)	67,067	0	(5,448,174)	(5,060,930)
1993	(4,948,644)	(20,360)	(9,747,620)	(462,971)	(53,141)	0	(25,054,522)	(25,256,967)
1994	(6,706,716)	0	(12,144,490)	(41,008)	203,898	0	12,192,132	13,112,518
1995	(10,150,609)	239,288	(18,368,273)	738,750	347,179	0	53,984,150	55,968,432
1996	(14,635,947)	0	(26,024,234)	379,003	509,183	588,853	78,236,319	80,732,304
1997	(14,675,319)	0	(25,926,506)	0	661,951	1,411,844	108,028,195	110,642,742
1998	(17,317,273)	0	(28,282,084)	0	747,710	1,734,723	117,585,730	120,690,892
1999	(17,743,727)	0	(28,927,908)	55,320	789,554	1,832,726	128,416,816	131,714,605
2000	(17,754,070)	0	(28,957,065)	50,462	804,388	1,867,562	132,224,476	135,605,383
2001	(17,762,844)	0	(28,985,582)	0	816,960	1,896,745	135,609,270	139,049,305
2002	(17,765,539)	0	(28,978,822)	684	831,722	1,931,022	139,647,756	143,156,669
2003	(17,769,132)	0	(28,979,620)	0	846,870	1,966,190	143,521,481	147,100,946
2004	(17,751,807)	0	(28,963,100)	29,901	862,505	2,002,489	147,703,687	151,355,720
2005	(17,753,536)	0	(28,945,220)	57,828	803,745	1,866,066	132,253,366	135,658,048
2006	(17,763,205)	0	(28,977,327)	0	812,079	1,885,415	134,445,363	137,884,305
2007	(17,701,317)	0	(28,859,325)	198,290	819,668	1,903,035	136,495,979	139,967,289
2008	(17,762,773)	0	(28,972,834)	0	831,647	1,930,849	139,638,816	143,161,093
2009	(17,765,262)	0	(28,974,258)	0	840,969	1,952,489	142,077,505	145,639,455
2010	(17,749,830)	0	(28,924,435)	95,223	852,055	1,978,232	145,040,151	148,649,297
2011	(17,766,688)	0	(28,973,595)	0	863,740	2,005,358	148,074,996	151,733,835
2012	(17,763,974)	0	(28,946,224)	57,998	872,262	2,025,143	150,355,451	154,050,631
2013	(17,722,716)	0	(28,902,604)	143,381	896,265	2,080,871	156,752,299	160,549,416
2014	(17,765,982)	0	(28,973,659)	0	913,260	2,120,332	156,885,908	160,755,280
2015	(17,774,334)	0	(28,975,676)	0	915,755	2,126,122	161,936,459	165,816,654
2016	(17,769,283)	0	(28,966,597)	19,067	920,446	2,137,013	163,000,779	166,899,839
2017	(17,760,494)	0	(28,973,679)	0	919,311	2,134,377	162,752,226	166,646,484
2018	(17,772,000)	0	(28,975,077)	0	919,276	2,134,297	162,772,870	166,666,979
2019	(17,772,383)	0	(28,975,159)	0	919,474	2,134,757	162,797,445	166,692,398
2020	(17,750,543)	0	(28,924,825)	104,099	900,150	2,089,892	157,745,540	161,558,641
2021	(17,768,262)	0	(28,974,146)	0	901,678	2,093,440	158,189,376	162,008,947
2022	(17,729,598)	0	(28,888,938)	175,011	897,551	2,083,859	157,159,918	160,962,009
2023	(17,742,662)	0	(28,971,018)	0	898,985	2,087,185	157,530,768	161,338,926
2024	(17,731,845)	0	(28,893,743)	165,787	899,473	2,088,322	157,556,802	161,367,032
2025	(17,754,019)	0	(28,970,976)	0	899,547	2,088,492	157,645,230	161,455,773
2026	(17,716,067)	0	(28,866,190)	217,527	890,651	2,067,837	155,228,435	159,001,293
2027	(17,755,531)	0	(28,971,342)	0	892,007	2,070,986	155,671,680	159,450,284
2028	(17,744,529)	0	(28,917,713)	115,606	890,859	2,068,321	155,273,374	159,047,114
2029	(17,770,281)	0	(28,975,255)	0	891,685	2,070,235	155,570,117	159,347,352
2030	(17,763,956)	0	(28,973,993)	0	890,689	2,067,926	155,306,590	159,079,610
2031	(17,762,134)	0	(28,973,988)	0	892,053	2,071,094	155,396,262	159,175,059
2032	(17,770,563)	0	(28,975,195)	0	892,119	2,071,246	155,453,439	159,232,517
2033	(17,763,645)	0	(28,950,556)	50,745	889,919	2,066,138	154,949,860	158,719,618
2034	(17,727,220)	0	(28,910,666)	125,164	889,792	2,065,842	154,887,218	158,656,437
2035	(17,767,259)	0	(28,973,834)	0	891,622	2,070,092	155,321,745	159,098,718
TOTAL	(783,265,120)	2,385,637	(1,321,784,247)	(1,831,688)	38,717,683	78,867,417	6,066,651,573	6,230,454,592

TABLE B-13

Capital and Operating Costs of Project Conservation Facilities to Be Reimbursed through Delta Water Charge

(Dollars)

Calendar Year	Initial Project Conservation Facilities (Portions of Upper Feather Lakes, Oroville-Thermalito and California Aqueduct Facilities)					Planning and Pre-operating Costs (a (f (6)	Total (7)
	Capital Costs (a (1)	Capital Cost Credits (b (2)	Operating Costs (c (3)	Application of Oroville Power Revenues to: Capital Costs (d (4)	Application of Oroville Power Revenues to: Operating Costs (e (5)		
1952	171,322	0	0	0	0	0	171,322
1953	312,190	0	0	0	0	0	312,190
1954	308,624	0	0	0	0	0	308,624
1955	194,645	0	0	0	0	0	194,645
1956	1,357,077	0	0	0	0	0	1,357,077
1957	6,210,709	0	0	0	0	0	6,210,709
1958	9,510,916	0	0	0	0	0	9,510,916
1959	11,390,586	0	0	0	0	0	11,390,586
1960	14,456,356	(4,850,000)	0	0	0	0	9,606,356
1961	18,682,616	(431,527)	0	0	0	0	18,251,089
1962	9,012,960	(479,280)	0	0	0	0	8,533,680
1963	72,965,728	(478,743)	(14,000)	0	0	0	72,472,985
1964	62,490,522	(751,330)	(14,000)	0	0	107,780	61,832,972
1965	70,913,845	(763,541)	(14,000)	0	0	551,850	70,688,154
1966	125,205,400	(748,649)	(14,000)	0	0	1,081,023	125,523,774
1967	94,296,914	(812,145)	(13,446)	0	0	1,189,212	94,660,535
1968	39,888,442	(431,574)	1,303,821	(951,000)	0	793,399	40,603,088
1969	5,279,786	(259,015)	2,890,772	(11,007,000)	0	601,867	(2,493,590)
1970	4,130,490	(203,733)	4,818,634	(14,650,000)	(1,500,000)	516,659	(6,887,950)
1971	3,877,493	(193,631)	6,026,480	(14,650,000)	(1,500,000)	408,754	(6,030,904)
1972	4,569,024	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,096,952)
1973	3,985,414	(136,997)	6,135,774	(14,650,000)	(1,500,000)	203,384	(5,962,425)
1974	6,660,000	(137,503)	6,944,723	(17,950,000)	(1,500,000)	201,907	(5,780,873)
1975	8,084,450	(234,567)	7,697,390	(14,650,000)	(1,500,000)	146,188	(456,539)
1976	5,870,531	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(3,212,142)
1977	21,285,849	(150,214)	10,547,977	(14,650,000)	(1,500,000)	857,419	16,391,031
1978	7,713,252	(64,566)	12,851,158	(14,650,000)	(1,500,000)	2,131,286	6,481,130
1979	9,030,801	0	9,547,014	(14,650,000)	(1,500,000)	2,131,884	4,559,699
1980	10,372,763	0	13,200,783	(14,650,000)	(1,500,000)	3,734,312	11,157,858
1981	11,189,191	0	10,391,987	(14,650,000)	(1,500,000)	4,599,246	10,030,424
1982	16,480,225	0	16,246,788	(14,650,000)	(1,500,000)	4,594,682	21,171,695
1983	11,935,061	0	22,255,887	(34,705,000)	(8,735,000)	3,751,993	(5,497,059)
1984	8,021,864	0	22,952,964	(14,650,000)	(10,348,000)	3,743,484	9,720,312
1985	10,314,802	0	23,933,169	(14,650,000)	(8,079,000)	3,675,801	15,194,772
1986	18,157,561	0	27,117,575	(14,650,000)	(9,107,000)	2,478,330	23,996,466
1987	28,575,452	0	24,651,132	(14,650,000)	(9,451,000)	1,766,739	30,892,323
1988	26,319,651	0	27,408,877	(14,650,000)	(8,677,000)	1,813,458	32,214,986
1989	6,781,928	0	29,194,676	(14,650,000)	(8,104,000)	2,675,611	15,898,215
1990	23,646,291	0	39,166,598	(14,650,000)	(8,497,000)	1,441,262	41,107,151
1991	31,720,916	0	79,060,981	(14,650,000)	(9,487,000)	1,728,338	88,373,235
1992	22,729,556	0	36,011,832	(14,650,000)	(8,526,000)	1,717,617	37,283,005
1993	17,252,547	0	38,326,713	(14,650,000)	(8,768,000)	1,706,437	33,867,697
1994	14,973,734	0	43,227,816	(14,650,000)	(7,484,000)	2,128,095	38,195,645
1995	11,554,736	0	44,314,572	(14,650,000)	(7,041,000)	6,822,000	41,000,308
1996	11,957,933	0	43,910,086	(14,650,000)	(7,288,000)	5,897,000	39,827,019
1997	26,439,517	0	45,787,388	(14,650,000)	(7,299,000)	10,172,000	60,449,905
1998	34,093,715	0	42,311,726	(14,650,000)	(7,210,000)	14,536,000	69,081,441
1999	13,935,735	0	45,651,247	(14,650,000)	(7,210,000)	14,536,000	52,262,982
2000	1,306,340	0	44,870,403	(14,650,000)	(7,210,000)	14,536,000	38,852,743
2001	0	0	45,613,054	(14,650,000)	(7,210,000)	4,619,000	28,372,054
2002	0	0	45,770,038	(14,650,000)	(7,210,000)	4,619,000	28,529,038
2003	0	0	45,836,767	(14,650,000)	(7,210,000)	4,619,000	28,595,767
2004	0	0	46,202,936	(14,650,000)	(7,210,000)	4,619,000	28,961,936
2005	0	0	45,625,352	(14,650,000)	(7,210,000)	4,619,000	28,384,352
2006	0	0	45,799,341	(14,650,000)	(7,210,000)	4,619,000	28,558,341
2007	0	0	45,982,300	(14,650,000)	(7,210,000)	4,619,000	28,741,300
2008	0	0	45,925,875	(14,650,000)	(7,210,000)	4,619,000	28,684,875
2009	0	0	45,943,774	(14,650,000)	(7,210,000)	4,619,000	28,702,774
2010	0	0	45,852,738	(14,650,000)	(7,210,000)	4,619,000	28,611,738
2011	0	0	41,686,509	(14,650,000)	(7,210,000)	0	19,826,509
2012	0	0	41,455,657	(14,650,000)	(7,210,000)	0	19,595,657
2013	0	0	41,139,237	(14,650,000)	(7,210,000)	0	19,279,237
2014	0	0	41,684,449	(14,650,000)	(7,210,000)	0	19,824,449
2015	0	0	41,687,504	(14,650,000)	(7,210,000)	0	19,827,504
2016	0	0	42,113,373	(14,650,000)	(7,210,000)	0	20,253,373
2017	0	0	41,544,644	(14,650,000)	(7,210,000)	0	19,684,644
2018	0	0	41,699,932	(14,650,000)	(7,210,000)	0	19,839,932
2019	0	0	41,702,277	(14,650,000)	(7,210,000)	0	19,842,277
2020	0	0	41,290,792	(14,650,000)	(7,210,000)	0	19,430,792
2021	0	0	40,764,522	(14,650,000)	(7,210,000)	0	18,904,522
2022	0	0	40,439,531	(14,650,000)	(7,210,000)	0	18,579,531
2023	0	0	40,835,922	(14,650,000)	(7,210,000)	0	18,975,922
2024	0	0	41,232,580	(14,650,000)	(7,210,000)	0	19,372,580
2025	0	0	41,007,401	(14,650,000)	(7,210,000)	0	19,147,401
2026	0	0	43,041,791	(14,650,000)	(7,210,000)	0	21,181,791
2027	0	0	43,048,666	(14,650,000)	(7,210,000)	0	21,188,666
2028	0	0	43,092,629	(14,650,000)	(7,210,000)	0	21,232,629
2029	0	0	43,001,175	(14,650,000)	(7,210,000)	0	21,141,175
2030	0	0	42,582,929	(14,650,000)	(7,210,000)	0	20,722,929
2031	0	0	43,154,306	(14,650,000)	(7,210,000)	0	21,294,306
2032	0	0	42,812,913	(14,650,000)	(7,210,000)	0	20,952,913
2033	0	0	43,126,496	(14,650,000)	(7,210,000)	0	21,266,496
2034	0	0	43,048,128	(14,650,000)	(7,210,000)	0	21,188,128
2035	0	0	44,596,542	(14,650,000)	(7,210,000)	0	22,736,542
TOTAL	975,615,460	(11,528,320)	2,311,489,625	(1,002,213,000)	(420,371,000)	165,659,625	2,018,652,390

a) Reimbursed through the capital cost component of the Delta Water Charge.
b) Negotiated settlements as to the magnitude of SWP planning costs from 1952 through 1978.
c) Reimbursed through the minimum OMP&R component of the Delta Water Charge. Credits for Gianelli power generation are reflected in these net costs.
d) Revenues credited through the capital cost component of the Delta Water Charge.
e) Revenues credited through the minimum OMP&R component of the Delta Water Charge.
f) Under amendments of Articles 22(e) and 22(g), planning and pre-operating costs of additional Project Conservation Facilities incurred through the previous year (1994) are reflected in the Delta Water Charge.

TABLE B-14

Capital Costs of Transportation Facilities Allocated to Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (a (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1952	0	0	0	83	114	410	607	121	224	345
1953	0	0	0	324	479	1,808	2,611	336	619	955
1954	0	0	0	819	1,305	5,150	7,274	422	779	1,201
1955	0	0	0	976	1,570	6,297	8,843	211	388	599
1956	0	0	0	8,844	14,459	63,816	87,119	227	419	646
1957	15,199	11,435	26,634	21,563	35,239	649,598	706,400	290	535	825
1958	33,420	16,591	50,011	67,764	71,717	733,415	872,896	721	1,329	2,050
1959	20,697	6,591	27,288	154,254	143,731	493,049	791,034	23,873	55,901	79,774
1960	9,097	8,830	17,927	296,491	275,611	1,018,661	1,590,763	33,968	81,078	115,046
1961	6,950	7,445	14,395	853,505	802,675	1,914,709	3,570,889	14,829	32,015	46,844
1962	(195)	(925)	(1,120)	545,122	615,142	1,686,043	2,846,307	19,299	37,552	56,851
1963	1,320	1,110	2,430	657,426	1,281,271	3,243,839	5,182,536	72,514	137,149	209,663
1964	38,392	35,467	73,859	712,650	1,747,783	7,251,800	9,712,233	145,578	275,038	420,616
1965	198,833	62,221	261,054	360,779	606,026	3,414,457	4,381,262	260,035	487,825	747,860
1966	461,619	49,917	511,536	592,714	592,598	2,245,216	3,430,528	597,151	1,108,285	1,705,436
1967	1,569,498	40,379	1,609,877	796,993	803,951	2,401,863	4,002,807	946,252	1,752,854	2,699,106
1968	859,613	61,691	921,304	736,470	696,074	1,997,925	3,430,469	359,010	667,342	1,026,352
1969	74,389	59,317	133,706	269,698	293,274	764,952	1,327,924	83,728	157,820	241,548
1970	43,362	67,876	111,238	58,677	61,200	135,569	255,446	54,101	103,013	157,114
1971	26,764	34,051	60,815	12,086	18,227	84,089	114,402	36,875	72,475	109,350
1972	19,643	18,905	38,548	12,291	12,762	63,612	88,665	23,764	45,755	69,519
1973	56,510	30,874	87,384	10,494	12,137	39,380	62,011	27,126	52,063	79,189
1974	165,830	65,832	231,662	15,721	24,402	73,121	113,244	29,803	56,615	86,418
1975	91,825	89,233	181,058	16,730	15,807	41,394	73,931	24,044	52,112	76,156
1976	57,766	83,650	141,416	34,004	34,663	109,610	178,277	51,536	112,544	164,080
1977	64,167	80,147	144,314	46,229	45,116	133,374	224,719	128,920	244,123	373,043
1978	69,319	81,717	151,036	71,234	66,008	174,897	312,139	42,446	82,791	125,237
1979	191,272	282,908	474,180	45,469	42,942	110,667	199,078	50,421	98,191	148,612
1980	264,433	386,006	650,439	134,522	124,352	304,615	563,489	183,967	342,943	526,910
1981	227,599	383,086	610,685	(33,761)	(29,878)	(65,702)	(129,341)	(74,739)	(133,570)	(208,309)
1982	546,899	870,611	1,417,510	3,173	3,735	13,684	20,592	(46,831)	(84,879)	(131,710)
1983	1,254,499	1,433,061	2,687,560	134,897	127,859	328,435	591,191	27,254	52,528	79,782
1984	2,547,878	2,750,040	5,297,918	152,990	140,970	351,914	645,874	32,422	61,777	94,199
1985	7,142,648	6,443,613	13,586,261	18,266	17,769	49,365	85,400	17,071	36,481	53,552
1986	10,565,936	16,926,630	27,492,566	32,030	31,578	88,063	151,671	75,867	186,280	262,147
1987	7,979,816	12,599,438	20,579,254	49,753	48,309	138,088	236,150	373,276	989,430	1,362,706
1988	2,312,479	4,340,117	6,652,596	114,077	110,323	296,796	521,196	422,593	1,104,661	1,527,254
1989	1,224,469	1,602,503	2,826,972	105,662	100,328	253,309	459,299	357,753	912,259	1,270,012
1990	434,829	885,008	1,319,837	171,190	174,189	495,433	840,812	459,519	1,155,456	1,614,975
1991	98,486	151,916	250,402	153,729	144,489	362,477	660,695	670,303	1,641,769	2,312,072
1992	57,037	120,034	177,071	89,920	83,816	207,253	380,989	1,098,173	2,580,322	3,678,495
1993	113,353	169,185	282,538	70,196	68,318	178,246	316,760	4,182,419	9,603,479	13,785,898
1994	66,659	143,831	210,490	53,684	53,162	141,244	248,090	17,177,389	38,616,184	55,793,573
1995	294,914	518,086	813,000	18,539	18,855	52,293	89,687	65,517,732	158,120,474	223,638,206
1996	461,338	658,662	1,120,000	34,242	33,530	89,312	157,084	29,039,667	91,082,235	120,121,902
1997	243,583	564,417	808,000	34,891	34,123	90,727	159,741	713,816	1,803,292	2,517,108
1998	3,571	3,429	7,000	14,174	13,989	37,487	65,650	345,219	761,584	1,106,803
1999	0	0	0	7,132	6,556	16,635	30,323	147,189	323,142	470,331
2000	0	0	0	0	0	0	0	46,681	103,319	150,000
2001	0	0	0	0	0	0	0	31,119	68,881	100,000
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
TOTAL	39,915,716	52,144,935	92,060,651	7,758,716	9,622,655	32,288,395	49,669,766	123,825,460	315,044,881	438,870,341

a) Costs from Table B-10 allocated to Solano County Water Agency are reduced herein by $2,102,700 in 1986 and $1,823,500 in 1987 under provisions of Amendment No. 10 to its water supply contract.

TABLE B-14

Capital Costs of Transportation Facilities Allocated to Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area									
				Kern County Water Agency						
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (b (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Municipal and Industrial (c (15)	Agri-cultural (16)	County of Kings (17)	Oak Flat Water District (18)	Tulare Lake Basin Water Storage District (19)	Total (20)
1952	389	19	59	938	120	9,127	19	13	784	11,468
1953	1,076	53	161	2,888	344	27,381	56	33	2,158	34,150
1954	1,350	67	200	3,374	416	32,371	70	42	2,719	40,609
1955	676	36	100	1,498	198	14,718	36	22	1,371	18,655
1956	727	33	107	2,703	272	24,257	34	26	1,416	29,575
1957	932	38	139	6,047	495	49,932	38	30	1,707	59,358
1958	2,308	100	345	14,372	1,154	119,049	103	61	4,367	141,859
1959	7,384	363	2,517	26,219	2,597	253,890	372	381	14,757	308,480
1960	12,940	629	3,666	34,053	4,155	352,167	644	498	25,696	434,448
1961	21,849	1,063	3,957	51,406	6,500	538,710	1,087	599	43,376	668,547
1962	49,320	2,410	7,866	94,932	13,836	1,017,145	2,466	1,879	98,141	1,287,995
1963	208,758	10,686	32,171	364,014	55,715	3,934,637	10,933	5,990	425,330	5,048,234
1964	328,285	16,961	64,891	600,151	88,904	6,636,279	17,349	11,942	672,011	8,436,773
1965	538,215	27,481	117,998	1,098,999	152,931	11,999,894	28,115	21,802	1,095,126	15,080,561
1966	1,107,759	52,587	279,171	2,218,832	339,222	24,857,488	53,788	38,891	2,173,090	31,120,828
1967	852,537	39,539	445,560	2,012,745	286,990	23,629,027	40,444	34,775	1,653,428	28,995,045
1968	198,739	9,739	166,266	1,104,133	70,088	11,544,940	9,962	12,237	396,074	13,512,178
1969	94,436	4,794	35,472	616,518	27,216	6,416,146	4,902	7,302	191,574	7,398,360
1970	54,345	2,719	21,684	414,660	15,521	4,145,045	2,783	3,999	109,471	4,770,227
1971	25,462	1,290	12,094	190,552	7,112	1,622,275	1,320	540	51,620	1,912,265
1972	11,589	589	8,354	82,884	3,409	723,623	601	343	23,526	854,918
1973	6,657	336	10,202	39,975	1,976	458,532	341	220	13,449	531,688
1974	9,478	469	11,044	45,421	2,767	483,865	478	326	18,981	572,829
1975	13,328	678	5,245	36,469	3,710	382,745	692	426	27,049	470,342
1976	17,507	837	12,616	53,085	5,621	654,024	856	1,152	34,454	780,152
1977	9,671	437	47,790	36,478	3,753	886,672	445	494	18,496	1,004,236
1978	23,499	(30,407)	6,178	54,218	6,579	575,170	1,208	1,402	47,447	685,294
1979	25,051	1,295	5,665	53,867	6,609	559,748	1,324	1,862	51,294	706,715
1980	144,981	(4,617)	31,161	321,889	38,126	3,211,810	7,682	7,144	297,216	4,055,392
1981	(5,438)	(15,464)	194	(44,642)	(1,222)	(384,347)	(297)	1,751	(11,347)	(460,812)
1982	47,866	2,482	5,672	78,941	12,566	602,098	2,533	1,179	98,146	851,483
1983	50,949	(35,369)	11,416	107,344	13,454	1,035,024	2,693	1,269	104,366	1,291,146
1984	86,347	4,474	14,303	155,328	22,775	1,621,389	4,571	2,678	177,021	2,088,886
1985	24,798	1,281	5,282	45,656	6,584	466,643	1,309	1,151	50,729	603,433
1986	38,308	(41,067)	9,861	71,704	10,320	796,426	2,008	777	78,140	966,477
1987	28,769	1,476	7,004	55,535	7,968	616,849	1,509	1,491	58,679	779,280
1988	51,763	2,801	16,757	69,251	11,889	892,291	2,863	4,604	108,552	1,160,771
1989	155,501	7,988	27,244	350,707	42,778	3,817,088	8,169	12,117	317,382	4,738,974
1990	278,130	14,416	44,294	521,606	83,234	5,696,036	14,746	22,054	570,297	7,244,813
1991	335,551	17,390	54,458	550,540	87,943	6,079,615	17,786	22,819	687,993	7,854,095
1992	102,532	5,300	20,395	174,293	27,047	1,960,563	5,419	10,195	209,932	2,515,676
1993	64,902	3,307	18,125	121,497	17,646	1,398,907	3,381	3,951	131,908	1,763,624
1994	78,322	4,035	16,161	135,186	20,836	1,516,300	4,125	2,568	160,069	1,937,602
1995	22,303	(4,114)	7,212	38,178	5,963	459,942	1,173	1,950	45,551	578,158
1996	50,261	2,599	11,934	83,279	13,271	962,212	2,657	4,670	102,916	1,233,799
1997	51,434	2,659	12,109	85,193	13,583	983,183	2,720	4,784	105,325	1,260,990
1998	18,211	938	6,854	31,018	4,853	385,439	958	1,606	37,212	487,089
1999	10,040	521	3,415	16,644	2,644	204,246	532	933	20,568	259,543
2000	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
TOTAL	5,259,797	115,877	1,625,369	12,230,578	1,550,468	134,270,571	267,003	256,978	10,549,567	166,126,208

b) Costs from Table B-10 allocated to Empire West Side Irrigation District are reduced herein by $31,588 in 1978; $12,129 in 1980; $15,173 in 1981; $38,004 in 1983; $43,033 in 1986; and $5,261 in 1995 in accordance with letters of agreement with the district.

c) Costs related to maximum annual entitlement of 15,000 acre-feet under Amendment No. 18 of the water supply contract with Kern County Water Agency.

TABLE B-14

Capital Costs of Transportation Facilities Allocated to Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (21)	Castaic Lake Water Agency (d (22)	Coachella Valley Water District (23)	Crestline-Lake Arrowhead Water Agency (24)	Desert Water Agency (25)	Littlerock Creek Irrigation District (26)	Mojave Water Agency (27)	Palmdale Water District (28)	San Bernardino Valley Municipal Water District (29)	San Gabriel Valley Municipal Water District (30)
1952	3,157	1,044	850	252	1,405	72	1,695	418	6,079	1,547
1953	10,024	3,326	2,667	800	4,401	221	5,322	1,327	19,058	4,855
1954	12,741	4,194	3,464	1,032	5,714	286	6,911	1,692	24,608	6,289
1955	5,411	1,879	1,376	398	2,266	115	2,753	713	9,227	2,376
1956	9,773	3,588	2,197	615	3,621	192	4,449	1,268	13,136	3,437
1957	26,304	9,255	6,342	1,818	10,462	541	12,769	3,451	40,646	10,536
1958	49,201	17,599	11,582	3,291	19,099	990	23,359	6,416	72,709	18,896
1959	70,246	29,741	15,870	4,614	26,170	1,346	31,757	9,029	98,594	25,519
1960	84,550	38,759	22,068	6,794	36,393	1,548	43,258	10,770	147,170	37,468
1961	126,540	54,258	34,617	12,534	57,086	2,250	63,709	16,436	236,163	57,706
1962	198,556	85,350	43,721	13,859	72,100	3,347	84,710	24,943	253,432	64,329
1963	580,138	255,252	116,797	33,149	192,624	9,829	234,926	73,257	610,278	160,623
1964	1,094,365	501,857	209,460	55,448	345,447	18,442	429,607	137,768	1,026,065	276,115
1965	1,908,076	947,523	385,531	103,756	635,821	32,818	786,986	244,589	1,913,091	512,861
1966	3,960,301	2,150,974	812,657	215,858	1,340,233	69,326	1,664,584	517,268	3,943,586	1,062,420
1967	4,976,539	4,100,533	1,077,423	296,069	1,776,895	88,302	2,182,238	653,250	5,821,682	1,550,237
1968	5,924,471	3,998,943	1,350,742	368,157	2,227,645	107,350	2,738,008	783,940	7,982,824	2,122,941
1969	5,822,708	3,079,427	1,690,259	539,852	2,787,631	121,302	3,256,507	865,454	10,898,186	2,769,647
1970	5,032,961	3,277,780	2,050,790	695,344	3,382,250	106,383	3,872,369	736,777	13,795,811	3,457,106
1971	2,577,508	2,146,955	1,071,521	338,583	1,767,179	48,337	2,087,224	347,057	8,137,052	1,987,119
1972	973,434	283,255	331,757	92,077	547,138	19,134	668,550	134,359	2,691,133	697,957
1973	354,409	914,305	158,582	82,223	261,558	6,304	238,095	46,103	1,760,569	403,583
1974	451,451	280,865	259,176	74,112	427,434	8,143	518,452	59,144	1,617,393	425,927
1975	253,437	246,493	193,631	52,820	319,338	4,954	392,109	33,995	1,533,663	407,917
1976	237,537	255,240	136,750	37,235	225,528	4,245	277,805	31,001	962,276	255,900
1977	199,550	371,467	91,384	25,857	150,713	3,755	183,607	26,835	591,447	155,535
1978	302,110	470,179	78,574	22,228	129,585	5,233	157,814	38,655	428,988	111,769
1979	358,559	938,984	81,968	21,835	135,178	5,978	167,263	44,519	404,284	108,604
1980	1,869,024	1,777,296	424,041	113,270	699,331	32,461	864,671	241,087	2,042,591	548,586
1981	(157,383)	610,909	(46,794)	(8,626)	(77,173)	(2,553)	(102,077)	(19,422)	(139,661)	(42,400)
1982	1,557,171	854,174	297,603	79,185	490,799	26,209	610,714	196,492	1,423,333	388,958
1983	2,071,145	516,423	397,130	117,128	654,943	34,832	805,229	260,952	2,149,707	588,267
1984	1,525,235	296,308	300,340	86,382	495,322	27,388	611,351	189,426	1,569,309	429,629
1985	898,873	156,151	221,802	63,754	365,794	13,313	450,973	108,168	1,142,739	312,387
1986	899,412	104,909	244,068	63,974	402,519	10,676	501,946	103,893	1,169,312	319,298
1987	346,816	105,630	197,903	52,139	326,378	6,001	406,101	43,546	963,051	262,162
1988	260,834	171,629	95,516	30,528	157,529	4,091	189,400	29,859	644,018	171,982
1989	1,050,705	431,549	351,428	104,767	579,571	17,669	707,537	129,339	1,878,642	507,500
1990	534,343	319,725	338,251	100,234	557,843	5,801	683,313	55,089	1,811,656	491,186
1991	640,017	343,823	361,282	121,975	595,827	9,272	718,866	74,329	2,235,370	608,912
1992	353,902	263,812	226,534	126,693	373,602	5,475	403,906	48,185	2,150,067	587,919
1993	381,773	226,751	177,436	174,308	292,635	6,560	247,714	47,856	4,107,540	1,117,402
1994	348,014	115,579	96,998	89,138	159,974	5,875	141,129	43,116	2,437,257	661,284
1995	51,767	34,696	29,494	32,177	48,640	903	38,421	6,673	1,747,679	471,046
1996	100,439	389,881	25,877	6,684	42,676	1,723	53,486	12,818	2,899,078	775,863
1997	102,396	52,665	20,895	5,423	34,460	1,757	43,201	13,063	737,072	197,522
1998	41,728	25,730	9,280	2,471	15,307	721	19,044	5,352	47,055	12,663
1999	20,706	12,588	4,303	1,135	7,095	350	8,862	2,621	21,205	5,742
2000	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
TOTAL	48,500,974	31,279,253	14,015,143	4,463,349	23,113,986	879,267	27,540,623	6,442,876	96,076,170	25,115,127

d) Costs from Table B-10 allocated to Castaic Lake Water Agency are reduced herein by $14,088 in 1978 in accordance with a letter of agreement with the district.

TABLE B-14

Capital Costs of Transportation Facilities Allocated to Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area					
	San Gorgonio Pass Water Agency (31)	Metropolitan Water District of Southern California (e (32)	Ventura County Flood Control District (33)	Total (34)	City of Yuba City (35)	County of Butte (36)	Plumas County FC&WCD (37)	Total (38)	South Bay Area Future Contractor (39)	Grand Total (40)
1952	963	69,021	371	86,874	0	0	0	0	59	99,353
1953	3,011	217,635	1,186	273,833	0	0	0	0	263	311,812
1954	3,903	279,966	1,492	352,292	0	0	0	0	767	402,143
1955	1,473	111,618	671	140,276	0	0	0	0	969	169,342
1956	2,123	179,340	1,299	225,038	0	0	0	0	9,173	351,551
1957	6,526	516,047	3,365	648,062	0	0	0	0	23,173	1,464,452
1958	11,701	945,682	6,392	1,186,917	0	0	2	2	32,888	2,286,623
1959	15,817	1,364,307	9,893	1,702,903	0	0	14	14	57,919	2,967,412
1960	23,309	1,914,533	12,799	2,379,419	0	0	28	28	123,202	4,660,833
1961	36,154	3,212,117	18,768	3,928,338	0	0	10	10	316,221	8,545,244
1962	40,012	3,543,478	29,068	4,456,905	0	0	32	32	228,201	8,875,171
1963	99,266	11,185,924	86,806	13,638,869	0	0	51	51	528,495	24,610,278
1964	170,010	18,065,460	164,709	22,494,753	0	0	7,791	7,791	590,035	41,736,060
1965	316,082	33,763,578	307,475	41,858,187	0	0	3,139	3,139	332,680	62,664,743
1966	654,195	74,485,021	681,899	91,558,322	0	0	(48)	(48)	783,728	129,110,330
1967	958,408	130,599,410	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	1,314,842	147,502,292	1,360,688	177,782,843	0	0	51,573	51,573	1,254,192	197,978,911
1969	1,726,890	140,096,647	1,085,028	174,739,538	0	0	234,232	234,232	398,182	184,473,490
1970	2,160,120	161,983,071	1,147,608	201,698,370	0	0	16,227	16,227	74,028	207,082,650
1971	1,237,575	133,903,313	738,824	156,388,247	0	0	27,204	27,204	12,456	158,624,739
1972	434,505	43,931,735	66,878	50,871,912	0	0	9	9	13,183	51,936,754
1973	256,715	39,722,992	290,020	44,495,458	0	0	25	25	8,098	45,263,853
1974	264,348	18,896,593	86,361	23,369,399	0	0	45	45	28,569	24,402,166
1975	253,840	16,732,933	83,976	20,509,106	0	0	21	21	8,224	21,318,838
1976	158,851	13,545,457	84,624	16,212,449	0	0	51	51	16,485	17,492,910
1977	96,516	11,769,364	110,830	13,776,860	0	0	28	28	21,182	15,544,382
1978	69,151	15,781,693	174,876	17,770,855	0	0	38	38	28,876	19,073,475
1979	66,968	27,631,258	343,358	30,308,756	0	0	23	23	26,667	31,864,031
1980	338,118	59,503,595	641,585	69,095,656	0	0	26	26	59,168	74,951,080
1981	(25,647)	15,686,863	224,302	15,900,338	0	0	34	34	(6,760)	15,705,835
1982	239,199	30,679,200	313,699	37,156,736	0	0	11	11	13,819	39,328,441
1983	361,843	25,064,864	185,633	33,208,096	0	0	19	19	70,455	37,928,249
1984	264,151	16,453,002	103,354	22,351,197	0	0	26	26	83,251	30,561,351
1985	192,074	10,314,673	55,369	14,296,070	0	0	29	29	15,669	28,640,414
1986	196,407	9,011,101	34,794	13,062,309	0	0	31	31	16,247	41,951,448
1987	161,398	7,912,207	36,143	10,819,475	0	0	32	32	28,930	33,805,827
1988	106,431	7,709,635	56,327	9,627,779	0	0	55	55	48,971	19,538,622
1989	312,572	21,120,692	152,283	27,344,254	0	0	45	45	42,068	36,681,624
1990	302,336	17,697,638	107,878	23,005,293	0	0	63	63	75,377	34,101,170
1991	374,472	20,722,076	113,796	26,920,017	0	0	54	54	59,186	38,056,521
1992	361,050	19,173,656	85,608	24,160,409	0	0	42	42	39,982	30,952,664
1993	691,224	28,255,299	72,772	35,799,270	0	0	30	30	30,670	51,978,790
1994	410,133	15,831,284	37,494	20,377,275	0	0	12	12	23,938	78,590,980
1995	294,509	10,012,443	10,024	12,778,472	0	0	0	0	8,545	237,906,068
1996	488,646	25,479,560	140,048	30,416,779	0	0	0	0	14,187	153,063,751
1997	124,097	5,064,428	15,583	6,412,562	0	0	0	0	14,420	11,172,821
1998	7,800	774,091	6,712	967,954	0	0	0	0	5,668	2,640,164
1999	3,532	367,120	3,321	458,580	0	0	0	0	2,695	1,221,472
2000	0	0	0	0	0	0	0	0	0	150,000
2001	0	0	0	0	0	0	0	0	0	100,000
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0
TOTAL	15,587,619	1,398,783,912	10,575,065	1,702,373,364	0	0	341,051	341,051	7,043,822	2,456,485,203

e) Costs from Table B-10 allocated to MWDSC are reduced herein by $16,425,537 in 1972 under provisions of Amendment No. 7 to its water contract.

TABLE B-15

Capital Cost Component of Transportation Charge for Each Contractor (a (b

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	105,210	105,872	366,617	577,699	0	0	0
1964	0	0	0	123,746	171,241	532,114	827,101	8,526	18,065	26,591
1965	0	0	0	156,305	260,411	902,093	1,318,809	14,254	28,962	43,216
1966	18,099	0	18,099	172,789	291,329	1,076,295	1,540,413	23,495	46,425	69,920
1967	41,651	0	41,651	199,869	321,563	1,190,843	1,712,275	41,791	80,516	122,307
1968	121,725	0	121,725	236,282	362,580	1,313,384	1,912,246	56,069	107,220	163,289
1969	165,581	0	165,581	269,930	398,093	1,415,316	2,083,339	59,797	114,355	174,152
1970	169,376	0	169,376	282,252	413,055	1,454,343	2,149,650	61,786	118,194	179,980
1971	171,589	0	171,589	284,933	416,178	1,461,259	2,162,370	63,096	120,774	183,870
1972	172,954	0	172,954	332,138	417,108	1,465,549	2,214,795	64,091	122,837	186,928
1973	173,956	31,440	205,396	332,765	417,759	1,468,795	2,219,319	64,596	123,866	188,462
1974	176,839	33,015	209,854	333,300	418,378	1,470,804	2,222,482	64,996	124,708	189,704
1975	185,300	36,373	221,673	334,102	419,623	1,474,534	2,228,259	65,489	125,699	191,188
1976	189,985	40,926	230,911	334,956	420,429	1,476,646	2,232,031	172,860	324,183	497,043
1977	192,932	45,194	238,126	336,691	422,198	1,482,238	2,241,127	175,490	329,925	505,415
1978	196,205	49,283	245,488	339,049	424,500	1,489,043	2,252,592	182,067	342,380	524,447
1979	199,742	53,452	253,194	342,684	427,867	1,497,966	2,268,517	184,232	346,604	530,836
1980	209,501	67,886	277,387	345,003	430,058	1,503,612	2,278,673	186,805	351,613	538,418
1981	222,992	87,579	310,571	351,867	436,402	1,519,153	2,307,422	196,191	369,110	565,301
1982	234,603	107,124	341,727	350,144	434,878	1,515,801	2,300,823	192,378	362,295	554,673
1983	262,506	151,541	414,047	350,306	435,069	1,516,499	2,301,874	189,988	357,965	547,953
1984	326,509	224,655	551,164	357,188	441,592	1,533,256	2,332,036	191,379	360,645	552,024
1985	456,499	364,959	821,458	364,994	448,784	1,551,210	2,364,988	193,033	363,797	556,830
1986	820,909	693,705	1,514,614	365,926	449,690	1,553,729	2,369,345	193,904	365,658	559,562
1987	1,362,893	1,561,964	2,924,857	367,569	451,310	1,558,246	2,377,125	197,795	375,213	573,008
1988	1,774,556	2,211,944	3,986,500	370,135	453,802	1,565,370	2,389,307	217,052	426,256	643,308
1989	1,894,569	2,437,186	4,331,755	376,056	459,528	1,580,773	2,416,357	238,984	483,585	722,569
1990	1,958,517	2,520,878	4,479,395	381,574	464,768	1,594,002	2,440,344	257,668	531,229	788,897
1991	1,981,378	2,567,406	4,548,784	390,574	473,925	1,620,048	2,484,547	281,826	591,975	873,801
1992	1,986,592	2,575,449	4,562,041	398,713	481,575	1,639,239	2,519,527	317,313	678,894	996,207
1993	1,989,634	2,581,850	4,571,484	403,508	486,045	1,650,292	2,539,845	375,882	816,511	1,192,393
1994	1,995,726	2,590,944	4,586,670	407,281	489,717	1,659,873	2,556,871	600,683	1,332,688	1,933,371
1995	1,999,339	2,598,738	4,598,077	410,191	492,598	1,667,527	2,570,316	1,531,538	3,425,327	4,956,865
1996	2,015,459	2,627,057	4,642,516	411,204	493,629	1,670,385	2,575,218	5,112,791	12,068,321	17,181,112
1997	2,040,907	2,663,390	4,704,297	413,093	495,478	1,675,312	2,583,883	6,714,660	17,092,546	23,807,206
1998	2,054,473	2,694,825	4,749,298	415,036	497,379	1,680,365	2,592,780	6,754,416	17,192,980	23,947,396
1999	2,054,674	2,695,018	4,749,692	415,834	498,166	1,682,474	2,596,474	6,773,840	17,235,830	24,009,670
2000	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,782,211	17,254,208	24,036,419
2001	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,784,896	17,260,152	24,045,048
2002	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2003	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2004	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2005	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2006	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2007	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2008	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2009	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2010	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2011	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2012	2,054,674	2,695,018	4,749,692	416,239	498,539	1,683,420	2,598,198	6,786,708	17,264,162	24,050,870
2013	2,054,674	2,695,018	4,749,692	305,091	392,667	1,316,803	2,014,561	6,786,708	17,264,162	24,050,870
2014	2,054,674	2,695,018	4,749,692	269,755	327,298	1,151,306	1,748,359	6,778,182	17,246,097	24,024,279
2015	2,054,674	2,695,018	4,749,692	231,747	238,128	781,327	1,251,202	6,772,454	17,235,200	24,007,654
2016	2,036,575	2,695,018	4,731,593	212,646	207,209	607,125	1,026,980	6,763,212	17,217,737	23,980,949
2017	2,013,024	2,695,018	4,708,042	181,485	176,975	492,577	851,037	6,744,917	17,183,646	23,928,563
2018	1,932,950	2,695,018	4,627,968	139,862	135,959	370,036	645,857	6,730,639	17,156,942	23,887,581
2019	1,889,093	2,695,018	4,584,111	101,641	100,446	268,104	470,191	6,726,910	17,149,807	23,876,717
2020	1,885,298	2,695,018	4,580,316	87,728	85,483	229,077	402,288	6,724,922	17,145,968	23,870,890
2021	1,883,086	2,695,018	4,578,104	84,718	82,361	222,161	389,240	6,723,612	17,143,388	23,867,000
2022	1,881,720	2,695,018	4,576,738	84,101	81,431	217,871	383,403	6,722,617	17,141,325	23,863,942
2023	1,880,718	2,663,579	4,544,297	83,474	80,780	214,625	378,879	6,722,112	17,140,296	23,862,408
2024	1,877,835	2,662,003	4,539,838	82,939	80,161	212,616	375,716	6,721,711	17,139,454	23,861,165
2025	1,869,375	2,658,645	4,528,020	82,137	78,916	208,886	369,939	6,721,219	17,138,463	23,859,682
2026	1,864,690	2,654,092	4,518,782	81,283	78,109	206,774	366,166	6,613,848	16,939,979	23,553,827
2027	1,861,743	2,649,824	4,511,567	79,548	76,341	201,182	357,071	6,611,218	16,934,237	23,545,455
2028	1,858,469	2,645,735	4,504,204	77,190	74,039	194,377	345,606	6,604,641	16,921,782	23,526,423
2029	1,854,932	2,641,566	4,496,498	73,555	70,671	185,454	329,680	6,602,475	16,917,558	23,520,033
2030	1,845,174	2,627,133	4,472,307	71,236	68,481	179,808	319,525	6,599,903	16,912,549	23,512,452
2031	1,831,683	2,607,439	4,439,122	64,372	62,136	164,267	290,775	6,590,517	16,895,052	23,485,569
2032	1,820,071	2,587,894	4,407,965	66,095	63,661	167,619	297,375	6,594,330	16,901,867	23,496,197
2033	1,792,169	2,543,477	4,335,646	65,933	63,470	166,921	296,324	6,596,720	16,906,197	23,502,917
2034	1,728,166	2,470,364	4,198,530	59,051	56,947	150,164	266,162	6,595,329	16,903,517	23,498,846
2035	1,598,176	2,330,060	3,928,236	51,245	49,755	132,210	233,210	6,593,675	16,900,365	23,494,040
TOTAL	99,897,901	130,041,006	229,938,907	20,211,136	24,635,008	83,400,755	128,246,899	273,883,527	694,112,881	967,996,408

a) Unadjusted for prior overpayments or underpayments of charges.
b) Determined at the current Project Interest Rate of 4.621 percent per annum.

TABLE B-15

Capital Cost Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area									
				Kern County Water Agency						
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Municipal and Industrial (c (15)	Agri-cultural (16)	County of Kings (17)	Oak Flat Water District (18)	Tulare Lake Basin Water Storage District (19)	Total (20)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	2,729	0	0	0	0	0	0	2,729
1965	0	0	6,040	64,404	9,302	0	0	0	0	79,746
1966	0	0	12,060	120,474	17,104	0	0	0	0	149,638
1967	0	0	26,303	233,676	34,411	0	0	0	0	294,390
1968	74,067	2,368	49,035	336,364	49,053	410,386	8,520	4,652	63,270	997,715
1969	74,197	7,103	57,518	392,696	52,628	842,788	9,028	5,057	239,395	1,680,410
1970	81,319	7,103	59,328	424,150	54,017	1,025,084	9,278	5,259	177,157	1,842,695
1971	92,714	7,103	60,434	445,305	54,809	1,361,495	9,420	5,663	188,520	2,225,463
1972	103,591	7,103	61,051	455,027	55,172	2,038,719	9,487	10,854	581,571	3,322,575
1973	113,950	7,103	61,477	459,256	55,346	2,351,352	9,518	6,270	224,943	3,289,215
1974	172,945	7,103	61,998	461,295	55,446	2,633,162	9,535	7,021	373,368	3,781,873
1975	210,056	7,103	62,561	463,612	55,588	3,153,806	9,560	7,233	445,517	4,415,036
1976	160,157	7,103	62,829	465,473	55,777	3,399,774	9,595	8,170	318,712	4,487,590
1977	157,458	7,103	63,472	468,181	56,064	3,725,176	9,639	7,484	304,731	4,799,308
1978	168,335	7,103	65,911	470,042	66,255	4,140,846	9,661	7,888	326,940	5,262,981
1979	199,640	7,103	66,226	472,808	56,591	4,546,828	9,723	8,091	367,955	5,734,965
1980	212,361	7,103	66,515	475,557	56,928	4,961,618	9,791	11,529	370,325	6,171,727
1981	212,361	7,103	68,105	491,979	58,873	5,430,127	10,183	8,697	392,535	6,679,963
1982	212,361	7,103	68,115	489,702	58,811	5,862,529	10,167	9,102	414,227	7,132,117
1983	222,202	7,103	68,404	493,729	59,452	6,354,816	10,297	9,304	49,315	7,274,622
1984	233,597	7,103	68,986	499,206	60,138	6,666,568	10,434	9,709	323,381	7,879,122
1985	244,474	7,103	69,716	507,130	61,300	7,098,970	10,667	9,911	235,257	8,244,528
1986	255,351	7,103	69,986	509,460	61,636	7,527,850	10,734	10,316	502,031	8,954,467
1987	266,228	7,103	70,491	513,138	62,166	7,964,656	10,837	10,518	523,724	9,428,861
1988	277,105	7,103	70,853	516,003	52,577	8,372,399	10,915	10,922	545,417	9,863,294
1989	287,982	7,103	71,722	519,597	63,194	8,666,539	11,064	11,327	567,626	10,206,154
1990	298,859	7,103	73,145	537,913	65,428	8,972,126	11,490	11,529	612,044	10,589,637
1991	298,859	7,103	75,474	565,335	69,804	8,972,126	12,265	11,529	612,044	10,624,539
1992	298,859	7,103	78,357	594,482	74,459	8,972,126	13,207	11,529	612,044	10,662,166
1993	298,859	7,103	79,445	603,777	75,902	8,972,126	13,496	11,529	612,044	10,674,281
1994	298,859	7,103	80,419	610,308	76,850	8,972,126	13,678	11,529	612,044	10,682,916
1995	298,859	7,103	81,295	617,634	77,980	8,972,126	13,901	11,529	612,044	10,692,471
1996	298,859	7,103	81,689	619,720	78,306	8,972,126	13,965	11,529	612,044	10,695,341
1997	298,859	7,103	82,347	624,314	79,038	8,972,126	14,112	11,529	612,044	10,701,472
1998	298,859	7,103	83,022	629,059	79,794	8,972,126	14,263	11,529	612,044	10,707,799
1999	298,859	7,103	83,407	630,804	80,067	8,972,126	14,317	11,529	612,044	10,710,256
2000	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2001	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2002	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2003	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2004	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2005	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2006	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2007	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2008	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2009	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2010	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2011	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2012	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2013	298,859	7,103	83,601	631,751	80,217	8,972,126	14,348	11,529	612,044	10,711,578
2014	298,859	7,103	80,872	631,751	80,217	8,972,126	14,348	11,529	612,044	10,708,849
2015	298,859	7,103	77,561	567,347	70,916	8,972,126	14,348	11,529	612,044	10,631,833
2016	298,859	7,103	71,541	511,277	63,113	8,972,126	14,348	11,529	612,044	10,561,940
2017	298,859	7,103	57,298	398,075	45,807	8,972,126	14,348	11,529	612,044	10,417,189
2018	298,859	7,103	34,566	295,387	31,165	8,972,126	5,828	11,529	612,044	10,268,607
2019	298,859	7,103	26,084	239,055	27,589	8,972,126	5,320	11,529	612,044	10,199,709
2020	298,859	7,103	24,274	207,601	26,200	8,972,126	5,070	11,529	612,044	10,164,806
2021	298,859	7,103	23,167	186,446	25,409	8,972,126	4,928	11,529	612,044	10,141,611
2022	298,859	7,103	22,550	176,724	25,046	8,972,126	4,860	11,529	612,044	10,130,841
2023	298,859	7,103	22,124	172,495	24,872	8,972,126	4,830	11,529	612,044	10,125,982
2024	298,859	7,103	21,604	170,456	24,771	8,972,126	4,812	11,529	612,044	10,123,304
2025	298,859	7,103	21,040	168,139	24,630	8,972,126	4,788	11,529	612,044	10,120,258
2026	298,859	7,103	20,773	166,278	24,441	8,972,126	4,752	11,529	612,044	10,117,905
2027	298,859	7,103	20,129	163,570	24,154	8,972,126	4,709	11,529	612,044	10,114,223
2028	298,859	7,103	17,691	161,709	23,962	8,972,126	4,686	11,529	612,044	10,109,709
2029	298,859	7,103	17,376	158,942	23,627	8,972,126	4,624	11,529	612,044	10,106,230
2030	298,859	7,103	17,087	156,194	23,289	8,972,126	4,557	11,529	612,044	10,102,788
2031	298,859	7,103	15,497	139,772	21,344	8,972,126	4,165	11,529	612,044	10,082,439
2032	298,859	7,103	15,487	142,049	21,407	8,972,126	4,180	11,529	612,044	10,084,784
2033	298,859	7,103	15,198	138,022	20,766	8,972,126	4,051	11,529	612,044	10,079,698
2034	298,859	7,103	14,615	132,545	20,079	8,972,126	3,914	11,529	612,044	10,072,814
2035	298,859	7,103	13,885	124,621	18,917	8,972,126	3,680	11,529	612,044	10,062,764
TOTAL	17,779,965	478,269	4,091,298	30,834,579	3,895,025	511,253,284	694,765	715,311	35,689,941	605,432,437

c) Charges under Amendment No. 18 of the water supply contract with Kern County Water Agency.

TABLE B-15

Capital Cost Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (21)	Castaic Lake Water Agency (22)	Coachella Valley Water District (23)	Crestline-Lake Arrowhead Water Agency (24)	Desert Water Agency (25)	Littlerock Creek Irrigation District (26)	Mojave Water Agency (27)	Palmdale Water District (28)	San Bernardino Valley Municipal Water District (29)	San Gabriel Valley Municipal Water District (30)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,386	0	0	0	0	0	0	0	51,831	0
1964	62,984	27,499	14,455	4,378	37,231	1,145	28,492	8,221	82,967	35,056
1965	118,817	53,103	25,141	7,207	40,844	2,086	50,410	15,250	135,316	35,409
1966	216,165	101,445	44,811	12,501	73,283	3,761	90,562	27,728	232,920	61,574
1967	418,215	211,185	86,271	23,514	141,660	7,298	175,487	54,119	434,117	115,778
1968	672,113	420,390	141,240	38,619	232,315	11,803	286,822	87,447	731,133	194,869
1969	974,373	624,412	210,154	57,402	345,967	17,280	426,512	127,443	1,138,408	303,179
1970	1,271,441	781,521	296,389	84,944	488,189	23,468	592,656	171,597	1,694,421	444,484
1971	1,528,217	948,749	401,018	120,420	660,748	28,896	790,220	209,187	2,398,268	620,861
1972	1,659,719	1,058,285	455,686	137,694	750,907	31,362	896,708	226,893	2,813,411	722,242
1973	1,709,382	1,072,736	472,612	142,392	778,822	32,338	930,816	233,748	2,950,710	757,851
1974	1,727,464	1,119,383	480,702	146,587	792,166	32,660	942,964	236,100	3,040,532	778,441
1975	1,750,496	1,133,712	493,925	150,368	813,973	33,075	969,414	239,118	3,123,050	800,172
1976	1,763,426	1,146,288	503,804	153,063	830,266	33,328	989,419	240,852	3,201,296	820,983
1977	1,775,545	1,159,310	510,781	154,962	841,772	33,545	1,003,593	242,434	3,250,390	834,039
1978	1,785,726	1,178,262	515,443	156,282	849,461	33,736	1,012,960	243,803	3,280,565	841,974
1979	1,801,139	1,202,250	519,452	157,416	856,072	34,003	1,021,012	245,775	3,302,451	847,676
1980	1,819,433	1,250,156	523,634	158,530	862,969	34,308	1,029,545	248,046	3,323,077	853,217
1981	1,914,788	1,340,831	545,268	164,309	898,648	35,964	1,073,660	260,346	3,427,288	881,206
1982	1,906,759	1,371,999	542,881	163,868	894,711	35,834	1,068,452	259,355	3,420,163	879,042
1983	1,986,204	1,415,578	558,064	167,908	919,751	37,171	1,099,610	269,380	3,492,780	898,887
1984	2,091,871	1,441,926	578,325	173,884	953,165	38,948	1,140,692	282,694	3,602,455	928,899
1985	2,169,687	1,457,043	593,648	178,291	978,436	40,345	1,171,882	292,358	3,682,520	950,818
1986	2,215,547	1,465,010	604,964	181,544	997,098	41,025	1,194,890	297,876	3,740,821	966,756
1987	2,261,682	1,470,391	617,484	184,826	1,017,746	41,572	1,220,638	303,206	3,800,801	983,135
1988	2,279,574	1,475,840	627,693	187,515	1,034,583	41,882	1,241,588	305,452	3,850,483	996,659
1989	2,293,111	1,484,747	632,650	189,100	1,042,758	42,094	1,251,417	307,002	3,883,906	1,005,585
1990	2,347,984	1,507,285	651,004	194,571	1,073,027	43,017	1,288,369	313,757	3,982,020	1,032,089
1991	2,376,077	1,524,094	668,787	199,841	1,102,354	43,322	1,324,293	316,653	4,077,265	1,057,912
1992	2,409,960	1,542,297	687,914	206,298	1,133,899	43,813	1,362,351	320,588	4,195,610	1,090,149
1993	2,428,835	1,556,367	699,996	213,055	1,153,824	44,105	1,383,893	323,158	4,310,280	1,121,505
1994	2,449,355	1,568,555	709,533	222,424	1,169,553	44,457	1,397,207	325,730	4,531,056	1,181,564
1995	2,468,214	1,574,818	714,789	227,255	1,178,222	44,776	1,404,855	328,067	4,663,133	1,217,400
1996	2,471,044	1,576,714	716,401	229,013	1,180,881	44,825	1,406,955	328,431	4,758,662	1,243,148
1997	2,476,584	1,598,221	717,829	229,382	1,183,235	44,920	1,409,906	329,138	4,918,579	1,285,945
1998	2,482,287	1,601,154	718,992	229,684	1,185,154	45,018	1,412,312	329,866	4,959,631	1,296,946
1999	2,484,635	1,602,602	719,514	229,823	1,186,015	45,059	1,413,383	330,167	4,962,278	1,297,659
2000	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2001	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2002	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2003	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2004	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2005	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2006	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2007	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2008	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2009	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2010	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2011	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2012	2,485,813	1,603,318	719,759	229,888	1,186,419	45,079	1,413,887	330,316	4,963,484	1,297,985
2013	2,452,427	1,603,318	719,759	229,888	1,173,027	45,079	1,413,887	330,316	4,911,653	1,284,858
2014	2,422,829	1,575,818	705,304	225,509	1,163,199	43,933	1,385,395	322,095	4,880,517	1,276,664
2015	2,366,995	1,550,214	694,618	222,680	1,145,575	42,992	1,363,477	315,066	4,828,168	1,262,576
2016	2,269,647	1,501,873	674,949	217,387	1,113,136	41,318	1,323,326	302,588	4,730,565	1,236,411
2017	2,067,597	1,392,132	633,488	206,374	1,044,759	37,781	1,238,400	276,197	4,529,367	1,182,207
2018	1,813,700	1,182,928	578,519	191,269	954,104	33,276	1,127,065	242,869	4,232,351	1,103,116
2019	1,511,440	978,906	509,605	172,486	840,452	27,799	987,375	202,873	3,825,077	994,806
2020	1,214,372	821,797	423,370	144,943	698,230	21,610	821,231	158,719	3,269,063	853,502
2021	957,596	654,568	318,741	109,468	525,671	16,183	623,667	121,129	2,565,216	677,124
2022	826,094	545,033	264,073	92,194	435,512	13,717	517,180	103,423	2,150,073	575,743
2023	776,430	530,582	247,148	87,496	407,597	12,740	483,071	96,568	2,012,774	540,134
2024	758,349	483,935	239,057	83,301	394,253	12,419	470,924	94,216	1,922,952	519,544
2025	735,316	469,606	225,834	79,520	372,446	12,003	444,473	91,198	1,840,434	497,814
2026	722,386	457,030	215,955	76,825	356,153	11,751	424,468	89,464	1,762,189	477,002
2027	710,267	444,008	208,978	74,925	344,647	11,534	410,294	87,882	1,713,094	463,946
2028	700,087	425,056	204,316	73,606	336,958	11,342	400,927	86,513	1,682,919	456,011
2029	684,673	401,068	200,307	72,472	330,347	11,075	392,876	84,541	1,661,033	450,309
2030	666,380	353,162	196,125	71,358	323,450	10,770	384,342	82,270	1,640,407	444,768
2031	571,024	262,486	174,491	65,579	287,771	9,114	340,227	69,970	1,536,196	416,780
2032	579,054	231,318	176,879	66,019	291,708	9,245	345,435	70,961	1,543,321	418,943
2033	499,609	187,739	161,695	61,979	266,668	7,907	314,277	60,936	1,470,705	399,099
2034	393,941	161,392	141,434	56,004	233,254	6,130	273,195	47,622	1,361,029	369,086
2035	316,125	146,275	126,111	51,597	207,983	4,733	242,005	37,958	1,280,964	347,167
TOTAL	122,934,146	79,267,536	35,398,877	11,200,293	58,350,052	2,232,717	69,611,993	16,350,467	239,319,953	62,504,524

TABLE B-15

Capital Cost Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (39)	Grand Total (40)
	San Gorgonio Pass Water Agency (31)	Metropolitan Water District of Southern California (32)	Ventura County Flood Control District (33)	Total (34)	City of Yuba City (35)	County of Butte (36)	Plumas County FC&WCD (37)	Total (38)		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	692,178	0	777,395	0	0	0	0	43,204	1,398,298
1964	21,778	1,262,872	9,395	1,596,473	0	0	0	0	70,167	2,523,061
1965	21,906	2,184,551	17,799	2,707,839	0	0	405	405	100,270	4,250,285
1966	38,033	3,907,132	33,486	4,843,401	0	0	565	565	117,243	6,739,279
1967	71,409	7,707,275	68,275	9,514,603	0	0	563	563	157,228	11,843,017
1968	120,306	14,370,312	133,532	17,440,901	0	0	565	565	232,706	20,869,147
1969	187,388	21,895,715	202,953	26,511,186	0	0	3,197	3,197	296,694	30,914,559
1970	275,492	29,043,291	258,310	35,426,203	0	0	15,147	15,147	317,009	40,100,060
1971	385,698	37,307,488	316,860	45,716,630	0	0	15,975	15,975	320,786	50,796,683
1972	448,838	44,139,086	354,554	53,695,385	0	0	17,363	17,363	321,421	59,931,421
1973	471,006	46,380,435	357,966	56,290,814	0	0	17,363	17,363	322,094	62,532,663
1974	484,103	48,407,058	372,762	58,560,922	0	0	17,364	17,364	322,507	65,304,706
1975	497,590	49,371,141	377,168	59,753,202	0	0	17,367	17,367	323,964	67,150,689
1976	510,541	50,224,837	381,453	60,799,556	0	0	17,368	17,368	324,384	68,588,883
1977	518,645	50,915,911	385,770	61,626,697	0	0	17,370	17,370	325,225	69,753,268
1978	523,569	51,516,371	391,424	62,329,576	0	0	17,372	17,372	326,306	70,958,762
1979	527,097	52,321,535	400,346	63,236,224	0	0	17,374	17,374	327,779	72,368,889
1980	530,514	53,731,251	417,864	64,782,544	0	0	17,375	17,375	329,139	74,395,263
1981	547,764	56,767,059	450,597	68,307,728	0	0	17,376	17,376	332,158	78,520,519
1982	546,456	57,567,385	462,041	69,118,946	0	0	17,378	17,378	331,813	79,797,477
1983	558,660	59,132,604	478,045	71,014,642	0	0	17,379	17,379	332,518	81,903,035
1984	577,120	60,411,385	487,516	72,708,880	0	0	17,380	17,380	336,113	84,376,719
1985	590,597	61,250,799	492,789	73,849,213	0	0	17,381	17,381	340,360	86,194,758
1986	600,397	61,777,043	495,614	74,578,585	0	0	17,382	17,382	341,160	88,335,115
1987	610,471	62,239,271	497,399	75,248,622	0	0	17,384	17,384	341,993	90,911,850
1988	618,798	62,647,446	499,263	75,806,776	0	0	17,386	17,386	343,485	93,050,056
1989	624,321	63,047,559	502,187	76,306,437	0	0	17,388	17,388	346,027	94,346,687
1990	640,645	64,150,602	510,140	77,734,510	0	0	17,391	17,391	348,224	96,398,398
1991	656,540	65,081,026	515,811	78,943,975	0	0	17,394	17,394	352,187	97,845,227
1992	676,365	66,178,095	521,836	80,369,175	0	0	17,397	17,397	355,320	99,481,833
1993	695,621	67,200,690	526,402	81,657,731	0	0	17,399	17,399	357,453	101,010,586
1994	732,774	68,719,382	530,313	83,581,903	0	0	17,401	17,401	359,101	103,718,233
1995	754,999	69,577,291	532,345	84,686,164	0	0	17,401	17,401	360,398	107,881,692
1996	771,098	70,124,580	532,893	85,384,645	0	0	17,401	17,401	360,865	120,857,098
1997	798,052	71,530,068	540,618	87,062,477	0	0	17,401	17,401	361,648	129,238,384
1998	804,964	71,812,132	541,486	87,419,626	0	0	17,401	17,401	362,451	129,796,751
1999	805,402	71,855,686	541,864	87,474,087	0	0	17,401	17,401	362,770	129,920,350
2000	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,976,379
2001	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,985,008
2002	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2003	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2004	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2005	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2006	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2007	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2008	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2009	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2010	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2011	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2012	805,603	71,876,565	542,052	87,500,168	0	0	17,401	17,401	362,923	129,990,830
2013	797,435	71,184,387	542,052	86,688,086	0	0	17,401	17,401	319,719	128,551,907
2014	792,371	70,613,693	532,657	85,939,984	0	0	17,401	17,401	292,756	127,481,320
2015	783,697	69,692,013	524,254	84,792,325	0	0	16,996	16,996	262,653	125,712,355
2016	767,571	67,969,433	508,567	82,656,771	0	0	16,836	16,836	245,680	123,220,749
2017	734,194	64,169,290	473,777	77,985,563	0	0	16,838	16,838	205,695	118,112,927
2018	685,298	57,506,253	408,520	70,059,268	0	0	16,836	16,836	130,217	109,636,334
2019	618,216	49,980,849	339,099	60,988,983	0	0	14,205	14,205	66,229	100,200,145
2020	530,112	42,833,274	283,742	52,073,965	0	0	2,255	2,255	45,914	91,140,434
2021	419,905	34,569,077	225,193	41,783,538	0	0	1,427	1,427	42,138	80,803,058
2022	356,765	27,737,479	187,499	33,804,785	0	0	39	39	41,502	72,801,250
2023	334,597	25,496,130	184,087	31,209,354	0	0	38	38	40,830	70,161,788
2024	321,500	23,469,507	169,290	28,939,247	0	0	37	37	40,416	67,879,723
2025	308,013	22,505,424	164,884	27,746,965	0	0	35	35	38,959	66,663,858
2026	295,062	21,651,728	160,600	26,700,613	0	0	34	34	38,539	65,295,866
2027	286,958	20,960,654	156,282	25,873,469	0	0	31	31	37,698	64,439,514
2028	282,034	20,360,194	150,628	25,170,591	0	0	30	30	36,618	63,693,181
2029	278,506	19,555,030	141,706	24,263,943	0	0	28	28	35,144	62,751,556
2030	275,089	18,145,314	124,188	22,717,623	0	0	27	27	33,784	61,158,506
2031	257,839	15,109,506	91,455	19,192,438	0	0	25	25	30,765	57,521,133
2032	259,147	14,309,180	80,012	18,381,222	0	0	23	23	31,110	56,698,676
2033	246,944	12,743,961	64,007	16,485,526	0	0	23	23	30,405	54,730,539
2034	228,483	11,465,179	54,536	14,791,285	0	0	22	22	26,810	52,854,469
2035	215,006	10,625,766	49,263	13,650,953	0	0	21	21	22,563	51,391,787
TOTAL	38,792,538	3,523,497,208	26,802,050	4,286,262,354	0	0	869,975	869,975	18,018,313	6,236,765,293

TABLE B-16A

Minimum OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	9,699	8,868	0	18,567	0	0	0
1963	0	0	0	38,048	34,788	82,896	155,732	0	0	0
1964	0	0	0	41,148	38,323	91,320	170,791	0	0	0
1965	0	0	0	78,529	75,616	195,792	349,937	0	0	0
1966	0	0	0	79,753	78,779	218,544	377,076	0	0	0
1967	0	0	0	127,896	123,665	335,225	586,786	0	0	0
1968	130	0	130	126,058	120,563	333,506	580,127	11,801	21,769	33,570
1969	80,875	0	80,875	145,410	138,051	372,584	656,045	63,112	116,434	179,546
1970	94,872	0	94,872	128,993	120,246	320,663	569,902	74,187	136,867	211,054
1971	45,579	0	45,579	113,071	108,346	296,004	517,421	74,011	136,541	210,552
1972	37,895	0	37,895	122,407	117,483	334,366	574,256	79,195	146,107	225,302
1973	32,993	0	32,993	122,738	116,785	325,727	565,250	75,714	139,685	215,399
1974	46,498	0	46,498	154,434	146,929	403,081	704,444	76,531	141,190	217,721
1975	37,707	0	37,707	189,176	182,087	513,823	885,086	92,605	170,845	263,450
1976	60,786	0	60,786	203,063	193,436	524,814	921,313	94,933	175,142	270,075
1977	78,400	0	78,400	179,870	169,065	500,102	849,037	102,946	189,923	292,869
1978	56,318	0	56,318	239,301	228,854	647,829	1,115,984	104,061	191,982	296,043
1979	73,852	0	73,852	236,986	232,103	666,744	1,135,833	100,749	185,873	286,622
1980	81,770	0	81,770	389,583	372,191	1,010,846	1,772,620	125,147	230,882	356,029
1981	100,779	0	100,779	316,970	301,871	833,301	1,452,142	138,607	255,711	394,318
1982	191,985	0	191,985	389,700	372,287	1,105,750	1,867,737	140,857	259,863	400,720
1983	80,218	0	80,218	438,508	428,951	1,269,311	2,136,770	169,784	313,234	483,018
1984	106,446	0	106,446	591,134	565,621	1,817,394	2,974,149	200,551	369,994	570,545
1985	215,389	0	215,389	679,106	659,266	1,849,208	3,187,580	246,202	454,211	700,413
1986	203,620	0	203,620	614,494	584,195	1,786,721	2,985,410	233,401	430,597	663,998
1987	293,960	0	293,960	683,554	648,744	1,991,918	3,324,216	229,954	462,820	692,774
1988	312,295	(186)	312,109	677,615	655,980	1,911,815	3,245,410	257,144	557,920	815,064
1989	399,470	680,418	1,079,888	715,520	711,173	1,894,324	3,321,017	242,422	664,103	906,525
1990	652,834	666,332	1,319,166	776,710	774,925	2,116,928	3,668,563	306,037	669,302	975,339
1991	722,466	855,075	1,577,541	538,989	520,881	1,511,223	2,571,093	298,276	666,308	964,584
1992	479,447	706,913	1,186,360	949,094	1,013,554	2,635,524	4,598,172	347,141	738,174	1,085,315
1993	504,428	679,912	1,184,340	1,305,375	1,287,391	3,402,483	5,995,249	387,022	735,908	1,122,930
1994	561,401	668,150	1,229,551	1,369,722	1,323,235	3,557,349	6,250,306	457,973	845,780	1,303,753
1995	669,094	1,135,689	1,804,783	1,278,360	1,230,313	3,274,968	5,783,641	548,206	1,010,986	1,559,192
1996	680,178	1,160,573	1,840,751	1,277,403	1,232,813	3,302,999	5,813,215	524,782	967,761	1,492,543
1997	672,496	1,161,225	1,833,721	1,275,770	1,233,839	3,324,160	5,833,769	944,868	1,834,703	2,779,571
1998	667,992	1,150,646	1,818,638	1,186,063	1,153,694	3,144,210	5,483,967	1,153,985	2,291,751	3,445,736
1999	669,774	1,154,372	1,824,146	1,189,480	1,156,883	3,152,649	5,499,012	1,154,017	2,291,090	3,445,107
2000	669,899	1,154,651	1,824,550	1,189,607	1,156,999	3,152,941	5,499,547	1,153,909	2,290,653	3,444,562
2001	670,004	1,154,890	1,824,894	1,189,698	1,157,084	3,153,148	5,499,930	1,154,050	2,290,952	3,445,002
2002	670,128	1,155,168	1,825,296	1,189,805	1,157,183	3,153,393	5,500,381	1,154,221	2,291,303	3,445,524
2003	670,254	1,155,454	1,825,708	1,189,916	1,157,284	3,153,643	5,500,843	1,154,392	2,291,671	3,446,063
2004	670,383	1,155,751	1,826,134	1,190,028	1,157,391	3,153,901	5,501,320	1,154,569	2,292,041	3,446,610
2005	669,886	1,154,635	1,824,521	1,189,598	1,156,990	3,152,913	5,499,501	1,153,887	2,290,605	3,444,492
2006	669,953	1,154,791	1,824,744	1,189,657	1,157,046	3,153,053	5,499,756	1,153,983	2,290,807	3,444,790
2007	670,015	1,154,934	1,824,949	1,189,712	1,157,095	3,153,180	5,499,987	1,154,069	2,290,989	3,445,058
2008	670,114	1,155,159	1,825,273	1,189,797	1,157,177	3,153,376	5,500,350	1,154,206	2,291,274	3,445,480
2009	670,189	1,155,335	1,825,524	1,189,866	1,157,239	3,153,530	5,500,635	1,154,309	2,291,496	3,445,805
2010	670,279	1,155,545	1,825,824	1,189,943	1,157,311	3,153,706	5,500,960	1,154,431	2,291,747	3,446,178
2011	670,374	1,155,765	1,826,139	1,190,027	1,157,389	3,153,897	5,501,313	1,154,561	2,292,026	3,446,587
2012	670,444	1,155,926	1,826,370	1,190,089	1,157,447	3,154,040	5,501,576	1,154,660	2,292,230	3,446,890
2013	670,642	1,156,379	1,827,021	1,190,263	1,157,608	3,154,437	5,502,308	1,154,931	2,292,804	3,447,735
2014	670,783	1,156,699	1,827,482	1,190,375	1,157,712	3,154,691	5,502,778	1,155,099	2,293,153	3,448,252
2015	670,803	1,156,746	1,827,549	1,190,404	1,157,737	3,154,757	5,502,898	1,155,149	2,293,265	3,448,414
2016	670,839	1,156,832	1,827,671	1,190,438	1,157,769	3,154,833	5,503,040	1,155,203	2,293,376	3,448,579
2017	670,829	1,156,810	1,827,639	1,190,430	1,157,761	3,154,815	5,503,006	1,155,191	2,293,349	3,448,540
2018	670,828	1,156,808	1,827,636	1,190,430	1,157,761	3,154,813	5,503,004	1,155,190	2,293,349	3,448,539
2019	670,827	1,156,811	1,827,638	1,190,430	1,157,763	3,154,818	5,503,011	1,155,193	2,293,354	3,448,547
2020	670,666	1,156,445	1,827,111	1,190,290	1,157,632	3,154,499	5,502,421	1,154,972	2,292,889	3,447,861
2021	670,678	1,156,474	1,827,152	1,190,301	1,157,642	3,154,522	5,502,465	1,154,987	2,292,927	3,447,914
2022	670,642	1,156,395	1,827,037	1,190,271	1,157,615	3,154,456	5,502,342	1,154,945	2,292,827	3,447,772
2023	670,655	1,156,423	1,827,078	1,190,282	1,157,625	3,154,479	5,502,386	1,154,959	2,292,864	3,447,823
2024	670,660	1,156,432	1,827,092	1,190,286	1,157,628	3,154,486	5,502,400	1,154,964	2,292,873	3,447,837
2025	670,660	1,156,433	1,827,093	1,190,286	1,157,629	3,154,488	5,502,403	1,154,964	2,292,876	3,447,840
2026	670,585	1,156,266	1,826,851	1,190,221	1,157,569	3,154,339	5,502,129	1,154,864	2,292,661	3,447,525
2027	670,595	1,156,292	1,826,887	1,190,231	1,157,577	3,154,364	5,502,172	1,154,881	2,292,696	3,447,577
2028	670,586	1,156,270	1,826,856	1,190,222	1,157,570	3,154,345	5,502,137	1,154,865	2,292,669	3,447,534
2029	670,593	1,156,286	1,826,879	1,190,229	1,157,575	3,154,359	5,502,163	1,154,876	2,292,688	3,447,564
2030	670,585	1,156,267	1,826,852	1,190,221	1,157,570	3,154,342	5,502,133	1,154,865	2,292,667	3,447,532
2031	670,596	1,156,293	1,826,889	1,190,230	1,157,578	3,154,362	5,502,170	1,154,878	2,292,693	3,447,571
2032	670,597	1,156,293	1,826,890	1,190,231	1,157,579	3,154,365	5,502,175	1,154,878	2,292,696	3,447,574
2033	670,579	1,156,252	1,826,831	1,190,216	1,157,563	3,154,327	5,502,106	1,154,855	2,292,641	3,447,496
2034	670,578	1,156,250	1,826,828	1,190,215	1,157,562	3,154,326	5,502,103	1,154,853	2,292,639	3,447,492
2035	670,593	1,156,284	1,826,877	1,190,228	1,157,573	3,154,354	5,502,155	1,154,872	2,292,679	3,447,551
TOTAL	33,049,268	51,635,563	84,684,831	61,824,203	60,131,027	164,604,399	286,559,629	50,625,902	100,327,885	150,953,787

TABLE B-16A

Minimum OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	37,806	1,963	5,639	60,702	678,085	2,007	2,073	77,592	865,867
1969	45,479	2,237	30,159	80,553	1,197,126	2,286	2,086	90,772	1,450,698
1970	46,969	2,292	35,450	96,672	1,381,493	2,345	2,158	93,407	1,660,786
1971	47,997	2,315	35,365	106,654	1,643,161	2,366	2,288	94,874	1,935,020
1972	49,867	2,414	37,845	122,312	1,729,170	2,470	2,254	98,776	2,045,108
1973	50,005	2,386	36,180	125,553	1,719,871	2,439	2,310	98,329	2,037,073
1974	52,816	2,557	36,571	135,661	1,823,063	2,615	2,529	104,610	2,160,422
1975	66,962	3,242	44,250	162,739	2,235,242	3,317	3,191	132,663	2,651,606
1976	66,504	3,327	45,365	159,304	2,215,996	3,404	2,919	133,940	2,630,759
1977	75,596	3,810	49,192	189,661	2,522,288	3,900	3,708	152,836	3,000,991
1978	70,688	3,504	49,725	174,899	2,427,160	3,583	3,644	141,673	2,874,876
1979	68,878	3,437	48,143	173,678	2,378,303	3,514	3,492	138,493	2,817,938
1980	95,903	4,724	59,801	235,749	3,149,510	4,830	4,778	191,591	3,746,886
1981	118,519	5,968	66,233	266,265	3,439,382	6,102	5,191	239,468	4,147,128
1982	134,075	6,709	67,309	311,869	3,851,587	6,863	6,381	270,045	4,654,838
1983	184,922	9,243	81,130	426,513	5,033,283	9,452	8,496	372,225	6,125,264
1984	194,203	9,654	95,833	471,841	5,638,512	9,872	8,724	389,826	6,818,465
1985	213,787	10,587	117,647	515,748	6,344,401	10,827	9,998	428,316	7,651,311
1986	212,383	10,557	111,530	541,989	6,490,322	10,797	10,714	426,316	7,814,608
1987	208,153	10,409	109,884	536,172	6,422,931	10,646	10,678	419,057	7,727,930
1988	203,979	10,236	122,876	517,399	6,394,203	10,470	10,360	411,418	7,680,941
1989	223,580	11,246	115,843	562,624	6,728,125	11,503	11,087	451,488	8,115,496
1990	266,302	13,422	146,236	653,657	7,992,294	13,727	13,152	538,282	9,637,072
1991	276,386	13,888	142,530	662,556	8,112,953	14,203	13,334	557,816	9,793,666
1992	321,420	16,211	162,907	770,693	9,189,512	16,580	18,426	649,929	11,145,678
1993	368,625	18,436	184,935	848,604	10,547,551	18,855	20,062	742,206	12,749,274
1994	334,138	16,760	213,527	820,954	10,123,278	17,144	17,828	673,782	12,217,411
1995	374,738	18,718	254,698	961,205	11,742,081	19,145	20,782	754,011	14,145,378
1996	380,016	18,982	243,288	978,849	11,681,001	19,415	21,565	764,656	14,107,772
1997	383,697	19,157	253,376	990,092	11,550,348	19,594	21,997	771,882	14,010,143
1998	381,645	19,027	244,870	909,025	11,468,092	19,463	21,930	767,193	13,831,245
1999	382,909	19,089	245,346	911,843	11,501,042	19,527	21,987	769,747	13,871,490
2000	382,997	19,095	245,372	912,039	11,503,303	19,531	21,990	769,922	13,874,249
2001	383,080	19,098	245,406	912,231	11,505,546	19,536	21,992	770,087	13,876,976
2002	383,178	19,104	245,448	912,458	11,508,231	19,541	21,995	770,284	13,880,239
2003	383,279	19,108	245,487	912,690	11,510,963	19,546	21,997	770,483	13,883,553
2004	383,383	19,115	245,529	912,932	11,513,776	19,551	22,000	770,691	13,886,977
2005	382,970	19,094	245,367	911,966	11,502,532	19,530	21,990	769,869	13,873,318
2006	383,027	19,096	245,388	912,095	11,504,020	19,532	21,990	769,979	13,875,127
2007	383,077	19,098	245,410	912,211	11,505,396	19,536	21,992	770,080	13,876,800
2008	383,156	19,103	245,442	912,396	11,507,550	19,538	21,994	770,236	13,879,415
2009	383,217	19,105	245,466	912,537	11,509,232	19,543	21,996	770,360	13,881,456
2010	383,281	19,108	245,493	912,678	11,510,926	19,547	21,997	770,486	13,883,516
2011	383,357	19,112	245,524	912,854	11,513,004	19,550	21,999	770,639	13,886,039
2012	383,414	19,116	245,545	912,985	11,514,545	19,553	22,001	770,753	13,887,912
2013	383,573	19,125	245,611	913,356	11,518,872	19,560	22,005	771,072	13,893,174
2014	383,646	19,128	245,645	913,505	11,520,791	19,563	22,007	771,220	13,895,505
2015	383,699	19,129	245,665	913,645	11,522,304	19,566	22,008	771,323	13,897,339
2016	383,727	19,130	245,674	913,715	11,523,123	19,568	22,009	771,382	13,898,328
2017	383,724	19,129	245,672	913,700	11,522,933	19,568	22,008	771,371	13,898,105
2018	383,724	19,129	245,671	913,698	11,522,925	19,568	22,008	771,370	13,898,093
2019	383,724	19,129	245,673	913,702	11,522,967	19,568	22,008	771,372	13,898,143
2020	383,595	19,126	245,620	913,404	11,519,440	19,561	22,005	771,115	13,893,866
2021	383,601	19,126	245,623	913,420	11,519,684	19,562	22,005	771,132	13,894,153
2022	383,577	19,126	245,614	913,363	11,518,968	19,560	22,005	771,079	13,893,292
2023	383,586	19,126	245,616	913,382	11,519,215	19,560	22,005	771,097	13,893,587
2024	383,588	19,126	245,617	913,390	11,519,300	19,561	22,005	771,104	13,893,691
2025	383,589	19,126	245,617	913,391	11,519,314	19,561	22,005	771,104	13,893,707
2026	383,530	19,120	245,594	913,254	11,517,726	19,558	22,004	770,987	13,891,773
2027	383,540	19,120	245,600	913,275	11,517,961	19,558	22,004	771,006	13,892,064
2028	383,533	19,120	245,595	913,257	11,517,759	19,558	22,004	770,992	13,891,818
2029	383,537	19,120	245,598	913,270	11,517,908	19,558	22,004	771,003	13,891,998
2030	383,530	19,120	245,594	913,256	11,517,743	19,558	22,004	770,989	13,891,794
2031	383,538	19,120	245,599	913,270	11,517,895	19,558	22,004	771,002	13,891,986
2032	383,539	19,120	245,600	913,271	11,517,912	19,558	22,004	771,002	13,892,006
2033	383,522	19,120	245,591	913,236	11,517,517	19,558	22,004	770,974	13,891,522
2034	383,522	19,120	245,592	913,235	11,517,498	19,558	22,004	770,972	13,891,501
2035	383,532	19,120	245,596	913,258	11,517,790	19,558	22,004	770,993	13,891,851
TOTAL	19,743,039	984,714	12,333,837	47,352,360	593,907,935	1,007,201	1,102,178	39,696,749	716,128,013

TABLE B-16A

Minimum OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	65,073	28,084	11,697	2,958	19,290	1,088	24,380	8,171	52,314	14,399
1969	86,340	70,345	15,522	3,924	25,595	1,444	32,346	10,843	69,418	19,106
1970	107,806	84,580	19,391	4,902	31,979	1,802	40,392	13,540	86,726	23,866
1971	178,822	105,978	32,230	8,152	53,149	2,991	66,998	22,459	144,137	39,636
1972	363,554	202,628	106,741	30,966	176,039	6,603	213,029	48,104	548,122	144,113
1973	404,662	222,767	121,341	34,673	200,118	7,347	243,320	53,976	724,532	190,155
1974	434,864	235,526	130,629	37,060	215,431	7,678	262,736	56,382	786,108	207,020
1975	504,790	289,504	151,033	43,179	249,085	9,082	303,109	65,579	905,424	238,842
1976	559,011	262,418	160,688	44,454	265,002	10,030	325,512	73,253	964,525	256,572
1977	675,504	335,750	184,810	47,744	304,794	11,886	381,160	87,354	1,069,446	289,792
1978	600,343	376,950	187,027	54,153	308,449	10,711	373,191	78,304	1,148,279	300,751
1979	661,123	349,073	196,264	52,212	323,679	12,125	401,467	87,126	1,125,451	302,509
1980	858,071	415,945	253,097	71,923	417,412	15,433	508,394	112,859	1,518,448	401,234
1981	999,467	510,597	284,433	73,376	469,083	18,014	586,963	131,743	1,544,857	419,611
1982	1,128,701	558,241	321,034	89,587	529,451	20,196	649,398	148,026	1,871,041	497,998
1983	1,744,999	818,024	450,032	119,238	742,187	30,645	922,091	225,800	2,372,790	639,621
1984	2,104,258	942,743	548,531	150,143	904,640	36,785	1,111,621	271,006	3,017,577	803,153
1985	2,191,317	1,070,207	590,780	159,378	974,311	39,530	1,203,974	281,441	3,257,662	868,279
1986	2,319,958	1,106,294	620,076	163,066	1,022,625	40,185	1,271,603	297,006	3,325,463	894,949
1987	2,324,574	1,017,497	618,707	164,842	1,020,373	41,076	1,264,192	302,619	3,358,082	902,204
1988	2,312,215	1,045,627	650,901	176,098	1,073,459	40,751	1,324,912	299,560	3,594,070	962,663
1989	2,274,493	1,085,519	611,635	169,546	1,008,707	39,413	1,237,556	292,073	3,492,057	930,361
1990	2,594,176	1,256,521	699,415	198,816	1,153,478	44,779	1,405,034	330,852	4,040,970	1,066,582
1991	2,717,820	1,161,016	758,487	209,165	1,250,898	48,607	1,535,362	355,698	4,322,304	1,143,441
1992	2,786,533	1,578,593	750,786	198,262	1,238,200	49,915	1,540,099	363,482	4,132,201	1,115,948
1993	3,133,346	1,690,937	856,308	235,742	1,412,229	56,555	1,734,861	414,597	4,789,789	1,275,881
1994	2,952,036	1,639,650	835,274	235,524	1,377,537	53,544	1,715,607	393,190	4,967,327	1,314,521
1995	3,318,129	1,883,021	873,351	249,546	1,440,337	57,955	1,791,057	436,466	5,239,266	1,362,463
1996	3,527,849	1,962,749	950,477	312,564	1,567,559	61,820	1,858,513	464,553	6,228,950	1,567,778
1997	3,587,452	1,980,779	870,010	202,871	1,434,798	62,356	1,883,391	467,947	4,282,631	1,191,451
1998	3,379,410	1,911,618	870,028	225,521	1,434,845	60,493	1,792,112	442,453	4,678,573	1,266,735
1999	3,389,146	1,887,136	878,091	232,508	1,448,147	60,682	1,798,242	443,810	4,804,527	1,292,492
2000	3,390,058	1,888,028	894,977	252,756	1,476,007	60,704	1,799,051	443,949	5,164,455	1,362,862
2001	3,390,916	1,890,633	897,875	255,935	1,480,786	60,725	1,799,830	444,087	5,220,982	1,374,033
2002	3,391,950	1,891,058	879,734	233,337	1,450,853	60,748	1,800,761	444,250	4,819,466	1,295,872
2003	3,392,995	1,892,382	889,504	244,835	1,466,976	60,773	1,801,704	444,415	5,023,837	1,335,911
2004	3,394,080	1,892,062	890,226	245,259	1,468,170	60,797	1,802,685	444,584	5,031,472	1,337,583
2005	3,389,627	1,887,328	885,516	241,433	1,460,397	60,695	1,798,559	443,877	4,963,192	1,323,512
2006	3,390,195	1,893,265	890,493	247,272	1,468,607	60,706	1,799,065	443,967	5,067,055	1,343,866
2007	3,390,726	1,884,270	882,710	237,543	1,455,766	60,720	1,799,542	444,050	4,894,155	1,310,220
2008	3,391,531	1,894,569	889,148	245,071	1,466,387	60,737	1,800,261	444,176	5,027,989	1,336,465
2009	3,392,177	1,892,479	886,735	241,849	1,462,404	60,750	1,800,840	444,276	4,970,820	1,325,415
2010	3,392,739	1,888,914	884,546	238,967	1,458,788	60,765	1,801,288	444,363	4,919,615	1,315,509
2011	3,393,539	1,895,670	889,238	244,372	1,466,535	60,784	1,802,009	444,489	5,015,647	1,334,378
2012	3,394,120	1,891,173	891,932	247,418	1,470,986	60,794	1,802,532	444,579	5,069,905	1,345,058
2013	3,395,764	1,890,157	890,333	244,773	1,468,338	60,836	1,804,005	444,838	5,022,994	1,336,180
2014	3,396,218	1,897,771	901,504	258,333	1,486,770	60,845	1,804,197	444,898	5,264,011	1,383,241
2015	3,397,057	1,895,649	873,187	223,294	1,440,058	60,866	1,805,157	445,041	4,641,396	1,261,936
2016	3,397,373	1,895,089	895,211	250,066	1,476,389	60,873	1,805,438	445,091	5,117,180	1,354,811
2017	3,397,308	1,896,290	887,893	241,147	1,464,312	60,870	1,805,382	445,079	4,958,676	1,323,880
2018	3,397,304	1,896,934	891,754	245,862	1,470,682	60,870	1,805,381	445,079	5,042,497	1,340,233
2019	3,397,317	1,896,739	890,827	244,727	1,469,153	60,870	1,805,394	445,082	5,022,287	1,336,296
2020	3,395,964	1,891,436	893,764	248,889	1,474,003	60,839	1,804,167	444,870	5,096,185	1,350,487
2021	3,396,044	1,897,093	897,081	252,912	1,479,474	60,841	1,804,231	444,883	5,167,660	1,364,442
2022	3,395,785	1,889,253	881,587	234,093	1,453,914	60,836	1,804,001	444,842	4,833,215	1,299,154
2023	3,395,879	1,895,936	888,300	242,253	1,464,987	60,839	1,804,088	444,856	4,978,224	1,327,459
2024	3,395,910	1,889,583	888,138	242,044	1,464,725	60,839	1,804,121	444,861	4,974,493	1,326,734
2025	3,395,913	1,901,105	886,778	240,383	1,462,483	60,839	1,804,123	444,861	4,944,981	1,320,978
2026	3,395,314	1,887,611	892,971	248,200	1,472,701	60,824	1,803,582	444,766	5,083,838	1,347,968
2027	3,395,399	1,900,070	886,565	240,332	1,462,122	60,827	1,803,660	444,779	4,944,029	1,320,706
2028	3,395,328	1,890,538	892,218	247,271	1,471,453	60,824	1,803,593	444,767	5,067,344	1,344,756
2029	3,395,377	1,894,128	891,720	246,639	1,470,630	60,825	1,803,642	444,776	5,056,114	1,342,571
2030	3,395,316	1,894,778	890,053	244,637	1,467,889	60,824	1,803,584	444,766	5,020,513	1,335,616
2031	3,395,357	1,894,477	895,274	250,998	1,476,495	60,824	1,803,608	444,772	5,133,580	1,357,678
2032	3,395,355	1,893,867	899,437	256,089	1,483,367	60,824	1,803,597	444,771	5,224,060	1,375,327
2033	3,395,205	1,892,296	892,229	247,344	1,471,469	60,818	1,803,462	444,749	5,068,615	1,344,981
2034	3,395,196	1,890,135	885,714	239,389	1,460,723	60,818	1,803,455	444,748	4,927,249	1,317,399
2035	3,395,321	1,896,961	893,767	249,174	1,474,010	60,824	1,803,572	444,768	5,101,168	1,351,351
TOTAL	176,487,499	96,236,044	46,647,765	12,816,989	76,931,695	3,150,514	94,706,189	23,087,277	263,341,966	70,048,994

TABLE B-16A

Minimum OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC & WCD (36)	Total (37)		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	18,567
1963	0	0	0	0	0	0	0	0	12,626	168,358
1964	0	0	0	0	0	0	0	0	13,938	184,729
1965	0	0	0	0	0	0	0	0	28,937	378,874
1966	0	0	0	0	0	0	0	0	31,321	408,397
1967	0	0	0	0	0	0	0	0	47,719	634,505
1968	8,819	972,744	9,504	1,218,521	0	0	0	0	46,945	2,745,160
1969	11,706	1,295,613	12,610	1,654,812	0	0	0	0	52,963	4,074,939
1970	14,621	1,624,573	15,745	2,069,923	0	0	0	0	69,745	4,676,282
1971	24,302	2,716,582	26,120	3,421,556	0	0	54	54	55,532	6,185,714
1972	89,132	8,038,457	68,368	10,035,856	0	0	40	40	80,412	12,998,869
1973	117,781	9,890,314	78,312	12,289,298	0	0	1	1	54,219	15,194,233
1974	128,166	11,581,499	83,451	14,166,550	0	0	143	143	76,783	17,372,561
1975	147,900	13,584,540	101,892	16,593,959	0	0	1,069	1,069	84,546	20,517,423
1976	158,663	12,862,497	94,799	16,037,424	0	0	139	139	106,717	20,027,213
1977	178,774	16,203,703	121,966	19,892,683	0	0	892	892	98,617	24,213,489
1978	186,386	17,811,759	132,438	21,568,741	0	0	39	39	100,785	26,012,786
1979	186,685	16,414,295	126,757	20,238,766	0	0	3,235	3,235	119,352	24,675,598
1980	248,407	20,927,493	154,101	25,902,817	0	0	416	416	178,817	32,039,355
1981	258,674	23,691,574	186,301	29,174,693	0	0	3,847	3,847	185,208	35,458,115
1982	308,030	28,023,111	209,270	34,354,084	0	0	10,956	10,956	181,914	41,662,234
1983	394,483	38,402,552	321,348	47,183,810	0	0	(422)	(422)	220,783	56,229,441
1984	496,665	45,551,121	381,622	56,319,865	0	0	643	643	225,922	67,016,035
1985	536,359	50,598,413	421,801	62,193,452	0	0	2,599	2,599	341,827	74,292,571
1986	552,221	52,975,993	443,423	65,032,862	0	0	2,595	2,595	279,652	76,982,745
1987	557,146	49,922,734	403,502	61,897,548	0	0	2,595	2,595	343,463	74,282,486
1988	594,826	51,423,135	407,960	63,906,177	0	0	2,600	2,600	365,217	76,327,518
1989	575,527	52,520,582	429,993	64,667,462	0	0	2,672	2,672	421,216	78,514,276
1990	660,430	60,257,545	487,196	74,195,794	0	0	2,687	2,687	470,430	90,269,051
1991	707,371	58,937,589	456,795	73,604,553	0	0	2,730	2,730	212,489	88,726,656
1992	688,729	67,449,605	502,000	82,394,353	0	0	2,774	2,774	552,853	100,965,505
1993	788,915	67,584,437	539,428	84,513,025	0	0	2,529	2,529	622,215	106,189,562
1994	812,839	66,185,675	492,926	82,975,650	0	0	3,058	3,058	618,051	104,597,780
1995	842,072	74,201,993	559,151	92,254,807	0	0	3,210	3,210	592,855	116,143,866
1996	975,725	80,099,185	593,025	100,170,747	0	0	3,370	3,370	595,305	124,023,703
1997	729,095	74,063,538	594,024	91,350,343	0	0	3,538	3,538	611,405	116,422,490
1998	781,102	72,889,922	584,197	90,317,009	0	0	3,538	3,538	599,941	115,500,074
1999	797,813	73,070,532	576,941	90,680,067	0	0	3,538	3,538	602,371	115,925,731
2000	843,903	74,090,437	577,221	92,244,408	0	0	3,538	3,538	602,557	117,493,411
2001	851,201	74,006,524	578,004	92,251,531	0	0	3,538	3,538	602,666	117,504,537
2002	799,959	73,207,718	578,146	90,853,852	0	0	3,538	3,538	602,795	116,111,625
2003	826,177	73,621,973	578,554	91,580,036	0	0	3,538	3,538	602,927	116,842,668
2004	827,245	73,615,328	578,478	91,587,969	0	0	3,538	3,538	603,063	116,855,611
2005	818,130	73,389,370	577,005	91,238,641	0	0	3,538	3,538	602,540	116,486,551
2006	831,454	73,804,213	578,760	91,818,918	0	0	3,538	3,538	602,611	117,069,484
2007	809,397	73,072,878	576,124	90,818,101	0	0	3,538	3,538	602,677	116,071,110
2008	826,573	73,726,626	579,167	91,688,700	0	0	3,538	3,538	602,783	116,945,539
2009	819,316	73,615,941	578,564	91,491,566	0	0	3,538	3,538	602,862	116,751,386
2010	812,817	73,461,827	577,523	91,257,661	0	0	3,538	3,538	602,953	116,520,630
2011	825,160	73,811,831	579,521	91,763,173	0	0	3,538	3,538	603,055	117,029,844
2012	832,148	73,792,952	578,210	91,821,807	0	0	3,538	3,538	603,129	117,091,222
2013	826,288	73,628,283	577,944	91,590,733	0	0	3,538	3,538	603,338	116,867,847
2014	857,122	74,568,891	580,180	92,903,981	0	0	3,538	3,538	603,465	118,185,001
2015	777,613	72,738,710	579,580	90,139,544	0	0	3,538	3,538	603,506	115,422,788
2016	838,464	74,109,002	579,418	92,224,405	0	0	3,538	3,538	603,546	117,509,107
2017	818,195	73,950,655	579,770	91,829,457	0	0	3,538	3,538	603,537	117,113,822
2018	828,910	73,906,957	579,960	91,912,423	0	0	3,538	3,538	603,537	117,196,770
2019	826,329	73,914,520	579,902	91,889,443	0	0	3,538	3,538	603,539	117,173,859
2020	835,660	73,925,726	578,322	92,000,312	0	0	3,538	3,538	603,370	117,278,479
2021	844,804	74,316,075	579,982	92,505,522	0	0	3,538	3,538	603,381	117,784,125
2022	802,028	73,000,771	577,676	90,677,155	0	0	3,538	3,538	603,347	115,954,483
2023	820,572	73,675,225	579,640	91,578,258	0	0	3,538	3,538	603,359	116,856,029
2024	820,097	73,566,903	577,774	91,456,222	0	0	3,538	3,538	603,363	116,734,143
2025	816,323	74,109,612	581,160	91,969,539	0	0	3,538	3,538	603,363	117,247,483
2026	834,026	73,529,746	577,184	91,578,731	0	0	3,538	3,538	603,287	116,853,834
2027	816,163	74,063,233	580,848	91,918,733	0	0	3,538	3,538	603,298	117,194,269
2028	831,922	73,529,580	578,043	91,557,637	0	0	3,538	3,538	603,289	116,832,809
2029	830,488	73,962,313	579,101	91,978,324	0	0	3,538	3,538	603,297	117,253,763
2030	825,931	73,809,342	579,289	91,772,538	0	0	3,538	3,538	603,287	117,047,674
2031	840,388	74,210,800	579,201	92,343,452	0	0	3,538	3,538	603,297	117,618,903
2032	851,957	74,465,319	579,023	92,732,993	0	0	3,538	3,538	603,298	118,008,474
2033	832,073	73,634,619	578,560	91,666,420	0	0	3,538	3,538	603,278	116,941,191
2034	813,998	73,632,583	577,925	91,449,332	0	0	3,538	3,538	603,278	116,724,072
2035	836,243	73,545,884	579,931	91,632,974	0	0	3,538	3,538	603,294	116,908,240
TOTAL	43,308,438	3,876,785,672	30,452,656	4,814,001,698	0	0	192,453	192,453	31,017,263	6,083,537,674

TABLE B-16B

Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	10,070	0	10,070	47,473	31,446	863,937	942,856	0	0	0
1984	29,957	0	29,957	157,280	77,388	2,040,188	2,274,856	0	0	0
1985	54,709	0	54,709	458,427	582,679	2,696,449	3,737,555	0	0	0
1986	45,886	0	45,886	312,937	365,147	2,595,766	3,273,850	0	0	0
1987	90,385	0	90,385	622,029	674,111	2,306,079	3,602,219	0	0	0
1988	115,970	114,196	230,166	616,865	804,606	2,116,236	3,537,707	0	0	0
1989	64,584	138,240	202,824	407,353	396,069	1,389,347	2,192,769	0	0	0
1990	77,126	138,805	215,931	535,269	514,372	1,490,250	2,539,891	0	0	0
1991	35,231	97,598	132,829	356,106	478,592	1,067,069	1,901,767	0	166,176	166,176
1992	74,531	152,502	227,033	405,020	528,827	1,182,813	2,116,660	0	0	0
1993	96,036	259,321	355,357	887,813	298,003	1,652,463	2,838,279	0	0	0
1994	136,077	242,114	378,191	597,039	645,900	1,590,618	2,833,557	0	0	0
1995	168,498	314,764	483,262	1,072,529	670,458	1,276,820	3,019,807	0	0	0
1996	69,231	124,457	193,688	433,092	413,406	984,299	1,830,797	62,695	463,101	525,796
1997	76,042	141,744	217,786	497,323	454,089	1,081,138	2,032,550	140,615	1,252,969	1,393,584
1998	81,882	143,905	225,787	504,541	460,656	1,096,828	2,062,025	142,655	1,271,151	1,413,806
1999	86,739	149,227	235,966	505,029	461,102	1,097,889	2,064,020	142,794	1,272,382	1,415,176
2000	97,204	152,657	249,861	507,849	463,711	1,104,021	2,075,581	143,591	1,279,488	1,423,079
2001	93,678	149,680	243,358	489,426	446,889	1,063,969	2,000,284	138,382	1,233,071	1,371,453
2002	89,124	144,841	233,965	465,632	425,163	1,012,244	1,903,039	131,654	1,173,125	1,304,779
2003	74,894	123,763	198,657	391,286	357,279	850,623	1,599,188	110,634	985,817	1,096,451
2004	71,057	119,320	190,377	371,241	338,975	807,046	1,517,262	104,966	935,313	1,040,279
2005	66,263	111,775	178,038	346,197	316,108	752,601	1,414,906	97,885	872,216	970,101
2006	61,716	103,769	165,485	322,440	294,415	700,956	1,317,811	91,167	812,362	903,529
2007	57,797	97,243	155,040	301,965	275,721	656,446	1,234,132	85,379	760,778	846,157
2008	69,815	117,538	187,353	364,751	333,050	792,938	1,490,739	103,131	918,963	1,022,094
2009	65,239	109,907	175,146	340,847	311,224	740,973	1,393,044	96,372	858,739	955,111
2010	61,422	103,543	164,965	320,905	293,014	697,619	1,311,538	90,733	808,495	899,228
2011	56,822	95,850	152,672	296,873	271,070	645,375	1,213,318	83,938	747,948	831,886
2012	53,352	90,054	143,406	278,741	254,515	605,958	1,139,214	78,812	702,266	781,078
2013	16,913	28,566	45,479	88,361	80,682	192,091	361,134	24,984	222,621	247,605
2014	20,923	35,362	56,285	109,313	99,812	237,638	446,763	30,907	275,406	306,313
2015	8,697	14,709	23,406	45,438	41,490	98,779	185,707	12,848	114,479	127,327
2016	4,329	7,302	11,631	22,616	20,651	49,165	92,432	6,395	56,980	63,375
2017	1,962	3,310	5,272	10,253	9,361	22,287	41,901	2,899	25,829	28,728
2018	1,962	3,308	5,270	10,249	9,357	22,279	41,885	2,898	25,820	28,718
2019	1,968	3,319	5,287	10,282	9,388	22,351	42,021	2,907	25,903	28,810
2020	1,975	3,332	5,307	10,319	9,423	22,433	42,175	2,918	25,998	28,916
2021	1,972	3,326	5,298	10,303	9,406	22,397	42,106	2,913	25,956	28,869
2022	1,977	3,334	5,311	10,327	9,430	22,450	42,207	2,920	26,018	28,938
2023	1,982	3,344	5,326	10,357	9,457	22,515	42,329	2,929	26,093	29,022
2024	4,098	6,912	11,010	21,409	19,549	46,542	87,500	6,053	53,939	59,992
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	2,300,095	3,652,937	5,953,032	13,573,505	12,565,991	37,739,885	63,879,381	1,946,974	17,419,402	19,366,376

TABLE B-16B

Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(Dollars)

Calendar Year	San Joaquin Valley Area							
			Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Municipal and Industrial (13)	Agricultural (14)	County of Kings (15)	Oak Flat Water District (16)	Tulare Lake Basin Water Storage District (17)	Total (18)
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	159,191	0	34,366	2,964,185	13,174	9,673	3,733	3,184,322
1984	389,518	0	816,103	9,095,509	26,774	33,576	49,601	10,411,081
1985	527,952	59,324	1,053,957	11,978,046	38,810	42,297	1,253,257	14,953,643
1986	552,171	12,858	885,988	11,788,715	40,659	38,275	872,009	14,190,675
1987	450,941	24,936	1,192,388	10,448,063	39,134	37,538	911,938	13,104,938
1988	425,261	31,146	1,130,988	9,910,050	35,851	26,779	850,225	12,410,300
1989	331,852	17,226	607,908	7,400,983	22,959	24,306	754,007	9,159,241
1990	219,381	7,731	428,482	5,216,562	12,089	12,046	344,943	6,241,234
1991	13,067	3,115	718,282	0	0	1,356	30,730	766,550
1992	244,494	13,927	705,765	5,785,401	18,577	15,707	480,638	7,264,509
1993	494,761	26,886	1,261,081	11,961,280	39,074	38,559	1,216,202	15,037,843
1994	328,536	24,933	1,018,924	8,041,620	21,871	21,743	927,107	10,384,734
1995	577,314	6,431	1,553,918	12,395,091	38,052	36,983	1,414,508	16,022,297
1996	211,576	11,000	533,941	4,539,433	14,667	14,255	434,520	5,759,392
1997	232,392	12,082	639,918	4,986,039	16,110	15,657	477,270	6,379,468
1998	235,765	12,258	649,204	5,058,395	16,344	15,885	484,195	6,472,046
1999	235,993	12,270	649,833	5,063,291	16,359	15,900	484,664	6,478,310
2000	237,310	12,339	653,462	5,091,569	16,451	15,989	487,371	6,514,491
2001	228,702	11,891	629,755	4,906,859	15,854	15,409	469,690	6,278,160
2002	217,583	11,313	599,140	4,668,311	15,084	14,660	446,855	5,972,946
2003	182,843	9,506	503,478	3,922,940	12,675	12,319	375,508	5,019,269
2004	173,475	9,020	477,684	3,721,966	12,026	11,688	356,271	4,762,130
2005	161,772	8,411	445,460	3,470,879	11,215	10,899	332,237	4,440,873
2006	150,671	7,834	414,891	3,232,696	10,445	10,152	309,437	4,136,126
2007	141,104	7,336	388,546	3,027,426	9,782	9,507	289,789	3,873,490
2008	170,442	8,862	469,334	3,656,905	11,816	11,483	350,043	4,678,885
2009	159,273	8,281	438,576	3,417,251	11,042	10,731	327,103	4,372,257
2010	149,954	7,796	412,916	3,217,310	10,396	10,103	307,964	4,116,439
2011	138,724	7,213	381,993	2,976,366	9,616	9,347	284,901	3,808,160
2012	130,251	6,772	358,663	2,794,585	9,030	8,775	267,501	3,575,577
2013	41,290	2,147	113,697	885,894	2,862	2,781	84,799	1,133,470
2014	51,080	2,656	140,656	1,095,946	3,542	3,441	104,906	1,402,227
2015	21,232	1,104	58,467	455,556	1,472	1,431	43,606	582,868
2016	10,569	549	29,101	226,744	732	712	21,705	290,112
2017	4,791	249	13,192	102,785	332	323	9,839	131,511
2018	4,789	249	13,187	102,747	332	322	9,836	131,462
2019	4,804	250	13,229	103,080	334	324	9,866	131,887
2020	4,822	250	13,278	103,459	335	325	9,903	132,372
2021	4,815	250	13,256	103,289	333	324	9,887	132,154
2022	4,826	250	13,289	103,537	335	325	9,911	132,473
2023	4,840	251	13,327	103,836	336	326	9,940	132,856
2024	10,004	520	27,548	214,644	694	674	20,546	274,630
2025	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
TOTAL	8,040,131	401,422	20,517,171	178,339,243	577,575	562,905	15,938,961	224,377,408

TABLE B-16B

Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (19)	Castaic Lake Water Agency (20)	Coachella Valley Water District (21)	Crestline-Lake Arrowhead Water Agency (22)	Desert Water Agency (23)	Littlerock Creek Irrigation District (24)	Mojave Water Agency (25)	Palmdale Water District (26)	San Bernardino Valley Municipal Water District (27)	San Gabriel Valley Municipal Water District (28)
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	1,083,881	411,247	565,798	35,432	894,572	1,250	0	0	233,134	28,548
1984	2,499,848	1,122,640	1,427,428	102,114	2,263,172	77	0	0	502,967	693,074
1985	3,775,658	1,572,025	2,032,672	170,137	3,230,452	0	0	131,200	884,188	601,582
1986	3,159,858	1,694,487	2,097,407	173,460	3,340,188	15,872	0	301,486	739,563	1,088,902
1987	3,167,759	1,694,698	1,991,841	190,149	3,230,424	95,994	1,786	258,719	1,951,799	1,091,691
1988	2,688,113	1,776,471	1,940,156	187,156	3,194,137	30,395	846	126,639	2,000,664	839,774
1989	2,357,669	1,348,806	1,326,863	132,076	2,218,516	50,948	13,206	493,424	1,257,332	792,087
1990	2,528,625	1,335,341	1,463,452	115,746	2,413,745	110,678	0	545,342	1,192,997	1,054,762
1991	1,049,969	531,949	1,023,921	125,885	1,688,805	65,207	473,994	488,931	540,920	797,713
1992	2,758,675	1,547,616	1,124,154	28,463	1,854,041	22,880	1,130,251	367,792	362,032	852,575
1993	3,778,509	1,436,691	2,365,183	38,327	3,901,014	65,994	1,185,147	669,663	500,627	1,496,650
1994	5,287,431	1,987,333	1,549,416	212,488	2,555,293	111,465	2,176,376	851,718	1,013,405	1,650,373
1995	4,118,708	2,329,882	2,303,360	319,080	3,799,047	193,897	3,466,823	843,031	717,931	1,296,362
1996	4,497,246	1,176,550	887,829	78,790	1,464,341	74,737	1,952,455	562,156	2,152,312	499,644
1997	5,006,265	1,420,269	975,176	94,985	1,608,408	82,090	2,144,544	628,884	2,701,788	675,446
1998	5,011,384	1,542,966	989,328	96,363	1,631,749	83,281	2,175,665	638,010	2,526,855	856,561
1999	5,016,236	1,655,976	990,286	102,887	1,633,328	83,362	2,177,772	638,627	2,529,302	1,071,737
2000	5,044,251	1,708,195	995,817	116,782	1,642,450	83,828	2,189,934	642,194	2,543,427	1,077,723
2001	4,861,257	1,646,227	959,690	112,546	1,582,866	80,786	2,110,488	618,897	2,451,158	1,038,626
2002	4,624,926	1,566,195	913,035	113,398	1,505,915	76,859	2,007,886	588,809	2,331,994	988,133
2003	3,886,483	1,316,126	767,255	100,673	1,265,471	64,587	1,687,295	494,797	1,959,653	830,362
2004	3,687,377	1,248,701	727,947	100,558	1,200,640	61,279	1,600,854	469,448	1,859,260	787,821
2005	3,438,623	1,164,462	678,839	98,506	1,119,644	57,145	1,492,859	437,778	1,733,833	734,674
2006	3,202,653	1,084,554	632,255	96,918	1,042,811	53,223	1,390,415	407,736	1,614,852	684,259
2007	2,999,291	1,015,686	592,108	95,635	976,594	49,844	1,302,125	381,846	1,512,312	640,810
2008	3,622,919	1,226,873	715,222	121,371	1,179,653	60,207	1,572,870	461,242	1,826,759	774,050
2009	3,385,492	1,146,470	668,351	118,914	1,102,345	56,262	1,469,793	431,014	1,707,043	723,323
2010	3,187,410	1,079,391	629,246	117,105	1,037,847	52,970	1,383,796	405,796	1,607,165	681,002
2011	2,948,706	998,555	582,122	111,838	960,123	49,004	1,280,164	375,406	1,486,805	630,002
2012	2,768,614	937,569	546,568	108,391	901,484	46,010	1,201,979	352,478	1,395,998	591,525
2013	877,660	297,213	173,264	35,403	285,773	14,586	381,031	111,737	442,536	187,515
2014	1,085,761	367,684	214,347	2,023	353,532	18,044	42,962	138,231	547,465	231,977
2015	451,322	152,837	89,098	19,285	146,954	7,501	195,939	57,459	227,566	96,427
2016	224,637	76,072	44,347	9,769	73,144	3,733	97,525	28,599	113,268	47,994
2017	101,830	34,484	20,103	4,508	33,157	1,692	44,209	12,965	51,345	21,756
2018	101,792	34,471	20,095	4,584	33,145	1,691	44,193	12,959	51,326	21,749
2019	102,122	34,583	20,160	4,679	33,252	1,697	44,336	13,001	51,492	21,819
2020	102,497	34,710	20,235	4,774	33,374	1,704	44,498	13,049	51,682	21,899
2021	102,328	34,653	20,202	4,809	33,319	1,701	44,425	13,028	51,597	21,862
2022	102,575	34,736	20,250	4,865	33,399	1,705	44,532	13,059	51,721	21,915
2023	102,871	34,837	20,309	4,923	33,496	1,709	44,661	13,097	51,870	21,979
2024	212,649	72,012	41,981	10,268	69,240	3,534	92,320	27,073	107,223	45,433
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	109,011,880	41,932,243	35,167,116	3,726,063	57,600,860	1,939,428	38,709,954	14,067,320	47,637,166	26,332,116

TABLE B-16B

Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				Total State Water Project (a (37)
	San Gorgonio Pass Water Agency (29)	Metropolitan Water District of Southern California (30)	Ventura County Flood Control District (31)	Total (32)	City of Yuba City (33)	County of Butte (34)	Plumas County FC&WCD (35)	Total (36)	
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	12,791,358	0	16,045,220	0	0	0	0	20,182,468
1984	0	39,229,567	0	47,840,887	0	0	0	0	60,556,781
1985	0	77,446,522	0	89,844,436	0	0	0	0	108,590,343
1986	0	77,581,287	0	90,192,510	0	0	0	0	107,702,921
1987	0	68,939,195	0	82,614,055	0	0	0	0	99,411,597
1988	0	79,936,309	0	92,720,660	0	0	0	0	108,898,833
1989	0	68,311,546	0	78,302,473	0	0	0	0	89,857,307
1990	0	83,964,409	277,885	95,002,982	0	0	0	0	104,000,038
1991	0	54,294,659	132,405	61,214,358	0	0	0	0	64,181,680
1992	0	72,037,396	0	82,085,875	0	0	0	0	91,694,077
1993	0	60,249,868	0	75,687,673	0	0	0	0	93,919,152
1994	0	94,083,382	988,356	112,467,036	0	0	0	0	126,063,518
1995	0	51,591,027	0	70,979,148	0	0	0	0	90,504,514
1996	0	73,618,810	697,205	87,662,075	0	0	0	0	95,971,748
1997	303,952	80,763,546	765,798	97,171,151	0	0	0	0	107,194,539
1998	308,362	81,836,006	776,912	98,473,442	0	0	0	0	108,647,106
1999	308,661	81,814,712	777,664	98,800,550	0	0	0	0	108,994,022
2000	310,385	82,271,636	782,007	99,408,629	0	0	0	0	109,671,641
2001	299,124	79,287,011	753,637	95,802,313	0	0	0	0	105,695,568
2002	284,582	75,432,453	716,999	91,151,184	0	0	0	0	100,565,913
2003	239,144	63,388,454	602,519	76,602,819	0	0	0	0	84,516,384
2004	226,893	60,141,040	571,651	72,683,469	0	0	0	0	80,193,517
2005	211,587	56,083,871	533,087	67,784,908	0	0	0	0	74,788,826
2006	197,066	52,235,216	496,505	63,138,463	0	0	0	0	69,661,414
2007	184,553	48,918,378	464,978	59,134,160	0	0	0	0	65,242,979
2008	222,926	59,089,734	561,659	71,435,485	0	0	0	0	78,814,556
2009	208,317	55,217,314	524,851	66,759,489	0	0	0	0	73,655,047
2010	196,129	51,986,588	494,142	62,858,587	0	0	0	0	69,350,757
2011	181,440	48,093,332	457,136	58,154,633	0	0	0	0	64,160,669
2012	170,359	45,156,031	429,216	54,606,222	0	0	0	0	60,245,497
2013	54,005	14,314,618	136,063	17,311,404	0	0	0	0	19,099,092
2014	66,810	17,708,741	168,325	20,945,902	0	0	0	0	23,157,490
2015	27,771	7,361,055	69,968	8,903,182	0	0	0	0	9,822,490
2016	13,823	3,663,829	34,825	4,431,565	0	0	0	0	4,889,115
2017	6,266	1,660,851	15,787	2,008,953	0	0	0	0	2,216,365
2018	6,263	1,660,231	15,781	2,008,280	0	0	0	0	2,215,615
2019	6,284	1,665,603	15,832	2,014,860	0	0	0	0	2,222,865
2020	6,307	1,671,726	15,890	2,022,345	0	0	0	0	2,231,115
2021	6,297	1,668,978	15,864	2,019,063	0	0	0	0	2,227,490
2022	6,312	1,672,996	15,902	2,023,967	0	0	0	0	2,232,896
2023	6,330	1,677,834	15,948	2,029,864	0	0	0	0	2,239,397
2024	13,085	3,468,305	32,967	4,196,090	0	0	0	0	4,629,222
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	4,073,033	1,993,985,424	12,357,764	2,386,540,367	0	0	0	0	2,700,116,564

a) Costs allocated to contractors in 1989 through 1993 are reduced by credits for Off-Aqueduct Power Facility costs allocated to the pumping of non-SWP water.

TABLE B-17

Unit Variable OMP&R Component of Transportation Charge

(Dollars per Acre-Foot)

Calendar Year	North Bay Aqueduct						South Bay Aqueduct		California Aqueduct	
	Reach 1 Barker Slough Pumping Plant		Reach 3A Cordelia Pumping Plant Solano County WA		Reach 3B Cordelia Pumping Plant Napa County FC&WCD (a		Reach 1 South Bay and Del Valle Pumping Plants (b		Reach 1 Banks Pumping Plant	
	Unit Rate (1)	Cumulative Unit Rate (2)	Unit Rate (3)	Cumulative Unit Rate (4)	Unit Rate (5)	Cumulative Unit Rate (6)	Unit Rate (7)	Cumulative Unit Rate (8)	Unit Rate (9)	Cumulative Unit Rate (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	4.1511341	4.15113410	0	0
1963	0	0	0	0	0	0	4.5639383	4.56393830	0	0
1964	0	0	0	0	0	0	3.5452154	3.54521540	0	0
1965	0	0	0	0	0	0	4.1911773	4.19117730	0	0
1966	0	0	0	0	0	0	3.5074573	3.50745730	0	0
1967	0	0	0	0	0	0	3.9306767	5.13374480	1.2030681	1.2030681
1968	0	0	0	0	5.7570016	5.7570016	3.3315620	4.87509420	1.5435322	1.5435322
1969	0	0	0	0	3.1823595	3.1823595	3.6949019	4.80161700	1.1067151	1.1067151
1970	0	0	0	0	3.7584301	3.7584301	4.4256141	5.37214900	0.9465349	0.9465349
1971	0	0	0	0	4.2082507	4.2082507	3.8714396	4.75228330	0.8808437	0.8808437
1972	0	0	0	0	3.9577735	3.9577735	4.3250690	5.22816860	0.9030996	0.9030996
1973	0	0	0	0	3.8103903	3.8103903	5.2455409	6.18418000	0.9386391	0.9386391
1974	0	0	0	0	3.5878850	3.5878850	6.3321503	7.22939090	0.8972406	0.8972406
1975	0	0	0	0	2.1606725	2.1606725	3.7365711	4.83277310	1.0962020	1.0962020
1976	0	0	0	0	2.9283909	2.9283909	4.5191527	5.71327950	1.1941268	1.1941268
1977	0	0	0	0	2.7516411	2.7516411	4.7630172	6.53099080	1.7679736	1.7679736
1978	0	0	0	0	3.5949619	3.5949619	5.2086183	6.82002090	1.6114026	1.6114026
1979	0	0	0	0	2.4747752	2.4747752	4.9524184	7.08892340	2.1365050	2.1365050
1980	0	0	0	0	2.9737588	2.9737588	4.5186576	5.88658520	1.3679276	1.3679276
1981	0	0	0	0	2.6487057	2.6487057	4.3834851	6.47722020	2.0937351	2.0937351
1982	0	0	0	0	10.0239077	10.0239077	4.9779475	6.72847820	1.7505307	1.7505307
1983	0	0	0	0	1.0209882	1.0209882	1.3122465	2.11570800	0.8034615	0.8034615
1984	0	0	0	0	1.6647280	1.6647280	2.7638756	3.95638430	1.1925087	1.1925087
1985	0	0	0	0	2.5219114	2.5219114	3.6775932	5.29796190	1.6203687	1.6203687
1986	0	0	0	0	4.3967036	4.3967036	7.4448499	10.72405330	3.2792034	3.2792034
1987	0	0	0	0	3.5385415	3.5385415	6.5424647	9.31619970	2.7737350	2.7737350
1988	1.1819144	1.1819144	2.0590231	3.2409375	4.2650223	5.4469367	6.1966928	8.68681500	2.4901222	2.4901222
1989	1.1263059	1.1263059	2.6374232	3.7637291	0.2663438	1.3926497	7.6122205	10.92216990	3.3099494	3.3099494
1990	2.2461356	2.2461356	4.3186176	6.5647532	6.2108069	8.4569425	11.9465877	15.84190320	3.8953155	3.8953155
1991	1.9499521	1.9499521	3.6329442	5.5828963	5.1028986	7.0528507	8.8411628	12.24805040	3.4068876	3.4068876
1992	1.1706083	1.1706083	2.1571584	3.3277667	2.8837791	4.0543874	4.3531000	6.60613460	2.2530346	2.2530346
1993	-0.6226136	-0.6226136	-0.8895722	-1.5121858	-1.1899357	-1.8125493	-1.5515282	-1.40301200	0.1485162	0.1485162
1994	1.4852502	1.4852502	2.2131894	3.6984396	4.6924323	6.1776825	8.0318735	11.29395480	3.2620813	3.2620813
1995	2.4560073	2.4560073	4.3163625	6.7723698	6.4955010	8.9515083	9.4655272	15.66693950	6.2014123	6.2014123
1996	2.9549078	2.9549078	5.1674574	8.1223652	7.7761759	10.7310837	11.5541075	16.22944480	4.6753373	4.6753373
1997	3.2035081	3.2035081	5.9771254	9.1806335	7.9510167	11.1545248	12.0790532	17.30088990	5.2218367	5.2218367
1998	2.9362555	2.9362555	5.7463604	8.6826159	8.2747225	11.2109780	14.7016489	20.45222560	5.7505767	5.7505767
1999	3.1464220	3.1464220	6.2071940	9.3536160	8.7885645	11.9349865	15.5175745	21.51554950	5.9979750	5.9979750
2000	3.2619518	3.2619518	6.3482435	9.6101953	9.4381609	12.7001127	15.7955106	21.87401360	6.0785030	6.0785030
2001	3.3084358	3.3084358	6.7293221	10.0377579	9.1543359	12.4627717	16.0423511	22.20347820	6.1611271	6.1611271
2002	3.3718242	3.3718242	7.1516656	10.5234898	8.9782164	12.3500406	16.3322447	22.59401670	6.2617720	6.2617720
2003	3.4279860	3.4279860	7.5893412	11.0173272	8.7620270	12.1900130	16.6297074	22.99392900	6.3642216	6.3642216
2004	3.4877136	3.4877136	8.0283850	11.5160986	8.5762338	12.0639474	16.9367021	23.40592400	6.4692219	6.4692219
2005	3.1378812	3.1378812	7.0387723	10.1766535	7.6923750	10.8302562	15.7828723	21.81299450	6.0301222	6.0301222
2006	3.1250043	3.1250043	6.9116357	10.0366400	7.5595137	10.6845180	15.9465053	22.03190500	6.0853997	6.0853997
2007	3.1284103	3.1284103	7.0119926	10.1404029	7.3834118	10.5118221	16.0955426	22.23231240	6.1367698	6.1367698
2008	3.1431615	3.1431615	7.1510921	10.2942536	7.2155241	10.3586856	16.3307872	22.54813920	6.2173520	6.2173520
2009	3.1523618	3.1523618	7.2686930	10.4210548	7.0759890	10.2283508	16.5138191	22.79426580	6.2804467	6.2804467
2010	3.1686639	3.1686639	6.9910047	10.1596686	6.9589867	10.1276506	16.7315319	23.06630850	6.3347766	6.3347766
2011	3.1811330	3.1811330	7.1218633	10.3029963	6.8181443	9.9992773	16.9609628	23.37258170	6.4116189	6.4116189
2012	3.1876810	3.1876810	7.2278594	10.4155404	6.6956391	9.8833201	17.1283032	23.59791340	6.4696102	6.4696102
2013	3.2451047	3.2451047	7.4638296	10.7089343	6.6628641	9.9079688	17.5996596	24.23118080	6.6315212	6.6315212
2014	3.2764303	3.2764303	7.6434517	10.9198820	6.5815529	9.8579832	17.9333883	24.60281740	6.6694291	6.6694291
2015	3.2302347	3.2302347	7.9101635	11.1403982	6.4036986	9.6339333	17.9823723	24.73936070	6.7569884	6.7569884
2016	3.2009147	3.2009147	7.7894443	10.9903590	6.2649333	9.4658480	18.0744734	24.86136410	6.7868907	6.7868907
2017	3.1675115	3.1675115	7.7798621	10.9473736	6.0947186	9.2622301	18.0522074	24.83300350	6.7807961	6.7807961
2018	3.1384932	3.1384932	7.7795579	10.9180511	5.9402110	9.0787042	18.0515053	24.83186030	6.7803550	6.7803550
2019	3.1107843	3.1107843	7.7812817	10.8920660	5.7948148	8.9055991	18.0554043	24.83719140	6.7817871	6.7817871
2020	3.0181166	3.0181166	7.6177753	10.6358919	5.5363454	8.5544620	17.6759628	24.32489150	6.6489287	6.6489287
2021	3.0187313	3.0187313	7.6306530	10.6493843	5.5235600	8.5422913	17.7059574	24.36296600	6.6570086	6.6570086
2022	3.0049254	3.0049254	7.5957209	10.6006463	5.4983200	8.5032454	17.6249202	24.25577960	6.6308594	6.6308594
2023	3.0097164	3.0097164	7.6078382	10.6175546	5.5070400	8.5167564	17.6530532	24.29293130	6.6398781	6.6398781
2024	3.0113433	3.0113433	7.6119955	10.6233388	5.5100400	8.5213833	17.6626596	24.30502400	6.6423644	6.6423644
2025	3.0115970	3.0115970	7.6126546	10.6242516	5.5105200	8.5221170	17.6641011	24.30766670	6.6435656	6.6435656
2026	2.9818209	2.9818209	7.5373149	10.5191358	5.4560400	8.4378609	17.4894096	24.07395060	6.5845410	6.5845410
2027	2.9863582	2.9863582	7.5488238	10.5351820	5.4643600	8.4507182	17.5160426	24.10934210	6.5932995	6.5932995
2028	2.9825075	2.9825075	7.5390894	10.5215969	5.4573200	8.4398275	17.4935000	24.07935360	6.5858536	6.5858536
2029	2.9852836	2.9852836	7.5460353	10.5313189	5.4623600	8.4476436	17.5097021	24.10105610	6.5913540	6.5913540
2030	2.9819403	2.9819403	7.5376698	10.5196101	5.4562800	8.4382203	17.4901596	24.07594440	6.5857848	6.5857848
2031	2.9865075	2.9865075	7.5491787	10.5356862	5.4646400	8.4511475	17.5169415	24.10546160	6.5885201	6.5885201
2032	2.9867313	2.9867313	7.5497871	10.5365184	5.4650400	8.4517713	17.5182394	24.10793030	6.5896909	6.5896909
2033	2.9793582	2.9793582	7.5311296	10.5104878	5.4515600	8.4309182	17.4750426	24.04959940	6.5745568	6.5745568
2034	2.9789403	2.9789403	7.5300649	10.5090052	5.4507600	8.4297003	17.4725426	24.04648400	6.5739414	6.5739414
2035	2.9850746	2.9850746	7.5455790	10.5306536	5.4620000	8.4470746	17.5084787	24.09111000	6.5826313	6.5826313

a) For the period 1968 through 1987, rates are for an interim facility.
b) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedure.

TABLE B-17

Unit Variable OMP&R Component of Transportation Charge

(Dollars per Acre-Foot)

	California Aqueduct (continued)									
	Reach 4 Dos Amigos Pumping Plant		Reach 14A Buena Vista Pumping Plant		Reach 15A Teerink Pumping Plant		Reach 16A Chrisman Pumping Plant		Reach 17E Edmonston Pumping Plant	
Calendar Year	Unit Rate (11)	Cumulative Unit Rate (12)	Unit Rate (13)	Cumulative Unit Rate (14)	Unit Rate (15)	Cumulative Unit Rate (16)	Unit Rate (17)	Cumulative Unit Rate (18)	Unit Rate (19)	Cumulative Unit Rate (20)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	1.0732031	2.6167353	0	0	0	0	0	0	0	0
1969	0.7028165	1.8095316	0	0	0	0	0	0	0	0
1970	0.7813430	1.7278779	0.3333333	2.0612112	0	0	0	0	0	0
1971	0.4125312	1.2933749	1.3594550	2.6528299	4.9729730	7.6258029	0	0	0	0
1972	0.5543469	1.4574465	1.0808850	2.5383315	1.1418280	3.6801595	2.2892599	5.9694194	7.3206022	13.2900216
1973	0.5996892	1.5383283	0.9844807	2.5228090	1.2143719	3.7371809	2.1051633	5.8423442	7.4512435	13.2935877
1974	0.5736894	1.4709300	0.9223291	2.3932591	1.0924098	3.4856689	1.9449022	5.4305711	6.9004732	12.3310443
1975	0.4602594	1.5564614	0.8190849	2.3755463	0.9574493	3.3329956	1.9610412	5.2940368	6.9962702	12.2903070
1976	0.5163827	1.7105095	0.9626676	2.6731771	1.0211874	3.6943645	2.2275746	5.9219391	7.9384515	13.8603906
1977	0.6138931	2.3818667	1.0969170	3.4787837	1.3715867	4.8503704	2.9301764	7.7805468	9.9990004	17.7795472
1978	0.4207825	2.0321851	0.9606230	2.9928081	1.0432294	4.0360375	1.9779157	6.0139532	7.0810192	13.0949724
1979	0.6587934	2.7952984	1.1099369	3.9052353	1.2652451	5.1704804	2.6939701	7.8644505	9.6345625	17.4990130
1980	0.8056952	2.1736228	1.3516057	3.5252285	1.5041463	5.0293748	3.1923433	8.2217181	10.9860288	19.2077469
1981	1.0840986	3.1778337	1.2388784	4.4167121	1.3195560	5.7362681	2.9541028	8.6903709	9.9484860	18.6388569
1982	0.7762022	2.5267329	1.2001820	3.7269149	1.3668611	5.0937760	2.8880977	7.9818737	10.1769284	18.1588021
1983	0.3690003	1.1724618	0.7434250	1.9158868	0.8851706	2.8010574	1.7730111	4.5740685	5.5794328	10.1535013
1984	0.6015073	1.7940160	1.0319640	2.8259800	1.2160125	4.0419925	2.5447825	6.5867750	8.3017115	14.8884865
1985	0.8634931	2.4838618	1.4180390	3.9019008	1.6505071	5.5524079	3.4670086	9.0194165	11.7565847	20.7760012
1986	1.3950680	4.6742714	2.3763988	7.0506702	2.7626510	9.8133212	5.9668234	15.7801446	20.6435041	36.4236487
1987	1.2880625	4.0617975	2.2541804	6.3159779	2.5738801	8.8898580	5.3754819	14.2653399	17.9512279	32.2165678
1988	1.1812361	3.6713583	2.1312092	5.8025675	2.4287598	8.2313273	5.0672280	13.2985553	16.7760708	30.0746261
1989	1.5049975	4.8149469	2.7015545	7.5165014	3.0191335	10.5356349	6.5760148	17.1116497	22.2736391	39.3852888
1990	1.8001953	5.6955108	3.3052168	9.0007276	3.7451498	12.7458774	8.6757569	21.4216343	31.0136723	52.4353066
1991	0.9986492	4.4055368	2.1278688	6.5334056	2.3570742	8.8904798	5.6831902	14.5736700	20.5711278	35.1447978
1992	0.9020806	3.1551152	1.5101991	4.6653143	1.7309793	6.3962936	3.5968120	9.9931056	12.2236163	22.2167219
1993	0.1549473	0.3034635	-0.0957775	0.2076860	-0.0744888	0.1331972	-0.6398966	-0.5066994	-3.0680558	-3.5747552
1994	1.4187164	4.6807977	2.4902632	7.1710609	2.7729808	9.9440417	6.0090744	15.9531161	21.2512921	37.2044082
1995	2.1441052	8.3455175	3.6105040	11.9560215	4.4245110	16.3805325	9.1521387	25.5326712	31.9028489	57.4355201
1996	2.1176835	6.7930208	3.4265517	10.2195725	4.1533863	14.3729588	8.7131621	23.0861209	30.5943001	53.6804210
1997	2.4032196	7.6250563	3.9929331	11.6179894	4.8597717	16.4777611	10.2445722	26.7223333	36.0596361	62.7819694
1998	2.6128810	8.3634577	4.3905579	12.7540156	5.3395397	18.0935553	11.2878157	29.3813710	39.8109114	69.1922824
1999	2.7346477	8.7326227	4.6242461	13.3568688	5.6247052	18.9815740	11.9057069	30.8872809	42.0171282	72.9044091
2000	2.7680439	8.8465469	4.6947206	13.5412675	5.7101921	19.2514596	12.0932990	31.3447586	42.6911172	74.0358758
2001	2.8069850	8.9681121	4.7644391	13.7325512	5.7952335	19.5277847	12.2772708	31.8050555	43.3474343	75.1524898
2002	2.8537452	9.1155172	4.8478095	13.9633267	5.8968847	19.8602114	12.4957432	32.3559546	44.1243831	76.4803377
2003	2.9001135	9.2643351	4.9312582	14.1955933	5.9986740	20.1942673	12.7170207	32.9112880	44.9157618	77.8270498
2004	2.9485426	9.4177645	5.0181281	14.4358926	6.1046304	20.5405230	12.9463900	33.4869130	45.7346030	79.2215160
2005	2.7449888	8.7751110	4.6375786	13.4126896	5.6376735	19.0503631	11.9358783	30.9862414	42.1275568	73.1137982
2006	2.7700568	8.8554565	4.6828314	13.5382879	5.6928814	19.2311693	12.0564590	31.2876283	42.5597153	73.8473436
2007	2.7944554	8.9312252	4.7257820	13.6570072	5.7452136	19.4022208	12.1679444	31.5701652	42.9544953	74.5246605
2008	2.8303999	9.0477519	4.7906410	13.8383929	5.8243153	19.6627082	12.3408612	32.0035694	43.5745046	75.5780740
2009	2.8592564	9.1397031	4.8421578	13.9818609	5.8870780	19.8689389	12.4764686	32.3454075	44.0580748	76.4034823
2010	2.8829061	9.2176827	4.8767874	14.0944701	5.9279374	20.0224075	12.5649534	32.5873609	44.3734602	76.9608211
2011	2.9182335	9.3298524	4.9401797	14.2700321	6.0052012	20.2752333	12.7330788	33.0083121	44.9750682	77.9833803
2012	2.9444079	9.4140181	4.9868975	14.4009156	6.0621219	20.4630375	12.8561567	33.3191942	45.4140897	78.7332839
2013	3.0179748	9.6494960	5.1179708	14.7674668	6.2217839	20.9892507	13.2015294	34.1907801	46.6460399	80.8368200
2014	3.0327929	9.7022220	5.1153936	14.8176156	6.2135468	21.0311624	13.1814283	34.2125907	46.5686472	80.7812379
2015	3.0761930	9.8331814	5.2195384	15.0527198	6.3452425	21.3979623	13.4672392	34.8652015	47.5916074	82.4568089
2016	3.0892398	9.8761305	5.2439643	15.1200948	6.3750948	21.4951896	13.5344982	35.0296878	47.8362582	82.8659460
2017	3.0860209	9.8668170	5.2381113	15.1049283	6.3679543	21.4728826	13.5187562	34.9916388	47.7795978	82.7712366
2018	3.0859995	9.8663545	5.2380997	15.1044542	6.3679715	21.4724257	13.5187168	34.9911425	47.7793857	82.7705282
2019	3.0866648	9.8684519	5.2393485	15.1078004	6.3695088	21.4773092	13.5220700	34.9993792	47.7913283	82.7907075
2020	3.0254254	9.6743541	5.1286080	14.8029621	6.2342941	21.0372562	13.2293802	34.2666364	46.7467617	81.0133981
2021	3.0291947	9.6862033	5.1353738	14.8215771	6.2425211	21.0640982	13.2480442	34.3121424	46.8148965	81.1270389
2022	3.0180418	9.6489012	5.1143026	14.7632038	6.2167448	20.9799486	13.1895790	34.1695276	46.6014635	80.7709911
2023	3.0217115	9.6615896	5.1215145	14.7831041	6.2255856	21.0086897	13.2101877	34.2188774	46.6774715	80.8963489
2024	3.0234034	9.6657678	5.1244354	14.7902032	6.2291151	21.0193183	13.2174748	34.2367931	46.7029650	80.9397581
2025	3.0230152	9.6665808	5.1243468	14.7909276	6.2290709	21.0199985	13.2186215	34.2386200	46.7092585	80.9478785
2026	2.9965729	9.5811139	5.0766803	14.6577942	6.1709681	20.8287623	13.0914816	33.9202439	46.2532208	80.1734647
2027	3.0000868	9.5933863	5.0835225	14.6769088	6.1793257	20.8562345	13.1108265	33.9670610	46.3244312	80.2914922
2028	2.9972195	9.5830731	5.0778599	14.6609330	6.1723914	20.8333244	13.0946782	33.9280026	46.2646438	80.1926464
2029	2.9992806	9.5906346	5.0819612	14.6725958	6.1774324	20.8500282	13.1064447	33.9564729	46.3083203	80.2647932
2030	2.9964072	9.5821920	5.0767484	14.6589404	6.1710408	20.8299812	13.0923498	33.9223310	46.2574066	80.1797376
2031	2.9978212	9.5863413	5.0776160	14.6639573	6.1718116	20.8357689	13.0945179	33.9302868	46.2659355	80.1962223
2032	2.9977438	9.5874347	5.0777488	14.6651835	6.1719941	20.8371776	13.0953861	33.9325637	46.2698747	80.2024384
2033	2.9918484	9.5664052	5.0665527	14.6329579	6.1582974	20.7912553	13.0640711	33.8553264	46.1552476	80.0105740
2034	2.9914816	9.5654230	5.0658695	14.6312925	6.1574512	20.7887437	13.0622439	33.8509876	46.1486511	79.9996387
2035	2.9970799	9.5797112	5.0758115	14.6555227	6.1695952	20.8251179	13.0884315	33.9135494	46.2420845	80.1556339

TABLE B-17

Unit Variable OMP&R Component of Transportation Charge

(Dollars per Acre-Foot)

	California Aqueduct (continued)									
	Reach 18A Alamo Powerplant		Reach 22B Pearblossom Pumping Plant		Reach 23 Mojave Siphon Powerplant		Reach 26A Devil Canyon Powerplant		Reach 29A Oso Pumping Plant	
Calendar Year	Unit Rate (21)	Cumulative Unit Rate (22)	Unit Rate (23)	Cumulative Unit Rate (24)	Unit Rate (25)	Cumulative Unit Rate (26)	Unit Rate (27)	Cumulative Unit Rate (28)	Unit Rate (29)	Cumulative Unit Rate (30)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	13.2900216	14.2519509	27.5419725	0	27.5419725	-2.3717647	25.1702078	1.4212193	14.7112409
1973	0	13.2935877	4.4326545	17.7262422	0	17.7262422	-8.4298618	9.2963804	1.0210537	14.3146414
1974	0	12.3310443	3.4431782	15.7742225	0	15.7742225	-5.1043660	10.6698565	0.9241725	13.2552168
1975	0	12.2903070	3.1739313	15.4642383	0	15.4642383	-5.6510611	9.8131772	0.9362286	13.2265356
1976	0	13.8603906	3.9391330	17.7995236	0	17.7995236	-6.4449941	11.3545295	0.8622774	14.7226680
1977	0	17.7795472	3.4988957	21.2784429	0	21.2784429	-11.6274558	9.6509871	0.9076172	18.6871644
1978	0	13.0949724	4.1377503	17.2327227	0	17.2327227	-8.1314274	9.1012953	0.7314697	13.8264421
1979	0	17.4990130	5.1961178	22.6951308	0	22.6951308	-9.5825772	13.1125536	0.9504526	18.4494656
1980	0	19.2077469	4.3918283	23.5995752	0	23.5995752	-8.3797007	15.2198745	1.4269064	20.6346533
1981	0	18.6388569	3.9979411	22.6367980	0	22.6367980	-6.7421980	15.8946000	1.5649076	20.2037645
1982	0	18.1588021	3.6618080	21.8206101	0	21.8206101	-6.9205064	14.9001037	1.4942612	19.6530633
1983	0	10.1535013	1.7398697	11.8933710	0	11.8933710	-23.7901875	-11.8968165	1.4582832	11.6117845
1984	0	14.8884865	2.4963740	17.3848605	0	17.3848605	-29.2940487	-11.9091882	1.7879684	16.6764549
1985	0	20.7760012	3.4967556	24.2727568	0	24.2727568	-30.7672356	-6.4944788	2.1683888	22.9443900
1986	-2.3583180	34.0653307	6.0001395	40.0654702	0	40.0654702	-29.2499580	10.8155122	3.2342581	39.6579068
1987	-2.6107019	29.6058659	5.1909608	34.7968267	0	34.7968267	-30.5133657	4.2834610	3.1272921	35.3438599
1988	-1.4076158	28.6670103	4.8456180	33.5126283	0	33.5126283	-29.5512806	3.9613477	2.9971055	33.0717316
1989	-1.1019487	38.2833401	6.4423849	44.7257250	0	44.7257250	-28.3706997	16.3550253	3.5381171	42.9234059
1990	-1.0672075	51.3680991	8.9799647	60.3480638	0	60.3480638	-28.8762479	31.4718159	3.6781647	56.1134713
1991	-2.0414639	33.1033339	5.9725774	39.0759113	0	39.0759113	-43.0761153	-4.0002040	2.1694523	37.3142501
1992	-2.6095224	19.6071995	3.7905614	23.3977609	0	23.3977609	-29.7202958	-6.3225349	1.8832487	24.0999706
1993	-0.1886687	-3.7634239	-1.0498314	-4.8132553	0	-4.8132553	-30.6629489	-35.4762042	0.2647680	-3.3099872
1994	-0.1285513	37.0758569	6.3924422	43.4682991	0	43.4682991	-30.4788692	12.9894299	3.0233630	40.2277712
1995	-1.2658257	56.1696944	8.5597970	64.7294914	-5.4502405	59.2792509	-28.4609038	30.8183471	5.6877154	63.1232355
1996	-1.5112903	52.1691307	8.8984875	61.0676182	-4.8135893	56.2540289	-26.4399414	29.8140875	4.4158062	58.0962272
1997	-1.6919035	61.0900659	11.7620004	72.8520663	-5.8257863	67.0262800	-26.0230364	41.0032436	4.6172372	67.3992066
1998	-4.2101177	64.9821647	12.2437087	77.2258734	-4.9813684	72.2445050	-28.1481628	44.0963422	5.2893618	74.4816442
1999	-4.2341973	68.6702118	12.9843904	81.6546022	-5.0642765	76.5903257	-28.3426330	48.2476927	5.5361700	78.4405791
2000	-4.2242682	69.8116076	13.1589853	82.9705929	-5.1801272	77.7904657	-28.2315062	49.5589595	5.6294125	79.6652883
2001	-4.2223671	70.9301227	13.3610676	84.2911903	-5.0891326	79.2020577	-28.2617425	50.9403152	5.7095023	80.8619921
2002	-4.2099855	72.2703522	13.6021746	85.8725268	-4.9326542	80.9398726	-28.3414699	52.5984027	5.8043869	82.2847246
2003	-4.2092040	73.6178458	13.8458412	87.4636870	-5.1128494	82.3508376	-28.2534261	54.0974115	5.9015102	83.7285600
2004	-4.1918159	75.0297001	14.0984336	89.1281337	-5.0706157	84.0575180	-28.2722383	55.7852797	6.0021951	85.2237111
2005	-4.0779459	69.0358523	12.7956436	81.8314959	-5.0212876	76.8102083	-27.4102807	49.3999276	5.6254190	78.7392172
2006	-4.0911522	69.7561914	12.9282923	82.6844837	-5.0285274	77.6559563	-27.4054247	50.2505316	5.6770258	79.5243694
2007	-4.0818750	70.4427855	13.0475428	83.4903283	-4.9905863	78.4997420	-27.4262048	51.0735372	5.7288909	80.2535514
2008	-4.1179497	71.4601243	13.2373987	84.6975230	-4.9675584	79.7299646	-27.4336944	52.2962702	5.8026082	81.3806822
2009	-4.1120178	72.2914645	13.3847952	85.6762597	-5.0180542	80.6582055	-27.4162300	53.2419755	5.8633068	82.2667891
2010	-4.0762455	72.8845756	13.3907835	86.2753591	-4.8995522	81.3758069	-27.0835934	54.2922135	5.9357260	82.8965471
2011	-4.0767442	73.9066361	13.5730563	87.4796924	-5.0050054	82.4746870	-27.0294077	55.4452793	6.0088387	83.9922190
2012	-4.0814614	74.6518225	13.7067821	88.3586046	-4.9381553	83.4204493	-27.0592302	56.3612191	6.0650120	84.7982959
2013	-4.0741431	76.7626769	14.0774737	90.8401506	-4.8909142	85.9492364	-27.0788046	58.8704318	6.2197563	87.0565763
2014	-3.9176199	76.8636180	13.7174539	90.5810719	-4.7138746	85.8671973	-27.0692406	58.7979567	6.3267043	87.1079422
2015	-4.0597153	78.3970936	14.3379552	92.7350488	-4.8263960	87.9086528	-27.0350295	60.8736233	6.3435548	88.8003637
2016	-4.0732329	78.7927131	14.4200154	93.2127285	-5.0646778	88.1480507	-26.9272106	61.2208401	6.3739542	89.2399002
2017	-4.0440065	78.7272301	14.4023424	93.1295725	-5.0769923	88.0525802	-26.9308709	61.1217093	6.3663041	89.1375407
2018	-4.0446438	78.7258844	14.4025841	93.1284685	-5.0427822	88.0856863	-26.9333120	61.1523743	6.3659141	89.1364423
2019	-4.0484955	78.7422120	14.4069216	93.1491336	-5.0828782	88.0662554	-26.9191899	61.1470655	6.3672396	89.1579471
2020	-4.0318536	76.9815445	14.0752379	91.0567824	-5.0384181	86.0183643	-26.8581192	59.1602451	6.2443621	87.2577602
2021	-4.0663580	77.0606809	14.0929972	91.1536781	-4.9258551	86.2278230	-26.8938374	59.3339856	6.2526176	87.3796565
2022	-4.0201709	76.7508202	14.0231245	90.7739447	-4.9247432	85.8492015	-26.8866215	58.9625800	6.2282692	86.9992603
2023	-4.0291401	76.8672088	14.0487924	90.9160012	-4.9947663	85.9212349	-26.8550454	59.0661895	6.2355986	87.1319475
2024	-4.0264039	76.9133542	14.0576173	90.9709715	-5.0742911	85.8966804	-26.8265155	59.0701649	6.2406148	87.1803729
2025	-4.0361923	76.9116862	14.0603931	90.9720793	-4.9959311	85.9761482	-26.8719246	59.1042236	6.2377005	87.1855790
2026	-4.0271358	76.1463289	13.9234159	90.0697448	-5.1106692	84.9590756	-26.7993794	58.1596962	6.1844074	86.3578721
2027	-4.0376990	76.2537932	13.9452252	90.1990184	-4.9762704	85.2227480	-26.8816498	58.3410982	6.1894972	86.4809894
2028	-4.0311987	76.1614477	13.9264576	90.0879053	-5.1321639	84.9557414	-26.7876812	58.1680602	6.1848409	86.3774873
2029	-4.0369806	76.2278126	13.9414426	90.1692552	-5.0027707	85.1664845	-26.8596255	58.3068590	6.1891414	86.4539346
2030	-4.0324855	76.1472521	13.9251978	90.0724499	-5.0373284	85.0351215	-26.8412088	58.1939127	6.1825406	86.3622782
2031	-4.0267856	76.1694367	13.9080121	90.0774488	-4.9795248	85.0979240	-26.8681455	58.2297785	6.1914076	86.3876299
2032	-4.0561637	76.1462747	13.9109076	90.0571823	-4.8513606	85.2058217	-26.9272007	58.2786210	6.1919711	86.3944095
2033	-4.0536262	75.9569478	13.8716981	89.8286459	-4.7432288	85.0854171	-26.9606062	58.1248109	6.1782555	86.1888295
2034	-4.0539380	75.9457007	13.8701530	89.8158537	-4.7644330	85.0514207	-26.9777378	58.0736829	6.1780922	86.1777309
2035	-4.0405241	76.1151098	13.8959892	90.0110990	-4.9060832	85.1050158	-26.8726619	58.2323539	6.1878262	86.3434601

TABLE B-17

Unit Variable OMP&R Component of Transportation Charge

(Dollars per Acre-Foot)

	California Aqueduct (continued)							
	Reach 29G Warne Powerplant		Reach 29J Castaic Powerplant		Reach 31A Las Perillas and Badger Hill Pumping Plants		Reach 33A Devil's Den, Bluestone, and Polonio Pass PP and San Luis Obispo Powerplant	
Calendar Year	Unit Rate (31)	Cumulative Unit Rate (32)	Unit Rate (33)	Cumulative Unit Rate (34)	Unit Rate (35)	Cumulative Unit Rate (36)	Unit Rate (37)	Cumulative Unit Rate (38)
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	1.5014866	4.1182219	0	0
1969	0	0	0	0	1.2624065	3.0719381	0	0
1970	0	0	0	0	1.6309699	3.3588478	0	0
1971	0	0	0	0	1.4985537	2.7919286	0	0
1972	0	14.7112409	-2.9350830	11.7761579	1.9517720	3.4092185	0	0
1973	0	14.3146414	-6.8099448	7.5046966	1.5374531	3.0757814	0	0
1974	0	13.2552168	-7.4013274	5.8538894	1.5168982	2.9878282	0	0
1975	0	13.2265356	-6.5604921	6.6660435	1.1130304	2.6694918	0	0
1976	0	14.7226680	-6.7213324	8.0013356	1.5685447	3.2790542	0	0
1977	0	18.6871644	-30.4985994	-11.8114350	1.7573375	4.1392042	0	0
1978	0	13.8264421	-9.0130187	4.8134234	1.9429506	3.9751357	0	0
1979	0	18.4494656	-19.0478097	-0.5983441	1.5600341	4.3553325	0	0
1980	0	20.6346533	-20.5438586	0.0907947	1.5124754	3.6860982	0	0
1981	0	20.2037645	-11.3026541	8.9011104	1.5414290	4.7192627	0	0
1982	-2.1714430	17.4816203	-9.5987314	7.8828889	1.7581649	4.2848978	0	0
1983	-9.1019731	2.5098114	-36.3842929	-33.8744815	0.1779482	1.3504100	0	0
1984	-15.0246012	1.6518537	-13.7320333	-12.0801796	0.8626279	2.6566439	0	0
1985	-14.7115359	8.2328541	-40.4779966	-32.2451425	1.2075223	3.6913841	0	0
1986	-14.1893653	25.4685415	-28.1596224	-2.6910809	2.2665598	6.9408312	0	0
1987	-14.8696165	20.4742434	-27.0536484	-6.5794050	1.9135072	5.9753047	0	0
1988	-14.7032843	18.3684473	-25.6857024	-7.3172551	1.7819524	5.4533107	0	0
1989	-14.4231503	28.5002556	-25.3986130	3.1016426	2.4279758	7.2429227	0	0
1990	-14.1850383	41.9284330	-26.0776141	15.8508189	3.5208739	9.2163847	0	0
1991	-20.2432732	17.0709769	-34.7357685	-17.6647916	1.6136364	6.0191732	0	0
1992	-14.0026305	10.0973401	-25.2448073	-15.1474672	0.8421799	3.9972951	0	0
1993	-11.3163585	-14.6263457	-22.2197351	-36.8460808	-0.5598445	-0.2563810	0	0
1994	-14.7246643	25.5031069	-26.6633504	-1.1602435	2.3394066	7.0202043	0	0
1995	-19.5767227	43.5465128	-35.3917305	8.1547823	3.4137561	11.7592736	0	0
1996	-13.7309016	44.3653256	-24.5197737	19.8455519	4.1163398	10.9093606	26.7684790	37.6778396
1997	-13.2329297	54.1662769	-23.4841540	30.6821229	4.4274697	12.0525260	29.5303075	41.5828335
1998	-15.2440783	59.2375659	-25.0062635	34.2313024	5.0010702	13.3645279	36.2836854	49.6482133
1999	-15.2061678	63.2344113	-24.8969390	38.3374723	4.8734893	13.6061120	30.3884265	43.9945385
2000	-15.1985676	64.4667207	-24.8950240	39.5716967	4.6716225	13.5181694	26.4955027	40.0136721
2001	-15.1897075	65.6722846	-24.8931484	40.7791362	4.7446366	13.7127487	26.9095281	40.6222768
2002	-15.1922199	67.0925047	-24.8876778	42.2048269	4.8303695	13.9458867	27.3958233	41.3417100
2003	-15.1950847	68.5334753	-24.8880282	43.6454471	4.9183441	14.1826792	27.8947592	42.0774384
2004	-15.1887772	70.0349339	-24.8875567	45.1473772	5.0091471	14.4269116	28.4097409	42.8366525
2005	-15.2009475	63.5382697	-24.8894169	38.6488528	4.6678882	13.4429992	26.4742786	39.9172778
2006	-15.1900162	64.3343532	-24.8860589	39.4482943	4.7162894	13.5717459	26.7487870	40.3205329
2007	-15.2004746	65.0530768	-24.8868379	40.1662389	4.7603638	13.6915890	26.9987657	40.6903547
2008	-15.1896468	66.1910354	-24.8822003	41.3088351	4.8299339	13.8776858	27.3933689	41.2710547
2009	-15.1917753	67.0750138	-24.8834232	42.1915906	4.8840730	14.0237761	27.7003802	41.7241563
2010	-15.2071755	67.6893716	-24.8866893	42.8026823	4.9484569	14.1661396	28.0656017	42.2317413
2011	-15.1929947	68.7992243	-24.8828538	43.9163705	5.0163196	14.3461720	28.4504441	42.7966161
2012	-15.2073585	69.5909374	-24.8862169	44.7047205	5.0658126	14.4798307	28.7311381	43.2109688
2013	-15.1946331	71.8619432	-24.8851305	46.9768127	5.2052141	14.8547101	29.5217632	44.3764733
2014	-15.1923910	71.9155512	-24.8829088	47.0326424	5.3039155	15.0061375	30.0816049	45.0877424
2015	-15.1995331	73.6008306	-24.8846410	48.7161896	5.3184057	15.1515871	30.1637488	45.3153359
2016	-15.2002052	74.0396950	-24.8848858	49.1548092	5.3456495	15.2217800	30.3182618	45.5400418
2017	-15.1876980	73.9498427	-24.8829260	49.0669167	5.3390578	15.2058748	30.2808643	45.4867391
2018	-15.1975372	73.9389051	-24.8841266	49.0547785	5.3388545	15.2052090	30.2797293	45.4849383
2019	-15.1978647	73.9600824	-24.8841970	49.0758854	5.3400044	15.2084563	30.2862554	45.4947117
2020	-15.2075902	72.0501700	-24.8867099	47.1634601	5.2277769	14.9021310	29.6497460	44.5518770
2021	-15.1943407	72.1853158	-24.8833270	47.3019888	5.2366511	14.9228544	29.7000823	44.6229367
2022	-15.2092962	71.7899641	-24.8874751	46.9024890	5.2126828	14.8615840	29.5641546	44.4257386
2023	-15.1724491	71.9594984	-24.8806407	47.0788577	5.2210110	14.8826006	29.6113413	44.4939419
2024	-15.2085095	71.9718634	-24.8872441	47.0846193	5.2238451	14.8896129	29.6274721	44.5170850
2025	-15.1821609	72.0034181	-24.8806046	47.1228135	5.2242749	14.8908557	29.6298839	44.5207396
2026	-15.2102146	71.1476575	-24.8880471	46.2596104	5.1726099	14.7537238	29.3368470	44.0905708
2027	-15.1834539	71.2975355	-24.8809189	46.4166166	5.1804851	14.7738714	29.3815226	44.1553940
2028	-15.2061767	71.1713106	-24.8866128	46.2846978	5.1738178	14.7568909	29.3437136	44.1006045
2029	-15.1960672	71.2578674	-24.8842795	46.3735879	5.1786150	14.7692496	29.3708680	44.1401176
2030	-15.1906585	71.1716197	-24.8831956	46.2884241	5.1728305	14.7550225	29.3381097	44.0931322
2031	-15.1891004	71.1985295	-24.8831913	46.3153382	5.1807522	14.7670935	29.3830548	44.1501483
2032	-15.1963084	71.1981011	-24.8842279	46.3138732	5.1811355	14.7685702	29.3852112	44.1537814
2033	-15.2045519	70.9842776	-24.8858743	46.0984033	5.1683586	14.7347638	29.3127430	44.0475068
2034	-15.1941432	70.9835877	-24.8850601	46.0985276	5.1676211	14.7330441	29.3085435	44.0415876
2035	-15.1934830	71.1499771	-24.8830591	46.2669180	5.1782491	14.7579603	29.3688392	44.1267995

TABLE B-18

Variable OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	2,051	34,919	0	36,970	0	0	0
1963	0	0	0	7,900	49,811	0	57,711	0	0	0
1964	0	0	0	5,931	68,203	0	74,134	0	0	0
1965	0	0	0	10,918	68,765	62,926	142,609	0	0	0
1966	0	0	0	19,330	52,135	121,140	192,605	0	0	0
1967	0	0	0	19,399	56,949	160,650	236,998	0	0	0
1968	6,989	0	6,989	29,898	120,985	341,769	492,652	0	0	0
1969	8,551	0	8,551	31,859	3,904	298,968	334,731	0	0	0
1970	13,598	0	13,598	49,688	0	431,442	481,130	0	0	0
1971	10,609	0	10,609	23,842	28,329	416,328	468,499	0	0	0
1972	14,434	0	14,434	54,839	144,669	524,207	723,715	0	0	0
1973	14,449	0	14,449	18,397	15,590	547,808	581,795	0	0	0
1974	17,473	0	17,473	9,499	29	636,187	645,715	0	0	0
1975	14,779	0	14,779	22,317	4,765	425,285	452,367	0	0	0
1976	20,856	0	20,856	97,875	121,693	502,768	722,336	0	0	0
1977	22,635	0	22,635	82,578	123,044	497,792	703,414	0	0	0
1978	21,692	0	21,692	74,911	39,986	652,861	767,758	0	0	0
1979	16,237	0	16,237	136,993	77,085	652,117	866,195	0	0	0
1980	19,945	0	19,945	98,836	64,953	518,020	681,809	0	0	0
1981	23,841	0	23,841	126,888	141,961	569,996	838,845	0	0	0
1982	12,159	0	12,159	88,298	42,497	587,133	717,928	0	0	0
1983	2,335	0	2,335	10,083	6,680	183,550	200,313	0	0	0
1984	4,866	0	4,866	26,840	13,207	351,036	391,083	0	0	0
1985	10,186	0	10,186	79,851	102,775	466,220	648,846	0	0	0
1986	15,472	0	15,472	113,771	132,753	943,717	1,190,241	0	0	0
1987	27,222	0	27,222	218,285	236,538	820,427	1,275,250	0	0	0
1988	30,261	31,617	61,878	225,043	291,256	764,101	1,280,400	0	0	0
1989	12,103	66,384	78,487	286,552	284,435	982,995	1,553,982	0	0	0
1990	58,755	111,447	170,202	523,767	502,236	1,455,065	2,481,068	0	0	0
1991	9,733	27,600	37,333	115,266	154,913	345,395	615,574	0	(21,904)	(21,904)
1992	16,349	37,182	53,531	96,906	126,527	283,000	506,433	0	0	0
1993	(9,581)	(31,041)	(40,622)	(43,634)	(14,411)	(87,077)	(145,122)	0	0	0
1994	41,959	73,026	114,985	230,947	258,756	642,795	1,132,498	0	0	0
1995	87,546	155,079	242,625	658,011	658,011	1,566,694	2,882,716	0	0	0
1996	104,950	195,437	300,387	714,096	681,637	1,622,944	3,018,677	98,829	730,008	828,837
1997	123,425	220,260	343,685	795,840	726,637	1,730,090	3,252,567	200,595	1,787,480	1,988,075
1998	131,281	209,971	341,252	940,803	858,993	2,045,223	3,845,019	239,503	2,134,178	2,373,681
1999	147,158	233,327	380,485	989,715	903,653	2,151,556	4,044,924	652,175	2,001,136	2,653,311
2000	165,736	245,615	411,351	1,006,204	918,708	2,187,402	4,112,314	1,000,343	1,820,061	2,820,404
2001	170,304	253,769	424,073	1,021,360	932,546	2,220,348	4,174,254	1,015,557	1,847,746	2,863,303
2002	175,185	263,266	438,451	1,039,325	948,948	2,259,402	4,247,675	1,033,543	1,880,468	2,914,011
2003	180,412	272,668	453,080	1,057,721	965,745	2,299,392	4,322,858	1,051,937	1,913,935	2,965,872
2004	185,785	282,148	467,933	1,076,672	983,048	2,340,593	4,400,313	1,070,918	1,948,467	3,019,385
2005	173,284	264,218	437,502	1,003,398	916,146	2,181,299	4,100,843	997,932	1,815,678	2,813,610
2006	175,760	265,239	440,999	1,013,467	925,340	2,203,191	4,141,998	1,008,013	1,834,019	2,842,032
2007	178,701	266,647	445,348	1,022,686	933,757	2,223,231	4,179,674	1,017,258	1,850,842	2,868,100
2008	182,831	269,258	452,089	1,037,214	947,022	2,254,814	4,239,050	1,031,776	1,877,255	2,909,031
2009	186,156	271,196	457,352	1,048,537	957,359	2,279,427	4,285,323	1,043,104	1,897,864	2,940,968
2010	189,893	273,725	463,618	1,061,050	968,785	2,306,632	4,336,467	1,055,793	1,920,954	2,976,747
2011	193,986	276,192	470,178	1,075,138	981,648	2,337,259	4,394,045	1,069,915	1,946,647	3,016,562
2012	197,172	277,887	475,059	1,085,504	991,113	2,359,791	4,436,408	1,080,273	1,965,495	3,045,768
2013	204,104	284,277	488,381	1,114,634	1,017,710	2,423,118	4,555,462	1,109,411	2,018,508	3,127,919
2014	209,482	288,413	497,895	1,131,730	1,033,318	2,460,282	4,625,330	1,127,194	2,050,862	3,178,056
2015	210,983	288,526	499,509	1,138,010	1,039,054	2,473,936	4,651,000	1,132,884	2,061,213	3,194,097
2016	212,982	288,077	501,059	1,143,623	1,044,177	2,486,136	4,673,936	1,138,501	2,071,434	3,209,935
2017	213,958	286,485	500,443	1,142,319	1,042,986	2,483,300	4,668,605	1,137,169	2,069,009	3,206,178
2018	215,165	285,261	500,426	1,142,265	1,042,938	2,483,187	4,668,390	1,137,123	2,068,928	3,206,051
2019	216,406	284,131	500,537	1,142,511	1,043,162	2,483,719	4,669,392	1,137,368	2,069,372	3,206,740
2020	213,006	277,014	490,020	1,118,945	1,021,645	2,432,490	4,573,080	1,113,797	2,026,486	3,140,283
2021	213,557	277,294	490,851	1,120,696	1,023,244	2,436,297	4,580,237	1,115,573	2,029,719	3,145,292
2022	212,581	276,025	488,606	1,115,766	1,018,743	2,425,578	4,560,087	1,110,643	2,020,749	3,131,392
2023	212,919	276,465	489,384	1,117,474	1,020,303	2,429,294	4,567,071	1,112,349	2,023,851	3,136,200
2024	213,035	276,615	489,650	1,118,031	1,020,811	2,430,502	4,569,344	1,112,927	2,024,905	3,137,832
2025	213,053	276,639	489,692	1,118,153	1,020,922	2,430,767	4,569,842	1,113,018	2,025,070	3,138,088
2026	210,947	273,902	484,849	1,107,402	1,011,106	2,407,395	4,525,903	1,102,264	2,005,503	3,107,767
2027	211,268	274,320	485,588	1,109,030	1,012,593	2,410,934	4,532,557	1,103,884	2,008,453	3,112,337
2028	210,996	273,966	484,962	1,107,650	1,011,333	2,407,935	4,526,918	1,102,514	2,005,960	3,108,474
2029	211,191	274,220	485,411	1,108,648	1,012,244	2,410,106	4,530,998	1,103,503	2,007,756	3,111,259
2030	210,956	273,914	484,870	1,107,493	1,011,190	2,407,594	4,526,277	1,102,329	2,005,620	3,107,949
2031	211,279	274,333	485,612	1,108,851	1,012,430	2,410,546	4,531,827	1,103,754	2,008,214	3,111,968
2032	211,294	274,355	485,649	1,108,965	1,012,533	2,410,793	4,532,291	1,103,844	2,008,379	3,112,223
2033	210,773	273,677	484,450	1,106,282	1,010,083	2,404,960	4,521,325	1,101,188	2,003,544	3,104,732
2034	210,743	273,638	484,381	1,106,138	1,009,953	2,404,648	4,520,739	1,101,041	2,003,275	3,104,316
2035	211,177	274,202	485,379	1,108,191	1,011,827	2,409,111	4,529,129	1,103,170	2,007,152	3,110,322
TOTAL	8,279,327	11,217,866	19,497,193	46,285,472	43,059,338	109,630,537	198,975,347	40,292,912	77,774,291	118,067,203

TABLE B-18

Variable OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	68,978	5,176	0	0	440,922	2,355	4,760	65,680	587,871
1969	56,774	101	0	0	321,387	181	3,338	17,956	399,737
1970	69,819	6,811	0	0	470,866	0	5,595	16,550	569,641
1971	53,097	7,747	0	0	769,055	4,785	6,353	158,419	999,456
1972	61,858	8,445	0	0	1,121,234	2,040	7,375	376,604	1,577,556
1973	33,931	4,615	0	0	764,104	2,308	3,017	77,630	885,605
1974	49,114	4,413	0	46,752	670,520	2,207	3,114	106,332	882,452
1975	63,122	4,670	0	34,574	841,679	2,490	3,920	134,257	1,084,712
1976	70,851	5,131	0	94,653	964,839	2,737	4,910	100,597	1,243,718
1977	26,565	1,758	0	84,875	498,624	3,644	2,602	43,067	661,135
1978	107,194	923	0	188,075	1,593,333	4,249	6,294	24,494	1,924,562
1979	107,742	4,861	0	193,697	2,364,555	5,591	13,137	433,610	3,123,193
1980	89,119	1,943	0	122,020	1,736,941	4,782	7,797	150,511	2,113,113
1981	130,291	18,619	0	264,159	2,406,918	7,309	9,003	265,152	3,101,451
1982	105,769	912	0	143,019	2,325,602	4,421	6,719	46,873	2,633,315
1983	59,746	0	0	13,666	904,437	5,517	3,071	1,179	987,616
1984	80,910	0	0	213,356	1,950,612	5,843	7,606	10,303	2,268,630
1985	114,881	12,973	0	243,229	2,570,922	8,445	8,901	272,706	3,232,057
1986	234,878	5,469	0	374,940	4,847,820	17,295	16,760	373,146	5,870,308
1987	188,326	10,340	0	507,477	4,257,417	16,247	15,697	378,088	5,373,592
1988	178,056	15,263	0	494,131	4,070,446	14,685	11,058	354,326	5,137,965
1989	273,796	14,848	0	656,466	5,952,776	19,260	20,400	623,901	7,561,447
1990	206,724	7,284	0	801,860	4,554,719	11,391	11,382	325,043	5,918,403
1991	4,084	974	0	173,869	44,242	0	480	9,604	233,253
1992	74,997	4,304	0	224,755	1,639,206	6,339	5,045	147,432	2,102,078
1993	15,361	3,972	0	52,155	257,885	3,673	1,031	93,233	427,310
1994	134,774	8,195	0	464,295	3,401,776	10,754	10,018	291,908	4,321,720
1995	481,536	25,036	0	1,193,225	9,726,976	33,382	35,348	988,943	12,484,446
1996	391,957	20,379	0	980,624	8,277,188	27,172	26,649	804,972	10,528,941
1997	439,966	22,876	0	1,104,006	9,319,083	30,500	29,764	903,570	11,849,765
1998	482,571	25,091	0	1,211,204	10,237,787	33,454	32,778	991,069	13,013,954
1999	503,872	26,198	0	1,265,513	10,670,618	34,931	34,188	1,034,816	13,570,136
2000	510,446	26,540	0	1,282,245	10,789,242	35,386	34,647	1,048,316	13,726,822
2001	517,460	26,904	0	1,299,983	10,939,894	35,873	35,118	1,062,722	13,917,954
2002	525,965	27,346	0	1,321,465	11,121,947	36,462	35,692	1,080,189	14,149,066
2003	534,553	27,793	0	1,343,147	11,305,714	37,057	36,276	1,097,823	14,382,363
2004	543,405	28,254	0	1,365,515	11,495,406	37,671	36,875	1,116,005	14,623,131
2005	506,324	26,325	0	1,271,463	10,699,204	35,100	34,372	1,039,850	13,612,638
2006	510,960	26,566	0	1,283,176	10,798,567	35,422	34,687	1,049,372	13,738,750
2007	515,332	26,793	0	1,294,215	10,892,150	35,725	34,980	1,058,350	13,857,545
2008	522,055	27,143	0	1,311,188	11,035,979	36,191	35,439	1,072,158	14,040,153
2009	527,361	27,419	0	1,324,580	11,149,469	36,559	35,799	1,083,055	14,184,242
2010	531,861	27,653	0	1,335,743	11,244,595	36,871	36,108	1,092,295	14,305,126
2011	538,332	27,990	0	1,352,096	11,383,385	37,319	36,546	1,105,588	14,481,256
2012	543,189	28,242	0	1,364,346	11,487,135	37,656	36,877	1,115,561	14,613,006
2013	556,776	28,949	0	1,398,627	11,777,594	38,598	37,800	1,143,465	14,981,809
2014	559,818	29,106	0	1,405,602	11,838,796	38,809	38,016	1,149,713	15,059,860
2015	567,374	29,500	0	1,425,347	12,004,313	39,333	38,515	1,165,232	15,269,614
2016	569,853	29,629	0	1,431,622	12,057,665	39,505	38,685	1,170,322	15,337,281
2017	569,315	29,600	0	1,430,250	12,045,879	39,467	38,651	1,169,217	15,322,379
2018	569,288	29,599	0	1,430,189	12,045,388	39,465	38,648	1,169,163	15,321,740
2019	569,410	29,605	0	1,430,496	12,047,992	39,474	38,656	1,169,412	15,325,045
2020	558,210	29,023	0	1,402,181	11,807,993	38,698	37,899	1,146,411	15,020,415
2021	558,894	29,059	0	1,403,912	11,822,839	38,745	37,945	1,147,816	15,039,210
2022	556,742	28,947	0	1,398,463	11,776,509	38,595	37,796	1,143,395	14,980,447
2023	557,474	28,985	0	1,400,321	11,792,309	38,647	37,847	1,144,899	15,000,482
2024	557,714	28,997	0	1,400,939	11,797,658	38,663	37,861	1,145,393	15,007,225
2025	557,762	29,000	0	1,401,052	11,798,529	38,666	37,868	1,145,490	15,008,367
2026	552,830	28,744	0	1,388,602	11,692,952	38,324	37,532	1,135,362	14,874,346
2027	553,538	28,780	0	1,390,394	11,708,175	38,373	37,582	1,136,816	14,893,658
2028	552,944	28,750	0	1,388,889	11,695,401	38,332	37,539	1,135,595	14,877,450
2029	553,379	28,772	0	1,389,991	11,704,746	38,362	37,571	1,136,490	14,889,311
2030	552,893	28,746	0	1,388,751	11,694,104	38,329	37,539	1,135,489	14,875,851
2031	553,132	28,759	0	1,389,326	11,699,268	38,345	37,555	1,135,982	14,882,367
2032	553,195	28,762	0	1,389,476	11,700,466	38,350	37,561	1,136,111	14,883,921
2033	551,982	28,700	0	1,386,418	11,674,609	38,265	37,475	1,133,619	14,851,068
2034	551,924	28,696	0	1,386,273	11,673,341	38,262	37,471	1,133,503	14,849,470
2035	552,750	28,739	0	1,388,391	11,691,740	38,319	37,521	1,135,196	14,872,656
TOTAL	24,625,099	1,301,742	0	60,541,269	515,865,442	1,691,205	1,693,059	50,007,346	655,725,162

TABLE B-18

Variable OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	30,401	0	0	0	0	0	0	0	0
1969	0	30,627	0	0	0	0	0	0	0	0
1970	0	39,429	0	0	0	0	0	0	0	0
1971	0	34,871	0	0	0	0	0	0	0	0
1972	779	47,405	0	12,780	0	4,491	1,515	0	32,092	0
1973	286	28,968	102,811	6,895	159,535	3,854	0	0	301,444	0
1974	15,558	28,982	100,954	9,891	157,742	4,932	221	0	177,172	6,529
1975	99,182	28,563	108,250	12,758	170,106	6,391	0	0	136,060	53,482
1976	385,090	38,365	135,276	17,835	213,595	8,163	0	0	139,356	68,933
1977	199,168	21,006	0	23,598	0	1,973	1,702	0	239,663	86,821
1978	580,236	45,166	173,774	20,834	263,661	2,724	0	0	36,905	70,726
1979	1,058,567	83,349	228,381	28,596	340,428	2,327	90,780	0	236	3,803
1980	1,390,776	51,281	256,858	29,240	401,192	3,668	94,398	0	0	16,513
1981	1,479,459	111,213	274,018	33,617	430,100	23,847	90,547	0	254,648	57,523
1982	917,895	130,560	290,783	27,013	458,232	0	229,117	0	125,294	188,148
1983	334,670	(303,898)	173,014	10,834	273,548	386	0	0	(71,309)	(8,732)
1984	486,288	(104,796)	274,124	19,611	434,622	15	0	0	(66,167)	(91,176)
1985	818,808	(355,211)	412,369	34,515	655,364	0	0	32,369	(47,995)	(32,654)
1986	1,109,999	54,839	729,592	60,338	1,161,900	5,553	0	105,465	69,447	102,249
1987	1,028,700	(35,735)	676,136	64,340	1,096,101	32,788	591	159,250	37,485	45,533
1988	1,021,466	(75,429)	692,103	67,226	1,139,429	12,011	302	50,742	50,059	35,448
1989	1,734,042	173,438	978,286	97,056	1,632,489	38,208	8,945	350,384	339,891	209,982
1990	2,424,972	410,275	1,394,042	110,256	2,299,261	89,818	0	443,148	592,645	523,974
1991	279,672	(63,629)	270,798	33,294	446,639	17,279	125,449	129,567	(14,645)	(21,596)
1992	593,412	(200,832)	243,969	6,178	402,371	4,921	245,064	79,116	(21,231)	(49,997)
1993	(162,208)	(507,515)	(804,651)	(1,453)	(1,327,189)	(2,762)	(53,831)	(25,934)	(154,712)	(510,750)
1994	1,822,389	63,458	183,178	19,388	302,094	40,743	723,585	312,104	118,660	197,828
1995	7,773,885	487,767	711,903	343,820	1,174,179	129,190	3,011,388	971,735	3,161,961	887,569
1996	7,220,208	764,915	688,703	115,319	1,135,916	119,989	2,857,704	901,484	1,669,589	387,582
1997	8,454,866	1,107,281	947,175	144,107	1,562,223	140,507	3,404,935	1,056,859	2,624,209	1,180,894
1998	8,993,532	1,302,786	1,018,625	162,551	1,680,071	149,459	3,670,019	1,124,192	2,601,684	1,269,976
1999	9,503,958	1,721,669	1,114,521	183,817	1,838,237	157,941	3,890,789	1,187,993	2,846,616	1,389,533
2000	9,661,927	1,813,907	1,144,811	451,183	1,888,196	160,568	3,951,757	1,207,740	2,973,538	1,427,299
2001	9,816,728	1,866,485	1,176,722	459,372	1,940,826	163,140	4,023,465	1,227,092	3,056,418	1,467,081
2002	10,002,217	1,928,613	1,215,023	469,451	2,004,001	166,222	4,111,746	1,250,277	3,155,905	1,514,834
2003	10,188,709	1,991,405	1,249,650	477,634	2,061,110	169,321	4,183,423	1,273,589	3,245,843	1,558,005
2004	10,384,110	2,056,837	1,288,640	487,533	2,125,418	172,570	4,270,122	1,298,016	3,347,117	1,606,617
2005	9,554,562	1,774,654	1,141,138	445,501	1,882,137	158,782	3,901,959	1,194,321	4,445,994	1,422,719
2006	9,654,258	1,809,467	1,160,787	450,403	1,914,545	160,439	3,944,922	1,206,782	4,522,547	1,447,217
2007	9,749,282	1,840,782	1,179,799	455,299	1,945,903	162,018	3,987,787	1,218,660	4,596,618	1,470,917
2008	9,890,081	1,890,565	1,208,044	462,434	1,992,487	164,358	4,050,282	1,236,260	4,706,666	1,506,133
2009	10,005,140	1,929,053	1,229,890	467,819	2,028,520	166,270	4,097,438	1,250,642	4,791,777	1,533,370
2010	10,087,226	1,956,222	1,254,149	471,981	2,068,534	167,635	4,133,893	1,260,903	5,570,379	1,563,618
2011	10,228,679	2,004,727	1,280,785	478,353	2,112,465	169,985	4,189,712	1,278,584	5,688,686	1,596,825
2012	10,331,813	2,039,141	1,301,944	483,840	2,147,362	171,699	4,237,760	1,291,477	5,782,662	1,623,203
2013	10,623,956	2,138,193	1,359,907	498,505	2,242,964	176,553	4,366,223	1,327,993	6,040,107	1,695,469
2014	10,637,925	2,142,432	1,358,234	498,030	2,240,200	176,785	4,362,054	1,329,740	6,032,670	1,693,381
2015	10,850,157	2,214,148	1,406,180	509,870	2,319,284	180,314	4,465,760	1,356,270	6,245,634	1,753,159
2016	10,904,913	2,233,241	1,414,201	511,259	2,332,514	181,223	4,477,921	1,363,114	6,281,259	1,763,159
2017	10,895,849	2,229,393	1,411,910	510,706	2,328,737	181,073	4,473,071	1,361,981	6,271,088	1,760,305
2018	10,895,661	2,228,880	1,412,620	510,897	2,329,907	181,070	4,474,753	1,361,958	6,274,234	1,761,188
2019	10,897,921	2,229,798	1,412,499	510,784	2,329,703	181,107	4,473,766	1,362,241	6,273,688	1,761,034
2020	10,654,245	2,146,541	1,366,601	498,905	2,254,006	177,059	4,369,733	1,331,780	6,069,841	1,703,816
2021	10,665,199	2,152,554	1,370,614	500,121	2,260,625	177,239	4,380,374	1,333,150	6,087,666	1,708,819
2022	10,622,313	2,135,197	1,362,035	497,925	2,246,474	176,527	4,361,141	1,327,789	6,049,560	1,698,122
2023	10,638,422	2,142,781	1,364,429	498,342	2,250,422	176,794	4,364,801	1,329,803	6,060,190	1,701,106
2024	10,644,809	2,143,109	1,364,521	498,201	2,250,574	176,900	4,363,552	1,330,601	6,060,600	1,701,220
2025	10,644,576	2,144,710	1,365,308	498,662	2,251,872	176,897	4,367,588	1,330,572	6,064,094	1,702,202
2026	10,538,652	2,107,146	1,343,488	492,764	2,215,885	175,135	4,315,922	1,317,334	5,967,183	1,674,999
2027	10,553,525	2,113,918	1,347,678	494,292	2,222,795	175,383	4,329,315	1,319,191	5,985,798	1,680,222
2028	10,540,744	2,108,228	1,343,682	492,743	2,216,202	175,172	4,315,751	1,317,592	5,968,043	1,675,241
2029	10,549,929	2,112,071	1,346,888	493,965	2,221,492	175,324	4,326,457	1,318,741	5,982,284	1,679,238
2030	10,538,780	2,108,358	1,344,280	493,204	2,217,188	175,138	4,319,784	1,317,348	5,970,695	1,675,985
2031	10,541,849	2,109,627	1,345,108	493,567	2,218,554	175,190	4,322,975	1,317,731	5,974,375	1,677,017
2032	10,538,644	2,109,589	1,346,237	494,193	2,220,415	175,137	4,328,456	1,317,330	5,979,387	1,678,423
2033	10,512,441	2,100,215	1,342,682	493,495	2,214,556	174,700	4,322,340	1,314,055	5,963,606	1,673,995
2034	10,510,884	2,100,199	1,341,503	493,298	2,212,607	174,674	4,320,612	1,313,862	5,958,359	1,672,523
2035	10,534,330	2,107,504	1,345,168	493,610	2,218,652	175,064	4,323,334	1,316,792	5,974,638	1,677,091
TOTAL	434,056,111	79,449,259	58,622,147	19,232,395	96,428,978	7,221,881	172,003,169	53,689,785	210,598,206	64,973,693

TABLE B-18

Variable OMP&R Component of Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	0	0	0	0	236,998
1968	0	0	0	30,401	0	0	0	0	0	1,117,913
1969	0	0	0	30,627	0	0	0	0	0	773,646
1970	0	0	0	39,429	0	0	0	0	0	1,103,798
1971	0	0	0	34,871	0	0	0	0	0	1,513,435
1972	0	847,155	0	946,217	0	0	0	0	0	3,261,922
1973	0	1,083,333	0	1,687,126	0	0	0	0	0	3,168,975
1974	0	1,872,299	0	2,374,280	0	0	0	0	0	3,919,920
1975	0	3,886,921	0	4,501,713	0	0	0	0	0	6,053,571
1976	0	5,485,263	0	6,491,876	0	0	0	0	0	8,478,786
1977	0	(796,688)	0	(222,757)	0	0	0	0	0	1,164,427
1978	0	3,679,270	0	4,873,296	0	0	0	0	0	7,587,308
1979	0	4,019,308	0	5,855,775	0	0	0	0	0	9,861,400
1980	0	5,367,081	0	7,611,007	0	0	0	0	0	10,425,874
1981	0	10,499,222	0	13,254,194	0	0	0	0	0	17,218,331
1982	0	7,595,699	0	9,962,741	0	0	0	0	0	13,326,143
1983	0	(8,441,958)	0	(8,033,445)	0	0	0	0	0	(6,843,181)
1984	0	(6,688,258)	0	(5,735,737)	0	0	0	0	0	(3,071,158)
1985	0	(15,853,883)	0	(14,336,318)	0	0	0	0	0	(10,445,229)
1986	0	1,162,864	0	4,562,246	0	0	0	0	0	11,638,267
1987	0	(3,035,350)	0	69,839	0	0	0	0	0	6,745,903
1988	0	(3,546,612)	0	(553,255)	0	0	0	0	0	5,926,988
1989	0	9,442,750	0	15,005,471	0	0	0	0	0	24,199,387
1990	0	30,240,363	202,767	38,731,521	0	0	0	0	0	47,301,194
1991	0	(5,879,957)	16,866	(4,660,263)	0	0	0	0	0	(3,796,007)
1992	0	(9,025,943)	0	(7,722,972)	0	0	0	0	0	(5,060,930)
1993	0	(21,947,528)	0	(25,498,533)	0	0	0	0	0	(25,256,967)
1994	0	3,759,888	0	7,543,315	0	0	0	0	0	13,112,518
1995	0	21,365,194	340,054	40,358,645	0	0	0	0	0	55,968,432
1996	0	49,674,543	519,510	66,055,462	0	0	0	0	0	80,732,304
1997	295,221	71,559,310	731,063	93,208,650	0	0	0	0	0	110,642,742
1998	317,494	78,016,940	809,657	101,116,986	0	0	0	0	0	120,690,892
1999	268,741	86,070,699	891,235	111,065,749	0	0	0	0	0	131,714,605
2000	314,699	88,622,958	915,909	114,534,492	0	0	0	0	0	135,605,383
2001	323,471	91,208,871	940,050	117,669,721	0	0	0	0	0	139,049,305
2002	334,001	94,286,640	968,536	121,407,466	0	0	0	0	0	143,156,669
2003	343,519	97,237,218	997,347	124,976,773	0	0	0	0	0	147,100,946
2004	354,237	100,426,355	1,027,386	128,844,958	0	0	0	0	0	151,355,720
2005	417,429	87,456,835	897,424	114,693,455	0	0	0	0	0	135,658,048
2006	424,618	89,111,144	913,397	116,720,526	0	0	0	0	0	137,884,305
2007	431,572	90,650,226	927,759	118,616,622	0	0	0	0	0	139,967,289
2008	441,903	93,020,970	950,587	121,520,770	0	0	0	0	0	143,161,093
2009	449,895	94,853,508	968,248	123,771,570	0	0	0	0	0	145,639,455
2010	572,784	96,479,527	980,488	126,567,339	0	0	0	0	0	148,649,297
2011	584,948	98,755,303	1,002,742	129,371,794	0	0	0	0	0	151,733,835
2012	594,611	100,456,353	1,018,525	131,480,390	0	0	0	0	0	154,050,631
2013	621,085	105,240,929	1,063,961	137,395,845	0	0	0	0	0	160,549,416
2014	620,318	105,237,302	1,065,068	137,394,139	0	0	0	0	0	160,755,280
2015	824,836	108,978,075	1,098,747	142,202,434	0	0	0	0	0	165,816,654
2016	829,542	109,777,761	1,107,521	143,177,628	0	0	0	0	0	166,899,839
2017	828,201	109,590,813	1,105,752	142,948,879	0	0	0	0	0	166,646,484
2018	828,615	109,605,074	1,105,515	142,970,372	0	0	0	0	0	166,666,979
2019	828,542	109,623,662	1,105,939	142,990,684	0	0	0	0	0	166,692,398
2020	985,018	105,709,595	1,067,703	138,334,843	0	0	0	0	0	161,558,641
2021	1,026,479	106,020,062	1,070,455	138,753,357	0	0	0	0	0	162,008,947
2022	1,020,052	105,241,855	1,062,487	137,801,477	0	0	0	0	0	160,962,009
2023	1,021,846	105,530,873	1,065,980	138,145,789	0	0	0	0	0	161,338,926
2024	1,021,914	105,540,853	1,066,127	138,162,981	0	0	0	0	0	161,367,032
2025	1,022,503	105,613,942	1,066,858	138,249,784	0	0	0	0	0	161,455,773
2026	1,006,165	103,804,123	1,049,632	136,008,428	0	0	0	0	0	159,001,293
2027	1,009,301	104,141,988	1,052,738	136,426,144	0	0	0	0	0	159,450,284
2028	1,006,307	103,839,478	1,050,127	136,049,310	0	0	0	0	0	159,047,114
2029	1,008,708	104,063,382	1,051,894	136,330,373	0	0	0	0	0	159,347,352
2030	1,006,755	103,866,963	1,050,185	136,084,663	0	0	0	0	0	159,079,610
2031	1,007,375	103,929,196	1,050,721	136,163,285	0	0	0	0	0	159,175,059
2032	1,008,219	103,971,704	1,050,699	136,218,433	0	0	0	0	0	159,232,517
2033	1,005,559	103,594,002	1,046,397	135,758,043	0	0	0	0	0	158,719,618
2034	1,004,676	103,547,938	1,046,396	135,697,531	0	0	0	0	0	158,656,437
2035	1,007,421	103,877,873	1,049,755	136,101,232	0	0	0	0	0	159,098,718
TOTAL	28,018,580	3,973,325,276	40,570,207	5,238,189,687	0	0	0	0	0	6,230,454,592

TABLE B-19

Total Transportation Charge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	0	55,537	0	0	0
1963	0	0	0	151,158	190,471	449,513	791,142	0	0	0
1964	0	0	0	170,825	277,767	623,434	1,072,026	8,526	18,065	26,591
1965	0	0	0	245,752	404,792	1,160,811	1,811,355	14,254	28,962	43,216
1966	18,099	0	18,099	271,872	422,243	1,415,979	2,110,094	23,495	46,425	69,920
1967	41,651	0	41,651	347,164	502,177	1,686,718	2,536,059	41,791	80,516	122,307
1968	128,844	0	128,844	392,238	604,128	1,988,659	2,985,025	67,870	128,989	196,859
1969	255,007	0	255,007	447,199	540,048	2,086,868	3,074,115	122,909	230,789	353,698
1970	277,846	0	277,846	460,933	533,301	2,206,448	3,200,682	135,973	255,061	391,034
1971	227,777	0	227,777	421,846	552,853	2,173,591	3,148,290	137,107	257,315	394,422
1972	225,283	0	225,283	509,384	679,260	2,324,122	3,512,766	143,286	268,944	412,230
1973	221,398	31,440	252,838	473,900	550,134	2,342,330	3,366,364	140,310	263,551	403,861
1974	240,810	33,015	273,825	497,233	565,336	2,510,072	3,572,641	141,527	265,898	407,425
1975	237,786	36,373	274,159	545,595	606,475	2,413,642	3,565,712	158,094	296,544	454,638
1976	271,627	40,926	312,553	635,894	735,558	2,504,228	3,875,680	267,793	499,325	767,118
1977	293,967	45,194	339,161	599,139	714,307	2,480,132	3,793,578	278,436	519,848	798,284
1978	274,215	49,283	323,498	653,261	693,340	2,789,733	4,136,334	286,128	534,362	820,490
1979	289,831	53,452	343,283	716,663	737,055	2,816,827	4,270,545	284,981	532,477	817,458
1980	311,216	67,886	379,102	833,422	867,202	3,032,478	4,733,102	311,952	582,495	894,447
1981	347,612	87,579	435,191	795,725	880,234	2,922,450	4,598,409	334,798	624,821	959,619
1982	438,747	107,124	545,871	828,142	849,662	3,208,684	4,886,488	333,235	622,158	955,393
1983	355,129	151,541	506,670	846,370	902,146	3,833,297	5,581,813	359,772	671,199	1,030,971
1984	467,778	224,655	692,433	1,132,442	1,097,808	5,741,874	7,972,124	391,930	730,639	1,122,569
1985	736,783	364,959	1,101,742	1,582,378	1,793,504	6,563,087	9,938,969	439,235	818,008	1,257,243
1986	1,085,887	693,705	1,779,592	1,407,128	1,531,785	6,879,933	9,818,846	427,305	796,255	1,223,560
1987	1,774,460	1,561,964	3,336,424	1,891,437	2,010,703	6,676,670	10,578,810	427,749	838,033	1,265,782
1988	2,233,082	2,357,571	4,590,653	1,889,658	2,205,644	6,357,522	10,452,824	474,196	984,176	1,458,372
1989	2,370,726	3,322,228	5,692,954	1,785,481	1,851,205	5,847,439	9,484,125	481,406	1,147,688	1,629,094
1990	2,747,232	3,437,462	6,184,694	2,217,320	2,256,301	6,656,245	11,129,866	563,705	1,200,531	1,764,236
1991	2,748,808	3,547,679	6,296,487	1,400,935	1,628,311	4,543,735	7,572,981	580,102	1,402,555	1,982,657
1992	2,556,919	3,472,046	6,028,965	1,849,733	2,150,483	5,740,576	9,740,792	664,454	1,417,068	2,081,522
1993	2,580,517	3,490,042	6,070,559	2,553,062	2,057,028	6,618,161	11,228,251	762,904	1,552,419	2,315,323
1994	2,735,163	3,574,234	6,309,397	2,604,989	2,717,608	7,450,635	12,773,232	1,058,656	2,178,468	3,237,124
1995	2,924,477	4,204,270	7,128,747	3,419,091	3,051,380	7,786,009	14,256,480	2,079,744	4,436,313	6,516,057
1996	2,869,818	4,107,524	6,977,342	2,835,795	2,821,485	7,580,627	13,237,907	5,799,097	14,229,191	20,028,288
1997	2,912,870	4,186,619	7,099,489	2,982,026	2,910,043	7,810,700	13,702,769	8,000,738	21,967,698	29,968,436
1998	2,935,628	4,199,347	7,134,975	3,046,443	2,970,722	7,966,626	13,983,791	8,290,559	22,890,060	31,180,619
1999	2,958,345	4,231,944	7,190,289	3,100,058	3,019,804	8,084,568	14,204,430	8,722,826	22,800,438	31,523,264
2000	2,987,513	4,247,941	7,235,454	3,119,899	3,037,957	8,127,784	14,285,640	9,080,054	22,644,410	31,724,464
2001	2,988,660	4,253,357	7,242,017	3,116,723	3,035,058	8,120,885	14,272,666	9,092,885	22,631,921	31,724,806
2002	2,989,111	4,258,293	7,247,404	3,111,001	3,029,833	8,108,459	14,249,293	9,106,126	22,609,058	31,715,184
2003	2,980,234	4,246,903	7,227,137	3,055,162	2,978,847	7,987,078	14,021,087	9,103,671	22,455,585	31,559,256
2004	2,981,899	4,252,237	7,234,136	3,054,180	2,977,953	7,984,960	14,017,093	9,117,161	22,439,983	31,557,144
2005	2,964,107	4,225,646	7,189,753	2,955,432	2,887,783	7,770,233	13,613,448	9,036,412	22,242,661	31,279,073
2006	2,962,103	4,218,817	7,180,920	2,941,803	2,875,340	7,740,620	13,557,763	9,039,871	22,201,350	31,241,221
2007	2,961,187	4,213,842	7,175,029	2,930,602	2,865,112	7,716,277	13,511,991	9,043,414	22,166,771	31,210,185
2008	2,977,434	4,236,973	7,214,407	3,008,001	2,935,788	7,884,548	13,828,337	9,075,821	22,351,654	31,427,475
2009	2,976,258	4,231,456	7,207,714	2,995,489	2,924,361	7,857,350	13,777,200	9,080,493	22,312,261	31,392,754
2010	2,976,268	4,227,831	7,204,099	2,988,137	2,917,649	7,841,377	13,747,163	9,087,665	22,285,358	31,373,023
2011	2,975,856	4,222,825	7,198,681	2,978,277	2,908,646	7,819,951	13,706,874	9,095,122	22,250,783	31,345,905
2012	2,975,642	4,218,885	7,194,527	2,970,573	2,901,614	7,803,209	13,675,396	9,100,453	22,224,153	31,324,606
2013	2,946,333	4,164,240	7,110,573	2,698,349	2,648,667	7,086,449	12,433,465	9,076,034	21,798,095	30,874,129
2014	2,955,862	4,175,492	7,131,354	2,701,173	2,618,140	7,003,917	12,323,230	9,091,382	21,865,518	30,956,900
2015	2,945,157	4,154,999	7,100,156	2,605,599	2,476,409	6,508,799	11,590,807	9,073,335	21,704,157	30,777,492
2016	2,924,725	4,147,229	7,071,954	2,569,323	2,429,806	6,297,259	11,296,388	9,063,311	21,639,527	30,702,838
2017	2,899,773	4,141,623	7,041,396	2,524,487	2,387,083	6,152,979	11,064,549	9,040,176	21,571,833	30,612,009
2018	2,820,905	4,140,395	6,961,300	2,482,806	2,346,015	6,030,315	10,859,136	9,025,850	21,545,039	30,570,889
2019	2,778,294	4,139,279	6,917,573	2,444,864	2,310,759	5,928,992	10,684,615	9,022,378	21,538,436	30,560,814
2020	2,770,945	4,131,809	6,902,754	2,407,282	2,274,183	5,838,499	10,519,964	8,996,609	21,491,341	30,487,950
2021	2,769,293	4,132,112	6,901,405	2,406,018	2,272,653	5,835,377	10,514,048	8,997,085	21,491,990	30,489,075
2022	2,766,920	4,130,772	6,897,692	2,400,465	2,267,219	5,820,355	10,488,039	8,991,125	21,480,919	30,472,044
2023	2,766,274	4,099,811	6,866,085	2,401,587	2,268,165	5,820,913	10,490,665	8,992,349	21,483,104	30,475,453
2024	2,765,628	4,101,962	6,867,590	2,412,665	2,278,149	5,844,146	10,534,960	8,995,655	21,511,171	30,506,826
2025	2,753,088	4,091,717	6,844,805	2,390,576	2,257,467	5,794,141	10,442,184	8,989,201	21,456,409	30,445,610
2026	2,746,222	4,084,260	6,830,482	2,378,906	2,246,784	5,768,508	10,394,198	8,870,976	21,238,143	30,109,119
2027	2,743,606	4,080,436	6,824,042	2,378,809	2,246,511	5,766,480	10,391,800	8,869,983	21,235,386	30,105,369
2028	2,740,051	4,075,971	6,816,022	2,375,062	2,242,942	5,756,657	10,374,661	8,862,020	21,220,411	30,082,431
2029	2,736,716	4,072,072	6,808,788	2,372,432	2,240,490	5,749,919	10,362,841	8,860,854	21,218,002	30,078,856
2030	2,726,715	4,057,314	6,784,029	2,368,950	2,237,241	5,741,744	10,347,935	8,857,097	21,210,836	30,067,933
2031	2,713,558	4,038,065	6,751,623	2,363,453	2,232,144	5,729,175	10,324,772	8,849,149	21,195,959	30,045,108
2032	2,701,962	4,018,542	6,720,504	2,365,291	2,233,773	5,732,777	10,331,841	8,853,052	21,202,942	30,055,994
2033	2,673,521	3,973,406	6,646,927	2,362,431	2,231,116	5,726,208	10,319,755	8,852,763	21,202,382	30,055,145
2034	2,609,487	3,900,252	6,509,739	2,355,404	2,224,462	5,709,138	10,289,004	8,851,223	21,199,431	30,050,654
2035	2,479,946	3,760,546	6,240,492	2,349,664	2,219,155	5,695,675	10,264,494	8,851,717	21,200,196	30,051,913
TOTAL	143,526,591	196,547,372	340,073,963	141,894,316	140,391,364	395,375,576	677,661,256	366,749,315	889,634,459	1,256,383,774

TABLE B-19

Total Transportation Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,729	0	0	0	0	0	2,729
1965	0	0	6,040	73,706	0	0	0	0	79,746
1966	0	0	12,060	137,578	0	0	0	0	149,638
1967	0	0	26,303	268,087	0	0	0	0	294,390
1968	180,851	9,507	54,674	446,119	1,529,393	12,882	11,485	206,542	2,451,453
1969	176,450	9,441	87,677	525,877	2,361,301	11,495	10,481	348,123	3,530,845
1970	198,107	16,206	94,778	574,839	2,877,443	11,623	13,012	287,114	4,073,122
1971	193,808	17,165	95,799	606,768	3,773,711	16,571	14,304	441,813	5,159,939
1972	215,316	17,962	98,896	632,511	4,889,123	13,997	20,483	1,056,951	6,945,239
1973	197,886	14,104	97,657	640,155	4,835,327	14,265	11,597	400,902	6,211,893
1974	274,875	14,073	98,569	699,154	5,126,745	14,357	12,664	584,310	6,824,747
1975	340,140	15,015	106,811	716,513	6,230,727	15,367	14,344	712,437	8,151,354
1976	297,512	15,561	108,194	775,207	6,580,609	15,736	15,999	553,249	8,362,067
1977	259,619	12,671	112,664	798,781	6,746,088	17,183	13,794	500,634	8,461,434
1978	346,217	11,530	115,636	899,271	8,161,339	17,493	17,826	493,107	10,062,419
1979	376,260	15,401	114,369	896,774	9,289,686	18,828	24,720	940,058	11,676,096
1980	397,383	13,770	126,316	890,254	9,848,069	19,403	24,104	712,427	12,031,726
1981	461,171	31,690	134,338	1,081,276	11,276,427	23,594	22,891	897,155	13,928,542
1982	452,205	14,724	135,424	1,003,401	12,039,718	21,451	22,202	731,145	14,420,270
1983	626,061	16,346	149,534	1,027,726	15,256,721	38,440	30,544	426,452	17,571,824
1984	898,228	16,757	164,819	2,060,644	23,351,201	52,923	59,615	773,111	27,377,298
1985	1,101,094	89,987	187,363	2,381,364	27,992,339	68,749	71,107	2,189,536	34,081,539
1986	1,254,783	35,987	181,516	2,374,013	30,654,707	79,485	76,065	2,173,502	36,830,058
1987	1,113,648	52,788	180,375	2,811,341	29,093,067	76,864	74,431	2,232,807	35,635,321
1988	1,084,401	63,748	193,729	2,711,098	28,747,098	71,921	59,119	2,161,386	35,092,500
1989	1,117,210	50,423	187,565	2,409,789	28,748,423	64,786	67,120	2,397,022	35,042,338
1990	991,266	35,540	219,381	2,487,340	26,735,701	48,697	48,109	1,820,312	32,386,346
1991	592,396	25,080	218,004	2,189,846	17,129,321	26,468	26,699	1,210,194	21,418,008
1992	939,770	41,545	241,264	2,370,154	25,586,245	54,703	50,707	1,890,043	31,174,431
1993	1,177,606	56,397	264,380	2,841,519	31,738,842	75,098	71,181	2,663,685	38,888,708
1994	1,096,307	56,991	293,946	2,991,331	30,538,800	63,447	61,118	2,504,841	37,606,781
1995	1,732,447	57,288	335,993	4,403,962	42,836,274	104,480	104,642	3,769,506	53,344,592
1996	1,282,408	57,464	324,977	3,191,440	33,469,748	75,219	73,998	2,616,192	41,091,446
1997	1,354,914	61,218	335,723	3,437,368	34,827,596	80,316	78,947	2,764,766	42,940,848
1998	1,398,840	63,479	327,892	3,478,286	35,736,400	83,524	82,122	2,854,501	44,025,044
1999	1,421,633	64,660	328,753	3,538,060	36,207,077	85,134	83,604	2,901,271	44,630,192
2000	1,429,612	65,077	328,973	3,559,714	36,356,240	85,716	84,155	2,917,653	44,827,140
2001	1,428,101	64,996	329,007	3,553,937	36,324,425	85,611	84,048	2,914,543	44,784,668
2002	1,425,585	64,866	329,049	3,545,031	36,270,615	85,435	83,876	2,909,372	44,713,829
2003	1,399,534	63,510	329,088	3,471,283	35,711,743	83,626	82,121	2,855,858	43,996,763
2004	1,399,122	63,492	329,130	3,468,099	35,703,274	83,596	82,092	2,855,011	43,983,816
2005	1,349,925	60,933	328,968	3,340,857	34,644,741	80,193	78,790	2,754,000	42,638,407
2006	1,343,517	60,599	328,989	3,322,130	34,507,409	79,747	78,358	2,740,832	42,461,581
2007	1,338,372	60,330	329,011	3,306,940	34,397,098	79,391	78,008	2,730,263	42,319,413
2008	1,374,512	62,211	329,043	3,404,886	35,172,560	81,893	80,445	2,804,481	43,310,031
2009	1,368,710	61,908	329,067	3,387,661	35,048,078	81,492	80,055	2,792,562	43,149,533
2010	1,363,955	61,660	329,094	3,373,305	34,944,957	81,162	79,737	2,782,789	43,016,659
2011	1,359,272	61,418	329,125	3,358,911	34,844,881	80,833	79,421	2,773,172	42,887,033
2012	1,355,713	61,233	329,146	3,347,962	34,768,391	80,587	79,182	2,765,859	42,788,073
2013	1,280,498	57,324	329,212	3,137,648	33,154,486	75,368	74,115	2,611,380	40,720,031
2014	1,293,403	57,993	326,517	3,171,731	33,427,659	76,262	74,993	2,637,883	41,066,441
2015	1,271,164	56,836	323,226	3,035,722	32,954,299	74,719	73,483	2,592,205	40,381,654
2016	1,263,008	56,411	317,215	2,948,828	32,779,658	74,153	72,935	2,575,453	40,087,661
2017	1,256,689	56,081	302,970	2,801,024	32,643,723	73,715	72,511	2,562,471	39,769,184
2018	1,256,660	56,080	280,237	2,683,626	32,643,186	65,193	72,507	2,562,413	39,619,902
2019	1,256,797	56,087	271,757	2,624,071	32,646,165	64,696	72,517	2,562,694	39,554,784
2020	1,245,486	55,502	269,894	2,562,664	32,403,018	63,664	71,758	2,539,473	39,211,459
2021	1,246,169	55,538	268,790	2,542,443	32,417,938	63,568	71,803	2,540,879	39,207,128
2022	1,244,004	55,426	268,164	2,526,885	32,371,140	63,350	71,655	2,536,429	39,137,053
2023	1,244,759	55,465	267,740	2,524,397	32,387,486	63,373	71,707	2,537,980	39,152,907
2024	1,250,165	55,746	267,221	2,537,104	32,503,728	63,730	72,069	2,549,087	39,298,850
2025	1,240,210	55,229	266,657	2,507,212	32,289,969	63,015	71,402	2,528,638	39,022,332
2026	1,235,219	54,967	266,367	2,492,575	32,182,804	62,634	71,065	2,518,393	38,884,024
2027	1,235,937	55,003	265,729	2,491,393	32,198,262	62,640	71,115	2,519,866	38,899,945
2028	1,235,336	54,973	263,286	2,487,817	32,185,286	62,576	71,072	2,518,631	38,878,977
2029	1,235,775	54,995	262,974	2,485,830	32,194,780	62,544	71,104	2,519,537	38,887,539
2030	1,235,282	54,969	262,681	2,481,490	32,183,973	62,444	71,072	2,518,522	38,870,433
2031	1,235,529	54,982	261,096	2,463,712	32,189,289	62,068	71,088	2,519,028	38,856,792
2032	1,235,593	54,985	261,087	2,466,203	32,190,504	62,088	71,094	2,519,157	38,860,711
2033	1,234,363	54,923	260,789	2,458,442	32,164,252	61,874	71,008	2,516,637	38,822,288
2034	1,234,305	54,919	260,207	2,452,132	32,162,965	61,734	71,004	2,516,519	38,813,785
2035	1,235,141	54,962	259,481	2,445,187	32,181,656	61,557	71,054	2,518,233	38,827,271
TOTAL	70,188,234	3,166,147	16,425,135	163,140,404	1,799,365,904	3,970,746	4,073,453	141,332,997	2,201,663,020

TABLE B-19

Total Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,386	0	0	0	0	0	0	0	51,831	0
1964	62,984	27,499	14,455	4,378	37,231	1,145	28,492	8,221	82,967	35,056
1965	118,817	53,103	25,141	7,207	40,844	2,086	50,410	15,250	135,316	35,409
1966	216,165	101,445	44,811	12,501	73,283	3,761	90,562	27,728	232,920	61,574
1967	418,215	211,185	86,271	23,514	141,660	7,298	175,487	54,119	434,117	115,778
1968	737,186	478,875	152,937	41,577	251,605	12,891	311,202	95,618	783,447	209,268
1969	1,060,713	725,384	225,676	61,326	371,562	18,724	458,858	138,286	1,207,826	322,285
1970	1,379,247	905,530	315,780	89,846	520,168	25,270	633,048	185,137	1,781,147	468,350
1971	1,707,039	1,089,598	433,248	128,572	713,897	31,887	857,218	231,646	2,542,405	660,497
1972	2,024,052	1,308,318	562,427	181,440	926,946	42,456	1,111,252	274,997	3,393,625	866,355
1973	2,114,330	1,324,471	696,764	183,960	1,138,475	43,539	1,174,136	287,724	3,976,686	948,006
1974	2,177,886	1,383,891	712,285	193,538	1,165,339	45,270	1,205,921	292,482	4,003,812	991,990
1975	2,354,468	1,451,779	753,208	206,305	1,233,164	48,548	1,272,523	304,697	4,164,534	1,092,496
1976	2,707,527	1,447,071	799,768	215,352	1,308,863	51,521	1,314,931	314,105	4,305,177	1,146,488
1977	2,650,217	1,516,066	695,591	226,304	1,146,566	47,404	1,386,455	329,788	4,559,499	1,210,652
1978	2,966,305	1,600,378	876,244	231,269	1,421,571	47,171	1,386,151	322,107	4,465,749	1,213,451
1979	3,520,829	1,634,672	944,097	238,224	1,520,179	48,455	1,513,259	332,901	4,428,138	1,153,988
1980	4,068,280	1,717,382	1,033,589	259,693	1,681,573	53,409	1,632,337	360,905	4,841,525	1,270,964
1981	4,393,714	1,962,641	1,103,719	271,302	1,797,831	77,825	1,751,170	392,089	5,226,793	1,358,340
1982	3,953,355	2,060,800	1,154,698	280,468	1,882,394	56,030	1,946,967	407,381	5,416,498	1,565,188
1983	5,149,754	2,340,951	1,746,908	333,412	2,830,058	69,452	2,021,701	495,180	6,027,395	1,558,324
1984	7,182,265	3,402,513	2,828,408	445,752	4,555,599	75,825	2,252,313	553,700	7,056,832	2,333,950
1985	8,955,470	3,744,064	3,629,469	542,321	5,838,563	79,875	2,375,856	737,368	7,776,375	2,388,025
1986	8,805,362	4,320,630	4,052,039	578,408	6,521,811	102,635	2,466,493	1,001,833	7,875,294	3,052,856
1987	8,782,715	4,146,851	3,904,168	604,157	6,364,644	211,430	2,487,207	1,023,794	9,148,167	3,022,563
1988	8,301,368	4,222,509	3,910,853	617,995	6,441,608	125,039	2,567,648	782,393	9,495,276	2,834,544
1989	8,659,315	4,092,510	3,549,434	587,778	5,902,470	170,663	2,511,124	1,442,883	8,973,186	2,938,015
1990	9,895,757	4,509,422	4,207,913	619,389	6,939,511	288,292	2,693,403	1,633,099	9,808,632	3,677,407
1991	6,423,538	3,153,430	2,721,993	568,185	4,488,696	174,415	3,459,098	1,290,849	8,925,844	2,977,470
1992	8,548,580	4,467,674	2,806,823	439,201	4,628,511	121,529	4,277,765	1,130,978	8,668,612	3,008,675
1993	9,178,482	4,176,480	3,116,836	485,671	5,139,878	163,892	4,250,070	1,381,484	9,445,984	3,383,286
1994	12,511,211	5,258,996	3,277,401	689,824	5,404,477	250,209	6,012,775	1,882,742	10,630,448	4,344,286
1995	17,678,936	6,275,488	4,603,403	1,139,701	7,591,785	425,818	9,674,123	2,579,299	13,782,291	4,763,794
1996	17,716,347	5,480,928	3,243,410	735,686	5,348,697	301,371	8,075,627	2,256,624	14,809,513	3,698,152
1997	19,525,167	6,106,550	3,510,190	671,345	5,788,664	329,873	8,842,776	2,482,828	14,527,207	4,333,736
1998	19,866,613	6,358,524	3,596,973	714,119	5,931,819	338,251	9,050,108	2,534,521	14,766,743	4,690,218
1999	20,393,975	6,867,383	3,702,412	749,035	6,105,727	347,044	9,280,186	2,600,597	15,142,723	5,051,421
2000	20,582,049	7,013,448	3,755,364	1,050,609	6,193,072	350,179	9,354,629	2,624,199	15,644,904	5,165,869
2001	20,554,714	7,006,663	3,754,046	1,057,741	6,190,897	349,730	9,347,670	2,620,392	15,692,042	5,177,725
2002	20,504,906	6,989,184	3,727,551	1,046,074	6,147,188	348,908	9,334,280	2,613,652	15,270,849	5,096,824
2003	19,954,000	6,803,231	3,626,168	1,053,030	5,979,976	339,760	9,086,309	2,543,117	15,192,817	5,022,263
2004	19,951,380	6,800,918	3,626,572	1,063,238	5,980,647	339,725	9,087,548	2,542,364	15,201,333	5,030,006
2005	18,868,625	6,429,762	3,425,252	1,015,328	5,648,597	321,701	8,607,264	2,406,292	16,106,503	4,778,890
2006	18,732,919	6,390,604	3,403,294	1,024,481	5,612,382	319,447	8,548,289	2,388,801	16,167,938	4,773,327
2007	18,625,112	6,344,056	3,374,376	1,018,365	5,564,682	317,661	8,503,341	2,374,872	15,966,569	4,719,932
2008	19,390,344	6,615,325	3,532,173	1,058,764	5,824,946	330,381	8,837,300	2,471,994	16,524,898	4,914,633
2009	19,268,622	6,571,320	3,504,735	1,058,470	5,779,688	328,361	8,781,958	2,456,248	16,433,124	4,880,093
2010	19,153,188	6,527,845	3,487,700	1,057,941	5,751,588	326,449	8,732,864	2,441,378	17,060,643	4,858,114
2011	19,056,737	6,502,270	3,471,904	1,064,451	5,725,542	324,852	8,685,772	2,428,795	17,154,622	4,859,190
2012	18,980,360	6,471,201	3,460,203	1,069,537	5,706,251	323,582	8,656,158	2,418,850	17,212,049	4,857,771
2013	17,349,807	5,928,881	3,143,263	1,008,569	5,170,102	297,054	7,965,146	2,214,884	16,417,290	4,504,022
2014	17,542,733	5,983,705	3,179,389	983,895	5,243,701	299,607	7,594,608	2,234,964	16,724,663	4,585,263
2015	17,065,531	5,812,848	3,063,083	975,129	5,051,871	291,673	7,830,333	2,173,836	15,942,764	4,374,098
2016	16,796,570	5,706,275	3,028,708	988,481	4,995,183	287,147	7,704,210	2,139,392	16,242,272	4,402,375
2017	16,462,584	5,552,299	2,953,394	962,735	4,870,965	281,416	7,561,062	2,096,222	15,810,476	4,288,148
2018	16,208,457	5,343,213	2,902,988	952,612	4,787,838	276,907	7,451,392	2,062,865	15,600,408	4,226,286
2019	15,908,800	5,140,026	2,833,091	932,676	4,672,560	271,473	7,310,871	2,023,197	15,172,544	4,113,955
2020	15,367,078	4,894,484	2,703,970	897,511	4,459,613	261,212	7,039,629	1,948,418	14,486,771	3,929,704
2021	15,121,167	4,738,868	2,606,638	867,310	4,299,089	255,964	6,852,697	1,912,190	13,872,139	3,772,247
2022	14,946,767	4,604,219	2,527,945	829,077	4,169,299	252,785	6,726,854	1,889,113	13,084,569	3,594,934
2023	14,913,602	4,604,136	2,520,186	833,014	4,156,502	252,082	6,696,621	1,884,324	13,103,058	3,590,678
2024	15,011,717	4,588,639	2,533,697	833,814	4,178,792	253,692	6,730,917	1,896,751	13,065,268	3,592,931
2025	14,775,805	4,515,421	2,477,920	818,565	4,086,801	249,739	6,616,184	1,866,631	12,849,509	3,520,994
2026	14,656,352	4,451,787	2,452,414	817,789	4,044,739	247,710	6,543,972	1,851,564	12,813,210	3,499,969
2027	14,659,191	4,457,996	2,443,221	809,549	4,029,564	247,744	6,543,269	1,851,852	12,642,921	3,464,874
2028	14,636,159	4,423,822	2,440,216	813,620	4,024,613	247,338	6,520,271	1,848,872	12,718,306	3,476,008
2029	14,629,979	4,407,267	2,438,915	813,076	4,022,469	247,224	6,522,975	1,848,058	12,699,431	3,472,118
2030	14,600,476	4,356,298	2,430,458	809,199	4,008,527	246,732	6,507,710	1,844,384	12,631,615	3,456,369
2031	14,508,230	4,266,590	2,414,873	810,144	3,982,820	245,128	6,466,810	1,832,473	12,644,151	3,451,475
2032	14,513,053	4,234,774	2,422,553	816,301	3,995,490	245,206	6,477,488	1,833,062	12,746,768	3,472,693
2033	14,407,255	4,180,250	2,396,606	802,818	3,952,693	243,425	6,440,079	1,819,740	12,502,926	3,418,075
2034	14,300,021	4,151,726	2,368,651	788,691	3,906,584	241,622	6,397,262	1,806,232	12,246,637	3,359,008
2035	14,245,776	4,150,740	2,365,046	794,381	3,900,645	240,621	6,368,911	1,799,518	12,356,770	3,375,609
TOTAL	842,489,636	296,885,082	175,835,905	46,975,740	289,311,585	14,544,540	375,031,305	107,194,849	760,897,291	223,859,327

TABLE B-19

Total Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area					
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)	South Bay Area Future Contractor (38)	Grand Total (39)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	55,537
1963	0	692,178	0	777,395	0	0	0	0	55,830	1,624,367
1964	21,778	1,262,872	9,395	1,596,473	0	0	0	0	84,105	2,781,924
1965	21,906	2,184,551	17,799	2,707,839	0	0	405	405	129,207	4,771,768
1966	38,033	3,907,132	33,486	4,843,401	0	0	565	565	148,564	7,340,281
1967	71,409	7,707,275	68,275	9,514,603	0	0	563	563	204,947	12,714,520
1968	129,125	15,343,056	143,036	18,689,823	0	0	565	565	279,651	24,732,220
1969	199,094	23,191,328	215,563	28,196,625	0	0	3,197	3,197	349,657	35,763,144
1970	290,113	30,667,864	274,055	37,535,555	0	0	15,147	15,147	386,754	45,880,140
1971	410,000	40,024,070	342,980	49,173,057	0	0	16,029	16,029	376,318	58,495,832
1972	537,970	53,024,698	422,922	64,677,458	0	0	17,403	17,403	401,833	76,192,212
1973	588,787	57,354,082	436,278	70,267,238	0	0	17,364	17,364	376,313	80,895,871
1974	612,269	61,860,856	456,213	75,101,752	0	0	17,507	17,507	399,290	86,597,187
1975	645,490	66,842,602	479,060	80,848,874	0	0	18,436	18,436	408,510	93,721,683
1976	669,204	68,572,597	476,252	83,328,856	0	0	17,507	17,507	431,101	97,094,882
1977	697,419	66,322,926	507,736	81,296,623	0	0	18,262	18,262	423,842	95,131,184
1978	709,955	73,007,400	523,862	88,771,613	0	0	17,411	17,411	427,091	104,558,856
1979	713,782	72,755,138	527,103	89,330,765	0	0	20,609	20,609	447,131	106,905,887
1980	778,921	80,025,825	571,965	98,296,368	0	0	17,791	17,791	507,956	116,860,492
1981	806,438	90,957,855	636,898	110,736,615	0	0	21,223	21,223	517,366	131,196,965
1982	854,486	93,186,195	671,311	113,435,771	0	0	28,334	28,334	513,727	134,785,854
1983	953,143	101,884,556	799,393	126,210,227	0	0	16,957	16,957	553,301	151,471,763
1984	1,073,785	138,503,815	869,138	171,133,895	0	0	18,023	18,023	562,035	208,878,377
1985	1,126,956	173,441,851	914,590	211,550,783	0	0	19,980	19,980	682,187	258,632,443
1986	1,152,618	193,497,187	939,037	234,366,203	0	0	19,977	19,977	620,812	284,659,048
1987	1,167,617	178,065,850	900,901	219,830,064	0	0	19,979	19,979	685,456	271,351,836
1988	1,213,624	190,460,278	907,223	231,880,358	0	0	19,986	19,986	708,702	284,203,395
1989	1,199,848	193,322,437	932,180	234,281,843	0	0	20,060	20,060	767,243	286,917,657
1990	1,301,075	238,612,919	1,477,988	285,664,807	0	0	20,078	20,078	818,654	337,968,681
1991	1,363,911	172,433,317	1,121,877	209,102,623	0	0	20,124	20,124	564,676	246,957,556
1992	1,365,094	196,639,153	1,023,836	237,126,431	0	0	20,171	20,171	908,173	287,080,485
1993	1,484,536	173,087,467	1,065,830	216,359,896	0	0	19,928	19,928	979,668	275,862,333
1994	1,545,613	232,748,327	2,011,595	286,567,904	0	0	20,459	20,459	977,152	347,492,049
1995	1,597,071	216,735,505	1,431,550	288,278,764	0	0	20,611	20,611	953,253	370,498,504
1996	1,746,823	273,517,118	2,342,633	339,272,929	0	0	20,771	20,771	956,170	421,584,853
1997	2,126,320	297,916,462	2,631,503	368,792,621	0	0	20,939	20,939	973,053	463,498,155
1998	2,211,922	304,555,000	2,712,252	377,327,063	0	0	20,939	20,939	962,392	474,634,823
1999	2,180,617	312,811,629	2,787,704	388,020,453	0	0	20,939	20,939	965,141	486,554,708
2000	2,274,590	316,861,596	2,817,189	393,687,697	0	0	20,939	20,939	965,480	492,746,814
2001	2,279,399	316,378,971	2,813,743	393,223,733	0	0	20,939	20,939	965,589	492,234,418
2002	2,224,145	314,803,376	2,805,733	390,912,670	0	0	20,939	20,939	965,718	489,825,037
2003	2,214,443	306,124,210	2,720,472	380,659,796	0	0	20,939	20,939	965,850	478,450,828
2004	2,213,978	306,059,288	2,719,567	380,616,564	0	0	20,939	20,939	965,986	478,395,678
2005	2,252,749	288,806,641	2,549,568	361,217,172	0	0	20,939	20,939	965,463	456,924,255
2006	2,258,741	287,027,138	2,530,714	359,178,075	0	0	20,939	20,939	965,534	454,606,033
2007	2,231,125	284,518,047	2,510,913	356,069,051	0	0	20,939	20,939	965,600	451,272,208
2008	2,297,005	297,713,895	2,633,465	372,145,123	0	0	20,939	20,939	965,706	468,912,018
2009	2,283,131	295,563,328	2,613,715	369,522,793	0	0	20,939	20,939	965,785	466,036,718
2010	2,387,333	293,804,507	2,594,205	368,183,755	0	0	20,939	20,939	965,876	464,511,514
2011	2,397,151	292,537,031	2,581,451	366,789,768	0	0	20,939	20,939	965,978	462,915,178
2012	2,402,721	291,281,901	2,568,003	365,408,587	0	0	20,939	20,939	966,052	461,378,180
2013	2,298,813	264,368,217	2,320,020	332,986,068	0	0	20,939	20,939	923,057	425,068,262
2014	2,336,621	268,128,627	2,346,230	337,184,006	0	0	20,939	20,939	896,221	429,579,091
2015	2,413,917	258,769,853	2,272,549	326,037,485	0	0	20,534	20,534	866,159	416,774,287
2016	2,449,400	255,520,025	2,230,331	322,490,369	0	0	20,374	20,374	849,226	412,518,810
2017	2,386,856	249,371,609	2,175,086	314,772,852	0	0	20,376	20,376	809,232	404,089,598
2018	2,349,086	242,678,515	2,109,776	306,950,343	0	0	20,374	20,374	733,754	395,715,698
2019	2,279,371	235,184,634	2,040,772	297,883,970	0	0	17,743	17,743	669,768	386,289,267
2020	2,357,097	224,140,321	1,945,657	284,431,465	0	0	5,793	5,793	649,284	372,208,669
2021	2,297,485	216,574,192	1,891,494	275,061,480	0	0	4,965	4,965	645,519	362,823,620
2022	2,185,157	207,653,101	1,843,564	264,307,384	0	0	3,577	3,577	644,849	351,950,638
2023	2,183,345	206,380,062	1,845,655	262,963,265	0	0	3,576	3,576	644,189	350,596,140
2024	2,176,596	206,045,568	1,846,158	262,754,540	0	0	3,575	3,575	643,779	350,610,120
2025	2,146,839	202,228,978	1,812,902	257,966,288	0	0	3,573	3,573	642,322	345,367,114
2026	2,135,253	198,985,597	1,787,416	254,287,772	0	0	3,572	3,572	641,826	341,150,993
2027	2,112,422	199,165,875	1,789,868	254,218,346	0	0	3,569	3,569	640,996	341,084,067
2028	2,120,263	197,729,252	1,778,798	252,777,538	0	0	3,568	3,568	639,907	339,573,104
2029	2,117,702	197,580,725	1,772,701	252,572,640	0	0	3,566	3,566	638,441	339,352,671
2030	2,107,775	195,821,619	1,753,662	250,574,824	0	0	3,565	3,565	637,071	337,285,790
2031	2,105,602	193,249,502	1,721,377	247,699,175	0	0	3,563	3,563	634,062	334,315,095
2032	2,119,323	192,746,203	1,709,734	247,332,648	0	0	3,561	3,561	634,408	333,939,667
2033	2,084,576	189,972,582	1,688,964	243,909,989	0	0	3,561	3,561	633,683	330,391,348
2034	2,047,157	188,645,700	1,678,857	241,938,148	0	0	3,560	3,560	630,088	328,234,978
2035	2,058,670	188,049,523	1,678,949	241,385,159	0	0	3,559	3,559	625,857	327,398,745
TOTAL	114,192,589	13,367,593,580	110,182,677	16,724,994,106	0	0	1,062,428	1,062,428	49,035,576	21,250,874,123

TABLE B-20A

Calculation of Delta Water Rates

(Millions of dollars [$] or millions of acre-feet [AF] discounted to 1994 at 4.621 percent per annum)

Procedure	*Capital Cost Component (1)*	*Minimum Operation, Maintenance, Power, and Replacement Component (a (2)*	*Total Delta Water Rate (3)*
Beginning in 1996			
Total costs of "Initial" Project Conservation Facilities to be reimbursed and project water entitlements during the Project Repayment Period	$2,826.25 (b 182.10 AF	$1,653.49 (c 182.10 AF	$4,479.74 174.05 AF
Less project power revenues to be realized during the Project Repayment Period	(1,055.92)	(327.98)	-1383.90
Less Delta Water Charges paid and project water entitlements prior to 1996	(962.03) (d (106.08)AF	(576.99) (106.08) AF	(1,539.02) (97.42) AF
Total	**$808.30 76.02 AF**	**$748.52 76.02 AF**	**$1,556.82 76.63 AF**
Rate Applicable in 1996	$10.63 per acre-foot	$9.85 per acre-foot	$20.48 per acre-foot

a) Considering that all operating costs of Project Conservation Facilities will not vary with annual amounts of project water delivered, and therefore are properly classified as "Minimum" OMP&R Costs.
b) Including net credits of $4,850,000 for settlements as to the magnitude of project capital costs incurred prior to December 31, 1960, and net credits of $6,678,320 for settlement as to the magnitude of project capital costs incurred from 1961 through 1978.
c) Including conservation power costs and credits at San Luis.
d) Applying all Delta Water Charges paid prior to 1970 to reimburse capital costs (the charge was not divided into components until 1970).

TABLE B-20B

Delta Water Rates by Facility

(Dollars per acre-foot)

Item	*Capital Cost Component (1)*	*Minimum Operation, Maintenance, Power, and Replacement Component (2)*	*Total Delta Water Rate (3)*
Initial Conservation Facilities			
Oroville Division			
Water supply and power costs (a	22.93	10.87	33.80
Less Oroville power revenues	-13.89	-4.31	-18.20
Subtotal	*9.04*	*6.56*	*15.60*
Delta facilities (b	6.07	5.28	11.35
California Aqueduct, portion			
Reach 1	1.47	2.19	3.66
Reach 2A	0.88	0.41	1.29
Reach 2B	0.44	0.17	0.61
Reach 3	0.32	0.12	0.44
Subtotal	*3.11*	*2.89*	*6.00*
San Luis facilities	4.43	2.71	7.14
Planning and preoperating costs through 1994	1.27	0.00	1.27
Less capital cost credits	-0.63	0.00	-0.63
Less Delta Water Charges paid prior to 1996	-12.66	-7.59	-20.25
Rate applicable in 1996	**10.63**	**9.85**	**20.48**

a) Includes revenue received from non-contractors.
b) Includes (1) Delta facility planning costs, (2) Delta studies costs, and (3) Suisun Marsh facilities costs.

TABLE B-21

Total Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	14,000	50,050	177,100	241,150	0	0	0
1968	0	0	0	19,156	29,701	193,245	242,102	0	0	0
1969	0	0	0	30,324	44,096	215,483	289,903	0	0	0
1970	0	0	0	80,908	107,730	585,200	773,838	0	0	0
1971	0	0	0	57,320	123,080	637,120	817,520	0	0	0
1972	0	0	0	99,668	143,877	707,328	950,873	0	0	0
1973	0	0	0	120,880	167,099	782,167	1,070,146	0	0	0
1974	0	0	0	137,684	182,339	818,664	1,138,687	0	0	0
1975	0	0	0	146,204	187,324	804,123	1,137,651	0	0	0
1976	0	0	0	168,489	208,652	862,036	1,239,177	0	0	0
1977	0	0	0	172,931	208,645	827,062	1,208,638	0	0	0
1978	0	0	0	206,378	243,231	926,594	1,376,203	0	0	0
1979	0	0	0	237,771	273,208	1,005,955	1,516,934	0	0	0
1980	0	18,325	18,325	272,717	307,426	1,090,867	1,671,010	12,396	3,479	15,875
1981	0	25,440	25,440	415,564	469,768	1,589,984	2,475,316	18,068	10,414	28,482
1982	0	34,917	34,917	457,988	519,053	1,679,289	2,656,330	38,166	99,788	137,954
1983	0	12,035	12,035	316,703	359,775	1,114,795	1,791,273	38,004	68,902	106,906
1984	0	22,453	22,453	334,587	380,914	1,132,448	1,847,949	57,909	105,498	163,407
1985	0	22,001	22,001	381,970	435,728	1,244,939	2,062,637	106,103	192,937	299,040
1986	35,358	21,767	57,125	423,378	485,372	1,330,615	2,239,365	151,206	275,347	426,553
1987	0	22,984	22,984	430,024	493,786	1,304,900	2,228,710	185,355	336,664	522,019
1988	88,878	150,466	239,344	464,114	533,731	1,361,400	2,359,245	239,792	436,607	676,399
1989	102,688	305,328	408,016	513,853	591,760	1,491,833	2,597,446	331,518	602,402	933,920
1990	112,723	355,132	467,855	534,787	616,676	1,537,512	2,688,975	417,802	760,166	1,177,968
1991	129,296	395,515	524,811	603,028	681,067	1,667,194	2,951,289	443,403	806,745	1,250,148
1992	158,879	489,808	648,687	729,545	808,579	1,945,453	3,483,577	506,628	921,780	1,428,408
1993	172,457	530,778	703,235	771,894	840,958	1,990,673	3,603,525	507,825	923,957	1,431,782
1994	181,978	559,380	741,358	796,838	836,680	1,992,094	3,625,612	498,023	906,124	1,404,147
1995	203,738	713,497	917,235	874,946	874,946	2,083,205	3,833,097	520,801	947,567	1,468,368
1996	213,506	774,152	987,658	901,129	860,168	2,048,020	3,809,317	512,005	931,562	1,443,567
1997	226,613	783,368	1,009,981	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
1998	239,823	792,789	1,032,612	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
1999	252,521	802,209	1,054,730	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2000	267,267	811,426	1,078,693	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2001	279,862	820,846	1,100,708	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2002	290,512	830,267	1,120,779	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2003	303,107	839,688	1,142,795	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2004	315,395	848,904	1,164,299	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2005	327,683	849,928	1,177,611	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2006	336,899	850,952	1,187,851	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2007	348,163	851,976	1,200,139	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2008	361,476	853,000	1,214,476	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2009	372,740	854,024	1,226,764	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2010	384,004	855,048	1,239,052	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2011	397,316	856,072	1,253,388	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2012	408,580	857,096	1,265,676	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2013	421,892	858,120	1,280,012	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2014	435,204	859,144	1,294,348	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2015	448,516	860,168	1,308,684	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2016	460,805	860,168	1,320,973	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2017	473,093	860,168	1,333,261	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2018	485,381	860,168	1,345,549	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2019	497,669	860,168	1,357,837	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2020	509,957	860,168	1,370,125	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2021	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2022	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2023	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2024	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2025	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2026	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2027	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2028	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2029	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2030	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2031	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2032	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2033	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2034	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
2035	512,005	860,168	1,372,173	942,089	860,168	2,048,020	3,850,277	512,005	931,562	1,443,567
TOTAL	17,924,054	37,592,363	55,516,417	47,456,249	45,611,971	115,020,078	208,088,298	24,553,199	44,660,857	69,214,056

TABLE B-21

Total Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	40,695	10,469	0	0	165,522	3,177	8,073	98,608	326,544
1969	61,267	3,281	0	0	337,686	4,200	8,805	102,478	517,717
1970	104,405	19,950	0	0	964,915	8,645	17,290	228,095	1,343,300
1971	129,596	21,720	0	0	1,377,772	9,412	20,272	264,260	1,823,032
1972	160,756	24,113	0	0	2,175,835	11,253	43,131	905,057	3,320,145
1973	195,541	26,664	0	386,638	2,373,167	13,333	27,553	373,307	3,396,203
1974	224,202	27,909	0	446,545	2,781,595	13,954	29,770	445,138	3,969,113
1975	329,688	27,413	0	481,560	3,041,048	14,620	33,702	827,591	4,755,622
1976	414,245	29,388	0	549,549	3,931,785	15,673	35,966	877,151	5,853,757
1977	312,532	28,195	0	569,545	4,071,218	15,977	40,289	626,210	5,663,966
1978	342,208	31,588	0	674,939	4,950,959	20,006	41,065	666,516	6,727,281
1979	395,523	34,294	0	772,757	5,901,986	22,863	45,725	771,613	7,944,761
1980	555,341	37,679	0	881,371	6,984,026	27,272	70,658	933,481	9,489,828
1981	740,789	54,204	0	1,351,487	11,140,730	41,556	77,692	1,373,168	14,779,626
1982	782,396	57,248	0	1,518,993	12,703,436	47,707	85,873	1,530,443	16,726,096
1983	543,462	38,004	0	1,057,789	9,141,315	35,471	58,273	78,506	10,952,820
1984	580,379	13,572	0	1,333,200	9,741,623	39,893	61,770	756,132	12,526,569
1985	667,740	42,441	0	1,540,611	11,403,920	48,100	69,320	644,383	14,416,515
1986	745,447	45,362	0	1,714,679	12,925,113	55,946	77,115	1,469,725	17,033,387
1987	762,180	44,485	0	1,766,065	13,410,817	59,314	77,108	1,503,601	17,623,570
1988	827,669	46,411	0	1,916,790	14,707,763	61,882	83,540	1,633,680	19,277,735
1989	921,621	49,728	0	2,125,033	16,312,361	66,304	92,825	1,821,693	21,389,565
1990	964,288	50,136	0	1,998,766	17,276,959	66,848	95,259	1,980,383	22,432,639
1991	1,023,374	53,208	0	2,121,239	18,335,590	70,944	101,096	2,101,729	23,807,180
1992	1,169,299	60,795	0	2,727,688	20,646,125	81,061	115,511	2,401,419	27,201,898
1993	1,172,060	60,939	0	2,734,129	20,694,874	81,252	115,784	2,407,089	27,266,127
1994	1,149,439	59,762	0	2,681,358	20,295,455	79,684	113,550	2,360,631	26,739,879
1995	1,202,009	62,497	0	2,803,994	21,223,695	83,328	118,743	2,468,598	27,962,864
1996	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
1997	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
1998	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
1999	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2000	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2001	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2002	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2003	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2004	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2005	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2006	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2007	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2008	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2009	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2010	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2011	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2012	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2013	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2014	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2015	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2016	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2017	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2018	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2019	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2020	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2021	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2022	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2023	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2024	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2025	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2026	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2027	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2028	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2029	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2030	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2031	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2032	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2033	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2034	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
2035	1,181,708	61,441	0	2,449,432	21,172,431	81,921	116,737	2,426,904	27,490,574
TOTAL	63,786,471	3,519,095	0	132,132,005	1,115,914,530	4,376,515	6,435,238	128,726,845	1,454,890,699

TABLE B-21

Total Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	13,060	0	0	0	0	0	0	0	0
1969	0	17,804	0	0	0	0	0	0	0	0
1970	0	37,905	0	0	0	0	0	0	0	0
1971	0	48,508	0	0	0	0	0	0	0	0
1972	160,756	74,751	41,797	4,662	64,303	1,367	67,518	13,021	369,739	85,202
1973	222,207	107,163	51,552	7,279	79,994	2,577	95,104	26,131	54,908	14,338
1974	279,090	143,266	59,539	10,791	93,030	3,721	121,869	39,631	465,150	114,427
1975	319,822	166,307	63,964	13,250	100,515	4,752	140,722	50,989	479,733	119,705
1976	431,018	207,673	74,449	17,045	117,550	6,269	174,366	67,591	538,772	137,142
1977	469,922	226,502	79,144	19,079	122,180	6,861	189,848	77,255	540,410	139,097
1978	600,180	274,819	97,313	24,428	147,413	9,687	236,913	98,345	631,768	165,313
1979	720,173	320,077	115,033	29,836	171,470	11,889	284,640	117,285	714,457	189,760
1980	857,818	376,845	134,920	35,949	210,736	14,256	337,177	138,590	811,952	215,694
1981	1,355,100	592,631	218,713	57,637	343,292	22,946	534,813	211,396	1,237,658	330,644
1982	1,551,434	664,082	254,298	66,408	400,739	26,335	313,057	235,100	1,341,923	364,482
1983	1,110,994	472,521	184,283	47,759	291,367	19,002	434,517	163,925	943,775	252,096
1984	450,405	509,602	202,914	52,247	321,718	20,719	472,282	174,500	1,003,760	266,383
1985	565,881	591,346	240,344	61,540	381,970	24,474	551,734	200,605	1,152,983	308,405
1986	635,066	659,259	275,347	70,160	438,498	27,822	625,994	223,785	1,285,253	350,799
1987	652,450	676,176	288,131	73,104	467,095	29,064	648,002	228,654	1,319,729	364,779
1988	711,641	742,582	319,496	80,756	525,996	32,024	711,641	248,146	1,438,752	402,232
1989	2,083,593	830,453	362,565	91,333	605,021	36,301	803,932	276,155	1,607,864	454,180
1990	2,207,667	869,029	386,049	96,930	636,731	38,438	848,974	289,119	1,696,277	481,308
1991	2,454,678	961,298	409,704	102,869	675,746	40,793	900,994	306,835	1,819,725	510,800
1992	2,804,695	1,098,371	468,125	117,538	772,102	46,610	1,029,469	350,587	2,079,203	583,636
1993	2,811,318	1,100,964	469,230	117,815	773,925	46,720	1,031,900	351,415	2,084,113	585,014
1994	2,757,058	1,079,715	460,174	115,542	758,988	45,818	1,011,983	344,633	2,043,888	573,723
1995	2,883,156	1,129,097	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963
1996	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1997	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1998	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1999	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2000	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2001	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2002	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2003	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2004	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2005	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2006	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2007	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2008	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2009	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2010	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2011	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2012	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2013	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2014	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2015	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2016	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2017	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2018	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2019	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2020	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2021	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2022	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2023	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2024	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2025	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2026	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2027	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2028	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2029	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2030	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2031	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2032	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2033	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2034	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
2035	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
TOTAL	142,474,522	58,392,886	24,662,024	6,186,183	40,505,921	2,450,519	54,241,478	18,766,367	111,849,921	31,202,322

TABLE B-21

Total Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)		
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	241,150
1968	0	0	0	13,060	0	1,050	875	1,925	0	583,631
1969	0	0	0	17,804	0	1,225	929	2,154	0	827,578
1970	0	0	0	37,905	0	3,848	1,995	5,843	0	2,160,886
1971	0	0	0	48,508	0	4,546	3,186	7,732	0	2,696,792
1972	0	2,043,211	0	2,926,327	0	4,929	3,778	8,707	0	7,206,052
1973	0	2,317,893	0	2,979,146	0	7,059	4,444	11,503	0	7,456,998
1974	0	4,231,933	0	5,562,447	0	8,336	4,931	13,267	0	10,683,514
1975	0	5,073,286	0	6,533,045	0	9,416	5,117	14,533	0	12,440,851
1976	0	6,422,167	0	8,194,042	0	7,004	5,780	12,784	0	15,299,760
1977	0	7,104,278	0	8,974,576	0	16,917	5,827	22,744	0	15,869,924
1978	0	9,016,389	0	11,302,568	0	12,635	6,844	19,479	0	19,425,531
1979	0	10,935,192	0	13,609,812	0	16,575	7,773	24,348	0	23,095,855
1980	84,294	13,102,796	12,396	16,333,423	0	19,834	8,801	28,635	0	27,557,096
1981	140,930	20,910,099	36,136	25,991,995	0	21,682	13,370	35,052	0	43,335,911
1982	167,929	23,998,560	57,248	29,441,595	0	16,117	14,694	30,811	0	49,027,703
1983	124,148	17,203,307	50,672	21,298,366	0	15,202	10,134	25,336	0	34,186,736
1984	138,982	18,766,458	64,344	22,444,314	20,590	15,442	10,681	46,713	0	37,051,405
1985	166,935	22,050,974	84,882	26,382,073	24,050	16,976	12,166	53,192	0	43,235,458
1986	195,056	25,089,658	120,965	29,997,662	31,753	18,145	13,457	63,355	0	49,817,447
1987	207,598	26,095,043	148,284	31,198,109	37,071	17,794	13,642	68,507	0	51,663,899
1988	233,604	28,781,238	201,116	34,429,224	46,722	18,565	14,852	80,139	0	57,062,086
1989	268,530	32,505,376	265,215	40,190,518	61,184	19,891	16,576	97,651	0	65,617,116
1990	289,119	33,616,369	334,242	41,790,252	63,506	20,055	17,381	100,942	0	68,658,631
1991	306,835	35,676,185	354,722	44,521,184	170,267	21,283	19,155	210,705	0	73,265,317
1992	350,587	40,763,329	405,303	50,869,555	194,545	24,318	22,697	241,560	0	83,873,685
1993	351,415	40,859,579	406,260	50,989,668	195,005	24,376	23,563	242,944	0	84,237,281
1994	344,633	40,070,973	398,419	50,005,547	191,241	23,906	23,906	239,053	0	82,755,596
1995	360,394	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	354,307	41,195,923	409,604	51,409,399	196,610	24,576	26,624	247,810	0	85,388,325
1997	354,307	41,195,923	409,604	51,409,399	196,610	24,576	27,648	248,834	0	85,452,632
1998	354,307	41,195,923	409,604	51,409,399	196,610	24,576	28,672	249,858	0	85,476,287
1999	354,307	41,195,923	409,604	51,409,399	196,610	24,576	29,696	250,882	0	85,499,429
2000	354,307	41,195,923	409,604	51,409,399	196,610	24,576	30,925	252,111	0	85,524,621
2001	354,307	41,195,923	409,604	51,409,399	196,610	563,206	32,154	791,970	0	86,086,495
2002	354,307	41,195,923	409,604	51,409,399	196,610	563,206	33,383	793,199	0	86,107,795
2003	354,307	41,195,923	409,604	51,409,399	196,610	563,206	34,612	794,428	0	86,131,040
2004	354,307	41,195,923	409,604	51,409,399	196,610	563,206	35,840	795,656	0	86,153,772
2005	354,307	41,195,923	409,604	51,409,399	196,610	563,206	37,069	796,885	0	86,168,313
2006	354,307	41,195,923	409,604	51,409,399	196,610	563,206	38,503	798,319	0	86,179,987
2007	354,307	41,195,923	409,604	51,409,399	196,610	563,206	39,936	799,752	0	86,193,708
2008	354,307	41,195,923	409,604	51,409,399	196,610	563,206	41,370	801,186	0	86,209,479
2009	354,307	41,195,923	409,604	51,409,399	196,610	563,206	42,804	802,620	0	86,223,201
2010	354,307	41,195,923	409,604	51,409,399	196,610	563,206	44,237	804,053	0	86,236,922
2011	354,307	41,195,923	409,604	51,409,399	196,610	563,206	45,876	805,692	0	86,252,897
2012	354,307	41,195,923	409,604	51,409,399	196,610	563,206	47,514	807,330	0	86,266,823
2013	354,307	41,195,923	409,604	51,409,399	196,610	563,206	49,357	809,173	0	86,283,002
2014	354,307	41,195,923	409,604	51,409,399	196,610	563,206	51,201	811,017	0	86,299,182
2015	354,307	41,195,923	409,604	51,409,399	196,610	563,206	53,249	813,065	0	86,315,566
2016	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,329,903
2017	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,342,191
2018	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,354,479
2019	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,366,767
2020	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,379,055
2021	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2022	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2023	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2024	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2025	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2026	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2027	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2028	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2029	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2030	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2031	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2032	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2033	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2034	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
2035	354,307	41,195,923	409,604	51,409,399	196,610	563,206	55,297	815,113	0	86,381,103
TOTAL	17,903,269	2,156,374,887	19,741,005	2,684,751,304	9,100,321	20,247,215	2,189,204	31,536,740	0	4,503,997,514

TABLE B-22

Water System Revenue Bond Surcharge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	29,131	40,505	69,636	25,436	30,176	100,035	155,647	13,126	24,392	37,518
1989	48,804	69,621	118,425	43,343	51,681	170,303	265,327	26,828	49,634	76,462
1990	41,166	60,482	101,648	38,407	51,185	149,440	239,032	27,956	51,795	79,751
1991	63,389	92,401	155,790	62,470	81,991	235,712	380,173	44,887	83,709	128,596
1992	84,320	126,227	210,547	89,247	115,208	325,629	530,084	61,137	113,925	175,062
1993	90,152	137,473	227,625	98,432	125,174	347,457	571,063	67,725	126,662	194,387
1994	91,785	141,222	233,007	102,021	126,216	352,415	580,652	81,420	159,156	240,576
1995	108,311	181,787	290,098	126,000	149,378	416,955	692,333	131,674	270,727	402,401
1996	248,948	437,460	686,408	299,965	342,174	956,310	1,598,449	455,872	1,003,503	1,459,375
1997	243,212	427,381	670,593	293,054	334,290	934,277	1,561,621	445,369	980,383	1,425,752
1998	242,214	425,626	667,840	291,851	332,918	930,441	1,555,210	443,540	976,357	1,419,897
1999	240,844	423,220	664,064	290,200	331,036	925,180	1,546,416	441,033	970,837	1,411,870
2000	236,629	415,814	652,443	285,122	325,242	908,990	1,519,354	433,315	953,848	1,387,163
2001	241,309	411,428	652,737	280,446	307,096	856,887	1,444,429	500,796	1,180,474	1,681,270
2002	238,694	406,969	645,663	277,407	303,768	847,601	1,428,776	495,369	1,167,681	1,663,050
2003	238,508	406,652	645,160	277,191	303,531	846,940	1,427,662	494,983	1,166,771	1,661,754
2004	245,112	417,913	663,025	284,866	311,936	870,392	1,467,194	508,689	1,199,080	1,707,769
2005	245,527	418,619	664,146	285,348	312,463	871,864	1,469,675	509,549	1,201,107	1,710,656
2006	246,122	419,634	665,756	286,039	313,221	873,977	1,473,237	510,784	1,204,018	1,714,802
2007	246,641	420,518	667,159	286,642	313,881	875,819	1,476,342	511,861	1,206,556	1,718,417
2008	245,762	419,021	664,783	285,621	312,763	872,700	1,471,084	510,038	1,202,259	1,712,297
2009	246,221	419,802	666,023	286,154	313,347	874,328	1,473,829	510,989	1,204,501	1,715,490
2010	247,764	422,435	670,199	287,948	315,311	879,810	1,483,069	514,193	1,212,054	1,726,247
2011	247,763	422,432	670,195	287,946	315,309	879,804	1,483,059	514,189	1,212,045	1,726,234
2012	247,814	422,519	670,333	288,006	315,374	879,986	1,483,366	514,296	1,212,296	1,726,592
2013	247,725	422,367	670,092	287,902	315,261	879,669	1,482,832	514,111	1,211,859	1,725,970
2014	247,713	422,347	670,060	287,889	315,246	879,628	1,482,763	514,087	1,211,803	1,725,890
2015	248,764	424,138	672,902	289,110	316,583	883,358	1,489,051	516,267	1,216,942	1,733,209
2016	248,584	423,831	672,415	288,901	316,354	882,720	1,487,975	515,893	1,216,062	1,731,955
2017	249,547	425,474	675,021	290,020	317,580	886,141	1,493,741	517,893	1,220,776	1,738,669
2018	249,064	424,650	673,714	289,459	316,965	884,425	1,490,849	516,890	1,218,412	1,735,302
2019	249,940	426,144	676,084	290,477	318,080	887,537	1,496,094	518,709	1,222,698	1,741,407
2020	250,537	427,161	677,698	291,170	318,839	889,655	1,499,664	519,946	1,225,616	1,745,562
2021	251,431	428,685	680,116	292,209	319,977	892,829	1,505,015	521,801	1,229,988	1,751,789
2022	252,270	430,116	682,386	293,184	321,045	895,809	1,510,038	523,543	1,234,094	1,757,637
2023	286,437	488,371	774,808	332,894	364,527	1,017,137	1,714,558	594,452	1,401,240	1,995,692
2024	209,364	356,962	566,326	243,320	266,442	743,450	1,253,212	434,499	1,024,200	1,458,699
2025	84,406	143,911	228,317	98,095	107,417	299,725	505,237	175,170	412,911	588,081
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	7,781,924	13,231,318	21,013,242	9,033,792	10,048,985	28,105,335	47,188,112	15,152,879	35,180,371	50,333,250

TABLE B-22

Water System Revenue Bond Surcharge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	33,986	1,657	0	67,288	726,501	2,228	2,851	66,748	901,259
1989	59,273	2,785	0	116,689	1,251,452	3,733	4,927	116,736	1,555,595
1990	53,349	2,419	0	287,811	947,351	3,248	4,367	109,118	1,407,663
1991	82,252	3,731	0	359,380	1,564,983	5,035	6,771	168,217	2,190,369
1992	112,566	5,127	0	452,691	2,153,423	6,927	9,285	230,217	2,970,236
1993	119,670	5,459	0	272,449	2,491,672	7,381	9,894	244,813	3,151,338
1994	118,265	5,379	0	244,671	2,485,820	7,300	9,766	241,933	3,113,134
1995	139,227	6,339	0	317,885	2,894,182	8,598	11,490	284,798	3,662,519
1996	320,201	14,568	0	670,122	5,139,783	19,779	26,428	654,926	6,845,807
1997	312,824	14,232	0	654,683	5,021,365	19,323	25,819	639,837	6,688,083
1998	311,539	14,174	0	651,995	5,000,748	19,244	25,713	637,210	6,660,623
1999	309,778	14,094	0	648,308	4,972,474	19,135	25,568	633,607	6,622,964
2000	304,357	13,847	0	636,963	4,885,456	18,800	25,120	622,519	6,507,062
2001	288,238	13,109	0	580,823	6,094,635	17,832	23,816	589,657	7,608,110
2002	285,114	12,967	0	574,529	6,028,587	17,639	23,558	583,267	7,525,661
2003	284,892	12,957	0	574,081	6,023,889	17,625	23,539	582,812	7,519,795
2004	292,781	13,315	0	589,977	6,190,693	18,113	24,191	598,950	7,728,020
2005	293,276	13,338	0	590,975	6,201,159	18,144	24,232	599,963	7,741,087
2006	293,987	13,370	0	592,407	6,216,189	18,188	24,291	601,417	7,759,849
2007	294,606	13,398	0	593,656	6,229,293	18,226	24,342	602,685	7,776,206
2008	293,557	13,351	0	591,542	6,207,108	18,161	24,255	600,539	7,748,513
2009	294,105	13,376	0	592,645	6,218,683	18,195	24,301	601,659	7,762,964
2010	295,949	13,460	0	596,361	6,257,677	18,309	24,453	605,431	7,811,640
2011	295,947	13,459	0	596,357	6,257,633	18,309	24,453	605,427	7,811,585
2012	296,008	13,462	0	596,480	6,258,927	18,313	24,458	605,552	7,813,200
2013	295,901	13,457	0	596,265	6,256,673	18,306	24,449	605,334	7,810,385
2014	295,888	13,457	0	596,238	6,256,384	18,305	24,448	605,306	7,810,026
2015	297,142	13,514	0	598,766	6,282,913	18,383	24,552	607,873	7,843,143
2016	296,927	13,504	0	598,333	6,278,371	18,369	24,534	607,433	7,837,471
2017	298,078	13,556	0	600,652	6,302,707	18,441	24,629	609,788	7,867,851
2018	297,501	13,530	0	599,489	6,290,502	18,405	24,581	608,607	7,852,615
2019	298,548	13,578	0	601,598	6,312,631	18,470	24,668	610,748	7,880,241
2020	299,260	13,610	0	603,034	6,327,696	18,514	24,727	612,206	7,899,047
2021	300,328	13,659	0	605,185	6,350,270	18,580	24,815	614,390	7,927,227
2022	301,330	13,704	0	607,205	6,371,466	18,642	24,898	616,440	7,953,685
2023	342,143	15,560	0	689,445	7,234,422	21,167	28,270	699,931	9,030,938
2024	250,080	11,373	0	503,932	5,287,810	15,471	20,663	511,596	6,600,925
2025	100,821	4,585	0	203,162	2,131,805	6,237	8,330	206,252	2,661,192
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	9,459,694	430,460	0	19,854,072	191,403,333	585,075	781,452	19,343,942	241,858,028

TABLE B-22

Water System Revenue Bond Surcharge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	64,266	57,111	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907
1989	205,668	98,720	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104
1990	185,010	87,808	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851
1991	296,854	140,371	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172
1992	402,015	234,421	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372
1993	424,871	247,076	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298
1994	424,023	247,222	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422
1995	500,083	290,999	111,729	31,823	184,169	8,769	229,530	64,852	623,848	165,594
1996	1,146,562	667,411	256,019	73,028	422,015	20,120	525,891	148,802	1,437,089	381,452
1997	1,120,146	652,034	250,121	71,346	412,292	19,656	513,775	145,374	1,403,979	372,664
1998	1,115,547	649,357	249,094	71,053	410,599	19,576	511,665	144,777	1,398,215	371,133
1999	1,109,240	645,686	247,685	70,651	408,278	19,465	508,773	143,958	1,390,309	369,035
2000	1,089,828	634,386	243,351	69,415	401,133	19,124	499,869	141,439	1,365,979	362,577
2001	1,031,497	601,430	230,268	65,684	379,570	18,093	473,048	133,845	1,301,934	345,650
2002	1,020,319	594,912	227,772	64,972	375,457	17,897	467,922	132,395	1,287,825	341,904
2003	1,019,523	594,449	227,595	64,921	375,164	17,883	467,557	132,291	1,286,821	341,638
2004	1,047,754	610,909	233,897	66,719	385,553	18,378	480,504	135,955	1,322,454	351,098
2005	1,049,526	611,942	234,292	66,832	386,204	18,409	481,316	136,184	1,324,690	351,691
2006	1,052,070	613,425	234,860	66,994	387,141	18,454	482,483	136,515	1,327,901	352,544
2007	1,054,288	614,718	235,355	67,135	387,957	18,493	483,500	136,802	1,330,700	353,287
2008	1,050,533	612,529	234,517	66,896	386,575	18,427	481,778	136,315	1,325,961	352,029
2009	1,052,492	613,671	234,955	67,021	387,296	18,461	482,676	136,569	1,328,433	352,685
2010	1,059,091	617,519	236,428	67,441	389,724	18,577	485,703	137,426	1,336,763	354,897
2011	1,059,084	617,515	236,426	67,441	389,722	18,577	485,699	137,425	1,336,754	354,894
2012	1,059,303	617,643	236,475	67,454	389,802	18,581	485,800	137,453	1,337,030	354,968
2013	1,058,921	617,420	236,390	67,430	389,662	18,574	485,625	137,404	1,336,549	354,840
2014	1,058,873	617,392	236,379	67,427	389,644	18,573	485,602	137,397	1,336,487	354,823
2015	1,063,362	620,010	237,381	67,713	391,296	18,652	487,662	137,980	1,342,154	356,328
2016	1,062,594	619,561	237,210	67,664	391,013	18,639	487,309	137,880	1,341,184	356,070
2017	1,066,713	621,963	238,129	67,926	392,529	18,711	489,198	138,415	1,346,382	357,450
2018	1,064,647	620,758	237,668	67,795	391,769	18,675	488,251	138,146	1,343,775	356,758
2019	1,068,392	622,942	238,504	68,033	393,147	18,740	489,968	138,632	1,348,502	358,013
2020	1,070,942	624,429	239,073	68,196	394,085	18,785	491,137	138,963	1,351,721	358,868
2021	1,074,763	626,657	239,926	68,439	395,491	18,852	492,890	139,459	1,356,543	360,148
2022	1,078,350	628,748	240,727	68,667	396,811	18,915	494,535	139,925	1,361,071	361,350
2023	1,224,402	713,906	273,331	77,968	450,555	21,477	561,515	158,876	1,545,415	410,292
2024	894,945	521,811	199,784	56,988	329,322	15,698	410,425	116,126	1,129,580	299,892
2025	360,801	210,370	80,544	22,975	132,767	6,329	165,465	46,817	455,396	120,903
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	33,787,298	19,639,231	7,556,147	2,154,042	12,456,004	594,019	15,524,520	4,394,388	42,601,756	11,309,601

TABLE B-22

Water System Revenue Bond Surcharge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)		
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	24,019	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	42,040	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	38,023	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	59,122	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	80,131	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	84,371	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	85,698	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	101,792	10,539,433	90,436	12,943,057	16,957	2,119	3,704	22,780	0	18,013,188
1996	234,506	24,217,834	207,570	29,738,299	39,024	4,879	8,736	52,639	0	40,380,977
1997	229,103	23,659,870	202,788	29,053,148	38,125	4,766	8,535	51,426	0	39,450,623
1998	228,162	23,562,722	201,955	28,933,855	37,969	4,747	8,500	51,216	0	39,288,641
1999	226,872	23,429,503	200,813	28,770,268	37,754	4,720	8,452	50,926	0	39,066,508
2000	222,902	23,019,489	197,299	28,266,791	37,093	4,637	8,304	50,034	0	38,382,847
2001	212,526	21,849,284	186,979	26,829,808	35,201	100,835	8,955	144,991	0	38,361,345
2002	210,223	21,612,504	184,953	26,539,055	34,820	99,742	8,858	143,420	0	37,945,625
2003	210,059	21,595,659	184,809	26,518,369	34,793	99,665	8,851	143,309	0	37,916,049
2004	215,876	22,193,651	189,926	27,252,674	35,756	102,424	9,096	147,276	0	38,965,958
2005	216,241	22,231,172	190,247	27,298,746	35,816	102,598	9,112	147,526	0	39,031,836
2006	216,765	22,285,058	190,708	27,364,918	35,903	102,846	9,134	147,883	0	39,126,445
2007	217,222	22,332,034	191,110	27,422,601	35,979	103,063	9,153	148,195	0	39,208,920
2008	216,448	22,252,502	190,430	27,324,940	35,851	102,696	9,120	147,667	0	39,069,284
2009	216,852	22,293,999	190,785	27,375,895	35,918	102,887	9,137	147,942	0	39,142,143
2010	218,212	22,433,792	191,981	27,547,554	36,143	103,533	9,195	148,871	0	39,387,580
2011	218,210	22,433,633	191,980	27,547,360	36,143	103,532	9,195	148,870	0	39,387,303
2012	218,255	22,438,273	192,019	27,553,056	36,150	103,553	9,196	148,899	0	39,395,446
2013	218,176	22,430,191	191,950	27,543,132	36,137	103,516	9,193	148,846	0	39,381,257
2014	218,166	22,429,157	191,941	27,541,861	36,135	103,511	9,193	148,839	0	39,379,439
2015	219,092	22,524,260	192,755	27,658,645	36,289	103,950	9,232	149,471	0	39,546,421
2016	218,933	22,507,978	192,616	27,638,651	36,262	103,875	9,225	149,362	0	39,517,829
2017	219,782	22,595,223	193,362	27,745,783	36,403	104,278	9,261	149,942	0	39,671,007
2018	219,356	22,551,466	192,988	27,692,052	36,332	104,076	9,243	149,651	0	39,594,183
2019	220,128	22,630,802	193,667	27,789,470	36,460	104,442	9,275	150,177	0	39,733,473
2020	220,653	22,684,810	194,129	27,855,791	36,547	104,691	9,298	150,536	0	39,828,298
2021	221,440	22,765,738	194,822	27,955,168	36,678	105,065	9,331	151,074	0	39,970,389
2022	222,179	22,841,724	195,472	28,048,474	36,800	105,415	9,362	151,577	0	40,103,797
2023	252,272	25,935,423	221,947	31,847,379	41,784	119,693	10,630	172,107	0	45,535,482
2024	184,391	18,956,813	162,226	23,278,001	30,541	87,486	7,770	125,797	0	33,282,960
2025	74,338	7,642,526	65,402	9,384,633	12,313	35,270	3,132	50,715	0	13,418,175
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	6,952,536	716,651,731	6,128,401	879,749,674	1,140,580	2,547,361	283,897	3,971,838	0	1,244,114,144

TABLE B-23

Total Transportation and Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	North Bay Area			South Bay Area				Central Coastal Area		
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Total (7)	San Luis Obispo County FC&WCD (8)	Santa Barbara County FC&WCD (9)	Total (10)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	0	55,537	0	0	0
1963	0	0	0	151,158	190,471	449,513	791,142	0	0	0
1964	0	0	0	170,825	277,767	623,434	1,072,026	8,526	18,065	26,591
1965	0	0	0	245,752	404,792	1,160,811	1,811,355	14,254	28,962	43,216
1966	18,099	0	18,099	271,872	422,243	1,415,979	2,110,094	23,495	46,425	69,920
1967	41,651	0	41,651	361,164	552,227	1,863,818	2,777,209	41,791	80,516	122,307
1968	128,844	0	128,844	411,394	633,829	2,181,904	3,227,127	67,870	128,989	196,859
1969	255,007	0	255,007	477,523	584,144	2,302,351	3,364,018	122,909	230,789	353,698
1970	277,846	0	277,846	541,841	641,031	2,791,648	3,974,520	135,973	255,061	391,034
1971	227,777	0	227,777	479,166	675,933	2,810,711	3,965,810	137,107	257,315	394,422
1972	225,283	0	225,283	609,052	823,137	3,031,450	4,463,639	143,286	268,944	412,230
1973	221,398	31,440	252,838	594,780	717,233	3,124,497	4,436,510	140,310	263,551	403,861
1974	240,810	33,015	273,825	634,917	747,675	3,328,736	4,711,328	141,527	265,898	407,425
1975	237,786	36,373	274,159	691,799	793,799	3,217,765	4,703,363	158,094	296,544	454,638
1976	271,627	40,926	312,553	804,383	944,210	3,366,264	5,114,857	267,793	499,325	767,118
1977	293,967	45,194	339,161	772,070	922,952	3,307,194	5,002,216	278,436	519,848	798,284
1978	274,215	49,283	323,498	859,639	936,571	3,716,327	5,512,537	286,128	534,362	820,490
1979	289,831	53,452	343,283	954,434	1,010,263	3,822,782	5,787,479	284,981	532,477	817,458
1980	311,216	86,211	397,427	1,106,139	1,174,628	4,123,345	6,404,112	324,348	585,974	910,322
1981	347,612	113,019	460,631	1,211,289	1,350,002	4,512,434	7,073,725	352,866	635,235	988,101
1982	438,747	142,041	580,788	1,286,130	1,368,715	4,887,973	7,542,818	371,401	721,946	1,093,347
1983	355,129	163,576	518,705	1,163,073	1,261,921	4,948,092	7,373,086	397,776	740,101	1,137,877
1984	467,778	247,108	714,886	1,467,029	1,478,722	6,874,322	9,820,073	449,839	836,137	1,285,976
1985	736,783	386,960	1,123,743	1,964,348	2,229,232	7,808,026	12,001,606	545,338	1,010,945	1,556,283
1986	1,121,245	715,472	1,836,717	1,830,506	2,017,157	8,210,548	12,058,211	578,511	1,071,602	1,650,113
1987	1,774,460	1,584,948	3,359,408	2,321,461	2,504,489	7,981,570	12,807,520	613,104	1,174,697	1,787,801
1988	2,351,091	2,548,542	4,899,633	2,379,208	2,769,551	7,818,957	12,967,716	727,114	1,445,175	2,172,289
1989	2,522,218	3,697,177	6,219,395	2,342,677	2,494,646	7,509,575	12,346,898	839,752	1,799,724	2,639,476
1990	2,901,121	3,853,076	6,754,197	2,790,514	2,924,162	8,343,197	14,057,873	1,009,463	2,012,492	3,021,955
1991	2,941,493	4,035,595	6,977,088	2,066,433	2,391,369	6,446,641	10,904,443	1,068,392	2,293,009	3,361,401
1992	2,800,118	4,088,081	6,888,199	2,668,525	3,074,270	8,011,658	13,754,453	1,232,219	2,452,773	3,684,992
1993	2,843,126	4,158,293	7,001,419	3,423,388	3,023,160	8,956,291	15,402,839	1,338,454	2,603,038	3,941,492
1994	3,008,926	4,274,836	7,283,762	3,503,848	3,680,504	9,795,144	16,979,496	1,638,099	3,243,748	4,881,847
1995	3,236,526	5,099,554	8,336,080	4,420,037	4,075,704	10,286,169	18,781,910	2,732,219	5,654,607	8,386,826
1996	3,332,272	5,319,136	8,651,408	4,036,889	4,023,827	10,584,957	18,645,673	6,766,974	16,164,256	22,931,230
1997	3,382,695	5,397,368	8,780,063	4,217,169	4,104,501	10,792,997	19,114,667	8,958,112	23,879,643	32,837,755
1998	3,417,665	5,417,762	8,835,427	4,280,383	4,163,808	10,945,087	19,389,278	9,246,104	24,797,979	34,044,083
1999	3,451,710	5,457,373	8,909,083	4,332,347	4,211,008	11,057,768	19,601,123	9,675,864	24,702,837	34,378,701
2000	3,491,409	5,475,181	8,966,590	4,347,110	4,223,367	11,084,794	19,655,271	10,025,374	24,529,820	34,555,194
2001	3,509,831	5,485,631	8,995,462	4,339,258	4,202,322	11,025,792	19,567,372	10,105,686	24,743,957	34,849,643
2002	3,518,317	5,495,529	9,013,846	4,330,497	4,193,769	11,004,080	19,528,346	10,113,500	24,708,301	34,821,801
2003	3,521,849	5,493,243	9,015,092	4,274,442	4,142,546	10,882,038	19,299,026	10,110,659	24,553,918	34,664,577
2004	3,542,406	5,519,054	9,061,460	4,281,135	4,150,057	10,903,372	19,334,564	10,137,855	24,570,625	34,708,480
2005	3,537,317	5,494,193	9,031,510	4,182,869	4,060,414	10,690,117	18,933,400	10,057,966	24,375,330	34,433,296
2006	3,545,124	5,489,403	9,034,527	4,169,931	4,048,729	10,662,617	18,881,277	10,062,660	24,336,930	34,399,590
2007	3,555,991	5,486,336	9,042,327	4,159,333	4,039,161	10,640,116	18,838,610	10,067,280	24,304,889	34,372,169
2008	3,584,672	5,508,994	9,093,666	4,235,711	4,108,719	10,805,268	19,149,698	10,097,864	24,485,475	34,583,339
2009	3,595,219	5,505,282	9,100,501	4,223,732	4,097,876	10,779,698	19,101,306	10,103,487	24,448,324	34,551,811
2010	3,608,036	5,505,314	9,113,350	4,218,174	4,093,128	10,769,207	19,080,509	10,113,863	24,428,974	34,542,837
2011	3,620,935	5,501,329	9,122,264	4,208,312	4,084,123	10,747,775	19,040,210	10,121,316	24,394,390	34,515,706
2012	3,632,036	5,498,500	9,130,536	4,200,668	4,077,156	10,731,215	19,009,039	10,126,754	24,368,011	34,494,765
2013	3,615,950	5,444,727	9,060,677	3,928,340	3,824,096	10,014,138	17,766,574	10,102,150	23,941,516	34,043,666
2014	3,638,779	5,456,983	9,095,762	3,931,151	3,793,554	9,931,565	17,656,270	10,117,474	24,008,883	34,126,357
2015	3,642,437	5,439,305	9,081,742	3,836,798	3,653,160	9,440,177	16,930,135	10,101,607	23,852,661	33,954,268
2016	3,634,114	5,431,228	9,065,342	3,800,313	3,606,328	9,227,999	16,634,640	10,091,209	23,787,151	33,878,360
2017	3,622,413	5,427,265	9,049,678	3,756,596	3,564,831	9,087,140	16,408,567	10,070,074	23,724,171	33,794,245
2018	3,555,350	5,425,213	8,980,563	3,714,354	3,523,148	8,962,760	16,200,262	10,054,745	23,695,013	33,749,758
2019	3,525,903	5,425,591	8,951,494	3,677,430	3,489,007	8,864,549	16,030,986	10,053,092	23,692,696	33,745,788
2020	3,531,439	5,419,138	8,950,577	3,640,541	3,453,190	8,776,174	15,869,905	10,028,560	23,648,519	33,677,079
2021	3,532,729	5,420,965	8,953,694	3,640,316	3,452,798	8,776,226	15,869,340	10,030,891	23,653,540	33,684,431
2022	3,531,195	5,421,056	8,952,251	3,635,738	3,448,432	8,764,184	15,848,354	10,026,673	23,646,575	33,673,248
2023	3,564,716	5,448,350	9,013,066	3,676,570	3,492,860	8,886,070	16,055,500	10,098,806	23,815,906	33,914,712
2024	3,486,997	5,319,092	8,806,089	3,598,074	3,404,759	8,635,616	15,638,449	9,942,159	23,466,933	33,409,092
2025	3,349,499	5,095,796	8,445,295	3,430,760	3,225,052	8,141,886	14,797,698	9,676,376	22,800,882	32,477,258
2026	3,258,227	4,944,428	8,202,655	3,320,995	3,106,952	7,816,528	14,244,475	9,382,981	22,169,705	31,552,686
2027	3,255,611	4,940,604	8,196,215	3,320,898	3,106,679	7,814,500	14,242,077	9,381,988	22,166,948	31,548,936
2028	3,252,056	4,936,139	8,188,195	3,317,151	3,103,110	7,804,677	14,224,938	9,374,025	22,151,973	31,525,998
2029	3,248,721	4,932,240	8,180,961	3,314,521	3,100,658	7,797,939	14,213,118	9,372,859	22,149,564	31,522,423
2030	3,238,720	4,917,482	8,156,202	3,311,039	3,097,409	7,789,764	14,198,212	9,369,102	22,142,398	31,511,500
2031	3,225,563	4,898,233	8,123,796	3,305,542	3,092,312	7,777,195	14,175,049	9,361,154	22,127,521	31,488,675
2032	3,213,967	4,878,710	8,092,677	3,307,380	3,093,941	7,780,797	14,182,118	9,365,057	22,134,504	31,499,561
2033	3,185,526	4,833,574	8,019,100	3,304,520	3,091,284	7,774,228	14,170,032	9,364,768	22,133,944	31,498,712
2034	3,121,492	4,760,420	7,881,912	3,297,493	3,084,630	7,757,158	14,139,281	9,363,228	22,130,993	31,494,221
2035	2,991,951	4,620,714	7,612,665	3,291,753	3,079,323	7,743,695	14,114,771	9,363,722	22,131,758	31,495,480
TOTAL	169,232,569	247,371,053	416,603,622	198,384,357	196,052,320	538,500,989	932,937,666	406,455,393	969,475,687	1,375,931,080

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Total Transportation and Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
				Kern County Water Agency					
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Municipal and Industrial (14)	Agricultural (15)	County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,729	0	0	0	0	0	2,729
1965	0	0	6,040	73,706	0	0	0	0	79,746
1966	0	0	12,060	137,578	0	0	0	0	149,638
1967	0	0	26,303	268,087	0	0	0	0	294,390
1968	221,546	19,976	54,674	446,119	1,694,915	16,059	19,558	305,150	2,777,997
1969	237,717	12,722	87,677	525,877	2,698,987	15,695	19,286	450,601	4,048,562
1970	302,512	36,156	94,778	574,839	3,842,358	20,268	30,302	515,209	5,416,422
1971	323,404	38,885	95,799	606,768	5,151,483	25,983	34,576	706,073	6,982,971
1972	376,072	42,075	98,896	632,511	7,064,958	25,250	63,614	1,962,008	10,265,384
1973	393,427	40,768	97,657	1,026,793	7,208,494	27,598	39,150	774,209	9,608,096
1974	499,077	41,982	98,569	1,145,699	7,908,340	28,311	42,434	1,029,448	10,793,860
1975	669,828	42,428	106,811	1,198,073	9,271,775	29,987	48,046	1,540,028	12,906,976
1976	711,757	44,949	108,194	1,324,756	10,512,394	31,409	51,965	1,430,400	14,215,824
1977	572,151	40,866	112,664	1,368,326	10,817,306	33,160	54,083	1,126,844	14,125,400
1978	688,425	43,118	115,636	1,574,210	13,112,298	37,499	58,891	1,159,623	16,789,700
1979	771,783	49,695	114,369	1,669,531	15,191,672	41,691	70,445	1,711,671	19,620,857
1980	952,724	51,449	126,316	1,771,625	16,832,095	46,675	94,762	1,645,908	21,521,554
1981	1,201,960	85,894	134,338	2,432,763	22,417,157	65,150	100,583	2,270,323	28,708,168
1982	1,234,601	71,972	135,424	2,522,394	24,743,154	69,158	108,075	2,261,588	31,146,366
1983	1,169,523	54,350	149,534	2,085,515	24,398,036	73,911	88,817	504,958	28,524,644
1984	1,478,607	30,329	164,819	3,393,844	33,092,824	92,816	121,385	1,529,243	39,903,867
1985	1,768,834	132,428	187,363	3,921,975	39,396,259	116,849	140,427	2,833,919	48,498,054
1986	2,000,230	81,349	181,516	4,088,692	43,579,820	135,431	153,180	3,643,227	53,863,445
1987	1,875,828	97,273	180,375	4,577,406	42,503,884	136,178	151,539	3,736,408	53,258,891
1988	1,946,056	111,816	193,729	4,695,176	44,181,362	136,031	145,510	3,861,814	55,271,494
1989	2,098,104	102,936	187,565	4,651,511	46,312,236	134,823	164,872	4,335,451	57,987,498
1990	2,008,903	88,095	219,381	4,773,917	44,960,011	118,793	147,735	3,909,813	56,226,648
1991	1,698,022	82,019	218,004	4,670,465	37,029,894	102,447	134,566	3,480,140	47,415,557
1992	2,221,635	107,467	241,264	5,550,533	48,385,793	142,691	175,503	4,521,679	61,346,565
1993	2,469,336	122,795	264,380	5,848,097	54,925,388	163,731	196,859	5,315,587	69,306,173
1994	2,364,011	122,132	293,946	5,917,360	53,320,075	150,431	184,434	5,107,405	67,459,794
1995	3,073,683	126,124	335,993	7,525,841	66,954,151	196,406	234,875	6,522,902	84,969,975
1996	2,784,317	133,473	324,977	6,310,994	59,781,962	176,919	217,163	5,698,022	75,427,827
1997	2,849,446	136,891	335,723	6,541,483	61,021,392	181,560	221,503	5,831,507	77,119,505
1998	2,892,087	139,094	327,892	6,579,713	61,909,579	184,689	224,572	5,918,615	78,176,241
1999	2,913,119	140,195	328,753	6,635,800	62,351,982	186,190	225,909	5,961,782	78,743,730
2000	2,915,677	140,365	328,973	6,646,109	62,414,127	186,437	226,012	5,967,076	78,824,776
2001	2,898,047	139,546	329,007	6,584,192	63,591,491	185,364	224,601	5,931,104	79,883,352
2002	2,892,407	139,274	329,049	6,568,992	63,471,633	184,995	224,171	5,919,543	79,730,064
2003	2,866,134	137,908	329,088	6,494,796	62,908,063	183,172	222,397	5,865,574	79,007,132
2004	2,873,611	138,248	329,130	6,507,508	63,066,398	183,630	223,020	5,880,865	79,202,410
2005	2,824,909	135,712	328,968	6,381,264	62,018,331	180,258	219,759	5,780,867	77,870,068
2006	2,819,212	135,410	328,989	6,363,969	61,896,029	179,856	219,386	5,769,153	77,712,004
2007	2,814,686	135,169	329,011	6,350,028	61,798,822	179,538	219,087	5,759,852	77,586,193
2008	2,849,777	137,003	329,043	6,445,860	62,552,099	181,975	221,437	5,831,924	78,549,118
2009	2,844,523	136,725	329,067	6,429,738	62,439,192	181,608	221,093	5,821,125	78,403,071
2010	2,841,612	136,561	329,094	6,419,098	62,375,065	181,392	220,927	5,815,124	78,318,873
2011	2,836,927	136,318	329,125	6,404,700	62,274,945	181,063	220,611	5,805,503	78,189,192
2012	2,833,429	136,136	329,146	6,393,874	62,199,749	180,821	220,377	5,798,315	78,091,847
2013	2,758,107	132,222	329,212	6,183,345	60,583,590	175,595	215,301	5,643,618	76,020,990
2014	2,770,999	132,891	326,517	6,217,401	60,856,474	176,488	216,178	5,670,093	76,367,041
2015	2,750,014	131,791	323,226	6,083,920	60,409,643	175,023	214,772	5,626,982	75,715,371
2016	2,741,643	131,356	317,215	5,996,593	60,230,460	174,443	214,206	5,609,790	75,415,706
2017	2,736,475	131,078	302,970	5,851,108	60,118,861	174,077	213,877	5,599,163	75,127,609
2018	2,735,869	131,051	280,237	5,732,547	60,106,119	165,519	213,825	5,597,924	74,963,091
2019	2,737,053	131,106	271,757	5,675,101	60,131,227	165,087	213,922	5,600,346	74,925,599
2020	2,726,454	130,553	269,894	5,615,130	59,903,145	164,099	213,222	5,578,583	74,601,080
2021	2,728,205	130,638	268,790	5,597,060	59,940,639	164,069	213,355	5,582,173	74,624,929
2022	2,727,042	130,571	268,164	5,583,522	59,915,037	163,913	213,290	5,579,773	74,581,312
2023	2,768,610	132,466	267,740	5,663,274	60,794,339	166,461	216,714	5,664,815	75,674,419
2024	2,681,953	128,560	267,221	5,490,468	58,963,969	161,122	209,469	5,487,587	73,390,349
2025	2,522,739	121,255	266,657	5,159,806	55,594,205	151,173	196,469	5,161,794	69,174,098
2026	2,416,927	116,408	266,367	4,942,007	53,355,235	144,555	187,802	4,945,297	66,374,598
2027	2,417,645	116,444	265,729	4,940,825	53,370,693	144,561	187,852	4,946,770	66,390,519
2028	2,417,044	116,414	263,286	4,937,249	53,357,717	144,497	187,809	4,945,535	66,369,551
2029	2,417,483	116,436	262,974	4,935,262	53,367,211	144,465	187,841	4,946,441	66,378,113
2030	2,416,990	116,410	262,681	4,930,922	53,356,404	144,365	187,809	4,945,426	66,361,007
2031	2,417,237	116,423	261,096	4,913,144	53,361,720	143,989	187,825	4,945,932	66,347,366
2032	2,417,301	116,426	261,087	4,915,635	53,362,935	144,009	187,831	4,946,061	66,351,285
2033	2,416,071	116,364	260,789	4,907,874	53,336,683	143,795	187,745	4,943,541	66,312,862
2034	2,416,013	116,360	260,207	4,901,564	53,335,396	143,655	187,741	4,943,423	66,304,359
2035	2,416,849	116,403	259,481	4,894,619	53,354,087	143,478	187,791	4,945,137	66,317,845
TOTAL	143,434,399	7,115,702	16,425,135	315,126,481	3,106,683,767	8,932,336	11,290,143	289,403,784	3,898,411,747

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Total Transportation and Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area									
	Antelope Valley-East Kern Water Agency (20)	Castaic Lake Water Agency (21)	Coachella Valley Water District (22)	Crestline-Lake Arrowhead Water Agency (23)	Desert Water Agency (24)	Littlerock Creek Irrigation District (25)	Mojave Water Agency (26)	Palmdale Water District (27)	San Bernardino Valley Municipal Water District (28)	San Gabriel Valley Municipal Water District (29)
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,386	0	0	0	0	0	0	0	51,831	0
1964	62,984	27,499	14,455	4,378	37,231	1,145	28,492	8,221	82,967	35,056
1965	118,817	53,103	25,141	7,207	40,844	2,086	50,410	15,250	135,316	35,409
1966	216,165	101,445	44,811	12,501	73,283	3,761	90,562	27,728	232,920	61,574
1967	418,215	211,185	86,271	23,514	141,660	7,298	175,487	54,119	434,117	115,778
1968	737,186	491,935	152,937	41,577	251,605	12,891	311,202	95,618	783,447	209,268
1969	1,060,713	743,188	225,676	61,326	371,562	18,724	458,858	138,286	1,207,826	322,285
1970	1,379,247	943,435	315,780	89,846	520,168	25,270	633,048	185,137	1,781,147	468,350
1971	1,707,039	1,138,106	433,248	128,572	713,897	31,887	857,218	231,646	2,542,405	660,497
1972	2,184,808	1,383,069	604,224	186,102	991,249	43,823	1,178,770	288,018	3,763,364	951,557
1973	2,336,537	1,431,634	748,316	191,239	1,218,469	46,116	1,269,240	313,855	4,031,594	962,344
1974	2,456,976	1,527,157	771,824	204,329	1,258,369	48,991	1,327,790	332,113	4,468,962	1,106,417
1975	2,674,290	1,618,086	817,172	219,555	1,333,679	53,300	1,413,245	355,686	4,644,267	1,212,201
1976	3,138,545	1,654,744	874,217	232,397	1,426,413	57,790	1,489,297	381,696	4,843,949	1,283,630
1977	3,120,139	1,742,568	774,735	245,383	1,268,746	54,265	1,576,303	407,043	5,099,909	1,349,749
1978	3,566,485	1,875,197	973,557	255,697	1,568,984	56,858	1,623,064	420,452	5,097,517	1,378,764
1979	4,241,002	1,954,749	1,059,130	268,060	1,691,649	60,344	1,797,899	450,186	5,142,595	1,343,748
1980	4,926,098	2,094,227	1,168,509	295,642	1,892,309	67,665	1,969,514	499,495	5,653,477	1,486,658
1981	5,748,814	2,555,272	1,322,432	328,939	2,141,123	100,771	2,285,983	603,485	6,464,451	1,688,984
1982	5,504,789	2,724,882	1,408,996	346,876	2,283,133	82,365	2,260,024	642,481	6,758,421	1,929,670
1983	6,260,748	2,813,472	1,931,191	381,171	3,121,425	88,454	2,456,218	659,105	6,971,170	1,810,420
1984	7,632,670	3,912,115	3,031,322	497,999	4,877,317	96,544	2,724,595	728,200	8,060,592	2,600,333
1985	9,521,351	4,335,410	3,869,813	603,861	6,220,533	104,349	2,927,590	937,973	8,929,358	2,696,430
1986	9,440,428	4,979,889	4,327,386	648,568	6,960,309	130,457	3,092,487	1,225,618	9,160,547	3,403,655
1987	9,435,165	4,823,027	4,192,299	677,261	6,831,739	240,494	3,135,209	1,252,448	10,467,896	3,387,342
1988	9,077,275	5,022,202	4,257,381	706,407	7,012,096	159,217	3,335,285	1,046,779	11,085,210	3,276,683
1989	10,948,576	5,021,683	3,958,992	692,374	6,585,595	210,727	3,412,194	1,747,019	10,840,910	3,461,299
1990	12,288,434	5,466,259	4,636,411	728,224	7,646,212	330,115	3,629,704	1,947,174	11,736,559	4,220,566
1991	9,175,070	4,255,099	3,197,644	689,602	5,273,146	220,444	4,495,715	1,636,325	11,108,879	3,584,442
1992	11,755,290	5,800,466	3,364,306	581,931	5,547,910	175,192	5,491,047	1,533,725	11,239,352	3,722,683
1993	12,414,671	5,524,520	3,680,047	630,052	6,068,722	218,049	5,475,331	1,787,944	12,047,476	4,105,598
1994	15,692,292	6,585,933	3,832,077	832,231	6,319,241	303,458	7,218,949	2,282,343	13,199,730	5,057,431
1995	21,062,175	7,695,584	5,196,352	1,292,350	8,569,656	482,501	10,961,922	3,004,545	16,543,508	5,529,351
1996	21,697,369	7,258,366	3,972,522	927,499	6,551,008	368,595	9,641,912	2,759,733	18,347,871	4,669,434
1997	23,479,773	7,868,611	4,233,404	861,476	6,981,252	396,633	10,396,945	2,982,509	18,032,455	5,296,230
1998	23,816,620	8,117,908	4,319,160	903,957	7,122,714	404,931	10,602,167	3,033,605	18,266,227	5,651,181
1999	24,337,675	8,623,096	4,423,190	938,471	7,294,301	413,613	10,829,353	3,098,862	18,634,301	6,010,286
2000	24,506,337	8,757,861	4,471,808	1,238,809	7,374,501	416,407	10,894,892	3,119,945	19,112,152	6,118,276
2001	24,420,671	8,718,120	4,457,407	1,242,210	7,350,763	414,927	10,861,112	3,108,544	19,095,245	6,113,205
2002	24,359,685	8,694,123	4,428,416	1,229,831	7,302,941	413,909	10,842,596	3,100,354	18,659,943	6,028,558
2003	23,807,983	8,507,707	4,326,856	1,236,736	7,135,436	404,747	10,594,260	3,029,715	18,580,907	5,953,731
2004	23,833,594	8,521,854	4,333,562	1,248,742	7,146,496	405,207	10,608,446	3,032,626	18,625,056	5,970,934
2005	22,752,611	8,151,731	4,132,637	1,200,945	6,815,097	387,214	10,128,974	2,896,783	19,532,462	5,720,411
2006	22,619,449	8,114,056	4,111,247	1,210,260	6,779,819	385,005	10,071,166	2,879,623	19,597,108	5,715,701
2007	22,513,860	8,068,801	4,082,824	1,204,285	6,732,935	383,258	10,027,235	2,865,981	19,398,538	5,663,049
2008	23,275,337	8,337,881	4,239,783	1,244,445	6,991,817	395,912	10,359,472	2,962,616	19,952,128	5,856,492
2009	23,155,574	8,295,018	4,212,783	1,244,276	6,947,280	393,926	10,305,028	2,947,124	19,862,826	5,822,608
2010	23,046,739	8,255,391	4,197,221	1,244,167	6,921,608	392,130	10,258,961	2,933,111	20,498,675	5,802,841
2011	22,950,281	8,229,812	4,181,423	1,250,677	6,895,560	390,533	10,211,865	2,920,527	20,592,645	5,803,914
2012	22,874,123	8,198,871	4,169,771	1,255,776	6,876,349	389,267	10,182,352	2,910,610	20,650,348	5,802,569
2013	21,243,188	7,656,328	3,852,746	1,194,784	6,340,060	362,732	9,491,165	2,706,595	19,855,108	5,448,692
2014	21,436,066	7,711,124	3,888,861	1,170,107	6,413,641	365,284	9,120,604	2,726,668	20,162,419	5,529,916
2015	20,963,353	7,542,885	3,773,557	1,161,627	6,223,463	357,429	9,358,389	2,666,123	19,386,187	5,320,256
2016	20,693,624	7,435,863	3,739,011	1,174,930	6,166,492	352,890	9,231,913	2,631,579	19,684,725	5,348,275
2017	20,363,757	7,284,289	3,664,616	1,149,446	6,043,790	347,231	9,090,654	2,588,944	19,258,127	5,235,428
2018	20,107,564	7,073,998	3,613,749	1,139,192	5,959,903	342,686	8,980,037	2,555,318	19,045,452	5,172,874
2019	19,811,652	6,872,995	3,544,688	1,119,494	5,846,003	337,317	8,841,233	2,516,136	18,622,315	5,061,798
2020	19,272,480	6,628,940	3,416,136	1,084,492	5,633,994	327,101	8,571,160	2,441,688	17,939,761	4,878,402
2021	19,030,390	6,475,552	3,319,657	1,054,534	5,474,876	321,920	8,385,981	2,405,956	17,329,951	4,722,225
2022	18,859,577	6,342,994	3,241,765	1,016,529	5,346,406	318,804	8,261,783	2,383,345	16,546,909	4,546,114
2023	18,972,464	6,428,069	3,266,610	1,029,767	5,387,353	320,663	8,298,530	2,397,507	16,749,742	4,590,800
2024	18,741,122	6,220,477	3,206,574	1,009,587	5,288,410	316,494	8,181,736	2,367,184	16,296,117	4,482,653
2025	17,971,066	5,835,818	3,031,557	960,325	4,999,864	303,172	7,822,043	2,267,755	15,406,174	4,231,727
2026	17,490,812	5,561,814	2,925,507	936,574	4,825,035	294,814	7,584,366	2,205,871	14,914,479	4,089,799
2027	17,493,651	5,568,023	2,916,314	928,334	4,809,860	294,848	7,583,663	2,206,159	14,744,190	4,054,704
2028	17,470,619	5,533,849	2,913,309	932,405	4,804,909	294,442	7,560,665	2,203,179	14,819,575	4,065,838
2029	17,464,439	5,517,294	2,912,008	931,861	4,802,765	294,328	7,563,369	2,202,365	14,800,700	4,061,948
2030	17,434,936	5,466,325	2,903,551	927,984	4,788,823	293,836	7,548,104	2,198,691	14,732,884	4,046,199
2031	17,342,690	5,376,617	2,887,966	928,929	4,763,116	292,232	7,507,204	2,186,780	14,745,420	4,041,305
2032	17,347,513	5,344,801	2,895,646	935,086	4,775,786	292,310	7,517,882	2,187,369	14,848,037	4,062,523
2033	17,241,715	5,290,277	2,869,699	921,603	4,732,989	290,529	7,480,473	2,174,047	14,604,195	4,007,905
2034	17,134,481	5,261,753	2,841,744	907,476	4,686,880	288,726	7,437,656	2,160,539	14,347,906	3,948,838
2035	17,080,236	5,260,767	2,838,139	913,166	4,680,941	287,725	7,409,305	2,153,825	14,458,039	3,965,439
TOTAL	1,018,751,456	374,917,199	208,054,076	55,315,965	342,273,510	17,589,078	444,797,303	130,355,604	915,348,968	266,371,250

TABLE B-23

Total Transportation and Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area (continued)				Feather River Area				South Bay Area Future Contractor (38)	Grand Total (39)
	San Gorgonio Pass Water Agency (30)	Metropolitan Water District of Southern California (31)	Ventura County Flood Control District (32)	Total (33)	City of Yuba City (34)	County of Butte (35)	Plumas County FC&WCD (36)	Total (37)		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	55,537
1963	0	692,178	0	777,395	0	0	0	0	55,830	1,624,367
1964	21,778	1,262,872	9,395	1,596,473	0	0	0	0	84,105	2,781,924
1965	21,906	2,184,551	17,799	2,707,839	0	0	405	405	129,207	4,771,768
1966	38,033	3,907,132	33,486	4,843,401	0	0	565	565	148,564	7,340,281
1967	71,409	7,707,275	68,275	9,514,603	0	0	563	563	204,947	12,955,670
1968	129,125	15,343,056	143,036	18,702,883	0	1,050	1,440	2,490	279,651	25,315,851
1969	199,094	23,191,328	215,563	28,214,429	0	1,225	4,126	5,351	349,657	36,590,722
1970	290,113	30,667,864	274,055	37,573,460	0	3,848	17,142	20,990	386,754	48,041,026
1971	410,000	40,024,070	342,980	49,221,565	0	4,546	19,215	23,761	376,318	61,192,624
1972	537,970	55,067,909	422,922	67,603,785	0	4,929	21,181	26,110	401,833	83,398,264
1973	588,787	59,671,975	436,278	73,246,384	0	7,059	21,808	28,867	376,313	88,352,869
1974	612,269	66,092,789	456,213	80,664,199	0	8,336	22,438	30,774	399,290	97,280,701
1975	645,490	71,915,888	479,060	87,381,919	0	9,416	23,553	32,969	408,510	106,162,534
1976	669,204	74,994,764	476,252	91,522,898	0	7,004	23,287	30,291	431,101	112,394,642
1977	697,419	73,427,204	507,736	90,271,199	0	16,917	24,089	41,006	423,842	111,001,108
1978	709,955	82,023,789	523,862	100,074,181	0	12,635	24,255	36,890	427,091	123,984,387
1979	713,782	83,690,330	527,103	102,940,577	0	16,575	28,382	44,957	447,131	130,001,742
1980	863,215	93,128,621	584,361	114,629,791	0	19,834	26,592	46,426	507,956	144,417,588
1981	947,368	111,867,954	673,034	136,728,610	0	21,682	34,593	56,275	517,366	174,532,876
1982	1,022,415	117,184,755	728,559	142,877,366	0	16,117	43,028	59,145	513,727	183,813,557
1983	1,077,291	119,087,863	850,065	147,508,593	0	15,202	27,091	42,293	553,301	185,658,499
1984	1,212,767	157,270,273	933,482	193,578,209	20,590	15,442	28,704	64,736	562,035	245,929,782
1985	1,293,891	195,492,825	999,472	237,932,856	24,050	16,976	32,146	73,172	682,187	301,867,901
1986	1,347,674	218,586,845	1,060,002	264,363,865	31,753	18,145	33,434	83,332	620,812	334,476,495
1987	1,375,215	204,160,893	1,049,185	251,028,173	37,071	17,794	33,621	88,486	685,456	323,015,735
1988	1,471,247	221,883,870	1,126,457	269,460,109	48,058	19,117	35,691	102,866	708,702	345,582,809
1989	1,510,418	230,415,454	1,231,960	280,037,201	61,184	20,809	38,090	120,083	767,243	360,117,794
1990	1,628,217	276,267,268	1,847,224	332,372,367	66,041	20,855	38,742	125,638	818,654	413,377,332
1991	1,729,868	214,369,395	1,530,714	261,266,343	180,212	22,526	41,306	244,044	564,676	330,733,552
1992	1,795,812	245,837,794	1,502,031	298,347,539	208,216	26,028	45,674	279,918	908,173	385,209,839
1993	1,920,322	222,832,319	1,548,948	278,253,999	209,613	26,203	46,517	282,333	979,668	375,167,923
1994	1,975,944	281,746,055	2,486,808	347,532,492	205,650	25,707	47,435	278,792	977,152	445,393,335
1995	2,059,257	269,178,612	1,938,627	353,514,440	216,944	27,118	50,355	294,417	953,253	475,236,901
1996	2,335,636	338,930,875	2,959,807	420,420,627	235,634	29,455	56,131	321,220	956,170	547,354,155
1997	2,709,730	362,772,255	3,243,895	449,255,168	234,735	29,342	57,122	321,199	973,053	588,401,410
1998	2,794,391	369,313,645	3,323,811	457,670,317	234,579	29,323	58,111	322,013	962,392	599,399,751
1999	2,761,796	377,437,055	3,398,121	468,200,120	234,364	29,296	59,087	322,747	965,141	611,120,645
2000	2,851,799	381,077,008	3,424,092	473,363,887	233,703	29,213	60,168	323,084	965,480	616,654,282
2001	2,846,232	379,424,178	3,410,326	471,462,940	231,811	664,041	62,048	957,900	965,589	616,682,258
2002	2,788,675	377,611,803	3,400,290	468,861,124	231,430	662,948	63,180	957,558	965,718	613,878,457
2003	2,778,809	368,915,792	3,314,885	458,587,564	231,403	662,871	64,402	958,676	965,850	602,497,917
2004	2,784,161	369,448,862	3,319,097	459,278,637	232,366	665,630	65,875	963,871	965,986	603,515,408
2005	2,823,297	352,233,736	3,149,419	439,925,317	232,426	665,804	67,120	965,350	965,463	582,124,404
2006	2,829,813	350,508,119	3,131,026	437,952,392	232,513	666,052	68,576	967,141	965,534	579,912,465
2007	2,802,654	348,046,004	3,111,627	434,901,051	232,589	666,269	70,028	968,886	965,600	576,674,836
2008	2,867,760	361,162,320	3,233,499	450,879,462	232,461	665,902	71,429	969,792	965,706	594,190,781
2009	2,854,290	359,053,250	3,214,104	448,308,087	232,528	666,093	72,880	971,501	965,785	591,402,062
2010	2,959,852	357,434,222	3,195,790	447,140,708	232,753	666,739	74,371	973,863	965,876	590,136,016
2011	2,969,668	356,166,587	3,183,035	445,746,527	232,753	666,738	76,010	975,501	965,978	588,555,378
2012	2,975,283	354,916,097	3,169,626	444,371,042	232,760	666,759	77,649	977,168	966,052	587,040,449
2013	2,871,296	327,994,331	2,921,574	411,938,599	232,747	666,722	79,489	978,958	923,057	550,732,521
2014	2,909,094	331,753,707	2,947,775	416,135,266	232,745	666,717	81,333	980,795	896,221	555,257,712
2015	2,987,316	322,490,036	2,874,908	405,105,529	232,899	667,156	83,015	983,070	866,159	542,636,274
2016	3,022,640	319,223,926	2,832,551	401,538,419	232,872	667,081	84,896	984,849	849,226	538,366,542
2017	2,960,945	313,162,755	2,778,052	393,928,034	233,013	667,484	84,934	985,431	809,232	530,102,796
2018	2,922,749	306,425,904	2,712,368	386,051,794	232,942	667,282	84,914	985,138	733,754	521,664,360
2019	2,853,806	299,011,359	2,644,043	377,082,839	233,070	667,648	82,315	983,033	669,768	512,389,507
2020	2,932,057	288,021,054	2,549,390	363,696,655	233,157	667,897	70,388	971,442	649,284	498,416,022
2021	2,873,232	280,535,853	2,495,920	354,426,047	233,288	668,271	69,593	971,152	645,519	489,175,112
2022	2,761,643	271,690,748	2,448,640	343,765,257	233,410	668,621	68,236	970,267	644,849	478,435,538
2023	2,789,924	273,511,408	2,477,206	346,220,043	238,394	682,899	69,503	990,796	644,189	482,512,725
2024	2,715,294	266,198,304	2,417,988	337,441,940	227,151	650,692	66,642	944,485	643,779	470,274,183
2025	2,575,484	251,067,427	2,287,908	318,760,320	208,923	598,476	62,002	869,401	642,322	445,166,392
2026	2,489,560	240,181,520	2,197,020	305,697,171	196,610	563,206	58,869	818,685	641,826	427,532,096
2027	2,466,729	240,361,798	2,199,472	305,627,745	196,610	563,206	58,866	818,682	640,996	427,465,170
2028	2,474,570	238,925,175	2,188,402	304,186,937	196,610	563,206	58,865	818,681	639,907	425,954,207
2029	2,472,009	238,776,648	2,182,305	303,982,039	196,610	563,206	58,863	818,679	638,441	425,733,774
2030	2,462,082	237,017,542	2,163,266	301,984,223	196,610	563,206	58,862	818,678	637,071	423,666,893
2031	2,459,909	234,445,425	2,130,981	299,108,574	196,610	563,206	58,860	818,676	634,062	420,696,198
2032	2,473,630	233,942,126	2,119,338	298,742,047	196,610	563,206	58,858	818,674	634,408	420,320,770
2033	2,438,883	231,168,505	2,098,568	295,319,388	196,610	563,206	58,858	818,674	633,683	416,772,451
2034	2,401,464	229,841,623	2,088,461	293,347,547	196,610	563,206	58,857	818,673	630,088	414,616,081
2035	2,412,977	229,245,446	2,088,553	292,794,558	196,610	563,206	58,856	818,672	625,857	413,779,848
TOTAL	139,048,394	16,240,620,198	136,052,083	20,289,495,084	10,240,901	22,794,576	3,535,529	36,571,006	49,035,576	26,998,985,781

TABLE B-24

Equivalent Unit Charge for Water Supply for Each Contractor (a

(Dollars per Acre-Foot)

Project Service Area and Water Supply Contractor	Transportation Charge					Delta Water Charge (6)	Water System Revenue Bond Surcharge (7)	Total Equivalent Unit Charge (8)
	Capital Cost Component (1)	Minimum OMP&R Component (2)	Off-Aqueduct Component (3)	Variable OMP&R Component (4)	Total (5)			
FEATHER RIVER AREA								
City of Yuba City	0.00	0.00	0.00	0.00	0.00	30.10	3.82	33.92
County of Butte	0.00	0.00	0.00	0.00	0.00	12.76	1.62	14.38
Plumas County Flood Control and Water Conservation District	17.63	2.28	0.00	0.00	19.91	19.91	6.84	46.66
Feather River Area	1.23	0.16	0.00	0.00	1.39	16.48	2.39	20.26
NORTH BAY AREA								
Napa County Flood Control and Water Conservation District	115.06	36.20	3.68	7.30	162.24	13.91	29.89	206.04
Solano County Water Agency	84.95	29.61	3.46	5.76	123.78	21.26	23.46	168.50
North Bay Area	96.61	32.16	3.55	6.36	138.68	18.42	25.95	183.05
SOUTH BAY AREA								
Alameda County Flood Control and Water Conservation District, Zone 7	17.37	28.10	8.34	15.59	69.40	20.51	6.85	96.76
Alameda County Water District	19.16	23.41	6.77	13.27	62.61	18.24	7.00	87.85
Santa Clara Valley Water District	18.00	17.50	6.14	10.75	52.39	13.93	6.17	72.49
South Bay Area	18.11	20.20	6.60	11.96	56.87	15.73	6.42	79.02
SAN JOAQUIN VALLEY AREA								
County of Kings	4.21	3.79	3.40	5.25	16.65	17.09	3.20	36.94
Dudley Ridge Water District	4.94	4.39	2.76	4.73	16.82	15.06	3.12	35.00
Empire West Side Irrigation District	2.67	3.62	2.26	4.35	12.90	15.50	2.62	31.02
Kern County Water Agency	8.93	8.92	4.25	6.58	28.68	17.50	4.40	50.58
Oak Flat Water District	2.17	2.38	1.98	3.39	9.92	16.06	2.57	28.55
Tulare Lake Basin Water Storage District	5.16	4.61	2.74	4.89	17.40	15.65	3.25	36.30
San Joaquin Valley Area	8.28	8.19	4.00	6.29	26.76	17.17	4.20	48.13
CENTRAL COASTAL AREA								
San Luis Obispo County Flood Control and Water Conservation District	338.22	73.10	3.46	42.91	457.69	36.78	87.35	581.82
Santa Barbara County Flood Control and Water Conservation District	410.60	70.03	15.10	42.93	538.66	32.48	104.49	675.63
Central Coastal Area	386.93	71.03	11.29	42.92	512.17	33.89	98.89	644.95
SOUTHERN CALIFORNIA AREA								
Antelope Valley-East Kern Water Agency	35.10	30.76	25.03	54.60	145.49	23.54	11.57	180.60
Castaic Lake Water Agency	47.88	34.46	21.52	18.47	122.33	21.78	14.47	158.58
Coachella Valley Water District	42.78	36.02	41.72	37.36	157.88	18.73	12.83	189.44
Crestline-Lake Arrowhead Water Agency	83.02	62.54	25.47	63.78	234.81	29.54	24.04	288.39
Desert Water Agency	43.48	36.61	41.98	37.64	159.71	18.81	13.02	191.54
Littlerock Creek Irrigation District	41.87	35.49	28.24	58.52	164.12	27.29	13.70	205.11
Mojave Water Agency	71.49	62.07	28.36	74.15	236.07	34.88	21.90	292.85
Palmdale Water District	46.69	39.84	30.87	64.22	181.62	33.06	15.61	230.29
San Bernardino Valley Municipal Water District	119.44	88.50	19.70	43.08	270.72	38.53	34.09	343.34
San Gabriel Valley Municipal Water District	81.82	62.16	31.92	37.77	213.67	28.02	23.56	265.25
San Gorgonio Pass Water Agency	220.70	166.93	15.31	55.47	458.41	63.07	61.95	583.43
The Metropolitan Water District of Southern California	64.21	45.18	31.68	29.47	170.54	24.68	18.83	214.05
Ventura County Flood Control District	77.15	54.63	23.52	45.97	201.27	29.65	22.62	253.54
Southern California Area	63.78	45.85	30.90	32.36	172.89	25.11	18.78	216.78
ALL AREAS	40.55	28.50	17.63	19.94	106.62	21.18	12.60	140.40

a) Hypothetical charges, which, if assessed on all entitlement water delivered to date, all surplus water delivered prior to May 1, 1973, and all entitlement water now estimated to be delivered during the remainder of the project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charge and Delta Water Charge payments required under a water supply contract, considering interest at the Project Interest Rate, 4.621 percent per annum.

TABLE B-25

Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach (a

(Dollars per Acre-Foot)

Aqueduct Reach	Unit Costs of Reach (b Capital Costs (1)	Water System Revenue Bond Surcharge (c (2)	Minimum OMP&R (3)	Off-Aqueduct Costs (4)	Variable OMP&R (5)	Total (6)	Cumulative Unit Costs from the Delta Capital Costs (7)	Water System Revenue Bond Surcharge (c (8)	Minimum OMP&R (9)	Off-Aqueduct Costs (10)	Variable OMP&R (11)	Total (12)
North Bay Aqueduct												
1	43.91	10.73	12.99	1.88	2.43	71.94	43.91	10.73	12.99	1.88	2.43	71.94
2	48.35	11.82	5.80	0.00	0.00	65.97	92.26	22.55	18.79	1.88	2.43	137.91
3A	10.16	2.48	13.72	4.12	4.06	34.54	102.42	25.03	32.51	6.00	6.49	172.45
3B	47.47	11.60	23.09	4.65	5.32	92.13	139.73	34.15	41.88	6.53	7.75	230.04
South Bay Aqueduct												
1	6.23	1.52	12.93	10.24	8.74	39.66	7.97	1.95	15.50	13.47	12.94	51.83
2	0.59	0.14	1.52	0.00	0.00	2.25	8.56	2.09	17.02	13.47	12.94	54.08
4	1.97	0.48	2.44	0.00	0.00	4.89	10.53	2.57	19.46	13.47	12.94	58.97
5	4.31	1.05	1.94	0.00	0.00	7.30	14.84	3.62	21.40	13.47	12.94	66.27
6	0.24	0.06	0.22	0.00	0.00	0.52	15.08	3.68	21.62	13.47	12.94	66.79
7	1.91	0.47	0.38	0.00	0.00	2.76	16.99	4.15	22.00	13.47	12.94	69.55
8	2.59	0.63	0.43	0.00	0.00	3.65	19.58	4.78	22.43	13.47	12.94	73.20
9	5.35	1.31	2.22	0.00	0.00	8.88	24.93	6.09	24.65	13.47	12.94	82.08
California Aqueduct												
1	1.74	0.43	2.57	3.23	4.20	12.17	1.74	0.43	2.57	3.23	4.20	12.17
2A	1.11	0.27	0.50	0.00	0.00	1.88	2.85	0.70	3.07	3.23	4.20	14.05
2B	0.56	0.14	0.21	0.00	0.00	0.91	3.41	0.84	3.28	3.23	4.20	14.96
3	0.49	0.12	0.18	0.00	0.00	0.79	3.90	0.96	3.46	3.23	4.20	15.75
4	0.77	0.19	1.23	1.50	1.93	5.62	4.67	1.15	4.69	4.73	6.13	21.37
5	0.60	0.15	0.25	0.00	0.00	1.00	5.27	1.30	4.94	4.73	6.13	22.37
6	0.16	0.04	0.12	0.00	0.00	0.32	5.43	1.34	5.06	4.73	6.13	22.69
7	0.67	0.16	0.30	0.00	0.00	1.13	6.10	1.50	5.36	4.73	6.13	23.82
8C	0.02	0.00	0.07	0.00	0.00	0.09	6.12	1.50	5.43	4.73	6.13	23.91
8D	0.35	0.09	0.23	0.00	0.00	0.67	6.47	1.59	5.66	4.73	6.13	24.58
9	0.28	0.07	0.21	0.00	0.00	0.56	6.75	1.66	5.87	4.73	6.13	25.14
10A	0.30	0.07	0.25	0.00	0.00	0.62	7.05	1.73	6.12	4.73	6.13	25.76
11B	0.44	0.11	0.20	0.00	0.00	0.75	7.49	1.84	6.32	4.73	6.13	26.51
12D	0.42	0.10	0.19	0.00	0.00	0.71	7.91	1.94	6.51	4.73	6.13	27.22
12E	0.28	0.07	0.26	0.00	0.00	0.61	8.19	2.01	6.77	4.73	6.13	27.83
13B	0.63	0.15	0.27	0.00	0.00	1.05	8.82	2.16	7.04	4.73	6.13	28.88
14A	2.38	0.58	2.42	2.56	3.50	11.44	11.20	2.74	9.46	7.29	9.63	40.32
14B	0.37	0.09	0.30	0.00	0.00	0.76	11.57	2.83	9.76	7.29	9.63	41.08
14C	0.32	0.08	0.24	0.00	0.00	0.64	11.89	2.91	10.00	7.29	9.63	41.72
15A	1.73	0.42	2.54	3.09	4.31	12.09	13.62	3.33	12.54	10.38	13.94	53.81
16A	2.87	0.70	3.89	6.68	9.21	23.35	16.49	4.03	16.43	17.06	23.15	77.16
17E	9.76	2.39	10.79	23.32	32.47	78.73	26.25	6.42	27.22	40.38	55.62	155.89
17F	2.56	0.63	0.12	0.00	0.00	3.31	28.81	7.05	27.34	40.38	55.62	159.20
18A	2.44	0.60	1.49	0.00	-2.63	1.90	31.25	7.65	28.83	40.38	52.99	161.10
19	1.79	0.44	0.93	0.00	0.00	3.16	33.04	8.09	29.76	40.38	52.99	164.26
19C	0.00	0.00	0.00	0.00	0.00	0.00	33.04	8.09	29.76	40.38	52.99	164.26
20A	1.48	0.36	1.02	0.00	0.00	2.86	34.52	8.45	30.78	40.38	52.99	167.12
20B	1.74	0.43	0.79	0.00	0.00	2.96	36.26	8.88	31.57	40.38	52.99	170.08
21	0.86	0.21	0.62	0.00	0.00	1.69	37.12	9.09	32.19	40.38	52.99	171.77
22A	0.89	0.22	0.42	0.00	0.00	1.53	38.01	9.31	32.61	40.38	52.99	173.30
22B	8.81	2.15	8.45	7.28	10.05	36.74	46.82	11.46	41.06	47.66	63.04	210.04
23	2.20	0.54	0.40	0.00	-3.25	(0.11)	49.02	12.00	41.46	47.66	59.79	209.93
24	4.65	1.14	1.75	0.00	0.00	7.54	53.67	13.14	43.21	47.66	59.79	217.47
25	3.56	0.87	0.12	0.00	0.00	4.55	57.23	14.01	43.33	47.66	59.79	222.02
26A	3.78	0.92	4.95	0.00	-24.28	(14.63)	61.01	14.93	48.28	47.66	35.51	207.39
28G	6.10	1.49	1.73	0.00	0.00	9.32	67.11	16.42	50.01	47.66	35.51	216.71
28H	5.88	1.44	2.04	0.00	0.00	9.36	72.99	17.86	52.05	47.66	35.51	226.07
28J	74.70	18.26	35.69	0.00	0.00	128.65	147.69	36.12	87.74	47.66	35.51	354.72
West Branch												
29A	2.98	0.73	5.52	2.98	4.40	16.61	31.79	7.78	32.86	43.36	60.02	175.81
29F	2.18	0.53	0.66	0.00	0.00	3.37	33.97	8.31	33.52	43.36	60.02	179.18
29G	7.36	1.80	3.07	0.00	-12.57	(0.34)	41.33	10.11	36.59	43.36	47.45	178.84
29H	4.60	1.12	2.98	0.00	0.00	8.70	45.93	11.23	39.57	43.36	47.45	187.54
29J	7.78	1.90	0.79	0.00	-23.12	(12.65)	53.71	13.13	40.36	43.36	24.33	174.89
30	12.42	3.04	2.26	0.00	0.00	17.72	66.13	16.17	42.62	43.36	24.33	192.61
Coastal Branch												
31A	6.53	1.60	15.98	3.06	2.83	30.00	13.00	3.19	21.64	7.79	8.96	54.58
33A	192.67	47.10	25.16	15.62	28.84	309.39	205.67	50.29	46.80	23.41	37.80	363.97
34	119.82	29.29	0.83	0.00	0.00	149.94	325.49	79.58	47.63	23.41	37.80	513.91
35	66.65	16.29	0.66	0.00	0.00	83.60	392.14	95.87	48.29	23.41	37.80	597.51

a) Representative of transportation unit costs only; does not include a unit cost of conservation. The Delta Water Rate should be added to these values in order to approximate unit costs at canal side. Includes surplus water prior to May 1, 1973.

b) Hypothetical charges which, if assessed on all entitlement water delivered to date, all surplus water delivered prior to May 1, 1973, and all entitlement water now estimated to be delivered during the remainder of the Project repayment period(Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charges required under the water supply contract considering interest rate at the Project Interest Rate of 4.621 percent per annum.

c) The Water System Revenue Bond Surcharge equivalent unit rate is calculated by dividing the WSRB surcharge for 1996 (from 132-95, Table B-22) by the total Transportation Capital (132-95, B-15) and the Capital component of the Delta Water Charge (132-95, B-4 * 10.63334806). This rate is multiplied by the equivalent rate for the Transportation Capital cost (column 1).

TABLE B-26

Capital Costs of Each Aqueduct Reach to Be Reimbursed through the Capital Cost Component of the East Branch Enlargement Transportation Charge

(Dollars)

Calendar Year	California Aqueduct							
	Mojave Division							
	Reach 18A (1)	Reach 19 (2)	Reach 20A (3)	Reach 20B (4)	Reach 21 (5)	Reach 22A (6)	Reach 22B (7)	Reach 23B (8)
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	117,000	0	0	0	0	0	0	0
1980	200,000	0	0	0	0	0	0	74,000
1981	135,000	0	0	0	0	0	0	385,000
1982	1,503,000	0	0	0	0	0	0	1,586,000
1983	2,260,000	0	0	0	0	0	0	2,965,000
1984	735,000	0	0	0	0	0	796,000	1,380,000
1985	93,000	435,000	75,000	544,000	859,000	703,000	966,000	146,000
1986	784,000	4,477,000	3,144,000	2,234,000	1,569,000	1,203,000	1,797,000	34,000
1987	11,000	951,000	1,076,000	666,000	399,000	47,000	16,402,000	43,000
1988	1,000	125,000	1,681,000	1,730,000	2,024,000	40,000	13,306,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,231,000	229,000
1990	1,000	577,000	903,000	735,000	928,000	194,000	20,132,000	887,000
1991	1,000	280,000	413,000	333,000	422,000	93,000	20,702,000	1,215,000
1992	0	40,000	41,000	39,000	35,000	13,000	9,599,000	3,719,000
1993	0	19,000	16,000	19,000	12,000	6,000	2,319,000	19,654,000
1994	0	2,000	3,000	2,000	4,000	3,000	1,469,000	3,173,000
1995	0	0	0	0	0	0	1,023,000	2,748,000
1996	0	0	0	0	0	0	800,000	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	5,841,000	7,112,000	9,441,000	8,476,000	8,762,000	2,363,000	100,542,000	38,308,000

TABLE B-26

Capital Costs of Each Aqueduct Reach to Be Reimbursed through the Capital Cost Component of the East Branch Enlargement Transportation Charge

(Dollars)

Calendar Year	California Aqueduct (continued)							Grand Total (16)
	Mojave Division (continued)			Santa Ana Division				
	Reach 23C (9)	Reach 24 (10)	Total (11)	Reach 25 (12)	Reach 26A (13)	Reach 26B (14)	Total (15)	
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	117,000	0	0	0	0	117,000
1980	0	0	274,000	0	0	0	0	274,000
1981	0	0	520,000	0	0	0	0	520,000
1982	0	0	3,089,000	0	0	0	0	3,089,000
1983	0	0	5,225,000	0	0	0	0	5,225,000
1984	0	0	2,911,000	0	0	0	0	2,911,000
1985	0	0	3,821,000	0	528,000	89,000	617,000	4,438,000
1986	25,000	0	15,267,000	0	1,926,000	154,000	2,080,000	17,347,000
1987	178,000	0	19,773,000	0	3,699,000	437,000	4,136,000	23,909,000
1988	632,000	0	19,609,000	0	5,350,000	3,329,000	8,679,000	28,288,000
1989	1,130,000	0	19,630,000	0	40,512,000	1,650,000	42,162,000	61,792,000
1990	2,066,000	0	26,423,000	0	29,456,000	1,650,000	31,106,000	57,529,000
1991	4,980,000	0	28,439,000	0	26,027,000	999,000	27,026,000	55,465,000
1992	11,920,000	0	25,406,000	0	16,397,000	299,000	16,696,000	42,102,000
1993	16,303,000	0	38,348,000	0	4,878,000	0	4,878,000	43,226,000
1994	7,081,000	0	11,737,000	0	3,151,000	0	3,151,000	14,888,000
1995	4,350,000	0	8,121,000	0	2,391,000	0	2,391,000	10,512,000
1996	0	0	800,000	0	0	0	0	800,000
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	48,665,000	0	229,510,000	0	134,315,000	8,607,000	142,922,000	372,432,000

TABLE B-27

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge (a

(Dollars)

Calendar Year	California Aqueduct / Mojave Division							
	Reach 18A (1)	Reach 19 (2)	Reach 20A (3)	Reach 20B (4)	Reach 21 (5)	Reach 22A (6)	Reach 22B (7)	Reach 23B (8)
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	605,500	0
1995	0	0	0	0	0	0	1,225,090	0
1996	0	0	0	0	0	0	1,217,840	0
1997	0	0	0	0	0	0	1,251,121	0
1998	0	0	0	0	0	0	1,269,749	0
1999	0	0	0	0	0	0	1,269,749	0
2000	0	0	0	0	0	0	1,269,749	0
2001	0	0	0	0	0	0	1,269,749	0
2002	0	0	0	0	0	0	1,269,749	0
2003	0	0	0	0	0	0	1,269,749	0
2004	0	0	0	0	0	0	1,269,749	0
2005	0	0	0	0	0	0	1,269,749	0
2006	0	0	0	0	0	0	1,269,749	0
2007	0	0	0	0	0	0	1,269,749	0
2008	0	0	0	0	0	0	1,269,749	0
2009	0	0	0	0	0	0	1,269,749	0
2010	0	0	0	0	0	0	1,269,749	0
2011	0	0	0	0	0	0	1,269,749	0
2012	0	0	0	0	0	0	1,269,749	0
2013	0	0	0	0	0	0	1,269,749	0
2014	0	0	0	0	0	0	1,269,749	0
2015	0	0	0	0	0	0	1,269,749	0
2016	0	0	0	0	0	0	1,269,749	0
2017	0	0	0	0	0	0	1,269,749	0
2018	0	0	0	0	0	0	1,269,749	0
2019	0	0	0	0	0	0	1,269,749	0
2020	0	0	0	0	0	0	1,269,749	0
2021	0	0	0	0	0	0	1,269,749	0
2022	0	0	0	0	0	0	1,269,749	0
2023	0	0	0	0	0	0	1,269,749	0
2024	0	0	0	0	0	0	1,269,749	0
2025	0	0	0	0	0	0	1,269,749	0
2026	0	0	0	0	0	0	1,269,749	0
2027	0	0	0	0	0	0	1,269,749	0
2028	0	0	0	0	0	0	1,269,749	0
2029	0	0	0	0	0	0	1,269,749	0
2030	0	0	0	0	0	0	1,269,749	0
2031	0	0	0	0	0	0	1,269,749	0
2032	0	0	0	0	0	0	1,269,749	0
2033	0	0	0	0	0	0	1,269,749	0
2034	0	0	0	0	0	0	1,269,749	0
2035	0	0	0	0	0	0	1,269,749	0
TOTAL	0	0	0	0	0	0	52,550,013	0

a)Presently, this table shows only the estimated incremental minimum OMP&R costs attributable to East Branch Enlargement. Under Article 49(e)(1), the contractors participating in the East Branch Enlargement will also share in the remaining minimum OMP&R costs of the affected reaches according to a formula to be developed by DWR in consultation with the affected contractors. Once the formula is developed, subsequent versions of this table will reflect the transfer of a share of the minimum OMP&R costs presently shown in Table B-11.

TABLE B-27

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge (a

(Dollars)

Calendar Year	California Aqueduct (continued)							Total (16)
	Mojave Division (continued)			Santa Ana Division				
	Reach 23C (9)	Reach 24 (10)	Subtotal (11)	Reach 25 (12)	Reach 26A (13)	Reach 26B (14)	Subtotal (15)	
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	605,500	0	588,000	0	588,000	1,193,500
1995	374,781	0	1,599,871	0	1,273,742	0	1,273,742	2,873,613
1996	718,178	0	1,936,018	0	1,265,019	0	1,265,019	3,201,037
1997	887,197	0	2,138,318	0	1,260,554	0	1,260,554	3,398,872
1998	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
1999	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2000	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2001	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2002	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2003	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2004	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2005	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2006	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2007	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2008	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2009	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2010	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2011	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2012	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2013	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2014	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2015	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2016	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2017	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2018	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2019	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2020	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2021	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2022	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2023	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2024	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2025	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2026	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2027	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2028	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2029	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2030	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2031	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2032	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2033	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2034	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
2035	900,407	0	2,170,156	0	1,326,571	0	1,326,571	3,496,727
TOTAL	36,195,622	0	88,745,635	0	54,797,013	0	54,797,013	143,542,648

TABLE B-28

Capital Costs of East Branch Enlargement Transportation Facilities Allocated to Each Contractor

(Dollars)

Calendar Year	Southern California Area							
	Antelope Valley-East Kern Water Agency (1)	*Coachella Valley Water District (2)*	*Desert Water Agency (3)*	*Mojave Water Agency (4)*	*Palmdale Water District (5)*	*San Bernardino Valley Municipal Water District (6)*	*Metropolitan Water District of Southern California (7)*	*Total (8)*
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	11,731	1,010	10,566	466	0	93,227	117,000
1980	0	28,241	4,708	27,495	797	0	212,759	274,000
1981	0	56,134	16,676	61,271	538	0	385,381	520,000
1982	0	326,180	76,872	337,913	5,988	0	2,342,047	3,089,000
1983	0	554,658	138,964	582,070	9,004	0	3,940,304	5,225,000
1984	0	306,514	68,842	314,468	2,928	0	2,218,248	2,911,000
1985	49,675	446,863	65,738	346,899	4,514	21,614	3,502,697	4,438,000
1986	185,353	1,756,526	236,229	1,362,589	41,900	78,842	13,685,561	17,347,000
1987	49,735	2,453,366	378,370	1,772,725	10,615	151,421	19,092,768	23,909,000
1988	124,534	2,648,192	483,196	1,710,618	13,783	219,006	23,088,671	28,288,000
1989	155,446	7,070,963	2,403,112	1,670,091	17,419	1,658,386	48,816,583	61,792,000
1990	62,786	6,409,543	1,922,516	2,234,542	8,680	1,205,801	45,685,132	57,529,000
1991	28,686	6,265,822	1,875,066	2,168,712	4,024	1,065,433	44,057,257	55,465,000
1992	2,911	4,962,202	1,669,167	1,359,335	471	671,222	33,436,692	42,102,000
1993	1,205	5,094,237	1,828,410	2,722,156	212	199,684	33,380,096	43,226,000
1994	273	1,793,420	637,588	538,927	27	128,988	11,788,777	14,888,000
1995	0	1,258,496	449,390	443,068	0	97,877	8,263,169	10,512,000
1996	0	80,533	6,933	72,533	0	0	640,001	800,000
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	660,604	41,523,621	12,262,787	17,735,978	121,366	5,498,274	294,629,370	372,432,000

TABLE B-29

Capital Cost Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area							
	Antelope Valley-East Kern Water Agency (1)	*Coachella Valley Water District (2)*	*Desert Water Agency (3)*	*Mojave Water Agency (4)*	*Palmdale Water District (5)*	*San Bernardino Valley Municipal Water District (a (6)*	*Metropolitan Water District of Southern California (7)*	*Total (8)*
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	19,167	1,204,788	355,799	514,601	3,521	0	8,548,534	10,646,410
1989	20,142	1,266,061	373,894	540,772	3,700	0	8,983,290	11,187,859
1990	20,137	1,265,767	373,807	540,647	3,700	0	8,981,206	11,185,264
1991	20,133	1,265,530	373,737	540,545	3,699	0	8,979,520	11,183,164
1992	42,394	2,664,759	786,959	1,138,198	7,789	0	18,907,701	23,547,800
1993	44,049	2,768,754	817,670	1,182,617	8,093	0	19,645,597	24,466,780
1994	43,827	2,754,850	813,564	1,176,678	8,052	0	19,546,939	24,343,910
1995	57,335	3,603,889	1,064,303	1,539,328	10,534	0	25,571,266	31,846,655
1996	61,313	3,853,938	1,138,148	1,646,132	11,264	0	27,345,479	34,056,274
1997	62,916	3,954,704	1,167,906	1,689,172	11,559	0	28,060,459	34,946,716
1998	62,837	3,949,710	1,166,431	1,687,039	11,544	0	28,025,027	34,902,588
1999	62,721	3,942,469	1,164,293	1,683,946	11,523	0	27,973,651	34,838,603
2000	64,466	4,052,129	1,196,678	1,730,785	11,844	0	28,751,732	35,807,634
2001	64,551	4,057,483	1,198,259	1,733,072	11,859	0	28,789,722	35,854,946
2002	64,036	4,025,113	1,188,699	1,719,246	11,765	0	28,560,047	35,568,906
2003	64,081	4,027,959	1,189,540	1,720,461	11,773	0	28,580,241	35,594,055
2004	61,593	3,871,544	1,143,347	1,653,652	11,316	0	27,470,401	34,211,853
2005	61,657	3,875,579	1,144,539	1,655,375	11,328	0	27,499,033	34,247,511
2006	61,755	3,881,709	1,146,349	1,657,994	11,346	0	27,542,527	34,301,680
2007	61,871	3,888,995	1,148,501	1,661,106	11,367	0	27,594,224	34,366,064
2008	61,870	3,888,965	1,148,492	1,661,093	11,367	0	27,594,011	34,365,798
2009	61,961	3,894,677	1,150,179	1,663,533	11,384	0	27,634,541	34,416,275
2010	62,193	3,909,273	1,154,489	1,669,767	11,426	0	27,738,107	34,545,255
2011	62,270	3,914,118	1,155,920	1,671,837	11,440	0	27,772,486	34,588,071
2012	62,346	3,918,873	1,157,324	1,673,868	11,454	0	27,806,225	34,630,090
2013	62,409	3,922,836	1,158,495	1,675,560	11,466	0	27,834,342	34,665,108
2014	62,470	3,926,649	1,159,621	1,677,189	11,477	0	27,861,392	34,698,798
2015	62,638	3,937,255	1,162,753	1,681,719	11,508	0	27,936,656	34,792,529
2016	62,696	3,940,863	1,163,818	1,683,260	11,519	0	27,962,252	34,824,408
2017	62,881	3,952,485	1,167,251	1,688,224	11,552	0	28,044,718	34,927,111
2018	62,952	3,957,000	1,168,584	1,690,153	11,566	0	28,076,749	34,967,004
2019	63,131	3,968,196	1,171,891	1,694,935	11,598	0	28,156,193	35,065,944
2020	63,319	3,980,042	1,175,389	1,699,995	11,633	0	28,240,246	35,170,624
2021	63,546	3,994,307	1,179,602	1,706,088	11,675	0	28,341,463	35,296,681
2022	63,789	4,009,555	1,184,105	1,712,601	11,719	0	28,449,654	35,431,423
2023	50,470	3,172,380	936,870	1,355,018	9,272	0	22,509,508	28,033,518
2024	51,899	3,262,180	963,389	1,393,374	9,535	0	23,146,682	28,827,059
2025	39,514	2,483,715	733,493	1,060,869	7,260	0	17,623,112	21,947,963
2026	8,563	538,242	158,954	229,899	1,573	0	3,819,077	4,756,308
2027	2,811	176,688	52,180	75,469	516	0	1,253,681	1,561,345
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
TOTAL	2,114,709	132,924,029	39,255,222	56,775,817	388,516	0	943,157,691	1,174,615,984

a) Under Article 49(d)(4)(A) of its contract, San Bernardino Valley Municipal Water District elected to pay a portion of its allocated costs of East Branch Enlargement in advance rather than to participate in payment of Water System Revenue Bonds. This election made via a letter of agreement signed June 1, 1987. As of January 1994, $6,347,938 has been received from the San Bernardino Valley Municipal Water District.

TABLE B-30

Minimum OMP&R Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area							
	Antelope Valley-East Kern Water Agency (1)	*Coachella Valley Water District (2)*	*Desert Water Agency (3)*	*Mojave Water Agency (4)*	*Palmdale Water District (5)*	*San Bernardino Valley Municipal Water District (6)*	*Metropolitan Water District of Southern California (7)*	*Total (8)*
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	134,692	36,959	54,899	0	24,070	942,880	1,193,500
1995	0	330,586	96,617	111,075	0	52,141	2,283,194	2,873,613
1996	0	372,309	111,940	110,417	0	51,784	2,554,587	3,201,037
1997	0	396,532	119,793	113,435	0	51,602	2,717,510	3,398,872
1998	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
1999	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2000	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2001	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2002	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2003	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2004	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2005	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2006	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2007	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2008	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2009	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2010	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2011	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2012	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2013	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2014	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2015	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2016	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2017	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2018	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2019	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2020	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2021	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2022	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2023	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2024	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2025	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2026	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2027	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2028	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2029	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2030	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2031	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2032	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2033	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2034	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2035	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
TOTAL	0	16,751,837	5,082,021	4,764,538	0	2,243,149	114,701,103	143,542,648

TABLE B-31

Total East Branch Enlargement Facilities Transportation Charge for Each Contractor

(Dollars)

Calendar Year	Southern California Area							
	Antelope Valley-East Kern Water Agency (1)	Coachella Valley Water District (2)	Desert Water Agency (3)	Mojave Water Agency (4)	Palmdale Water District (5)	San Bernardino Valley Municipal Water District (6)	Metropolitan Water District of Southern California (7)	Total (8)
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	19,167	1,204,788	355,799	514,601	3,521	0	8,548,534	10,646,410
1989	20,142	1,266,061	373,894	540,772	3,700	0	8,983,290	11,187,859
1990	20,137	1,265,767	373,807	540,647	3,700	0	8,981,206	11,185,264
1991	20,133	1,265,530	373,737	540,545	3,699	0	8,979,520	11,183,164
1992	42,394	2,664,759	786,959	1,138,198	7,789	0	18,907,701	23,547,800
1993	44,049	2,768,754	817,670	1,182,617	8,093	0	19,645,597	24,466,780
1994	43,827	2,889,542	850,523	1,231,577	8,052	24,070	20,489,819	25,537,410
1995	57,335	3,934,475	1,160,920	1,650,403	10,534	52,141	27,854,460	34,720,268
1996	61,313	4,226,247	1,250,088	1,756,549	11,264	51,784	29,900,066	37,257,311
1997	62,916	4,351,236	1,287,699	1,802,607	11,559	51,602	30,777,969	38,345,588
1998	62,837	4,358,071	1,290,555	1,802,163	11,544	54,304	30,819,841	38,399,315
1999	62,721	4,350,830	1,288,417	1,799,070	11,523	54,304	30,768,465	38,335,330
2000	64,466	4,460,490	1,320,802	1,845,909	11,844	54,304	31,546,546	39,304,361
2001	64,551	4,465,844	1,322,383	1,848,196	11,859	54,304	31,584,536	39,351,673
2002	64,036	4,433,474	1,312,823	1,834,370	11,765	54,304	31,354,861	39,065,633
2003	64,081	4,436,320	1,313,664	1,835,585	11,773	54,304	31,375,055	39,090,782
2004	61,593	4,279,905	1,267,471	1,768,776	11,316	54,304	30,265,215	37,708,580
2005	61,657	4,283,940	1,268,663	1,770,499	11,328	54,304	30,293,847	37,744,238
2006	61,755	4,290,070	1,270,473	1,773,118	11,346	54,304	30,337,341	37,798,407
2007	61,871	4,297,356	1,272,625	1,776,230	11,367	54,304	30,389,038	37,862,791
2008	61,870	4,297,326	1,272,616	1,776,217	11,367	54,304	30,388,825	37,862,525
2009	61,961	4,303,038	1,274,303	1,778,657	11,384	54,304	30,429,355	37,913,002
2010	62,193	4,317,634	1,278,613	1,784,891	11,426	54,304	30,532,921	38,041,982
2011	62,270	4,322,479	1,280,044	1,786,961	11,440	54,304	30,567,300	38,084,798
2012	62,346	4,327,234	1,281,448	1,788,992	11,454	54,304	30,601,039	38,126,817
2013	62,409	4,331,197	1,282,619	1,790,684	11,466	54,304	30,629,156	38,161,835
2014	62,470	4,335,010	1,283,745	1,792,313	11,477	54,304	30,656,206	38,195,525
2015	62,638	4,345,616	1,286,877	1,796,843	11,508	54,304	30,731,470	38,289,256
2016	62,696	4,349,224	1,287,942	1,798,384	11,519	54,304	30,757,066	38,321,135
2017	62,881	4,360,846	1,291,375	1,803,348	11,552	54,304	30,839,532	38,423,838
2018	62,952	4,365,361	1,292,708	1,805,277	11,566	54,304	30,871,563	38,463,731
2019	63,131	4,376,557	1,296,015	1,810,059	11,598	54,304	30,951,007	38,562,671
2020	63,319	4,388,403	1,299,513	1,815,119	11,633	54,304	31,035,060	38,667,351
2021	63,546	4,402,668	1,303,726	1,821,212	11,675	54,304	31,136,277	38,793,408
2022	63,789	4,417,916	1,308,229	1,827,725	11,719	54,304	31,244,468	38,928,150
2023	50,470	3,580,741	1,060,994	1,470,142	9,272	54,304	25,304,322	31,530,245
2024	51,899	3,670,541	1,087,513	1,508,498	9,535	54,304	25,941,496	32,323,786
2025	39,514	2,892,076	857,617	1,175,993	7,260	54,304	20,417,926	25,444,690
2026	8,563	946,603	283,078	345,023	1,573	54,304	6,613,891	8,253,035
2027	2,811	585,049	176,304	190,593	516	54,304	4,048,495	5,058,072
2028	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2029	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2030	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2031	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2032	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2033	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2034	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
2035	0	408,361	124,124	115,124	0	54,304	2,794,814	3,496,727
TOTAL	2,114,709	149,675,866	44,337,243	61,540,355	388,516	2,243,149	1,057,858,794	1,318,158,632

TABLE B-32

Annual Surplus and Unscheduled Water Deliveries (Acre-feet)

Calendar Year (a	North Bay Area			South Bay Area			
	Napa County FC&WCD (1)	Solano County Water Agency (2)	Area Total (3)	Alameda County FC&WCD, Zone 7 (4)	Alameda County Water District (5)	Santa Clara Valley Water District (6)	Area Total (7)
1973	0	0	0	0	0	2,499	2,499
1974	0	0	0	0	0	2,934	2,934
1975	0	0	0	0	0	18,470	18,470
1976	0	0	0	3,636	4,147	24,705	32,488
1977	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0
1979	0	0	0	0	0	15,998	15,998
1980(b	0	0	0	0	0	14,278	14,278
1981(b	0	0	0	0	0	18,920	18,920
1982(b	0	0	0	0	0	1,303	1,303
1983	0	0	0	0	0	0	0
1984	0	0	0	0	0	3,663	3,663
1985	0	0	0	0	0	9,638	9,638
1986(c	0	0	0	0	0	2,595	2,595
1987(d	0	0	0	0	0	6,949	6,949
1988	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0
1990(d	0	0	0	0	0	0	0
1991(d	768	2,753	3,521	0	0	0	0
1992(d	1,156	0	1,156	0	0	0	0
Total	1,924	2,753	4,677	3,636	4,147	121,952	129,735

Calendar Year (a	San Joaquin Valley Area						Southern California Area			Total All Areas (17)
	Dudley Ridge Water District (8)	Empire West Side Irrigation District (9)	Kern County Water Agency (10)	Oak Flat Water District (11)	Tulare Lake Basin Water Storage District (12)	Area Total (13)	Castaic Lake Water Agency (14)	Littlerock Creek Irrigation District (15)	Area Total (16)	
1973	13,192	2,814	163,744	1,013	69,588	250,351	4,104	80	4,184	257,034
1974	33,391	1,539	299,433	3,471	70,961	408,795	4,128	67	4,195	415,924
1975	40,555	3,448	410,820	3,576	135,965	594,364	7,495	356	7,851	620,685
1976	30,922	3,457	442,150	3,840	61,526	541,895	5,727	0	5,727	580,110
1977	0	0	0	0	0	0	0	0	0	0
1978	7,586	0	8,623	6	0	16,215	0	0	0	16,215
1979	38,545	0	524,247	698	67,342	630,832	0	0	0	646,830
1980(b	39,079	0	327,233	718	14,817	381,847	6,092	0	6,092	402,217
1981(b	32,327	2,992	624,581	2,788	215,926	878,614	10,647	247	10,894	908,428
1982(b	14,463	926	124,736	721	67,365	208,211	6,359	0	6,359	215,873
1983	13,019	0	0	0	0	13,019	0	0	0	13,019
1984	19,500	0	230,691	1,644	0	251,835	7,419	0	7,419	262,917
1985	7,636	0	186,486	764	96,887	291,773	6,095	0	6,095	307,506
1986(c	903	1,130	14,987	247	12,788	30,055	3,970	0	3,970	36,620
1987(d	0	1,876	52,048	255	51,206	105,385	2,573	0	2,573	114,907
1988	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0
1990(d	0	0	0	90	0	90	0	0	0	90
1991(d	0	0	0	0	0	0	0	0	0	3,521
1992(d	0	0	0	0	0	0	0	0	0	1,156
Total	291,118	18,182	3,409,779	19,831	864,371	4,603,281	64,609	750	65,359	4,803,052

a) All deliveries are surplus water deliveries unless otherwise indicated.
b) Includes surplus and unscheduled water.
c) Includes 12,270 acre-feet of 1985 surplus water carried over and delivered during January and February 1986. Also includes 22,034 acre-feet of unscheduled water.
d) Unscheduled water only.

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CONVERSION FACTORS

Quantity	To convert from customary unit	To metric unit	Multiply customary unit by	To convert to customary unit, multiply metric unit by
Length	inches (in)	millimeters (mm)*	25.4	0.03937
	inches (in)	centimeters (cm)	2.54	0.3937
	feet (ft)	meters (m)	0.3048	3.2808
	miles (mi)	kilometers (km)	1.6093	0.62139
Area	square inches (in^2)	square millimeters (mm^2)	645.16	0.00155
	square feet (ft^2)	square meters (m^2)	0.092903	10.764
	acres (ac)	hectares (ha)	0.40469	2.4710
	square miles (mi^2)	square kilometers (km^2)	2.590	0.3861
Volume	gallons (gal)	liters (L)	3.7854	0.26417
	million gallons (10^6 gal)	megaliters (ML)	3.7854	0.26417
	cubic feet (ft^3)	cubic meters (m^3)	0.028317	35.315
	cubic yards (yd^3)	cubic meters (m^3)	0.76455	1.308
	acre-feet (ac-ft)	thousand cubic meters ($m^3 \times 10^3$)	1.2335	0.8107
	acre-feet (ac-ft)	hectare-meters (ha – m)■	0.1234	8.107
	thousand acre-feet (taf)	million cubic meters ($m^3 \times 10^6$)	1.2335	0.8107
	thousand acre-feet (taf)	hectare-meters (ha – m)■	123.35	0.008107
	million acre-feet (maf)	billion cubic meters ($m^3 \times 10^9$)◆	1.2335	0.8107
	million acre-feet (maf)	cubic kilometers (km^3)	1.2335	0.8107
Flow	cubic feet per second (ft^3/s)	cubic meters per second (m^3/s)	0.028317	35.315
	gallons per minute (gal/min)	liters per minute (L/min)	3.7854	0.26417
	gallons per day (gal/day)	liters per day (L/day)	3.7854	0.26417
	million gallons per day (mgd)	megaliters per day (ML/day)	3.7854	0.26417
	acre-feet per day (ac-ft/day)	thousand cubic meters ($m^3 \times 10^3$/day)	1.2335	0.8107
Mass	pounds (lb)	kilograms (kg)	0.45359	2.2046
	tons (short, 2,000 lb)	megagrams (Mg)	0.90718	1.1023
Velocity	feet per second (ft/s)	meters per second (m/s)	0.3048	3.2808
Power	horsepower (hp)	kilowatts (kW)	0.746	1.3405
Pressure	pounds per square inch (psi)	kilopascals (kPa)	6.8948	0.14505
	feet head of water	kilopascals (kPa)	2.989	0.33456
Specific capacity	gallons per minute per foot of drawdown	liters per minute per meter of drawdown	12.419	0.08052
Concentration	parts per million (ppm)	milligrams per liter (mg/L)	1.0	1.0
Electrical conductivity	micromhos per centimeter	microsiemens per centimeter (μS/cm)	1.0	1.0
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	(°F – 32)/1.8	(1.8 x °C) + 32

* When using "dual units," inches are normally converted to millimeters (rather than centimeters).

■ Not used often in metric countries, but is offered as a conceptual equivalent of customary western U.S. practice (a standard depth of water over a given area of land).

◆ ASTM Manual E380 discourages the use of billion cubic meters since that magnitude is represented by *giga* (a thousand million) in other countries. It is shown here for potential use for quantifying large reservoir volumes (similar to million acre-feet).


DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA