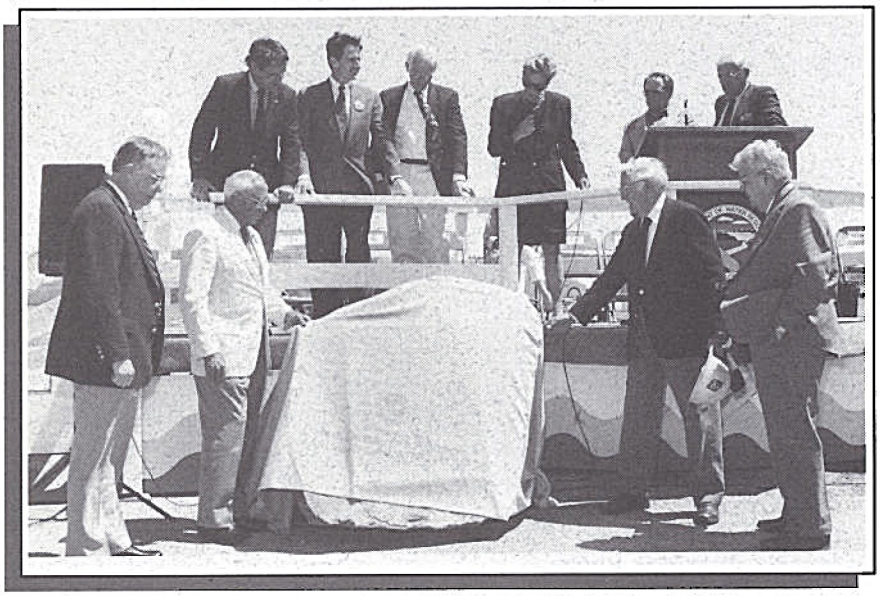
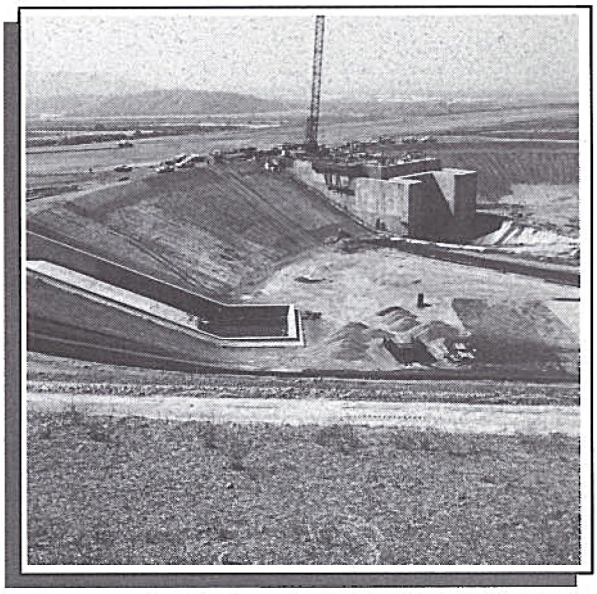
BULLETIN 132-94 DECEMBER 1995

Management of the California State Water Project





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Cover: In 1993, the Oroville Dam project celebrated its 25th anniversary, the Vista del Lago Visitors Center opened to the public, and the State Water Project continued to grow with the construction of the Devil Canyon Powerplant Second Afterbay.

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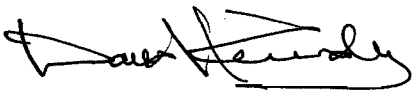
Foreword

This edition of the Bulletin 132 series is the thirty-second annual summary of the activities of the California State Water Project. Bulletin 132-94 reports on project operations and water deliveries from the State Water Project for the 1993 calendar year, and presents an analysis of project costs and financing through June 30, 1994. Forecasts of water supply needs as well as power requirements and resources are also included. In addition, the bulletin discusses activities and events between July 1, 1993, and June 30, 1994, that significantly affect management of the State Water Project. Programs to design and construct new project facilities, augment water supplies, and protect the environment are highlighted. Appendix B of this document presents data and computations used to determine the State Water Project contractors' Statement of Charges for 1995.



DAVID N. KENNEDY
Director

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Introduction

The State Water Project

The State Water Project: Thermalito Afterbay

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 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 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 20 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,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 nearly 550 miles of aqueducts.

Facilities were designed and built to meet demands for water through the mid-1980s; these demands were projected at 4.0 million acre-feet. Actual demand, however, has not developed as projected, owing to circumstances such as slower 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 northernmost SWP facilities. Situated on Feather River tributaries in Plumas County,

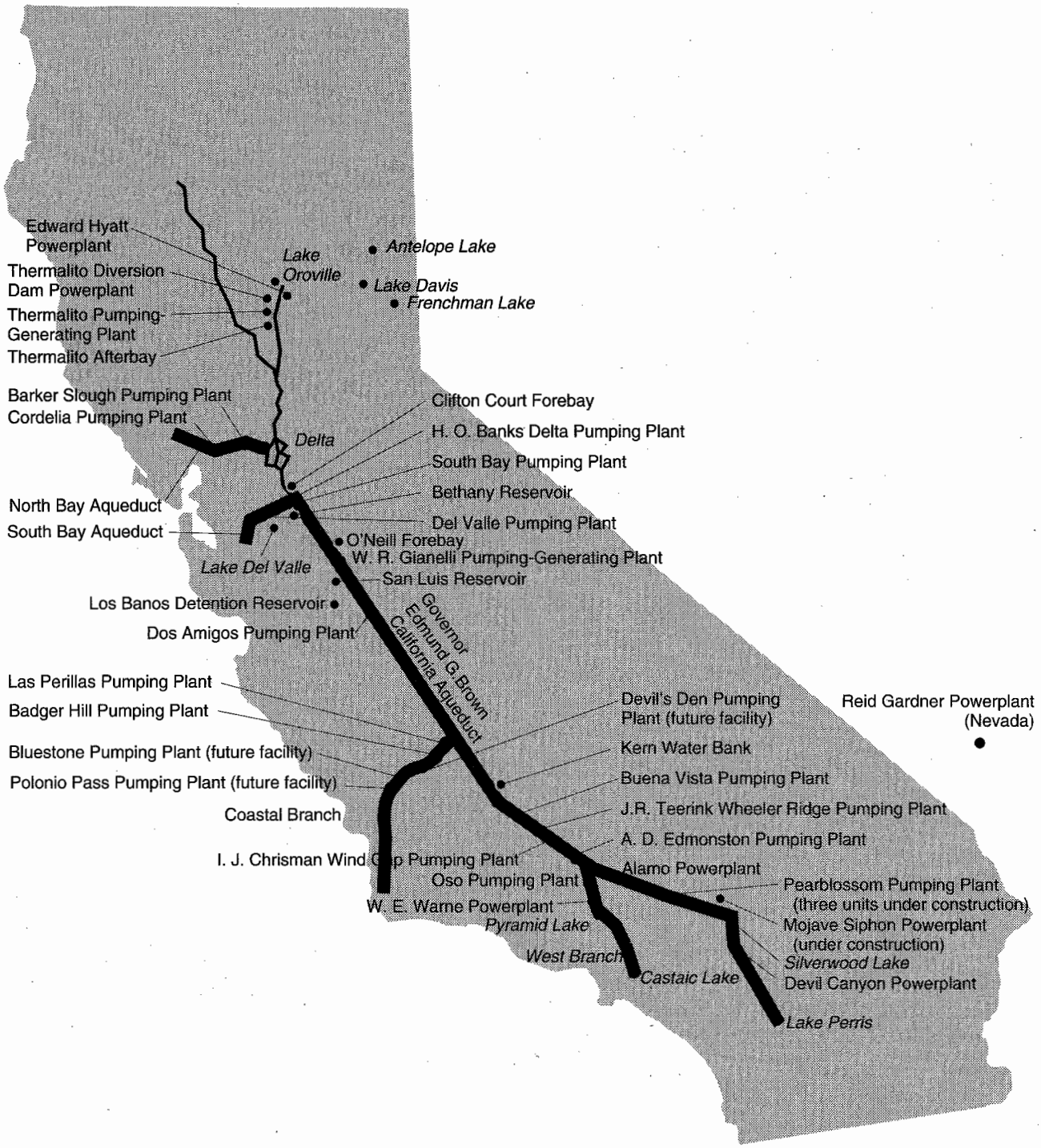


Fig I-1. Names and Locations of Primary Water Delivery Facilities, Current and Projected

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, SWP diverts water into Clifton Court Forebay for delivery south of the Delta. The Harvey O. Banks 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 and transports water to O'Neill Forebay, William R. Gianelli Pumping-Generating Plant, and San Luis Reservoir. These facilities 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 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 1,069 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. The amount of water used in the San Joaquin Valley is determined by the difference between the amount of water pumped over the Tehachapi Mountains and the amount conveyed past Kettleman City, which marks the end of the joint-use facilities shared with the CVP.

In the southern San Joaquin Valley, the existing Coastal Branch Aqueduct stub serves agricultural areas west of the California Aqueduct. This branch is 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 1996.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, where most 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 and 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, produce enough electricity to reduce SWP demand for outside energy significantly.

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 the mid-1980s. These demands were estimated at 4.0 million acre-feet. 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 was 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.

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

TABLE I-1
Physical Characteristics of Primary Reservoirs and Ground Water 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, 1,062,000 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		
Other local elements	up to 2,000,000		
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	290	3

with concerns about how best to transfer water across the Delta, suspended additional planning for Los Banos Grandes and Red Bank 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.

In the meantime, the Department continues to plan, design, and construct facilities for the SWP. Mojave Siphon Powerplant, which is now under construction, is scheduled for completion in 1995. The enlarged Devil Canyon Powerplant and the new Devil Canyon Powerplant Second Afterbay will also 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 (both 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 paid as they are incurred.

The contracts initially provided for a combined maximum annual entitlement of

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	384	167	1,370	2,100
Pyramid	2,606	400	1,090	6,860
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[a]

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 SWP share	8 (p-g)	99-327	11,000	504,000
Dos Amigos SWP share	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,000
Badger Hill	6	151	454	11,800
Devil's Den (future facility)	6	515	150	10,500
Bluestone (future facility)	6	482	150	10,500
Polonio Pass (future facility)	6	524	150	10,500
Casmalia (future facility)	4	362	45	3,200
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

a) For information on operation of these plants under full development see Table 11-6.

TABLE I-4

Power Plant Characteristics, by Type of Facility [a]

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	
San Luis Obispo (future facility)	1	752	74	3,750
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 (b			245,000
SWP share				169,500

a) For information on operation of these plants under full development see Table 11-9.
b) 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	1.4	67.0	0.0	0.0	68.4
Delta to O'Neill Forebay					
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 (planned)	0.0	14.8 (a	101.0	0.0	115.8
Subtotal	9.2	23.9	107.4	7.2	147.7
Total	**15.7**	**417.3**	**208.5**	**20.5**	**662.0**

a) Existing

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 Basin Water Storage District. On January 1, 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 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.

Information for this chapter was provided by the State Water Project Analysis Office and the Division of Operations and Maintenance Civil Maintenance Branch.

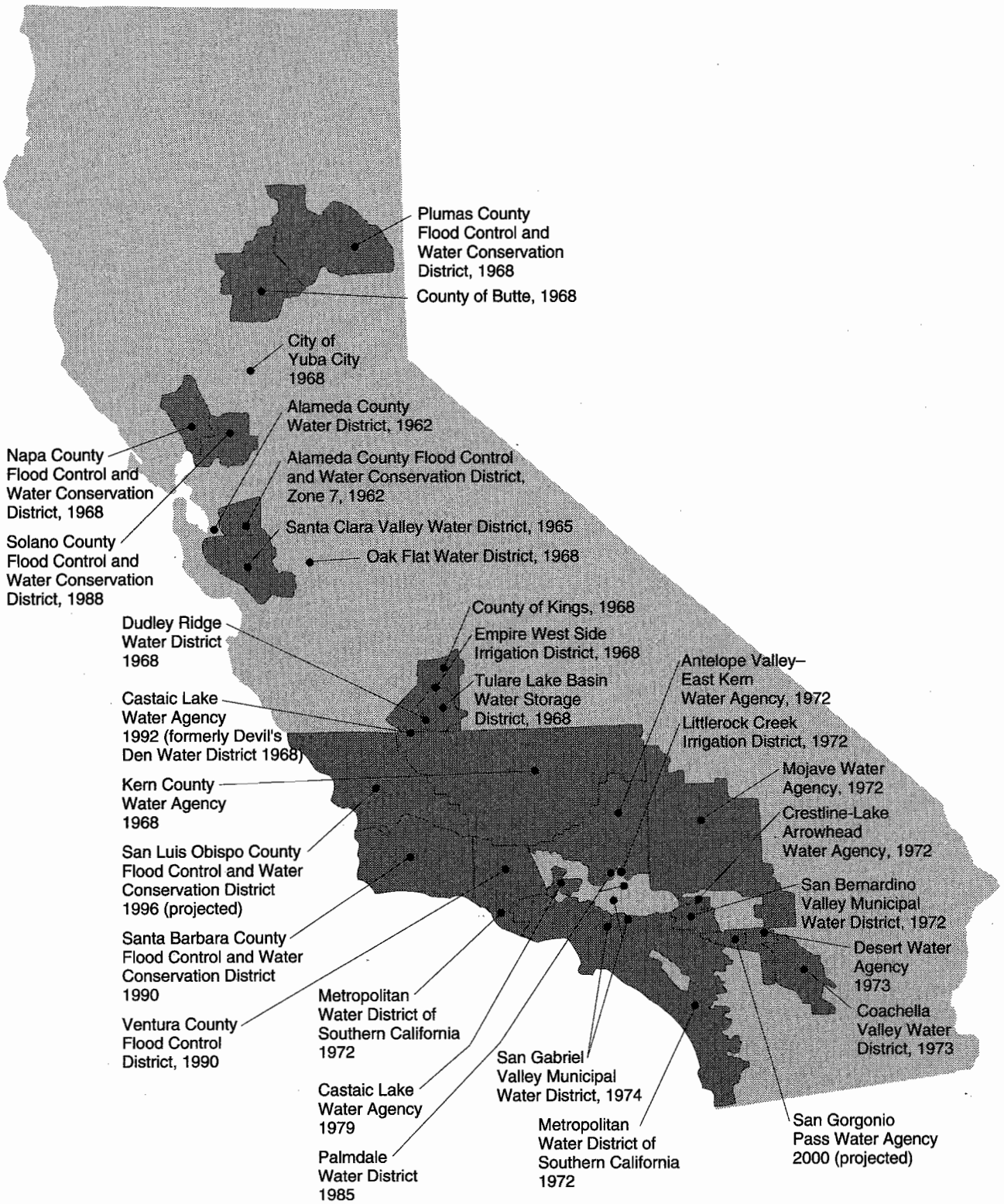


Fig I-2. Names and Locations of, and First Year of Service to, Long-Term Contracting Agencies, June 30, 1994

TABLE I-6

Long-Term Water Supply Contracting Agencies, by Area

Contracting Agency	Cumulative Deliveries through December 31, 1993 (Acre-Feet)(a	Maximum Annual Entitlement (Acre-Feet)	Payments through December 31, 1993 (Dollars)	Gross Area as of July 1, 1994 (Acres)	Assessed Valuation 1994-95 (Dollars) (b	Estimated Population July 1, 1994
Upper Feather River Area						
City of Yuba City	9,248	9,600	886,788	4,480	714,942,000	25,000
County of Butte	2,270	27,500	370,270	1,069,000	6,239,500,000	172,600
Plumas County Flood Control and Water Conservation District	8,097	2,700	749,744	1,644,000 (c	1,554,303,000 (c	18,000
Subtotal	*19,615*	*39,800*	*2,006,802*	*2,717,480*	*8,508,745,000*	*215,600*
North Bay Area						
Napa County Flood Control and Water Conservation District	125,354	25,000	25,471,492	508,000	5,797,081,000	108,600
Solano County Water Agency	99,988	42,000	27,193,894	537,600	12,309,472,000	340,000
Subtotal	*225,342*	*67,000*	*52,665,386*	*1,045,600*	*18,106,553,000*	*448,600*
South Bay Area						
Alameda County Flood Control and Water Conservation District, Zone 7	445,557	46,000	37,796,388	272,000	7,009,487,000	161,600
Alameda County Water District	581,660	42,000	42,358,458	63,000	12,104,371,000	255,000
Santa Clara Valley Water District	2,337,036	100,000	141,661,053	833,000	79,624,000,000	1,448,000
Subtotal	*3,364,253*	*188,000*	*221,815,899*	*1,168,000*	*98,737,858,000*	*1,864,600*
San Joaquin Valley Area						
County of Kings	57,706	4,000	1,882,978	893,300 (e	2,569,000,000 (e	99,300 (e
Dudley Ridge Water District	1,279,257	57,700	30,135,506	29,970	-- (f	50
Empire West Side Irrigation District	80,567	3,000	1,698,698	7,400	-- (f	50
Kern County Water Agency	18,775,510	1,153,400	690,511,861	5,161,000 (g	32,622,680,000 (g	537,500 (g
Oak Flat Water District	134,787	5,700	2,467,895	4,000	-- (f	50
Tulare Lake Basin Water Storage District	2,677,531	118,500	56,802,612	189,200	-- (f	50
Subtotal	*23,005,358*	*1,342,300*	*783,499,550*	*6,284,870*	*35,191,680,000*	*637,000*
Central Coastal Area						
San Luis Obispo County Flood Control and Water Conservation District	0	25,000	12,770,946	2,131,300	14,109,987,000	212,074
Santa Barbara County Flood Control and Water Conservation District	1,240	45,486	24,536,712	1,775,296	18,122,495,000	348,400
Subtotal	*1,240*	*70,486*	*37,307,658*	*3,906,596*	*32,232,482,000*	*560,474*
Southern California Area						
Antelope Valley-East Kern Water Agency	757,378	138,400	154,720,308	1,524,949	7,597,600,000	200,000
Castaic Lake Water Agency(d	528,091	54,200	73,050,656	133,700	6,738,030,000	150,250
Coachella Valley Water District	274,289	23,100	55,502,683	637,600	11,132,616,000	200,000
Crestline-Lake Arrowhead Water Agency	25,578	5,800	10,117,245	55,100	1,030,166,000	14,000
Desert Water Agency	440,127	38,100	86,672,268	208,800	4,233,795,000	100,000
Littlerock Creek Irrigation District	8,754	2,300	2,772,551	43,300	85,052,000	2,900
Metropolitan Water District of Southern California	13,063,537	2,011,500	3,374,702,664	3,289,593 (h	671,699,559,000 (h	14,500,000 (h
Mojave Water Agency	81,924	50,800	62,767,107	3,160,400	8,444,241,000	268,000
Palmdale Water District	45,130	17,300	20,165,601	73,900	1,956,651,000	90,000
San Bernardino Valley Municipal Water District	246,271	102,600	178,237,155	210,200	10,380,911,000	468,000
San Gabriel Valley Municipal Water District	146,135	28,800	53,465,826	17,335	5,770,749,000	190,000
San Gorgonio Pass Water Agency	0	17,300	26,041,743	140,600	1,238,913,000	44,600
Ventura County Flood Control District	5,824	20,000	20,895,334	1,199,900 (i	33,418,587,000 (i	653,600 (i
Subtotal	*15,623,038*	*2,510,200*	*4,119,111,141*	*10,695,377*	*763,726,870,000*	*16,881,350*
Total, State Water Project	42,238,846	4,217,786	5,216,406,436	25,817,923 (j	956,504,188,000 (j	20,607,624 (j
Net Total, SWP Service Area				24,778,000 (k	895,727,000,000 (k	20,250,000 (k
Total, State of California				100,314,000	1,863,390,349,000	32,140,000
Percentage, Net SWP of Total California				25	48	63

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) Total for all Kings County, including the following contracting agencies: County of Kings, Dudley Ridge Water District, Empire West Side Irrigation District, nearly all Tulare Lake Basin Water Storage District, and about 40 percent of the old Devil's Den Water District
f) Assessed valuation not available on an agency area breakdown.
g) Total for all Kern County, including the following contracting agencies: Kern County Water Agency, about 60 percent of the old Devil's Den water District,and about 50 percent of Antelope Valley-East Kern Water Agency.
h) Total for MWDSC, including Calleguas Municipal Water District, which is common to MWDSC and Ventura County Flood Control District.
i) Total for all Ventura County, including the following contracting agencies: Ventura County Flood Control District and portions of Antelope Valley-East Kern Water Agency, Castaic Lake Water Agency, and Metropolitan Water District of Southern California.
j) Includes duplicate values. Some areas that are within two or more agencies are included in each agency's total.
k) Excludes duplicate values where agencies have overlapping boundaries.

Part I

The Year in Review

Chapter 1

Summary of Significant Events

Coastal Branch ground-breaking ceremony

Governor Ronald Reagan at the May 8, 1968, Oroville Dam dedication ceremony. 1993 marks the 25th anniversary of Oroville Dam.

Since its inaugural edition in 1963, Bulletin 132 has annually reported the activities of the Department of Water Resources in planning, constructing, operating, financing, and managing the State Water Project. This issue, Bulletin 132-94, summarizes those activities for the past fiscal year, water year, and calendar year[1], discussing the accomplishments of the SWP as well as the challenges that faced the project's managers. Among the many events that occurred during the reporting period covered in this bulletin, three hold special significance for the SWP: the twenty-fifth anniversary of Oroville Dam, the groundbreaking ceremony for Phase II of the Coastal Branch of the California Aqueduct, and the opening of the Vista del Lago Visitors Center.

On May 8, 1993, the Department, the city of Oroville, and local area legislators observed the twenty-fifth anniversary of the dedication of the Oroville Dam. On that day in 1968 Governor Ronald Reagan dedicated the dam to the people of California, "who will benefit from this giant structure and the water it impounds." With that dedication, a new chapter in California water history began.

For people living near and downstream of Oroville Dam, the Dam provided flood protection, a dependable water supply, and local recreational opportunities. Californians statewide could benefit from a regulated and reliable SWP water supply. Oroville facilities would also provide hydroelectric power, control freshwater releases to improve water quality in the Sacramento-San Joaquin Delta, and enhance habitat for fish and wildlife.

Developing the SWP from a vision to its current preeminent status among public waterworks has continually tested the Department's ability to accomplish its overall mission. In fact, the construction of Oroville Dam was itself such a test. Not only did the Department's engineers have to meet the many technical challenges of constructing the dam—the highest earthfill dam in the world—and its appurtenant facilities, but other considerations also had to be addressed. Although William E. Warne, then-Director of the Department, recommended that construction begin immediately (in the early 1960s), some consultants disagreed with that recommendation. They advised the Department to wait until 1970 to

[1]This summary generally discusses State Water Project management activities between January 1993 and June 1994 and SWP operational activities in calendar year 1993.

As the SWP's cornerstone facility and the world's highest earthfill dam, Oroville Dam stands as an impressive embodiment of the Department's overall mission:

"To manage the water resources of California, in cooperation with other agencies, to benefit the State's people and protect, restore and enhance the natural and human environments."

begin construction, arguing that the water stored in Lake Oroville would not be needed until then.

Weighing the pros and cons of each course of action, Governor Edmund G. Brown decided to proceed with the development of Oroville facilities, which California voters had authorized through their approval of the Burns-Porter Act in 1960. Recognizing that cost of the facilities would increase if construction was postponed and that flood control was urgently needed for the Feather River basin-where communities were still recovering from the disastrous floods of 1955-the Governor signed a memorandum from Director Warne authorizing construction to begin. Work at the damsite started in summer 1961; construction of the dam began in 1962.

Then in 1964, torrential rains fell throughout Northern California and record-breaking runoff swelled the Feather River. Although Oroville Dam was only partially completed, the structure nevertheless prevented a flood that could have caused widespread destruction comparable to that of 1955. Governor Brown's decisive action had paid off. The Oroville facilities continue to prevent floods; potential floodflows were controlled during the heavy rains of 1969, 1978, 1983, and 1986.

Besides flood control, the Oroville facilities have also accomplished the other purposes specified in the Burns-Porter Act for an SWP facility on the Feather River: providing water supply, recreation, power, and enhanced fisheries to benefit California. The recreational facilities at the Oroville complex have served millions of people since Oroville Dam was dedicated, with an average of 700,000 visits per year over the past 10 years. Oroville's power plants generate approximately 2,172 million kilowatt-hours of energy per year. The Feather River Fish Hatchery has been remarkably successful and supports one of the largest populations of salmon and steelhead in California. The hatchery produces 10 million young fish each year.

In 1969, the American Society of Civil Engineers honored the Department with a plaque naming Oroville Dam and the Hyatt Powerplant the "Outstanding Civil Engineering Achievement of 1969." The Oroville facilities—and additional SWP facilities constructed since Oroville's completion—continue to live up to that honor. While record floods and droughts, fluctuating economic conditions, population growth, and shifting public policy trends have challenged managers of the SWP, those challenges have always reaffirmed the need for the Oroville Dam and other facilities of the SWP. Celebrating the twenty-fifth anniversary of Oroville Dam provided an opportunity to acknowledge the role of the SWP in continuing to meet the challenges of managing California's water resources for the maximum benefit of the state.

The Coastal Branch, Phase II, Facilities—scheduled for completion in 1996—will deliver water to thousands of Californians in Santa Barbara and San Luis Obispo counties. Although construction has generated some controversy, the Department has responded to local concerns. The Department is working closely with local interests, environmentalists, and other concerned parties to construct affordable facilities, complete them on schedule, and protect the environment.

As the Department celebrated its past SWP accomplishments with the Oroville Dam rededication and looked toward the future with the start of construction of Phase II of the Coastal Branch, it also com-

pleted a new facility to tell the story of the SWP. Vista del Lago Visitors Center opened November 15, 1993, and features state-of-the-art exhibits that describe how the SWP was built, how it operates, and how it benefits Californians. Each exhibit room at Vista del Lago highlights a specific theme to educate visitors about water and its importance in their life as well as to communicate the importance of the SWP in providing a water supply for many beneficial uses. Impressive attendance figures at Vista del Lago show that people are eager to learn about the state's most precious resource and the role of DWR in managing it wisely.

SWP Management

State Water Project activities for 1993-94 reflected the impacts of evolving water policy issues. For example, issues related to mitigation of the record-breaking 1987-92 drought continued to challenge SWP managers even after the Governor declared the drought over on February 24, 1993. Although winter storms in 1993 replenished snowpack and reservoir storage and eased concerns about an unprecedented seventh year of drought, dry conditions returned in 1994, again reminding Californians of the fluctuating hydrologic conditions that affect management of the SWP. Figure 1-1 compares key hydrological measurements of the last years of the drought with those of the most recent water year[2], and illustrates the extreme variations in annual operating conditions that the Department must successfully manage.

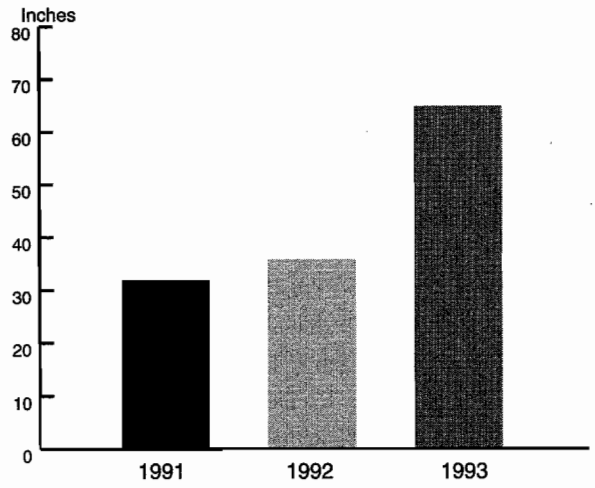
[2]For additional information on water year 1992–93, see Chapter 9, "Water Storage." Bulletin 132-93 and other Department publications contain detailed information on the drought.

Despite those varying hydrologic conditions, the Department delivered water to long-term contractors throughout the drought. The Department's true achievement in coping with the drought, however, may be its use of drought management techniques for general water resources management. To mitigate the effects of drought, the Department found new ways to use limited water supplies effectively, including water banks, expanded conjunctive use programs, water transfers, and water exchanges. Concepts such as those–and the programs that have grown out of them–will continue to help the Department maximize the beneficial use of limited water supplies.

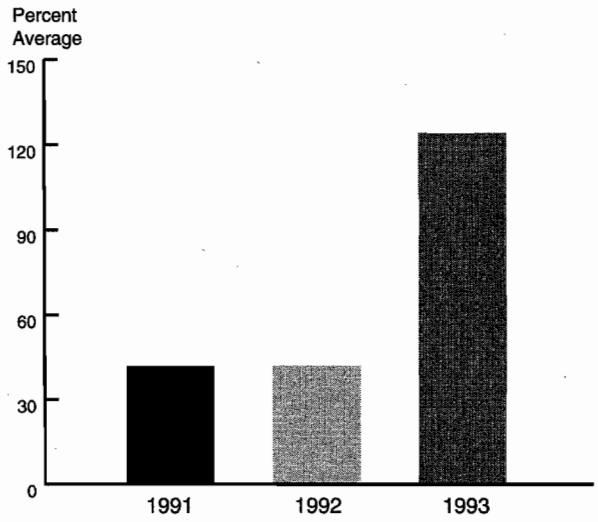
In addition to meeting water delivery requirements to long-term contractors, the Department complied with numerous regulatory, judicial, and legislative decrees to protect endangered species and safeguard water quality in the Sacramento-San Joaquin Delta. For instance, operators of the SWP and the federal Central Valley Project found that in addition to complying with the existing requirements of State Water Resources

The Delta

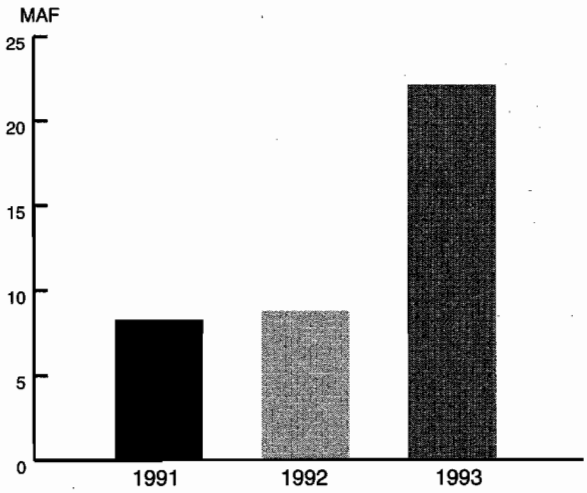
The 738,000-acre Delta, interlaced with hundreds of miles of waterways, receives runoff from 40 percent of the State's land area, including runoff and flood flows from the water basins of the Sacramento, San Joaquin, Mokelumne, and Cosumnes rivers. As part of an interconnected estuary system that includes 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.



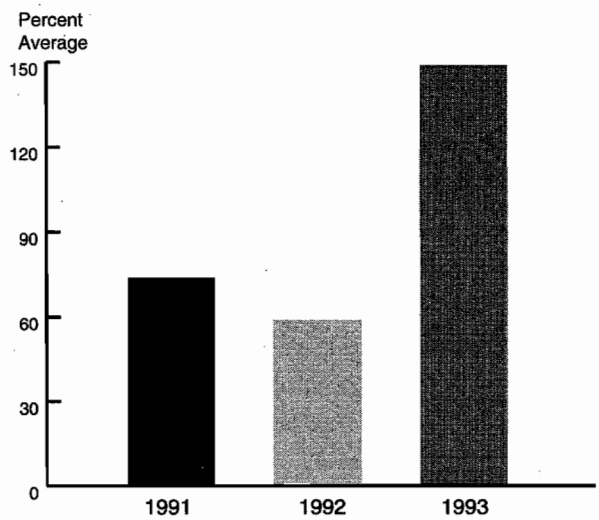
Northern Sierra Precipitation



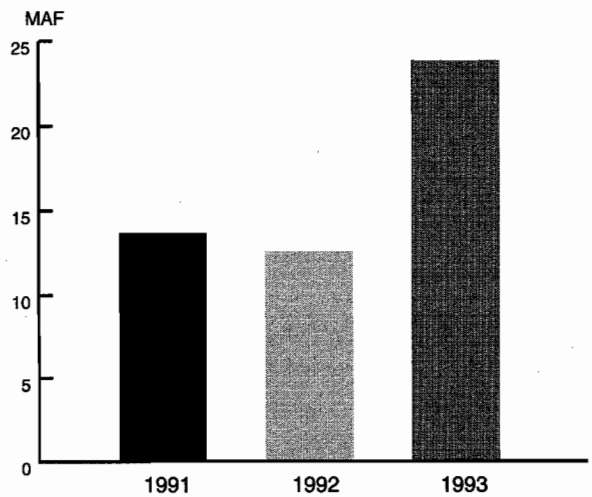
Statewide Runoff



Sacramento River Unimpaired Runoff



April 1 Snowpack Water Content



155 Major Statewide Reservoir Storage

Fig. 1-1. Key Hydrological Measurements, 1991-1993 Water Years

Control Board Decision 1485, they also had to comply with new water quality and flow standards arising from two recently released biological opinions and with limits imposed by the Central Valley Project Improvement Act when operating their projects.

1993 Water Delivery Requests and Approvals

In December 1992, the Department initially allocated water to long-term contractors for 1993. Because of the continuing drought, which had begun in 1987, the Department made very conservative initial allocations—10 percent of the 3,850,000 acre-feet requested. Allocations were based only on the amount of water held in storage, with the idea that as the water supply developed through the winter and spring, allocations could be revised upward. Later in the year, allocations were increased as precipitation, runoff, and snowpack increased.

In 1993, because of above-average rain and snowfall, the Department was able to increase deliveries to 40 percent of the requested amounts in January and 70 percent in March. By April, because additional local water had become available for the first time in several years, some contractors were able to revise their demand downward. That decrease in demand, combined with above-normal hydrologic conditions, allowed other contractors to receive 100 percent of the original amount they requested.

Endangered Species Issues

In a series of biological opinions issued from 1993 through mid-1994, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service specified conditions to protect the winter-run chinook salmon and the delta smelt. These two fish species are listed under state and federal endangered species acts. The opinions concluded that unmodified operation of the SWP and CVP could jeopardize the existence of these two species.

Both the NMFS and the USFWS continue to evaluate data on the winter-run chinook salmon and delta smelt and to review criteria on which the opinions were based. In 1995, the NMFS is expected to amend its opinion on winter-run chinook salmon, while the USFWS will issue a long-term opinion on delta smelt. In the meantime, SWP operations were modified to conform with provisions imposed by the biological opinions and minimize impacts to the fish.

Impacts on SWP Operations

To ensure species protection, the Department minimized takes of winter-run chinook salmon and delta smelt by:

- scheduling reservoir releases to produce seasonal pulse flows in the Delta;
- maintaining seasonal flow standards for several key measurement points in the Delta estuary; and
- minimizing losses due to Delta export pumping as measured by incidental take calculations at fish salvage facilities.

For example, in late February and early March 1993, the Department ceased all pumping at Banks Pumping Plant for 12 days. Pumping resumed at a fraction of capacity until late May, when most winter-run salmon migration ended. Although no actual take of winter-run salmon was confirmed, the final estimate of the take of winter-run-sized salmon for SWP and CVP operations combined was 1,892 smolts, well below the ceiling target level of 2,700.

Pumping was also curtailed at Banks Pumping Plant and the North Bay Aqueduct's Barker Slough Pumping Plant for intermittent periods between April and July.

Because of pumping restrictions, both SWP and CVP gave up an estimated 590,000 acre-feet of water that would have been diverted at the Delta pumping plants during that period. Owing to favorable hydrologic conditions later in the year, however, that water was eventually replaced.

Special Studies

Annual population estimates of winter-run chinook salmon and delta smelt are considered key measurements of the impact of SWP and CVP operations on these species. Collecting population data by towing a net at mid-depth behind one boat provides what is known as the mid-water trawl abundance index, which estimates prespawning adult delta smelt. This method of sampling indicates that the prespawning adult delta smelt population has declined from levels first observed in 1967 when sampling began. In 1994, the index showed one of the lowest indexes observed.

However, other studies conducted in 1994 indicate that the mid-water trawl method may be underestimating the abundance of juvenile and adult delta smelt. In these comparative studies, towing a net between two boats caught more fish than the mid-water trawl and caught fish at locations where the mid-water trawl indicated that no delta smelt were present. This method, known as the kodiak trawl, will be evaluated for possible application in real-time monitoring for project operations.

Environmental Activities Outside the Delta

In 1993 and 1994, the Department continued programs and measures to eliminate, minimize, and mitigate adverse impacts to the environment that might result from operation of the SWP. These programs included:

- completing a programmatic environmental impact report on water transfers made as part of the drought water bank programs;
- submitting to the State Water Resources Control Board a report on the Instream Flow Incremental Methodology study, which can be used in conjunction with other information to help determine optimum flows for salmon production;
- increasing the SWP share of funding for a warden program to reduce illegal fish harvesting in the Delta and some Central Valley streams; and
- increasing coordination between the Department's environmental specialists and maintenance personnel to avoid adverse impacts to listed species during maintenance activities.

Water Quality

Approximately 20 million Californians depend on the State Water Project for all or part of the water they use every day. In addition, the SWP supplies water for agriculture, industry, recreation, and fish and wildlife. Therefore, the quality of water supplied by the SWP and the health of the contributing resource—the Delta—were safeguarded in 1993-94 by numerous water quality standards resulting from:

- regulations set by the State Water Resources Control Board and Department of Health Services;
- objectives set by Article 19 of the long-term SWP water supply contracts;
- legislation specified in the Central Valley Project Improvement Act (PL 102-575, title 34, October 1992);
- conditions contained in the winter-run chinook salmon and the delta smelt biological opinions; and
- proposals set out by the Federal Ecosystem Directorate to further protect the San Francisco Bay-Delta Estuary.

SWP Remedial Actions

The Department and USBR meet water quality and flow standards in the Delta with operational measures such as releases from reservoirs, operation of the Delta Cross Channel gates, and reductions in exports from the Delta. The need for these measures is determined by water quality readings obtained through an automated network of continuously operating recorders and by laboratory analyses of field samples collected weekly, monthly, quarterly, or annually.

In addition to meeting water quality standards for the Delta and Suisun Marsh, the Department also takes measures to protect water quality within the California Aqueduct and other SWP facilities.

1993-94 Delta Water Quality Standards

SWP operations in 1993 initially complied with standards contained in the SWRCB's Draft Decision 1630, issued in December 1992. Draft Decision 1630 was intended to replace Decision 1485, which specifies measures to protect the San Francisco Bay and the Sacramento-San Joaquin Delta. While the draft decision retained many Decision 1485 standards, it also added stricter Delta standards for flow, salinity, export, water temperature, and water quality.

Those standards, however, were to be used only for a five-year period. At the request of the Governor, the SWRCB stopped work on the formal adoption of Water Rights Decision 1630 in April 1993 in favor of formulating long-term guidelines for protecting the Delta. Consequently, baseline SWP operations reverted to Decision 1485 criteria combined with operational guidelines set in the biological opinion for winter-run chinook salmon and provisions of the CVPIA. Operations of the SWP were affected by the federal CVPIA because of the Department's joint operations with the USBR under the Coordinated Operations Agreement and Decision 1485. Measures in the rescinded Draft Decision 1630 were incorporated into several federal operational guidelines. Additional operational conditions were set following the issue of a biological opinion for the delta smelt.

SWP 1993-94 Delta Operations

Decision 1485, along with the biological opinions and the CVPIA, set standards for 1993 SWP operations for water quality within the Delta and Suisun Marsh as well as for the amount of outflow and water exported from the Delta. The SWP's operational responses to several of these standards were as follows:

- All Decision 1485 water quality standards were met, as was the delta smelt biological opinion salinity standard at Mallard Slough.
- The Decision 1485 municipal and industrial chloride standard of less than 150 mg/L for at least 240 days at the Contra Costa Canal Intake was met by August 28, 1993.

- All operational criteria for Delta outflow related to Decision 1485 and biological opinions were met during 1993.
- All Decision 1485 minimum flow standards for the Sacramento River at Rio Vista were met in 1993.
- The standard that defines the allowable magnitude of reverse flows in the lower San Joaquin River ("Qwest flows") was met during all of 1993.
- The Delta Cross Channel gates were closed from January 3 until June 18 with the exception of the last three days in May.

Programs Outside the Delta

In addition to meeting water quality standards for the Delta, the Department also takes measures to protect water quality within the California Aqueduct and other SWP facilities. The Department's activities outside the Delta include routine measurements of SWP water quality as well as special studies. Many special studies are initiated in response to fish and wildlife issues and to water quality issues that concern agencies providing domestic water supply. Those agencies face increasingly stringent regulatory requirements and look to the Department to deliver a raw water supply of high quality.

Municipal Water Quality Investigations Program

Because the Sacramento-San Joaquin Delta is a source of drinking water for about two-thirds of the state's population, the Municipal Water Quality Investigations Program monitors and evaluates constituents in the waters of the Delta and recommends ways to improve the quality of those waters as a drinking water supply. The municipalities sponsoring the program believe that technology and practice for improving drinking water will continue to evolve, and the MWQI Program will help the agencies adapt to those changes in planning for a high-quality drinking water supply.

Pathogen Monitoring Program

At the request of the State Water Project Sanitary Survey Review Committee, the Metropolitan Water District of Southern California initiated a pathogen monitoring survey for the protozoan organisms *Giardia* and *Cryptosporidium*. From April 1992 through April 1993, water samples were collected, analyzed, and screened for enteric viruses and coliform bacteria. Samples were collected monthly from Banks Pumping Plant, California Aqueduct Check No. 29 in Kern County, the federal Delta Mendota Canal at McCabe Road, and Greene's Landing in the north Delta for a total of 48 samples.

The results of the survey suggest that the decreasing number of pathogens detected in areas progressively farther south from the Delta indicates a possible pathogen die-off during transport through the aqueduct. Mean total coliform/fecal coliform concentrations also reflect this trend, as Greene's Landing had the highest level of coliform, while the lowest coliform counts occurred at Check No. 29. The SWP/Delta pathogen values observed were approximately six times lower than the national average.

Mitigation of Algal Blooms

Algal blooms in reservoirs can lead to taste and odor problems, increased turbidity, increased concentrations of organic THM (trihalomethane) precursors, and filter clogging in water treatment plants. Bloom-related taste and odor problems in SWP reservoirs

are caused by the chemical compounds 2-methylisoborneol (MIB) and geosim, which impart an earthy-musty taste and odor to water. The incidence and magnitude of taste and odor problems in southern SWP reservoirs have increased in recent years.

Taste and odor problems at Castaic Lake first occurred in the mid-1970s and returned in 1993 with a very extensive event that began in August and another that lasted from the end of September through November. The problems in Castaic Lake are primarily caused by the filamentous bluegreen algae, *Anabaena* and *Psuedoanabaena* spp. To solve these problems, water releases from Elderberry Forebay into Castaic Lake were halted from September 24 through 27 and minimized during October and November. Inflows from Elderberry Forebay occurred only 13 days during this period. Elderberry Forebay releases in Castaic Lake are thought to encourage algal growth by introducing fresh nutrients into the lake and mixing water layers.

Water Supply Planning

To meet water deliveries specified in long-term water supply contracts, the Department plans to construct additional storage and delivery facilities as part of the State Water Project. In planning and developing those facilities, the Department faces the challenge of satisfying an increasing number of complex regulations that have made the amount of Delta water supplies available for export uncertain.

As the Department continues to address this challenge, it currently investigates and implements plans to augment SWP water supply. Those plans include programs to routinely transfer water between SWP long-term contractors and other agencies and to establish conjunctive use arrangements with various water agencies.

Water Transfers

In November 1993, the Department published a report entitled "Water Transfers in California: Translating Concept into Reality." Based on the Department's experience in managing the 1991 and 1992 Drought Emergency Water Banks, the report presents an overview of water transfers issues. In November 1993, the Department also released a final *State Drought Water Bank Environmental Impact Report* for future water transfers under specified drought conditions. Because the Department recognizes that water transfers will undoubtedly play an important role in California's water supply future, both reports offer guidance to individuals and agencies interested in implementing water transfers.

Following a wet 1993 when a water bank was not activated, a dry winter and severe water restrictions in the Delta resulted in major cutbacks in 1994 water deliveries to SWP and CVP water contractors. In June 1994, Department Director, David Kennedy, announced the need for a 1994 water bank. The Department immediately initiated activities to acquire water to meet critical needs. Under this program, the Department expects to transfer about 170,000 acre-feet of water during 1994.

The 1991 and 1992 water banks' success increased interest in water transfers as a management tool to alleviate short-term water shortages and augment long-term supplies. Therefore, in June 1993 the Department began drafting a work plan and time line to complete the environmental documentation required for supplemental water purchases by the SWP.

Future Water Supply Planning Strategy

In spring 1994, because of the increasing need for additional water supplies for the SWP and the impacts of current Delta constraints, the Department began a new planning strategy for the SWP Future Water Supply Program. Based on initial discussions with the State Water Contractors, the Department outlined a proposal to develop SWP water supplies during the next 30 years through interim and long-term measures. This proposal will be the basis for a two-year, intensive scoping process to identify the key components of the strategy for implementing a new SWP water supply development plan. The Department plans to conduct workshops with SWP contractors and various regulatory agencies and to hold public involvement meetings to seek consensus and generate broad-based support for implementing the strategy.

A key element in the strategy will be active coordination with SWP contractors to integrate planning for the SWP with regional water management plans. This coordination could include formalizing water contract procedures that would allow SWP contractors to determine individual participation in future SWP projects. The Department has held discussions with SWP contractors during the past years on these SWP contract procedures. The procedures would allow the contractors to balance their desired SWP water supply reliability with levels of affordability. The Department will also encourage and support (through changes in SWP operations or financial mechanisms) development and use of local projects that would allow SWP contractors to store additional SWP water in their service areas when it is available, thus increasing the total yield of the SWP.

Water Conservation Storage Facilities

One component of the Department's current plans to meet California's growing water needs is 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 release during dry periods. The Department initially envisioned two additional "south-of-the-Delta" water banking facilities—Los Banos Grandes and Kern Water Bank. However, after these future facilities were initially studied and proposed, new constraints on Delta exports arising from the Endangered Species Act have made the feasibility of the proposed projects uncertain.

Los Banos Grandes

The Department will reassess the feasibility of constructing the Los Banos Grandes facilities when a long-term 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 processing, and the financial capabilities of the SWP contractors. The reevaluation analyses will be integrated into the ongoing SWP Future Water Supply Planning Strategy.

Kern Water Bank

Design activities for new facilities of the Kern Fan Element, the portion of the Kern Water Bank that would be constructed on Department-owned land, and all planning activities for the other elements of the Kern Water Bank were discontinued in spring 1993. The program was then directed toward completing the Habitat Conservation Plan for the Kern Fan Element; 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 view of water supply uncertainties. Until the Kern Fan Element has been reassessed and a decision made to proceed, all other planning efforts for the Kern Water Bank have been discontinued.

SWP Operations

In 1993, with the record-breaking drought ended and favorable hydrologic conditions prevailing, the Department was able to meet 100 percent of the contractors' requests for water deliveries. In spite of this accomplishment, discussions continue between the Department and SWP contractors about the Department's methods for allocating water. Those methods have evolved over the years to make delivery allocation procedures more equitable.

Approval Methodologies for Water Deliveries

The methodology for approving water delivery requests has been the subject of discussions between water contractors and the Department for several years. However, the drought caused the Department to modify its process for approving water deliveries, taking into account the following processes for:

- approving the total amount of delivery requests,
- allocating deficiencies among the agricultural and municipal water contractors, and
- allocating limited water supplies equitably while providing a sound basis for water contractors to plan their yearly water operations.

The methodologies used–Rule Curve, Risk Analysis, and Water Budget– focused on the same four annual variables, although the weight given each variable during the approval process was refined because of the drought. These four variables concern the amount of water:

- currently available in Oroville and San Luis reservoirs;
- expected to be available during the coming water year, primarily through precipitation;
- scheduled to be stored in Oroville and San Luis reservoirs at the end of the water year for future water demands; and
- requested by water contractors.

Rule Curve

The Rule Curve, used to determine the amount of water available for allocation in 1988, was based on the December 1987 forecasted Four-Basin Index for the water year and the Department's estimated capabilities of delivering water during the 1988 calendar year. The Four-Basin Index was the forecast of unimpaired flows from the Sacramento River near Red Bluff, the Feather River at Lake Oroville, the Yuba River at Smartville, and the American River at Folsom Lake. Other water available for delivery included amounts already in storage minus amounts needed to remain in storage and to be used for environmental protection of the Sacramento-San Joaquin Delta. Once those amounts were determined, the Department allocated water based on contractors' requests.

Risk Analysis

In 1989, the Department modified the way it determined the amount of water available for allocation. No longer using the December forecast of the Four-Basin Index (also known as the Sacramento River Index)

as the basis for initial allocations, the Department instead based allocations on a statistical analysis of the index from 1906 to 1985. Additional allocations were based on the most current index. To more clearly identify its purpose, the Rule Curve was renamed Risk Analysis, and the Department continued to use the Risk Analysis methodology through 1991.

By February 1991, four years of drought had left storage in Oroville and San Luis reservoirs very low; the Sacramento River Index indicated very low levels of unimpaired runoff in the critical watershed basins. In late February, municipal and industrial deliveries were cut to just 10 percent of requested amounts. All deliveries to agricultural contractors had been curtailed in early February. An unusually wet March, however, allowed the Department to increase deliveries to municipal and industrial contractors from 10 percent to 20 percent of requested amounts. Deliveries were again increased when 200,000 acre-feet was delivered from San Luis Reservoir to contractors' local storage, an action taken by the Department to create additional capacity in San Luis Reservoir in preparation for potential winter storms.

Water Budget

Dry conditions persisted into 1991 with low reservoir storage and low precipitation. At that time, water allocations were based on the Water Budget, which used the same process employed in the 1991 Risk Analysis. However, the Department relied more heavily on amounts in storage and on monthly increases in precipitation, runoff, and snowpack as well as reduction in contractor demand. In December 1991 the Department approved very conservative initial allocations for 1992 delivery requests. Additional allocations made during 1992 were approved on a case-by-case basis. As precipitation, runoff, and snowpack increased, so did allocations. Therefore, as the water supply developed in early 1992, the Department increased deliveries to 45 percent of requested amounts.

In late 1992, the drought continued to affect the amount of water available for delivery. Water allocation was again based on the Water Budget. In December 1992, the Department gave initial approval for 10 percent of the total amount requested by contractors. Furthermore, in planning additional allocations, the Department had to consider another significant factor in addition to the drought–threatened and endangered species protection in the Sacramento-San Joaquin Delta.

Although determining annual water delivery amounts had always been influenced by the need for environmental protection in the Delta, SWP operations could now be curtailed significantly or stopped altogether if certain species in the Delta were thought to be in danger. Thus, even if the Department determined that it could meet certain levels of deliveries, its schedules for deliveries could be subject to unanticipated interruptions. For example, Delta pumping halted for 12 days in February 1993 because of the need to protect the winter-run chinook salmon.

Above-average hydrologic conditions in 1993 allowed the Department to approve up to 70 percent of requested deliveries by April. Later in the year, after some contractors decreased their requests due to the favorable hydrology in their service areas, the Department was able to approve 100 percent of their revised requests.

Entitlement Based Allocations

In 1993 and 1994, the Department and concerned water contractors continued

to discuss procedures for allocating water deliveries equitably. To make the best use of available water supplies and ensure equity among water contractors for 1994 water deliveries, the Department was faced with assessing contractor needs and available supplies. The Department considered the amount of water stored in Oroville and San Luis reservoirs, the amount of water supply reasonably expected in 1994, operational constraints anticipated in the Delta, and an assessment of delivery needs.

After additional discussions with water contractors, the Department devised a new allocation methodology based on each water contractor's entitlement as indicated in Table A, "Annual Entitlements," of its long-term water supply contract. In return, the water contractors agreed to relinquish entitlement water they do not need; that water could then be reallocated to other water contractors. Agreement was also reached on other modifications to the allocation procedures that are a function of changes in the actual water supply.

By March 1994, precipitation totals for the 1993-1994 water year were extremely low, resulting in the declaration of a "critically dry" water year and the projection of the water year as the fourth driest year of record in the Sacramento River basin. The Department determined that it would need to reduce approved allocations if water supply did not reach 2 million acre-feet by April 15, 1994. Several water contractors returned portions of their entitlement, allowing the Department to reallocate 50,000 acre-feet. The water was reallocated in proportion to 1994 Table A Entitlement.

1993 Water Deliveries

In 1993, the SWP delivered 2,315,098 acre-feet of entitlement water to 25 long-term contractors. In addition, 1,080,189 acre-feet of nonentitlement water was delivered to other agencies. Table 1-1 presents information about water deliveries through 1993.

Entitlement Water

The 2,315,098 acre-feet of entitlement water delivered includes 2,093,317 acre-feet of 1993 entitlement water delivered to 25 long-term contractors; 219,782 acre-feet of 1992 carryover entitlement water delivered to 13 long-term water contractors in 1993; and 1,999 acre-feet of make-up water delivered under Article 12(d) of the long-term water supply contracts.

Transfers of Entitlement Water and Carryover Entitlement Water

During 1993, 125,033 acre-feet of entitlement water and 197 acre-feet of carryover entitlement water was transferred between six long-term water contractors and one non-SWP water agency.

Water for Recreation, Fish, and Wildlife

A total of 2,609 acre-feet of SWP water was conveyed for recreational use and for fish and wildlife as follows:

- The SWP delivered 860 acre-feet of water for recreational use at Lake Del Valle, O'Neill Forebay, Silverwood Lake, Lake Perris, and Castaic Lake. In addition, 1,025 acre-feet was delivered to Castaic Lagoon, an impoundment downstream from Castaic Lake devoted entirely to recreation.
- The SWP delivered 188 acre-feet of water for wildlife management in the Pilibos Wildlife Area, 40 miles south of Los Banos, and on about 770 acres of land near O'Neill Forebay.

TABLE 1-1

Water Delivered, by Category, 1962 through 1993

	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	516,481	794,834	4,889	3,701,326
1989	1,602,454	1,251,293	2,853,747	0	0	487,567	809,250	8,135	4,158,699
1990	1,876,072	706,079	2,582,151	0	90	457,316	851,247	9,262	3,900,066
1991	536,672	12,444	549,116	3,521	0	551,048	565,395	4,912	1,673,992
1992	961,394	509,805	1,471,199	1,156	0	145,044	613,978	2,605	2,233,982
1993	1,064,926	1,250,172	2,315,098	0	0	253,644	822,589	2,609	3,395,287
Total	**18,659,336**	**17,012,703**	**35,672,039**	**224,941**	**5,673,164**	**5,817,117**	**20,665,047**	**93,796**	**68,147,451**

a) Includes amounts of deliveries of carryover 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.

Non-Project Water Deliveries

In 1993, SWP facilities were used to deliver non-Project water for other agencies, including the Central Valley Project. In addition, SWP facilities were used to deliver water purchased from the 1992 Drought Water Bank. This category also includes non-Project water transferred from one agency to another.

Central Valley Project Water

In 1993, the Department conveyed 233,142 acre-feet of CVP water through SWP facilities. The Department regularly enters into agreements for conveying 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.

On May 23, 1993, eight CVC contractors requested that the Department change the point of delivery for their CVP water from the CVC turnout to Westlands Water District's turnouts in Reaches 4 through 7 of the California Aqueduct. As a result, the Department and the CVC contractors executed common agreements on August 18 and October 18, 1993. Under these agreements, the Department conveyed 25,421 acre-feet to WWD's turnouts during 1993. These agreements superseded earlier agreements between the Department and CVC contractors to convey CVP-related water during 1993 from SWP storage. No water was conveyed by the Department under the earlier agreements.

Water Transfers

During 1993, the Department conveyed non-Project water according to terms of several water transfer agreements. Non-project water includes water purchased by other agencies from non-SWP sources.

Feather River Water Rights Settlement Agreements

Nine agencies in the Feather River service area received 822,589 acre-feet of regulated local supplies under agreements with the Department. Those agencies hold water rights to Feather River water that predate operation of the SWP.

Water Contracts Administration

Long-term water supply contracts between the Department of Water Resources and 29 public agencies for water service from the State Water Project stipulate the terms of 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 pursuant to these agreements.

In addition to delivering water according to the terms of the long-term water supply contracts, the Department also delivers or conveys water according to long-term and short-term agreements with SWP contractors and other agencies for specified arrangements.

Between July 1, 1993, and June 30, 1994, the Department entered into agreements with several SWP contractors and amended existing agreements as follows:

- A May 23, 1994, agreement between Kern County Water Agency and the Department converted a temporary turnout facility to a

permanent facility. The temporary facility, located at Milepost 242.65 in Kern County, was built under an earlier agreement between the Department and KCWA that allowed 50,000 acre-feet of the agency's 1993 entitlement to be delivered at this location for irrigation.

- An agreement between the Department and San Luis Obispo County Flood Control and Water Conservation District signed on April 5, 1994, provides for the Department to construct the Coastal Branch Pipeline through the Cuesta Tunnel in conjunction with construction of the Coastal Branch Phase II of the California Aqueduct.
- In addition to the Coastal Branch pipeline construction, the Department must remove and reconstruct a portion of the Salinas River Project facilities and also construct an auxiliary pipeline for San Luis Obispo County through the Cuesta Tunnel to Highway 101 because any future construction in and around the Cuesta Tunnel will be physically infeasible.

La Hacienda Agreement

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.

According to the original operating agreement, water can be extracted from the La Hacienda well field only during years when SWP cannot deliver the total entitlement requested by the long-term contractors and the Department projects storage levels in Lake Oroville to drop below the minimum power pool. However, the minimum power pool requirement was waived during the 1992-93 water year, allowing the Department to extract ground water and to alleviate water shortages caused by the continuing drought. In 1993, an amendment was signed that allows the Department to extract up to 30,000 acre-feet of ground water each year when entitlement deliveries to SWP agricultural contractors are less than 50 percent of their entitlement requests.

Power Activities

The State Water Project needs dependable and 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 strategic timing of generation and pumping schedules, purchases of power resources and transmission services, short-term sales of occasional power surpluses, and 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; and

- meet responsibilities and criteria of the Western System 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 also takes advantage of SWP water storage and conveyance capacities that allow the Department to operate SWP pumps and and generating resources somewhat independently of water delivery needs. This pumping load and generation control 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.

1993 Power Program Performance

In 1993, the SWP power resources program produced the following significant events:

- SWP facilities consumed 4.51 billion kilowatt-hours; this increase of 5.6 percent over 1992 consumption represents the first increase in energy requirements since 1990.
- SWP hydroelectric powerplants generated 3.25 billion kilowatt-hours, while its coal-fired resource generated 1.20 billion kilowatt-hours.
- The Department purchased 1.44 billion kilowatt-hours of energy at a cost of $23.38 million, while additional costs for associated capacity, transmission, and dispatching services totaled $22.24 million.
- The Department sold 4.17 billion kilowatt-hours of energy with revenues of $93.47 million and also received $17.59 million in revenue from capacity sales and transmission service arrangements.
- The Department's two major exchange agreements produced about 2.33 billion kilowatt-hours in net energy for the SWP.
- The Department formed a task force to make recommendations for the power resources program when major SWP power contracts begin to expire in 2004.

SWP Facilities Construction

From the early 1970s to the late 1980s, design and construction activities centered on building power plants and adding pumping units and turbine-generators that were 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 will focus 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, constructing the Devil Canyon Second Afterbay, and possibly extending the SWP to the San Gorgonio Pass service area.

1993 Activities

Activities for about 40 design projects and 75 construction projects were in progress or completed between July 1993 and June 1994. As part of the Department's compliance with license requirements at its facilities, the Design Office routinely studies data obtained from field investigations of selected SWP facilities. Known as defi-

ciency studies, the studies are designed to provide early identification of problems at dams, embankments, and other SWP facilities. In 1993-1994, Oroville Dam, Thermalito Forebay Dam, Thermalito Diversion Dam, Castaic Dam, Pyramid Dam, Bethany Dam, Perris Dam, Peace Valley Pipeline, and Lower Quail Canal were investigated. The investigations will lead to remedial construction contracts for grouting defective instrumentation at Oroville Dam, providing seepage control filters at Lower Quail Canal Embankment, and performing seepage repair for subsurface erosion along Peace Valley Pipeline.

Other significant events in 1993 were as follows:

- Notice to begin work for the first contract of Phase II of the Coastal Branch was issued on August 13, 1993, and 14 additional awards and notices to begin work were issued during fiscal year 1993-94.
- Mojave Siphon was returned to service on March 28, 1994, after a section of Pipeline No. 1 failed on March 2, 1994.
- Construction work was started in November 1992 for an 800-acre-foot second afterbay adjacent to Devil Canyon Powerplant to permit full use of the new generating units and to improve downstream water delivery capabilities; completion is scheduled for early 1995.
- Construction of the initial Mojave Siphon Powerplant structure and fabrication of a gantry crane was completed in 1993.

Recreation Programs

In keeping with the celebration of the twenty-fifth anniversary of Oroville Dam, the Department renewed its commitment to residents of the Oroville area by revising its recreation plan for the Oroville facilities. The Department will construct additional recreation facilities and improve fisheries management programs at the Oroville complex.

The new Oroville recreational facilities will complement SWP's recreation program, which in 1993 served over 400,000 people at visitors centers and more than 5 million people at other facilities throughout the State.

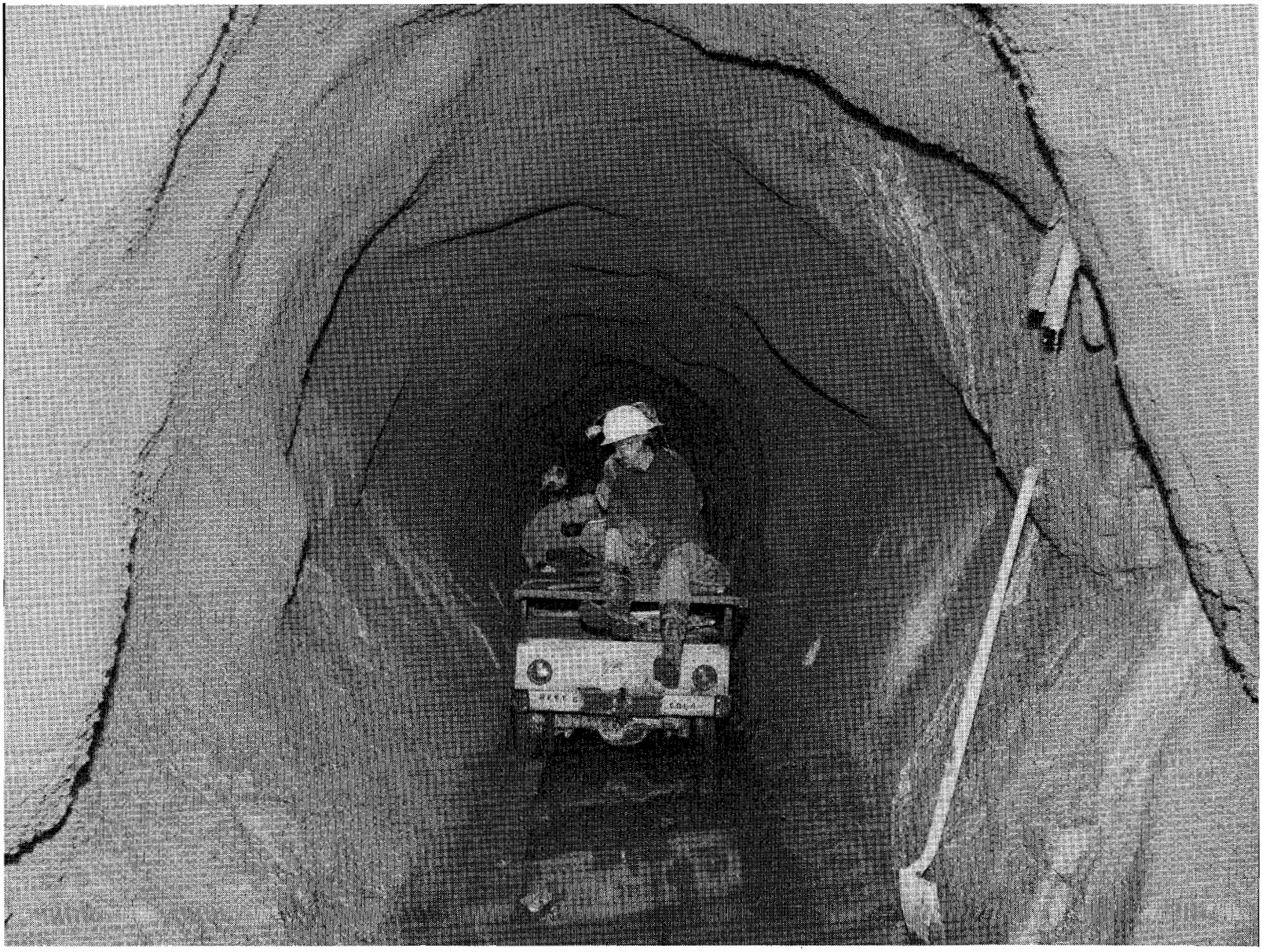
The Oroville Dam discussion was provided by the State Water Project Analysis Office in conjunction with the Division of Planning Reports Administration section. Additional information in this chapter was compiled by Bulletin 132 staff on information found throughout this Bulletin.

Part II

State Water Project Management

Chapter 2

Future Storage and Delivery Capabilities



Coastal Branch Phase II construction

Significant Events

- In spring 1994, the Department initiated efforts to formulate a new planning strategy for the State Water Project Future Water Supply Program. The strategy will focus on developing SWP water supplies for at least the next 30 years. A two-year scoping process closely coordinated with SWP long-term contractors is in progress, with a strategy report to be published in spring 1995 and a scoping report to be published in summer 1996.

- In late spring 1994, the Department began the two-year Service Area Impact Study to update information about the SWP service areas and reevaluate the effects of developing and distributing additional water supplies within those areas. The study will focus on socioeconomic trends that might affect the environment, habitat for threatened and endangered species, and the potential for growth in the service areas to affect this habitat. Information obtained from this study will help SWP contractors meet environmental requirements while developing water projects.

- On April 18, 1994, a groundbreaking ceremony held at Vandenberg Air Force Base in Santa Barbara County initiated construction of Phase II of the Coastal Branch of the California Aqueduct, planned to transport 47,316 acre-feet of municipal and industrial water to San Luis Obispo and Santa Barbara counties. In early 1994, the Department began construction of the first two reaches of the aqueduct. Construction of Phase II is scheduled to be completed in late 1996.

To meet the water deliveries specified in water service contracts, the Department of Water Resources plans 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 sites; and (2) satisfying many complex environmental procedures, laws, and regulations.

In 1994, construction began on Phase II of the Coastal Branch of the California Aqueduct, which has been under development since 1986. Phase II facilities will deliver water to municipal and industrial contractors in Santa Barbara and San Luis Obispo counties.

Several other projects designed to increase SWP delivery capability and yield have been suspended until water supply uncertainties in the Delta can be resolved. The Department continues the limited work necessary to maintain the projects for reactivation if they become feasible. Those projects would provide off-stream storage south of the Delta (Los Banos Grandes facilities and Kern Water Bank) and develop additional water supply north of the Delta in the Cottonwood Creek and Red Bank Creek basins (Red Bank Project).

Because meeting contractual water delivery amounts remains a priority with the Department, two planning programs have been initiated to meet that priority: the SWP Future Water Supply Planning Strategy and the Service Area Impact Study. The SWP Future Water Supply 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, which will update a previous study, will provide information to help planners, SWP contractors, and other SWP water recipients satisfy environmental requirements for new water development projects.

SWP Future Water Supply Planning Strategy

Because of the significantly increasing need for additional water supplies for the SWP along with the impacts of current Delta constraints, the Department initiated efforts in spring 1994 to formulate a new planning strategy for the SWP Future Water Supply Program. Based on initial discussions with the contractors, the Department outlined a draft planning strategy proposal for developing SWP water supplies during the next 30+ years through interim, short-term (next 10 years), and long-term measures. This draft proposal will be the basis for a two-year, intensive scoping process to identify the key components of the most effective strategy for implementing a new SWP water supply development plan for the next 30+ years.

Scoping Process

The two-year scoping process will be closely coordinated with SWP contractors to ensure that the SWP Future Water Supply Planning Strategy will meet individual contractors' needs. During the first year, the scoping process will focus on such activities as identifying specific potential SWP water supply projects, gathering existing basic data, and defining appropriate planning approaches for compliance with the National Environmental Protection Act, California Environmental Quality Act, and Endangered Species Act. Results of these activities will be presented in "Initial Report on the Development of a SWP Planning Strategy," which will be published in spring 1995. This strategy report will

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.

outline an overall approach for developing SWP water supplies for the next 30+ years.

The second year's scoping activities will focus on identifying key projects for further study; developing schedules, budgets, and staffing for these projects; identifying critical issues (environmental, financial, institutional, etc.) and major "selling points" for each project; prioritizing "best" key projects; and evaluating environmental, regulatory, technical, and public involvement strategies for taking the "best" projects from planning to implementation. Based on the results of these efforts, the Department will publish a "scoping report" in summer 1996. This report will outline the details for implementing the SWP Future Water Supply Planning Strategy.

The Department recognizes that the SWP Future Water Supply 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, this planning strategy needs to examine both traditional and nontraditional measures for SWP water supply development. Many nontraditional measures would allow water supply development 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, in conjunction 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 Department will also conduct workshops with various regulatory agencies and hold public involvement meetings to seek consensus and generate broad-based support for implementation of the planning strategy.

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 deliveries to the SWP service areas. As part of the process of complying with the California Environmental Quality Act, the Division of Planning conducted the Service Area Impact Study, designed to provide a consistent method of measuring the impacts of future water supply projects in the SWP service areas. The Department then prepared several environmental impact reports based on information derived from the study.

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 two-year Service Area Impact Study in late spring 1994 to update and reevaluate the effects of developing and distributing additional SWP supplies within the service areas.

Two-Year Study Update

The two-year Service Area Impact Study will reexamine the effects of developing and distributing additional water 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 in the service areas to affect this habitat. By providing this information, the study will

assist the SWP contractors and other recipients of SWP water, such as county and local agencies and potential developers, in identifying measures and conditions that can be carried out to ensure ESA compliance. Since the exact locations of future urban and/or agricultural development within the SWP service areas is unknown, project proponents may need to prepare additional environmental documents that tier from the project-specific EIRs prepared by the Department.

In addition to identifying sensitive environmental areas where impacts from development may occur, the Division of Planning will work with the SWP contractors and local planning agencies to develop memoranda of agreements with federal and State regulatory agencies. These agreements should acknowledge the responsibility of the local agencies to mitigate impacts to natural communities and to protect endangered and threatened species.

A scope of study has been prepared. Preliminary tasks in progress include preparing and developing resource base maps; reviewing county and regional general plans; and compiling base year (1990) estimates of population, housing, major industries, and income; and developing preliminary water demand and supply balances for the six SWP service areas (Feather River, North Bay, South Bay, San Joaquin, Central Coast and Southern California).

The results of the updated Service Area Impact Study will be presented in a memorandum report. The Department expects to update the new study biannually to allow the Department better tracking of future development in the service areas. A Service Area Impact Study status report summarizing the pertinent data collected to date will be distributed in June 1995 to appropriate planning agencies, SWP contractors, and developers.

Coastal Branch Delivery Facilities

The Coastal Branch of the California Aqueduct is being constructed in two phases. The first phase delivers water for agricultural use to contractors in northwestern Kern County; the second 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.

The first phase of the Coastal Branch was completed in the late 1960s. It includes two pumping plants and a 14.8-mile coastal stub canal extending 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.

Phase II Facilities

Construction of Phase II facilities began in early1994. These facilities, as initially designed, may include:

- 102 miles of buried pipe, which will extend from the existing terminus near Devil's Den to the site of Tank 5 on Vandenberg Air Force Base, 12 miles south of the Santa Maria River;
- four pumping plants;
- one power recovery plant; and
- five water-tank facilities.

The project will transport about 47,300 acre-feet per year of municipal and industrial water to San Luis Obispo and Santa Barbara counties.

In October 1986, Santa Barbara County FCWCD and San Luis Obispo County FCWCD 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.

Santa Barbara County FCWCD and San Luis Obispo County FCWCD 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. San Luis Obispo County FCWCD requested 4,830 acre-feet per year; Santa Barbara County FCWCD requested 42,486 acre-feet per year.

Phase II Construction

The Phase II project has been divided into seven construction reaches. In early 1994, the Department began construction of the first two reaches and was preparing the final design for the remaining five reaches, acquiring rights-of-way, and obtaining additional permits necessary to construct the project. Three addenda to the final EIR have been prepared to document changes in the project. With mitigation, the project will result in no long-term significant impacts. All significant impacts are short-term and associated with construction (traffic, noise, and air quality).

Construction of Phase II of the Coastal Branch requires laying 102 miles of buried pipe from the existing 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, Polonio Pass, and Casmalia Pumping Plants, San Luis Obispo Powerplant, and five water-storage facilities. San Luis Obispo Powerplant is designed to dissipate excess water pressure in the pipeline and will generateapproximately 4 megawatts of power. The five 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 is being constructed at Tank Site 1 at Polonio Pass.

The project has been divided into 31 construction contracts. Six contracts were awarded in late 1993 and an additional nine by mid-1994. Construction is scheduled to be completed in late 1996.

The estimated cost of the project (in 1992 dollars) is $400,000,000, which includes costs for mitigation and rights-of-way. The unit cost of the water at the turnouts is estimated at $480 to $650 per acre-foot, depending on the repayment reach and the amount of water subscribed. Costs for treating the water and constructing local facilities to transport water to areas of use are not included.

Los Banos Grandes

A key component of the Department's plans to meet California's growing water needs is 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 release later during dry periods.

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

- improve 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; 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 have mandated measures to protect the delta smelt and winter-run chinook salmon – two Delta fish species listed under the federal Endangered Species Act – and 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 that are anticipated to be available for diversion and storage in the proposed Los Banos Grandes facilities.

In June 1994, the federal and State governments signed a framework agreement to establish a coordinated, comprehensive program for setting water-quality standards and developing a long-term solution to fish and wildlife issues, water supply reliability, flood control, and water quality problems in the Bay-Delta Estuary.

In December 1994, the State Water Resources Control Board, in cooperation with other State and federal agencies and representatives of urban, agricultural, and environmental interests, released a draft Water Quality Control Plan for the Bay/Delta. It is expected that this plan will be finalized in 1995, and work will proceed through the State and federal Bay Delta Advisory Council 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 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 financial capabilities of the SWP contractors. The reevaluation analyses of a south-of-the-Delta offstream reservoir will be integrated into the ongoing SWP future water supply planning strategy.

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, a pilot program developed by the Department to evaluate survival parameters for over 1,200 sycamores ranging in size from seedlings to established trees; and testing potential mitigation measures for impacts to the San Joaquin kit fox.

Kern Water Bank

The Kern Water Bank includes all opportunities to recharge the 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 the SWP water supply, whereas 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.

Endangered Species Acts

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.

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.

The program emphasis is now directed toward completing the Habitat Conservation Plan for the Kern Fan Element; 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. Until the Kern Fan Element has been reassessed and a decision made either to proceed with implementation or to delay further implementation, or until another alternative action is adopted, all other planning efforts for the Kern Water Bank have been discontinued.

Kern Fan Element

The Kern Fan Element is located on 20,000 acres of Department-owned land that straddles the Kern River between Bakersfield and the Elk Hills Naval Petroleum Reserve. Initially, the Kern Fan Element was planned to be built in two stages. Planned storage capacity of the first stage was about 350,000 acre-feet with an expected average annual SWP water supply benefit of about 44,000 acre-feet per year and an average annual dry period supply benefit of about 50,000 acre-feet per year. The second stage was expected to increase the storage capacity to about 1 million acre-feet with an expected average annual dry period water supply benefit of about 140,000 acre-feet per year and a corresponding increase in the average annual SWP water supply.

Environmental Documentation

The purchase by the Department of the Kern Fan Element land and subsequent planning activities for the Kern Water Bank program were based on a final environmental impact report released in December 1986. A supplemental environmental impact report for the Kern Fan Element was prepared according to the guidelines of CEQA and distributed for review on December 31, 1990. Efforts to finalize the EIR were stopped pending evaluation and resolution of water supply issues related to endangered species in the Delta.

Habitat Conservation Plan

Plant and animal species presently listed as threatened or endangered under state and federal endangered species acts, and found, or expected to be found on the Kern Fan Element, include the slough thistle, recurved larkspur, Hoover's eriastrum, San Joaquin woolly threads, San Joaquin kit fox, Swainson's hawk, Tipton kangaroo rat, San Joaquin antelope squirrel, and bluntnose leopard lizard. Construction and operation of the project facilities would result in a take of these species as defined and prohibited under both endangered species acts. Permits to allow construction and operation of the project facilities can be obtained under Section 2091 of the State act, and Section 10(a) of the federal act.

Both acts require the Habitat Conservation Plan as part of the permit applications. The plan will define the impacts to the listed species related to construction, operation, and maintenance of the project; set requirements that minimize and mitigate for project-related disturbance of listed species; and compensate for destruction of habitat by setting aside habitat management areas.

The permitting process for the Kern Fan Element will be done in two steps. The first step will be to acquire a permit that covers only local impacts. This permit would allow only recharge of water that has no additional impact on winter-run salmon, delta smelt, and other endangered species in the Delta. This permit for the first step would allow recharge of contractor entitlement deliveries. The second step will be to amend the permit to cover the endangered species impacts resulting from recharging all water that can be diverted from the Delta.

The regulatory agencies also require that significant existing and planned activities by other entities on the Kern Fan Element property, as well as related activities on neighboring lands, be included in the permit. Those activities include construction of additional recharge facilities by the Kern County Water Agency; and construction, operation, and maintenance of oil and gas wells and related facilities by ARCO Oil and Gas Company and their lessees, as well as the activities of other utility easement holders. In addition, recharge facilities belonging to the city of Bakersfield, Buena Vista Water Storage District, and West Kern Water Storage District are adjacent to the Kern Fan Element and used interchangeably. Consequently, those entities will be included in the permit.

Administrative drafts of the Habitat Conservation Plan were circulated for review during spring 1994. Pending approval by the KCWA, and final editing of review comments, the HCP will be ready for submittal in June 1994.

Kern Fan Element Reevaluation

Reevaluation of the Kern Fan Element to reflect reductions in project water supplies due to Endangered Species Act issues in the Delta was not yet complete at the end of the 1993-94 fiscal year. Analysis of water quality restrictions, ground water modeling, and the cost evaluation remain to be completed. Cost comparisons of project alternatives, discussion of options, and a decision to stop efforts or proceed to implement the project are expected to be accomplished by the end of December 1994.

Local Elements

The seven proposed local elements of the Kern Water Bank could add about 2 million acre-feet of ground water storage and increase the average annual dry period water supply of the Kern Water Bank by about 280,000 acre-feet per year. The local elements are planned in cooperation with the Department and are in various stages of the planning process. A feasibility investigation is nearly complete for one local element, and prefeasibility investigations are nearly complete for the remaining six. Also, a master plan for evaluating and implementing the local elements has been completed.

Feasibility Studies

As of the end of the 1992-93 fiscal year, prefeasibility studies were completed for local elements sponsored by the Kern Delta Water District, Improvement District Number 4, Buena Vista Water Storage District/West Kern Water Storage District, Cawelo Water District, and Rosedale Rio Bravo Water Storage District. A draft prefeasibility study for the element sponsored by the North Kern Water Storage District was completed and circulated for review in late June 1993. The Department is analyzing *Components of Feasibility Study of Semitropic Local Element of Kern Water Bank,* a feasibility report prepared for the Semitropic Water Storage District by Bookman-Edmonston Engineering, Inc. All other planning efforts for this program have now been suspended until water supply impacts relative to Endangered Species Act issues in the Delta can be evaluated.

Master Plan

A master plan was prepared by a Kern County working group to ensure that criteria and procedures are set for implementing local elements in an orderly manner and all local elements are assessed equita-

bly. Once Kern County Water Agency decides that a local element meets the criteria set forth in the master plan, the feasibility of the element can be determined. If the project is feasible, documents required by the CEQA can be prepared, and negotiations between the project's sponsor and the Department to implement the local element can begin.

Red Bank Project

Cottonwood Creek in Shasta and Tehama counties, the largest uncontrolled tributary of the Sacramento River, is a primary cause of flooding locally and along the upper Sacramento River. In 1964, the U.S. Army Corps of Engineers selected the Cottonwood Creek drainage basin for constructing facilities to provide flood protection as well as an additional water supply.

Since then, both the Corps and the Department have conducted studies to determine the feasibility of constructing those facilities. The facilities studied by the Department are much smaller and are located higher in the watershed than those investigated by the Corps. The facilities evaluated by DWR are known as the Red Bank Project.

Project Description

As defined in a 1993 final report published by the Department, the Red Bank Project would consist of:

- a storage dam, reservoir, and combination diversion at the Dippingvat site on the South Fork of Cottonwood Creek;
- a storage dam and reservoir at the Schoenfield site in the adjacent Red Bank Creek basin; and
- a conveyance system connecting the two reservoirs.

Dippingvat Dam would be about 251 feet high with a reservoir capacity of 104,000 acre-feet. The Schoenfield Dam would be about 300 feet high with 250,000 acre-feet of storage capacity.

Cost and Benefits

In conducting the study, the Department determined that the cost of constructing the dams and reservoirs would be $209 million (1992 dollars) and that the project would provide the following benefits:

- approximately 47,000 acre-feet per year of additional water to the SWP system,
- an annual flood control benefit of about $2.4 million for the Cottonwood Creek basin, and
- a warm-water fishery and other recreational facilities (approximately 113,000 recreation-days per year).

The Department also determined that the project could potentially provide benefits to the anadromous fisheries in lower Cottonwood Creek through increased in-stream flows.

Project Viability

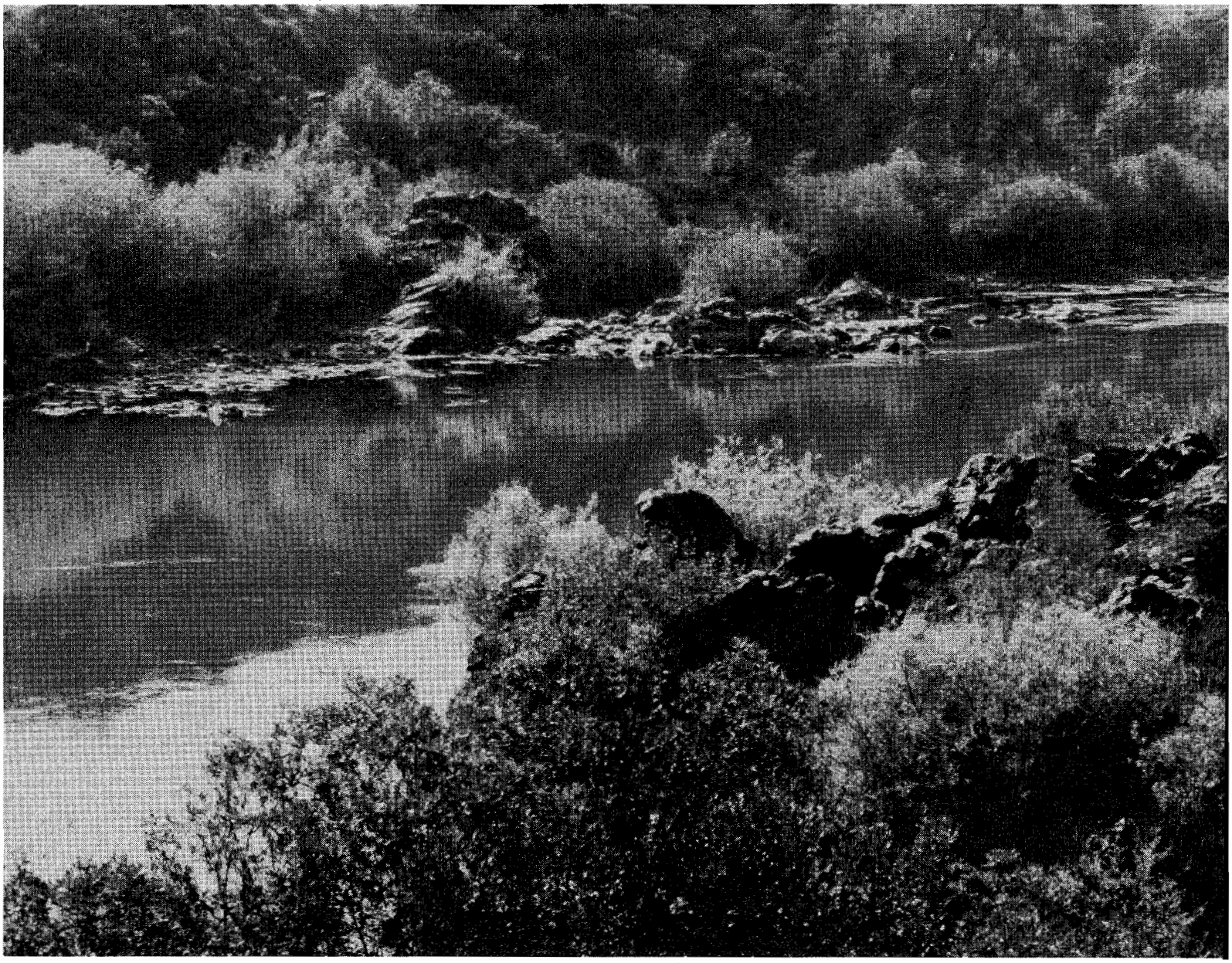
During initial studies in the 1980s, the Red Bank Project was thought to be a viable addition to the SWP supplies. However, the Department's studies, completed in 1993, identified increased costs, potential on-site environmental concerns such as sensitive plants and wetlands, and serious water supply-related concerns associated with endangered species in the Delta. Those issues make this project infeasible. Project feasibility could be restored if solutions to those concerns are found. Until then, further study of the Red Bank Project will be minimal.

Information in this chapter was contributed by the Division of Planning, State Water Project Planning Branch.

Sidebars were provided by the Office of the Chief Counsel.

Chapter 3

Water Supply Development



Sacramento River Basin

Significant Events

- In November 1993, the Department issued a final environmental impact report for future Drought Water Banks. The EIR establishes a framework for water bank operations and water transfers under specified drought conditions.

- Based on its experience in managing the 1991 and 1992 Drought Water Banks, the Department published a report in November 1993 reviewing issues and challenges involved in water transfers.

- In June 1994, after a dry winter and Delta restrictions led to cutbacks in SWP and CVP water deliveries, the Department established a 1994 water bank and took immediate action to acquire water to meet critical needs.

- The Department continues to investigate the potential for conjunctive use of water in the Sacramento Valley and to conduct demonstration programs as conditions permit. Studies are being undertaken in Butte and Yolo counties and in the American and Bear River basins.

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. Plans recently evolved from the traditional conserving of existing supply through storage to:

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

Water Transfers

Before 1991, most water transfers in California were negotiated by the Department 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 1991, as the 1987-1992 drought continued, California began its first large-scale water transfer program when the Governor established the 1991 Drought Water Bank. As the drought continued, in March 1992, the 1992 water bank was 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 the drought ended, no water bank was established. To facilitate future water banks, however, the Department issued a final environmental impact report in November 1993 for future State drought water banks. The EIR outlines the framework for future water bank operations and water transfers 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.

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. Final accounting of the 1991 water bank and adjustments to the 1991 melded water purchase rate will be computed after final billings have been paid. A fiscal report on the 1992 water bank was transmitted to all purchasers of Drought Water Bank water.

1994 Drought Water Bank

Following a wet 1993, when a water bank was not activated, a dry winter along with severe water restrictions in the Delta resulted in major cutbacks in 1994 water deliveries to SWP and CVP contractors. In June 1994, Secretary Wheeler announced the need for a 1994 water bank. Activities were immediately initiated to secure water acquisitions necessary to meet 1994 critical

needs. Under this program, the Department expects to transfer about 148,000 acre-feet of water during 1994.

Short-Term Water Purchases

Because of the success of the 1991 and 1992 Drought Water Banks, 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. The Department continues to explore possibilities of purchasing water via short-term transfers. In June 1993 the Department began drafting a work plan and time line to complete the environmental documentation required for short-term water purchases by the SWP.

State Water Project Transfers

The Department, through the State Water Project Analysis Office, negotiates temporary transfers of water 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 non-Project water between non-SWP and SWP agencies. Most temporary water transfers must be approved by the State Water Resources Control Board in accordance with sections 1725 through 1728 of the *California Water Code.*

Chapter 10 contains specific information on water transfers during 1993 and contracts for water transfers written between July 1, 1993, and June 30, 1994.

Conjunctive Water Use

As a water management tool, conjunctive use of surface water and ground water provides two important benefits:

1. 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.
2. Conjunctive use is a relatively low-cost method of storing water in times of above-average supplies for 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.

The Department has actively promoted conjunctive use as a water management tool since the 1960s. Since 1986, the Department has worked on the Stanislaus River Basin and Calaveras River Water Use Program to evaluate the potential for conjunctive use within these river basins. In 1992 the Department expanded its conjunctive use program to investigate the potential for conjunctive use of surface water and ground water in the Sacramento Valley.

Sacramento Valley

The Department continues its investigation, begun in 1992, of the potential for conjunctive use of surface and ground water in the Sacramento Valley to augment the SWP water supply.

The Department adopted the following three-part approach to its conjunctive use investigation:

1. conduct prefeasibility investigations and develop demonstration programs to allow incremental expansion as conditions permit;

2. evaluate water supply and hydrogeologic conditions, existing facilities, legal and institutional relationships, and existing operations; and
3. work with local agencies to establish cooperative relationships needed to resolve legal and institutional concerns.

Resource Inventory

The Department identified seven regions in the Sacramento Valley that may be suitable for conjunctive use programs. To select the most suitable local areas for project development within those regions, the Department compiled and analyzed information about the physical suitability of the Sacramento Valley for conjunctive use, then prepared generalized maps showing:

- historical water level changes,
- well yields and specific capacity,
- base of fresh water,
- number of wells,
- recharge suitability,
- drought Water Bank extractions,
- ground water quality,
- potential land subsidence,
- intensity of ground water use, and
- 1990-level surface and ground water use.

These items were synthesized into a map showing that portion of the valley most suitable for conjunctive use. This effort is being coordinated with similar evaluations the USBR is conducting as part of its Central Valley Project Improvement Act augmentation studies and by the Natural Heritage Institute.

Prefeasibility Studies

The Department is conducting several investigations to determine the potential for conjunctive use of water in the Sacramento Valley and is also working to develop demonstration programs as conditions permit. These projects could 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 water supply for delivery in dry years. The Department is working with cooperating land owners and coordinating with local agencies and other parties to develop a three- to five-year demonstration program.

American and Bear River Basins

The Department continued the prefeasibility investigation in the basins of the American and Bear rivers in Sutter, Placer, and Sacramento counties. This investigation contemplates 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 the surface water normally used in the area; during wet periods, ground water would be recharged by "in lieu" means. This study is anticipated to be completed in 1994 and to proceed to either a feasibility investigation or demonstration program.

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 the well field design. This study is anticipated to be completed in 1994.

Butte Basin

As ground water was intensively pumped during the 1987–1992 drought, water levels were monitored in Butte Basin. Information collected from this activity during the 1992 Drought Emergency Water Bank was used to formulate an approach to evaluating the conjunctive use potential of the area and to secure local cooperation in further studies. However, these studies were delayed by the resumption of Drought Water Bank activities; the studies are anticipated to begin in late 1994 or early 1995.

Local Agency Concerns

The Department continues to work with local agencies and other interested parties to address concerns about additional use of ground water and water transfers and to inform them about the potential for conjunctive use as an element of overall resource management. Local agencies continue to develop ground water management programs; the Department continues to assist them with their plans. However, the difficulty of resolving the conflicts of local interests has slowed the adoption of programs, and the implications 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 for releasing CVP water from the New Melones Dam in exchange for financing diversion and conveyance facilities. Specifically, the districts proposed to release up to their 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 years of critical shortages. In exchange, the SWP 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. The districts would revert to ground water use during critically dry years.

In 1988, in response to the proposal, the Department, USBR, and local water agencies agreed to investigate 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. A memorandum of understanding was signed by the Department, 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.

Oakdale Irrigation District and South San Joaquin Irrigation District, two irrigation districts 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 is reviewing alternatives to determine the one that best:

- meets the future in-basin and out-of-basin water needs of all involved agencies and counties;
- improves in-stream flows for the Stanislaus, Calaveras, and San Joaquin rivers;
- improves water quality in the channels of the southern Delta;
- increases CVP and SWP water supp lies in the Delta; and
- assists in meeting outflow requirements in the Delta.

In 1991, Stockton East Water District and Central San Joaquin Water Conservation District decided that they could not wait for completion of the joint study and began constructing a portion of the diversion and conveyance facilities necessary to import CVP water to their service areas. A 3.5-mile diversion tunnel and 8 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 increased in-stream flow requirements for the Stanislaus River by 200,000 acre-feet in 1993; this increase left no water for Stockton East Water District and Central San

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.

Joaquin Water Conservation District 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.

Environmental Documentation

In addition to identifying alternatives to meet demands, the Department and USBR are preparing a combined draft environmental impact report and environmental impact statement. A scoping report published in 1991 identified the following issues to be examined in the environmental documentation:

- conjunctive use of Stockton East Water and Central San Joaquin Water Conservation Districts' 155,000 acre-feet of interim and firm water supply,
- county-of-origin water needs and protection,
- fishery flows in the Stanislaus River,
- ground water levels in eastern San Joaquin County's ground water basin,
- improved water quality at Vernalis on the San Joaquin River for the south Delta area,
- protection of existing water rights,
- return of interim out-of-basin contracted water to in-basin users when needed,
- recreational needs in the Stanislaus River, and
- source of water supply to cities in the study area.

Current Activities

In addition to conducting environmental studies, planners are completing surface water and ground water models to be used in evaluating the various alternatives. Water flow requirements for fish in the Stanislaus River are also being evaluated by DFG and the U.S. Fish and Wildlife Service.

The Department is reevaluating the potential water supply available to the SWP from this program. New demands on the Stanislaus River water supply from the CVPIA, the Endangered Species Act, and new Delta standards may eliminate the potential water supply to the SWP. The Department will complete the reevaluation by January 1, 1995, and decide whether to continue participating in the program.

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 non-participating SWP contractors.

The Department conducts a feasibility study of local projects 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.

Weather Modification

Encouraged by the results of a 1985 contract to study the feasibility of cloud seeding, the Department funded a prototype project carried out in a remote area of the Middle Fork Feather River near Johnsville. The project, which began in 1988, used liquid propane to increase snowfall.

This weather modification project employed 10 dispensers fitted with spray nozzles on 10-foot towers. When remotely activated by Department personnel in Sacramento, the dispensers released liquid propane, which as it evaporated, immediately lowered temperatures in a selected cloud and created billions of ice crystals. If cloud conditions were right, those crystals became snowflakes, thereby increasing the snowpack.

Based on the success of this innovative project, the Department planned a larger cloud-seeding program to be conducted in the Feather River watershed.

With partial funding provided by the USBR, the Department began randomized seeding of winter storms in November 1991. Through June 1993, the Department had completed 258 hours of the estimated 1,200 hours of seeding needed to reach statistical significance for properly evaluating the program. Evaluation was to be based on the analysis of information received from 11 remotely operated rain-snow gauges installed in the target area and from detailed physical studies directly documenting the effects of seeding.

After three years of the intended five-year program had been completed, the Department decided to terminate the project for the following reasons:

1. The USBR made a policy decision to end participation in weather modification research and terminated its cost-sharing arrangement with the Department.
2. The three winter seasons of the program were extreme, either excessively dry, as in 1991-92 and 1993-94, or excessively snowy, as in 1992-93. These extreme conditions significantly reduced the number of randomized cases expected after three years (93 versus 180). Therefore, to achieve statistical significance, the project would likely have needed to continue at least three years beyond the five years intended, and for each of those years precipitation would need to be near normal. However, continuing the project beyond its intended completion date would have required extending the environmental permits, which would then have required public review and an associated delay in the project.
3. Physical studies relating specifically to the transport of a tracer gas within the target area showed that moderate-to-strong downdrafts and

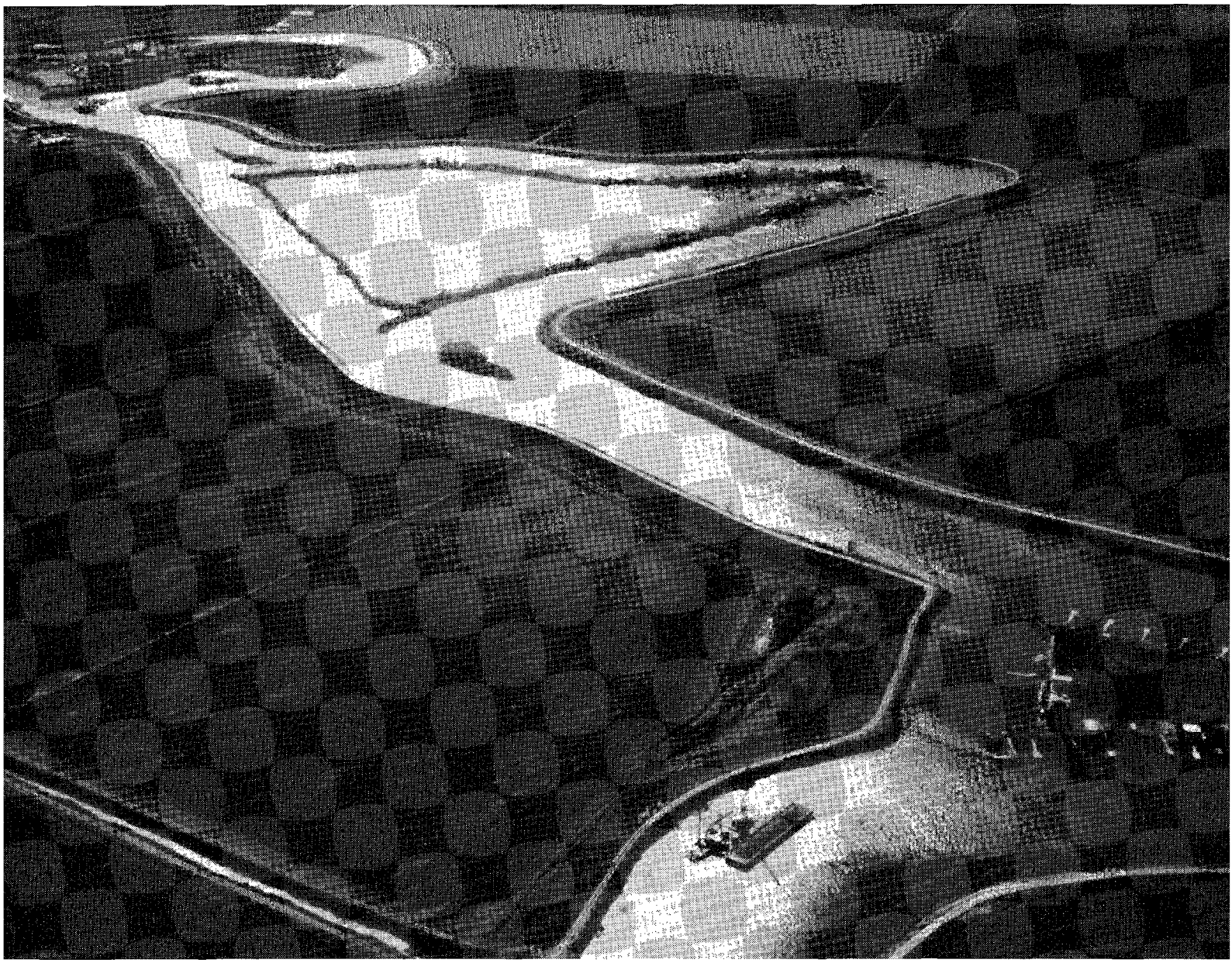
updrafts to the lee of the main Sierra crest significantly affect the targeting of seeding-produced ice crystals. This difficulty in targeting is compounded by the fact that propane seeding is normally conducted at temperatures near -3 degrees Centigrade. At these temperatures the growth rate of the ice crystals is very slow, requiring up to an hour to reach the size necessary to significantly contribute to precipitation.

The results of these studies indicate that the targeting problem could be solved by moving the propane dispensers further west and south of their current locations, which would provide more time for crystal growth time before the crystals pass into the strong vertical motion field. However, when the Department tried to move two dispensers prior to the 1993-94 season, the U.S. Forest Service required a written amendment to the project environmental impact statement and a period of public review. Carrying out those requirements would have delayed or prevented preparation for the 1993-94 season. Therefore, the Department decided not to move the dispensers and instead to conclude the program.

Information on water transfers was provided by the State Water Project Analysis Office. The Division of Planning, State Water Project Planning Branch, furnished material about conjunctive use and State Water Project funds. Information on weather modification was contributed by the Division of Operations and Maintenance Water Operations Branch.

Chapter 4

Delta Resources



The Sacramento-San Joaquin Delta

Significant Events

- The Department of Water Resources Division of Planning, in conjunction with the Division of Operations and Maintenance, Reclamation District 1601, Twitchell Island, and the U.S. Army Corps of Engineers, completed a major rehabilitation of the south levee on Twitchell Island. Using funds from the Delta Flood Protection Act of 1988 Special Flood Control Program, the Department shared a portion of the construction cost with RD 1601. Most of the material for the levee work, 400,000 cubic yards, came from the Department's dredging within Clifton Court Forebay. This dredged material was barged from the forebay to Twitchell Island as a joint effort of the Department and RD 1601. The Corps of Engineers provided an additional 50,000 cubic yards of sediment from the Corps' Simmons Island storage site. This material originated in Suisun Slough and required monitoring of drainage for possible adverse salinity impacts. Approximately 50,000 cubic yards of commercial material was obtained from a private source near Rio Vista. In addition to relying on cost sharing and cooperation between agencies, this project also innovated methods of using geotechnical fabrics, drainage systems, and landside berms for improved stability.

- The Division of Planning worked closely with the managers of Staten Island, staff of the Central Valley Regional Water Quality Control Board, and the California Department of Fish and Game to facilitate construction of riparian berms from dredged material along the South Fork of the Mokelumne River. This project will develop shaded aquatic riverine habitat by using methods compatible with the objectives of the North Delta Program. The Department sampled dredged materials and water in the affected area to monitor potential toxic constituents. This sampling will provide baseline data for potential mitigation for future channel improvements.

- The Department obtained all the required permits and installed barriers in Middle River and Old River near Tracy during the irrigation season of 1993. Because of hydrologic conditions and concerns with the Endangered Species Act, the fish barrier at the head of Old River was not installed in spring 1993. The Department conducted, and funded the Department of Fish and Game for assistance, an extensive environmental monitoring program while the barriers were installed and after they were removed. A report documenting the findings was submitted to the Corps of Engineers. The report showed that the two barriers were effective in improving water levels, circulation, and water quality.

No area in California's waterscape has been the subject of more investigations than the Sacramento-San Joaquin Delta, 738,000 acres of land interlaced with hundreds of miles of waterways. Natural runoff and flood flows from the Sacramento, San Joaquin, Mokelumne, and Cosumnes rivers flow into the Delta, which receives runoff from 40 percent of the State's land area.

With its concentrated water supply, the Delta supports hundreds of species of fish, wildlife, and plants. As part of an interconnected estuary system that includes Suisun Marsh and San Francisco Bay, the Delta serves as a passageway for fish migrating to and from the Pacific Ocean. It also provides refuge for migrating waterfowl and numerous other wildlife species. Because of the miles of waterways and diverse wildlife, the Delta is a popular destination for outdoor recreationists. In addition, the rich soil and available water sustain many agricultural crops and farms.

The Delta also serves as part of a large system designed to divert water from the northern part of the State to over 20 million Californians. The Delta's channels have been used by the Central Valley Project since 1951 and the State Water Project since late 1967 to transport winter flows and water from upstream reservoirs to the southern Delta, where pumps lift the water into the Delta-Mendota Canal and California Aqueduct for distribution south and west.

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 these 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 developed planning programs for three distinct areas of the Delta: the north Delta, south Delta, and west Delta (Figure 4-1). Work on those planning programs continues under the guidelines contained in Governor Pete Wilson's April 22, 1992, water policy. As part of his 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.

In keeping with the Governor's policy, the Department's Delta planning programs emphasize interim solutions for improving conditions in the Delta. The process for finding a long-term solution was delegated to the 22-member Bay-Delta Oversight Council, established by Executive Order W-38-92 on December 9, 1992. The council began deliberations in February 1993 and, with the assistance of staff and technical advisory committees, has developed preliminary options for a solution and established criteria for evaluating alternatives. The criteria will be used to narrow the range of alternative solutions.

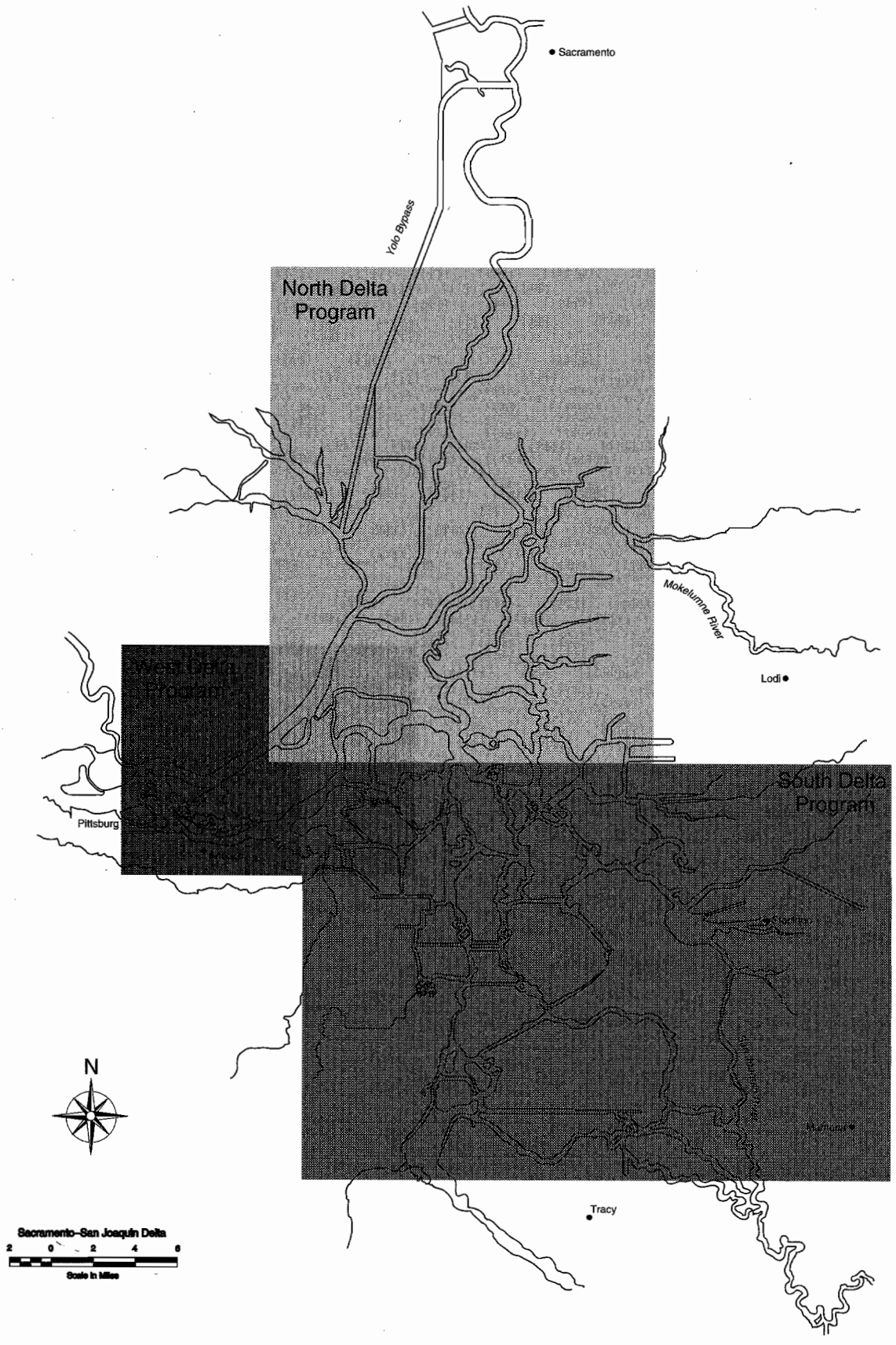


Fig 4-1. Boundaries of North, West, and South Delta Water Management Programs

Concurrently, key State and federal agencies negotiated a framework agreement to establish mutually agreeable water quality standards, coordinate federal and State water operations, and jointly sponsor and manage a process to document long-term solutions for the Bay-Delta Estuary. This agreement was signed in June 1994.

Under the framework agreement, the Bay-Delta Oversight Council will become a joint State-federal process with staff support by a joint federal-State program team. The new process is expected to be under way in 1995.

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 until a long-term solution is implemented. The long-term solution is to be developed by the Bay-Delta Oversight Council.

The Interim South Delta Program is designed to improve hydraulic conditions in the south Delta as well as improve water levels and circulation in south Delta channels for local agricultural diversions. Improved hydraulic conditions will increase operational flexibility for diverting water into Clifton Court Forebay and improve reliability of pumping capacity 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 for:

- constructing up to four control structures in south Delta channels to improve local water levels and circulations and provide fish protection on the San Joaquin River;
- enlarging some existing south Delta channels to improve conveyance and circulation;
- constructing an additional intake to Clifton Court Forebay north of the existing intake; and
- obtaining a permit from the U.S. Army Corps of Engineers to increase diversions into Clifton Court Forebay, thereby allowing Harvey O. Banks Delta Pumping Plant to pump up to its maximum design capacity of about 10,300 cubic feet per second with less restrictions.

The proposal for increasing diversions into Clifton Court Forebay would increase operational flexibility and capacity to store water south of the Delta while reducing fish losses. It would also improve reliability of the water supply. In addition, the proposal to construct 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 for improving 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 negotiate fishery mitigation.

Environmental Review Process

The draft environmental impact report/environmental impact statement for the South Delta Program was released in

June 1990, and the extended public review period ended September 30, 1991. However, environmental regulations that were assumed for impact analyses in the draft EIR/EIS have changed significantly and continue to be unsettled. The listing of winter-run salmon and Delta smelt under the federal and state Endangered Species Acts, the passage of the Central Valley Project Improvement Act, and the water quality requirements being developed by the federal Environmental Protection Agency and State Water Resources Control Board contribute to this uncertainty about environmental regulations.

Because conditions have changed greatly since the release of the draft EIR/EIS, the Department and USBR have decided to issue a revised draft EIR/EIS that will be based on the new regulations and will address current issues. The revised draft is expected to be released for public review and comment during 1995; the final EIR/EIS is planned to be completed by early 1996. 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 River 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;

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.

- reduce project impacts on fisheries; and
- increase flexibility of the State Water Project for water transfers and improve reliability of its water supply.

The program is also designed to enhance wildlife habitat and recreational opportunities.

Environmental and engineering studies for the Interim North Delta Program are currently in progress. 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 land-use management program for controlling subsidence and soil erosion on Sherman and Twitchell Islands as well as for providing diverse habitat for wildlife and waterfowl.

The Department 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.

Implementing the wildlife management plan would significantly reduce subsidence by minimizing oxidation and erosion of the peat soils on the islands. Oxidation and erosion would be minimized by replacing present agricultural cultivation practices with land-use management practices designed to stabilize the soil. Those practices range from minimizing tillage to establishing wetland habitats.

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

- Up to 13,600 acres of managed diverse wildlife and waterfowl habitat,
- 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 through shifting of diversions,
- Improved water quality through shifting of drainage,
- Increased wetlands and wildlife habitats to help meet State and federal mandates, and
- Increased terrestrial biodiversity.

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

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, for developing 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 for protecting 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 further 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 has been 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 the Special Projects program was fully funded in 1993-94, the Department obtained final easements and mitigation and relocations planning were completed. Construction began in July 1994; completion is expected in fall 1995.

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. This 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 will be 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.

Levee Rehabilitation

Rehabilitating the threatened levee sites will provide short-term protection for the western Delta until long-term improvements can be made. To date, more than $4 million has been spent at locations on Hotchkiss and Webb Tracts and Sherman, Twitchell, Bethel, and Bradford islands. 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 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. Fieldwork for the second-phase work is finished. A report covering Hotchkiss Tract was published in February 1994. The Bethel Island report should be published in 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 returned to their original geometry and elevation.

The Legislature recognized that problem and, with the Delta Flood Protection Act, requested that the Department monitor subsidence and study its causes. Accordingly, the Department contributed $380,000 to the U.S. Geological Survey to help fund an investigation of subsidence 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 a carbon dioxide gas subsequently discharged from the peat appears to be the primary cause of subsidence.

This type of investigation will continue to quantify rates of subsidence, identify the underlying physical and chemical processes that lead to surface subsidence, and identify troublesome land management practices in order to minimize subsidence of Delta peat soils.

Upland Relocation of Dredged Material

As local sources of fill material are depleted, new economical sources must be located. The Department, in coordination with the U.S. Army Corps of Engineers,

Reclamation District 341, Reclamation District 1601, 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, consisted of using approximately 1,600 cubic yards of sediment dredged from Suisun Slough as part of constructing 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 two years and ended in late 1992 with the Board's approval. 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, which was dredged from Suisun Slough, was transported from the Corps storage site on Simmons Island for use 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 Central Valley Regional Water Quality Control Board, 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, 1993, no adverse salinity impacts have been measured.

A third project, the Jersey Island Demonstration Project, is now under way. This project consists of the construction of a levee-stabilizing berm using approximately 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, Corps of Engineers, Reclamation District 830 on Jersey Island, and Department of Fish and Game. In addition, the Central Valley Regional Water Quality Control Board required an extensive monitoring and testing program as part of the waste discharge permit issued for the project. This project was completed in December 1994.

Elevation Verification

In 1987, the Department obtained Global Positioning System equipment, which is used in conjunction with U.S. Navy navigational satellites to establish precise horizontal and vertical positions. Field surveys of the Delta were made with this equipment in 1989. The data are being used to verify elevations in the Delta and to ensure that improved levees will be high enough to avoid overtopping during high-water conditions.

The National Geodetic Survey will eventually publish data obtained from those surveys. In the meantime the Department published an interim report—*Use of the Global Positioning System to Establish a Common Vertical Datum in the Sacramento-San Joaquin Delta, California, August 1991* — which included elevations verified through data from the surveys.

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 upgrading of levees to the standards contained in Bulletin 192-82, the Department is using available special project funds when other sources of funds are not available.

To augment its flood control actions, the Department is developing long-term plans to provide higher levels of protection for all eight islands included in the Special Flood Control Program. The preparation 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 levee improvement program for Twitchell Island was completed in 1993. A long-term improvement project for Sherman Island is scheduled to begin in summer 1995.

Federal Delta Planning Programs

To provide flood control measures and also improve navigation, the U.S. Army Corps of Engineers became actively involved in Delta flood control and navigation projects in 1877. The Corps is responsible for several flood control projects in the Delta, including building levees along the Sacramento River and adjoining sloughs, Mormon Slough, Calaveras River, and the Lower San Joaquin River and its tributaries. The Corps also works closely with the Department in planning conservation and protection activities in the Delta.

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 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.

Cooperative Studies

The Corps has been active in Delta planning activities since 1962, when it initiated an investigation of the Sacramento-San Joaquin Delta. The Corps, with the USBR and the Department, formed the Interagency Delta Committee, which held public hearings to set objectives for water quality and transfer, local water supply, fish and wildlife, recreation, flood control, seepage, drainage, navigation and vehicular transportation. The IDC developed and recommended the Peripheral Canal as the Delta transfer facility in 1964.

1982 Study

In October 1982, after intermittent planning, done in close cooperation with the Department, the Corps released a draft feasibility report and draft environmental impact statement for the Sacramento-San Joaquin Delta. This study listed project alternatives for providing additional flood protection, controlling tidal salinity intrusion, enhancing recreational opportunities, and preserving scenic values.

Changes since 1982 require that the study be revised to reflect present conditions. 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.

1991 Special Study

As with the 1982 study, the FCSA special study under the feasibility cost-sharing agreement 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. Also, the study will 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 was completed 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 includes a plan that identifies existing and future land uses in years 2000, 2020, and 2040. In addition, the report includes a discussion on developing a comprehensive plan, primarily for flood control, navigation, and environmental restoration.

The comprehensive plan will become the focus of phase two of the study. Potential Corps involvement in plans and projects in the Delta will be identified within this report. Phase two planning studies will be coordinated with the Delta Protection Commission, the process initiated in 1992 by the Governor to find a long-term Delta solution, and public agencies and interest groups.

An executive committee is providing overall management and policy direction, while a study management team is coordinating the execution of the study. The study could lead to authorization of a federal flood control project in the Delta, which would incorporate as many of the Department's Delta planning programs as possible.

Reconnaissance Studies

The Corps is also conducting three reconnaissance studies in the Delta. The first involves investigation of potential flood control, navigation, and environmental enhancement opportunities on Jersey, Webb, and Twitchell islands. The second involves the potential conversion of Prospect Island (recently purchased by the USBR) into a riparian, wetland, and shallow-water habitat zone. This conversion could provide substantial environmental benefits while reducing the long-term levee maintenance costs along the Sacramento Deep Water Ship Channel. The third study involves evaluating the potential role of the Sacramento Deep Water Ship Channel in reducing losses of migrating salmon either by allowing adults migrating upstream to return to the Sacramento River or by allowing juveniles migrating downstream to take a short cut to the Pacific Ocean.

Delta Water Rights Management

Several agencies in the western Delta claim rights to usable water in the Delta. To manage those water rights issues and resolve problems 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 has 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 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, parties agree to proceed with the design, construction, and operation of certain barrier facilities in the channels of the SDWA. 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 is conducting a project to test barriers in SDWA channels. The test involves:

- reducing or eliminating adverse water levels;
- improving hydraulic circulation;
- reviewing alternative timing patterns for the barriers;
- monitoring fish and vegetation;

[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.

- evaluating and reviewing computer model calibration;
- developing comprehensive environmental information; and
- defining potential effects on vegetation and fisheries.

The biological information gathered from this project will be used to find solutions to fishery resources and water use problems in the south Delta.

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 the 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.

The proposed contract also includes the framework for USBR and SDWA use in negotiating an amendment to provide a permanent settlement to issues concerning the quantity and quality of water entering SDWA boundaries from the south through the San Joaquin River system.

SDWA held an election in September 1991 and voted overwhelmingly (97 percent) to approve the contract. However, Congressional authorization is needed for the USBR to sign the contract. The USBR is seeking authorization under the recently

enacted Central Valley Project Improvement Act.

Western Delta Industrial Water Users

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 contracts signed in 1987 and 1991, at times the Department pays for providing that water.

According to the terms of a water entitlement contract executed in 1987, the Department makes payments to Fibreboard Corporation and its successors (now Gaylord Container Corporation), the operator of a mill located in the western Delta, 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 by purchasing a substitute water supply and treating water needed to operate the mill. According to the Department's initial interpretation of the provisions, payments were due in water years 1986-87, 1987-88, 1988-89, 1989-90, and for the first 151 days of 1990-91, after which the plant was closed.

On November 19, 1991, the Department negotiated a second 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 were assumed due in water years 1990-91, 1991-92, and 1992-93.

Determination of Payments

The contracts contain a chart used by the Department to determine the number of days for which Gaylord Container Corporation should be paid. The determination is based on the relationship between the Sacramento River Index and the number of days the corporation is entitled to water 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.)

The Department is evaluating the information supplied for these contracts and the method of computing the payments and is holding meetings with Gaylord's representatives to discuss some differences in interpretation of the contracts.

Western Delta Municipal Water Users

The Department signed contracts with the Contra Costa Water District in 1967 and the City of Antioch in 1968.

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.

During the 1991-92 water year, water of usable quality was available to Contra Costa Water District for 11 days of the water year; its standard is 142 days. For the

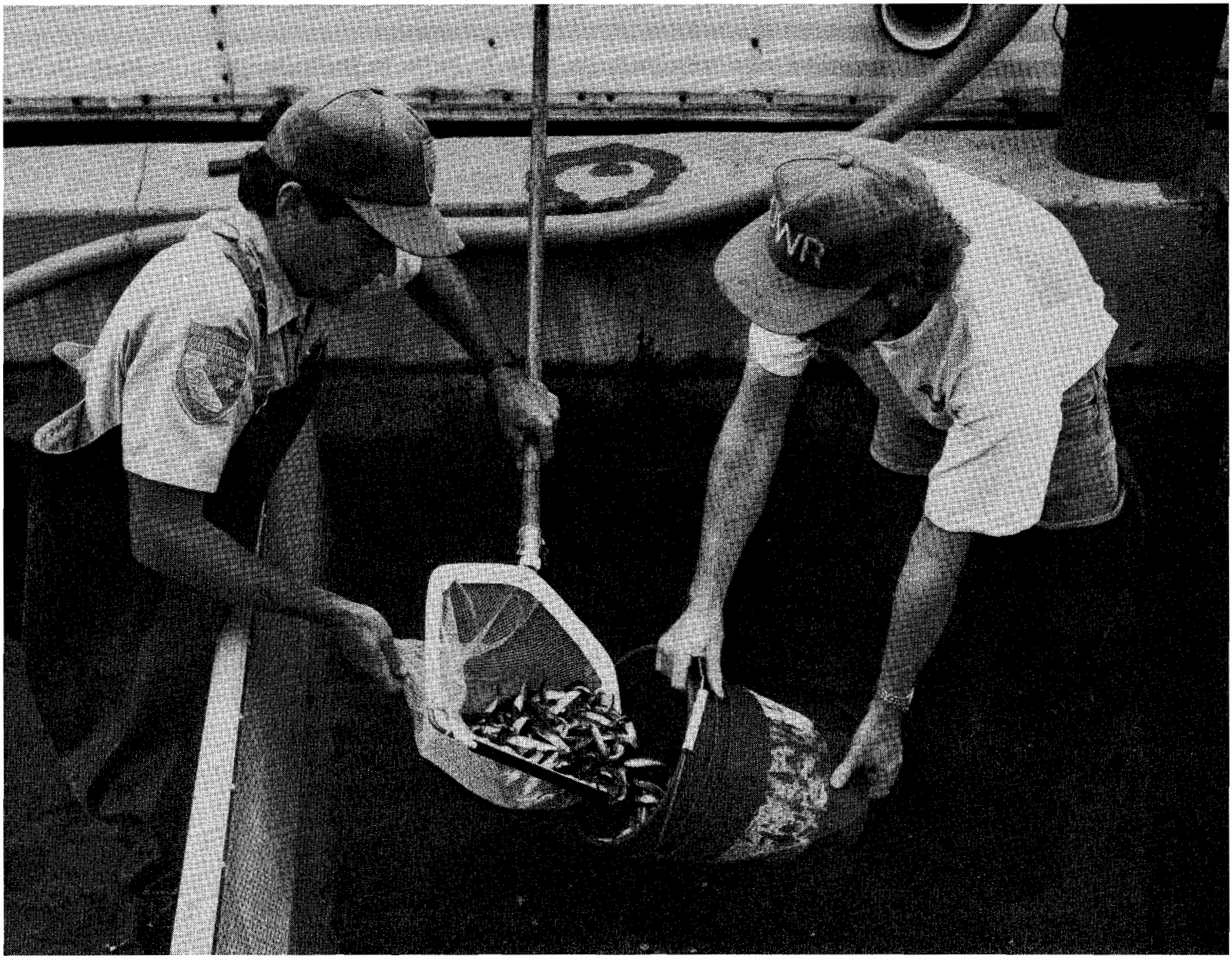
City of Antioch, usable water was available for 51 days; its standard is 208 days. Because previous deficiencies in water of usable quality had depleted accumulated credits, none of the deficient number of days in the 1991-92 water year (131 for Contra Costa Water District and 157 for the City of Antioch) were offset.

In 1993, the Department paid $17,993 to Contra Costa Water District in compensation for 3,528 acre-feet of usable water purchased during the 1991-92 water year. The City of Antioch was paid $473,963 for 1,192 acre-feet of usable water. The Department is evaluating the cost information supplied for this contract.

Information in this chapter was contributed by the Division of Planning, Delta Planning Branch. Information on *South Delta Water Agency v. United States, et al.* and the Clean Water Act was provided by the Office of the Chief Counsel.

Chapter 5

Environmental Programs



Collecting chinook salmon to be tagged and released into Lake Oroville

Significant Events

- In 1993, the Department completed a generic environmental impact report on water transfers, including transfers made as part of drought water bank programs.

- In 1994, the Department completed an Incremental Instream Flow Methodology study to determine the relationship between flow and biologically important variables for chinook salmon. The Department is conducting follow-up studies to gain further information about the salmon.

- A 1994 study using a kodiak trawl to sample delta smelt indicates that the population of delta smelt may have been underestimated by the mid-water trawls used in the past. The use of the kodiak trawl is being evaluated for its potential in project operations monitoring.

- A study conducted during 1993 and 1994 indicates that the use of an acoustical barrier across the mouth of Georgiana Slough is effective in keeping downstream migrating salmon in the Sacramento River and preventing the majority of the salmon from entering the slough. Follow-up tests are being conducted to gather more information about the effectiveness of acoustical barriers and any adverse impact they may have on nontarget species and adult salmon migrating upstream.

The Department of Water Resources has developed several programs and taken measures to eliminate, minimize, or offset adverse impacts that might result from construction and operation of State Water Project facilities. These programs and measures are undertaken in addition to the environmental documentation and mitigation activities required to obtain approvals for any additional project facilities.

Department programs and measures designed to reduce project impacts on fish and wildlife include:

- scheduling water transfers to reduce impacts on fish in the streams conveying water to the Sacramento-San Joaquin Delta and in the Delta itself;
- operating the water project in the Delta in accordance with existing biological opinions so that the continued existence of listed plants and animals is not jeopardized;
- reducing losses of fish entrained at the intake to the California Aqueduct and mitigating for unavoidable losses to the extent possible;
- funding programs through the Delta pumps mitigation process to increase fish populations; and
- scheduling and conducting maintenance operations along the California Aqueduct to minimize disturbance to listed plants and animals.

Water Transfers

California has adopted a statewide policy of encouraging both short-term and long-term water transfers. Some of the transfers that move water from Central Valley sources through the Delta for delivery south must be approved by the State Water Resources Control Board. The SWRCB must find that the transfers do not cause unreasonable impacts on fish and wildlife.

Effects of Drought Water Bank Transfers

In 1993, the Department completed a generic environmental impact report on water transfers, including transfers made as part of drought water bank programs. In 1994 the Department sponsored a drought water bank in which about 200,000 acre-feet of water was purchased from willing sellers for transfer to agricultural and urban water agencies. To reduce potential impacts on winter-run chinook salmon and delta smelt, the water was transferred across the Delta from July through October. During that period, Department staff submitted weekly reports to the SWRCB describing the transfers, the effects of the transfers on streamflow, and the numbers of fish salvaged that could be attributed to the transfers.

The 1994 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 on stream and recreational fisheries affected by the transfers.

Instream Flow Incremental Methodology Study

In 1994, Department staff transmitted a report to the SWRCB describing the results of an Instream Flow Incremental Methodology study on the Feather River between Feather River Fish Barrier Dam and the confluence with the Yuba River. The study was a condition in a past transfer involving the Yuba County Water Agency.

The IFIM study results describe the relationship between flow and such biologically important variables as nursery and spawning habitat for chinook salmon. The

results can be used, in conjunction with other information, to help determine optimum flows for salmon production. To augment this information, the Department is conducting a more in-depth study of salmon production in the Feather River, including an estimation of the relative contributions of natural in-river and hatchery spawners to the fishery and returning spawners. The study, which started in 1994, will result in tagging up to one million young hatchery salmon for release in the river and in San Francisco Bay. Tagging will continue for at least five years to ensure that the tagged salmon are exposed to a variety of environmental conditions in the river, estuary, and ocean. Tags will be recovered in the fishery, on the spawning grounds, and in the hatchery.

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.

Threatened and Endangered Fish Species

The National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the California Fish and Game Commission have listed two fish species, the winter-run chinook salmon and the delta smelt under the State and federal endangered species acts. The winter-run, one of four chinook salmon races in the Central Valley, is listed as endangered by both NMFS and the Fish and Game Commission. The delta smelt is listed as threatened by the USFWS and the Fish and Game Commission.

Biological Opinions

In most years, the delta smelt spends its entire life cycle in the Delta and Suisun Bay and can be affected by project operations. Juvenile winter-run chinook salmon pass through the estuary on their way to the ocean and also 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 State and federal water projects may jeopardize the continued existence of these two fish species, the Department joined with USBR in consultations with the State and federal fish and wildlife agencies.

The consultations resulted in biological opinions that concluded that the continued operation of the two projects could jeopardize the existence of winter-run chinook salmon and delta smelt. The NMFS issued its long-term opinion in February 1993, and the USFWS issued two one-year opinions—the first in May 1993 and the second in February 1994. The NMFS is expected to amend its opinion in early 1995, and the USFWS will be issuing a long-term opinion also early in 1995.

Operational Changes

The biological opinions contain operational changes (called the reasonable and prudent alternative) designed to remove jeopardy due to project operations. For example, to protect winter-run chinook salmon, calculated net westward flow in the lower San Joaquin River (called Qwest) must be greater than zero from February 1 through April 30 of each year. During this same period, the Delta Cross Channel gates on the Sacramento River near Walnut Grove remain closed. The opinions also contain incidental take statements that estimate the losses of fish at the salvage facilities.

Pumping Restrictions

Smolts in the size range for winter-run chinook salmon first appeared at the Delta pumps in late December 1992. In late February 1993, the SWP ceased all pumping at Banks Pumping Plant for 12 days in response to an increase in take of chinook salmon in the winter-run size range. Pumping resumed at a fraction of capacity until late May, when winter-run conditions ended. Daily pumping averaged only 2,030 cfs at Banks Pumping Plant from March 8 through May 31. The final estimate of winter-run-sized salmon take (October 1 through May 31) was 1,892 smolts, well below the permit level of 2,700 smolts.

The CVP and SWP limited exports during April, May, June, and July. Furthermore, during a period of springtime pulse flows from April 26 through May 16, coincident with the arrival of the San Joaquin pulse flows into the Delta, combined daily exports were limited to 1,500 cfs. Springtime pulse flows are specified in the Central Valley Project Improvement Act to move young fish from Delta river channels where spawning occurs to suitable rearing habitat in eastern Suisun Bay.

Combined export pumping increased slowly when the springtime pulse flows ended. However, the rate of delta smelt salvage increased in late May. The delta smelt formal consultation (May 1993) set the estimated take of delta smelt at 400. The combined smelt salvage rose above the permitted level of 400 smelt on May 15 and was intermittently above the take estimate for a total of 20 days through June 16.

In response to this situation, incidental take provisions in the delta smelt biological opinion were modified on June 15, 1993. The incidental take was changed from a daily

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.

count of 400 smelt to a take level of 400 smelts based on 14-day running average of previous daily counts. No further take above the 400 smelt occurred, and pumping increased after mid-June.

The SWP North Bay Aqueduct, which begins at the Barker Slough Pumping Plant upstream of Rio Vista and has a maximum pumping capacity of 175 cfs, is screened to exclude salmon from entrainment. However, larval and early juvenile delta smelt are not excluded by the screens. Pumping at Barker Slough Pumping Plant was limited to a 14-day running average of 65 cfs when delta smelt eggs and larvae were found near the North Bay Aqueduct intake from May 6 through July 31 in 1993.

Altered Delta export pumping from April through July resulted in the State and federal projects foregoing an estimated 590,000 acre-feet of water that otherwise would have been diverted at the Delta pumping plants during that period. Fortunately, favorable hydrologic conditions later in the year allowed State and federal projects to catch up on the pumping lost between April and July.

Delta Cross Channel Standards

Operation of the Delta Cross Channel gates is addressed in the winter-run chinook salmon biological opinion. The opinion requires closure of the gates from February 1 through April 30. Additional closure of the gates from October 1 through January 31 depends on real-time monitoring for the presence of winter-run salmon and changes in flow and turbidity. The CVPIA requires Delta Cross Channel closure in conjunction with CVPIA-required springtime pulse flow during the last two weeks in May. No Delta Cross Channel operational measures were specified in the delta smelt biological opinion.

Sacramento and San Joaquin River Flow Requirements

The earlier delta smelt and winter-run salmon biological opinions and Decision 1485 contained standards for Qwest flows, Sacramento River flows at Freeport and Rio Vista, and San Joaquin River flow at Vernalis in addition to Delta Outflow Index requirements.

Qwest is a calculation of the magnitude of reverse flows in the lower San Joaquin River. It has a negative value with net reverse flow conditions in the western delta. Both the winter-run chinook salmon and the delta smelt biological opinions required minimum Qwest flows (14-day average) during all but September and October 1993. All Qwest minimum flows were met during 1993.

A springtime pulse flow criterion to help transport delta smelt through the delta into Suisun Bay was set by the CVPIA and included in the May 1993 delta smelt biological opinion. Daily flows in the San Joaquin River at Vernalis were specified to be "about 4,500 cfs" during the pulse period. This operational criterion was further clarified in June as a result of ongoing consultation with federal agencies and following a high delta smelt take in mid-May.

Minimum Sacramento River flows during this same period (April 26-May 16) were set at Freeport to be 18,000 cfs continuous flow for 14 days and 13,000 cfs flow for 42 days based on a 14-day average. Rio Vista minimum flows based on 14-day running averages were similar to the 30-day running averages set by Decision 1485 for an "above-normal" water year. Flow rates were identical during the March 16 through June 30 standard period (3,000 cfs) and during July and August (2,000 cfs and 1,000 cfs). During the December 1- February 15 period, the standard was the same as the Decision 1485 Sep-

tember 1-February 1 standard. However, the Decision 1485 flow minimum continued through March 15, a period not addressed by the CVPIA operational measures.

Population Estimates

Figures 5-1 and 5-2 show graphs of population estimates for winter-run chinook salmon and delta smelt through 1994. The winter-run chinook salmon spawning escapement remained low, 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 to the Coleman National Fish Hatchery on Battle Creek. Whereas the summer tow-net index was the highest since 1981 (see Figure 5-3), the annual fall midwater trawl index of delta smelt abundance dropped to the lowest fall index on record of slightly more than 100 from a high index of over 1,000 in 1993. The cause of the poor survival from summer to fall is not known with flows being uniform and the take at the delta pumps being near zero.

The fall midwater trawl index is generally considered to provide the best estimate of the abundance of prespawning adult delta smelt. However, information collected in 1994 indicates that the midwater trawl may be underestimating the abundance of juvenile and adult delta smelt. 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 middepth behind one boat.) As shown in Table 5-1, the kodiak trawl caught more fish than the midwater trawl and caught fish at locations where the midwater trawl data would indicate that there were no delta smelt present. The use of this new gear is being evaluated, especially in reference to its possible application in real-time monitoring for project operations.

Petitions for Additional Listings

In recent years, several petitions for listing additional fish species have been submitted to, or are being prepared for submittal to, the federal fish and wildlife agencies. On one of these petitions, for the longfin smelt, the USFWS decided in 1993 not to list. On another petition, for the splittail, a decision was postponed until mid-1995. A third petition, for the spring-run chinook salmon, is being held in abeyance while an ad hoc group of agency staff, representatives of commercial fisheries, and landowners along the tributary spawning

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.

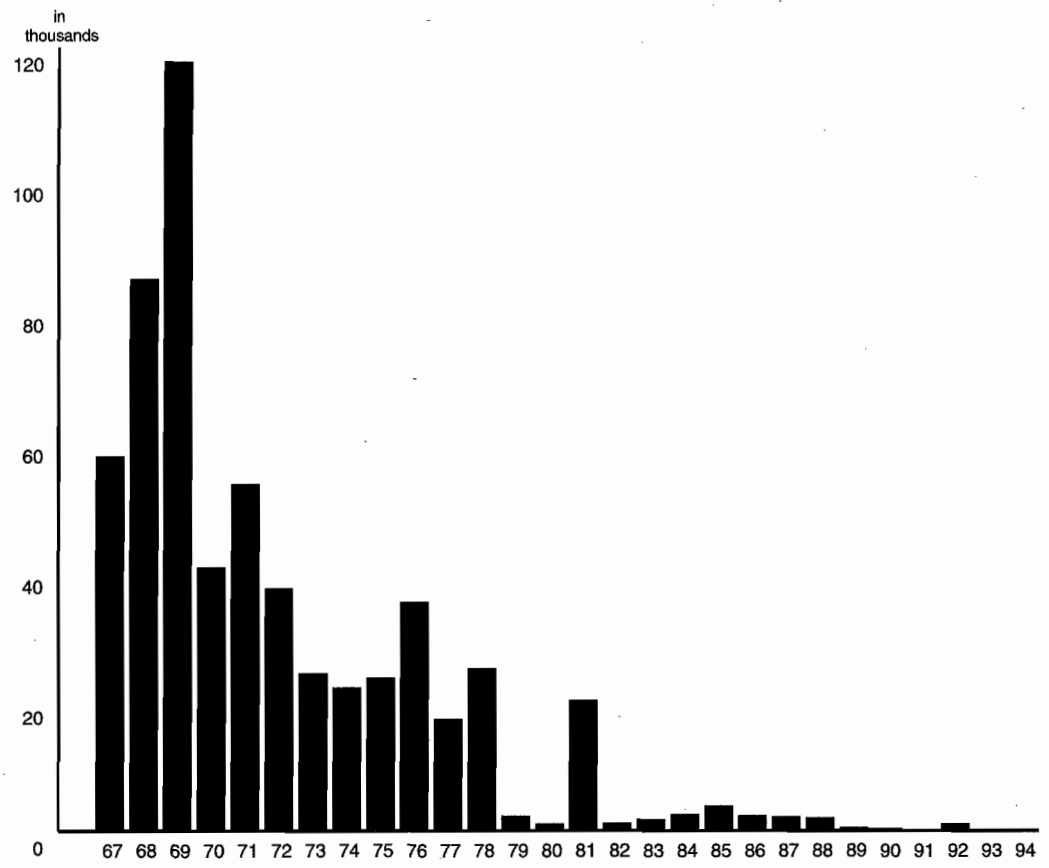
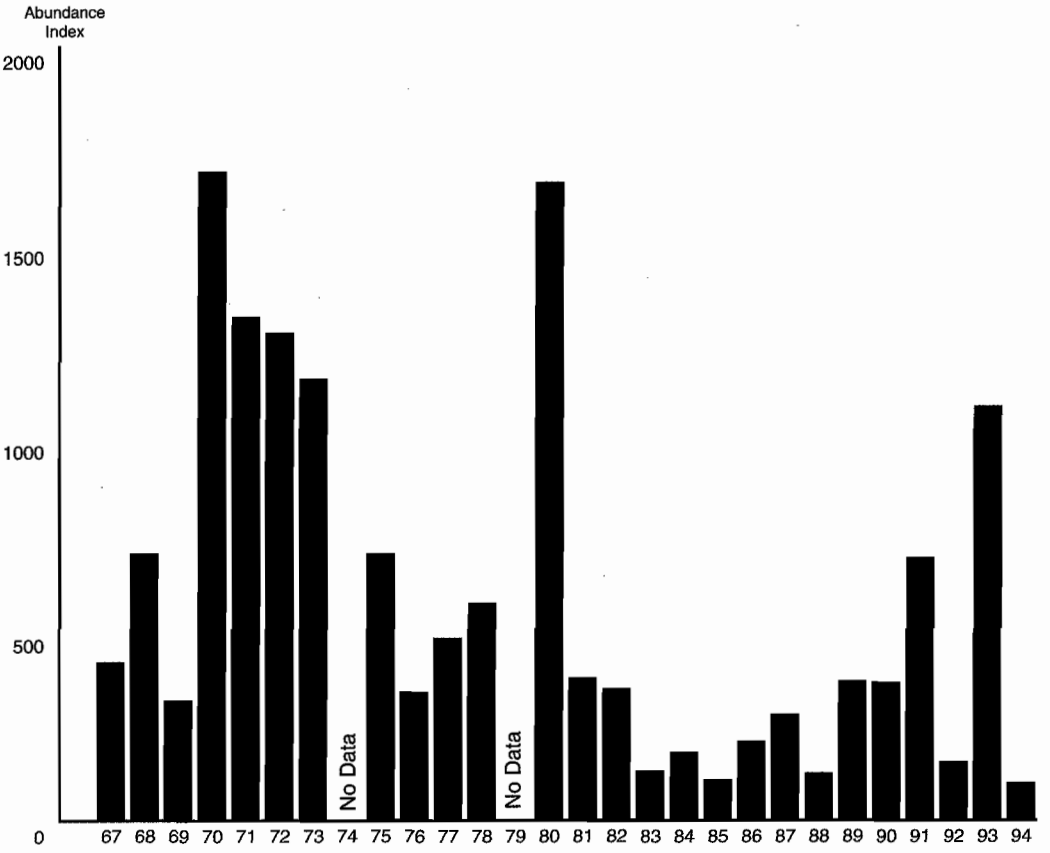


Fig 5-1. Estimated Total Winter-run Chinook Salmon Escapement , 1967 through 1994



Note: no sampling in 1974 or 1979.

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

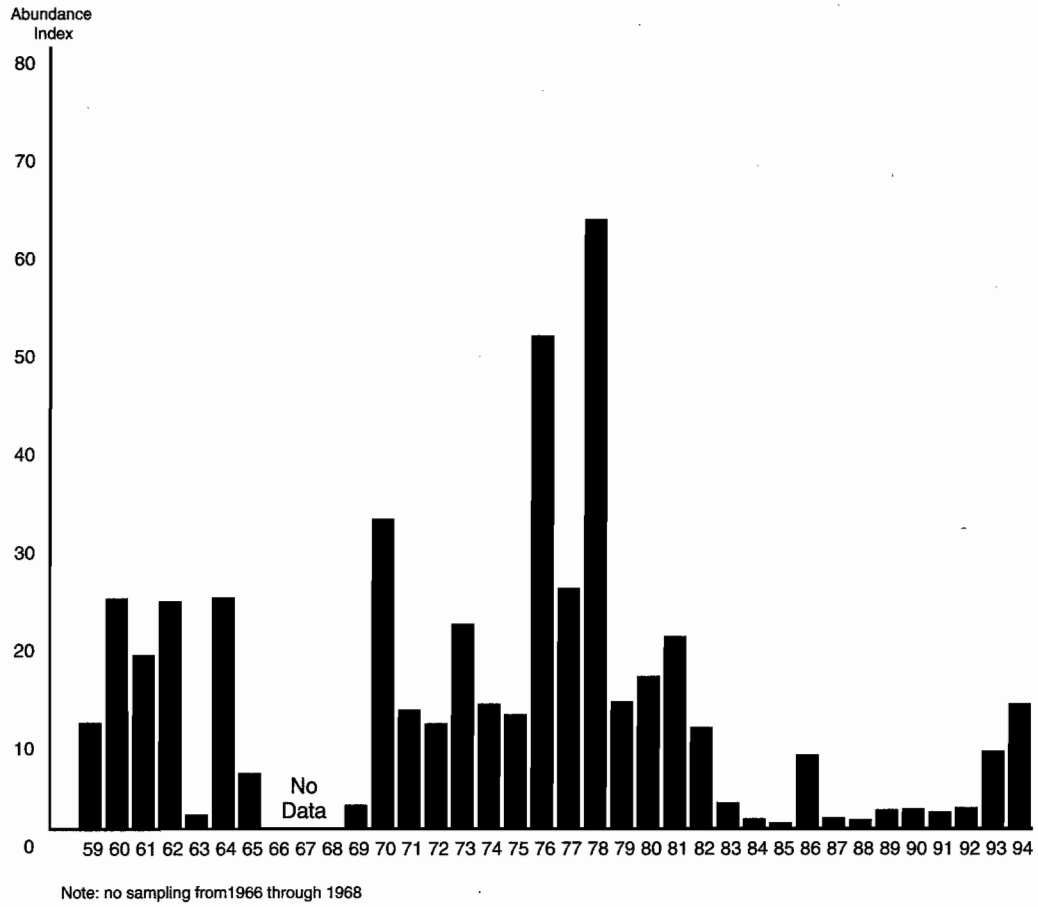


Fig 5-3. Delta Smelt Summer Tow-Net Indices, 1959 through 1994

streams attempts to develop habitat improvement measures that will help ensure the race's recovery without the need to formally list. Finally, the NMFS may act on a petition to list the steelhead trout early in 1996.

In addition to the formal petitions that have been prepared or submitted, some environmental organizations are considering petitions for green and white sturgeon and San Joaquin River fall-run chinook salmon.

Georgiana Slough Acoustical Barrier

Past studies conducted under the auspices of the Interagency Ecological Studies Program have 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 salmon 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. These studies were conducted through the Interagency Program under contract to the San Luis and Delta-Mendota Water Authority.

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 about 20 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.

The tests will be continued through spring 1995 to provide the fisheries agencies with one more year of data before asking them to consider a barrier installation from October through June every year. The 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 from reentering the Sacramento River those upstream adult winter-run salmon using Georgiana Slough as a migration corridor. Preliminary tests indicated no need for concern in these matters, but another field season may be needed to fully allay the concerns of biologists.

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 State Water Project designed to salvage as many fish as possible from water being pumped from the Delta. The salvaged fish are then transported by truck to release sites where they are unlikely to return to the vicinity of the pumps in the southern Delta.

The Department has made significant improvements in the fish protective 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 efficiency of the fish salvage process and to reduce stress (and losses) of the salvaged fish. The new holding tanks are now operational.

Mitigation Projects

In 1986, the Department of Fish and Game and Department of Water Resources signed an agreement to mitigate for the direct losses of fish at the intake to the aqueduct. Although the agreement focused on chinook salmon, striped bass, and steelhead rainbow trout, it did consider other fish as well. Since 1986, the Department has allocated over $11.4 million on mitigation projects ranging from placing gravel in streams to purchasing and planting hatchery striped bass and to screening a diversion in Suisun Marsh.

In 1994, a fish advisory committee organized to provide guidance on project selection recommended that $2 million be allocated to additional fish screens in Suisun Marsh, $1 million to predator control projects on San Joaquin tributaries, $2 million to a conjunctive use project on Deer Creek to help protect spring-run chinook salmon, and $4 million to a conservation salmon hatchery on the Tuolumne River. These funds were to be allocated from an original $15 million lump sum specified in the 1986 agreement. Agency staff concurred in these recommendations, and the projects will proceed as designs are completed and permits obtained.

Other mitigation projects approved in the last several months include:

- partial funding of the Georgiana Slough Acoustical Barrier;
- a physical barrier near the confluence of the Merced and San Joaquin rivers to prevent adult chinook from migrating up the San Joaquin River where there is no spawning habitat;
- increased funding for a warden program to reduce illegal fish harvesting in the Delta and some Central Valley streams; and
- a net-pen rearing program for striped bass.

Net-Pen Rearing Program

In the net-pen rearing program, small striped bass salvaged from SWP and CVP fish screens are reared in pens floating in a Suisun Marsh channel. In 1994, about 200,000 striped bass were growing in these pens for release to the estuary during spring 1995. Whether they will be released or not depends on the outcome of endangered species consultations between DFG, NMFS, and USFWS to determine if the releases will jeopardize winter-run chinook salmon or delta smelt. About 37,000 yearling striped bass were released in the estuary in spring 1994 from a test net-pen project. If the Section 10 consultation results in a no-jeopardy opinion, the Department and DFG would plan on a net-pen rearing program with a target of about 500,000 yearling striped bass to be released annually.

Predator Removal Program

One of the major sources of mortality for fish nearing the intake to the Skinner Fish Facility screening system appears to be predation by two- to three-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 used to estimate salmon losses for incidental take purposes 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 be netted from the reservoir and placed in fish transport trucks for release to San Pablo Bay or other distant locations.

The proposed test predator removal project did not occur, mainly because of strong opposition from striped bass fishing groups and the effect of this opposition on the ability of the State agencies to complete the necessary environmental documentation. In the meantime, studies with subadult stripers tagged with small radio transmitters demonstrated that striped bass appear to move freely between the forebay and the Delta. The rapid exchange between Delta and forebay bass populations raises questions about the effectiveness of the predator removal program. It may well be that the fish would reestablish themselves in the forebay almost as rapidly as they were removed. Agency staff are reconsidering the feasibility and usefulness of a predator removal program for the forebay.

Aquatic Weed Removal Program

Over the past few years, growth of several aquatic weeds has increased in Clifton Court Forebay. These weeds break apart due to wind action and other causes and drift toward the fish facilities. The process of cleaning the screens to remove the weeds, the presence of weeds in the fish holding tanks, and the clogging effects of weeds in the fish hauling trucks reduce the overall salvage efficiency of the fish protection facilities. Department staff are exploring several techniques to keep the weed problem under control, including herbicides, mechanical harvesting, and automated trash rakes in front of the fish screens. Measures will be implemented in 1995 and early 1996 to bring the weed problem under control.

Mitigation along the Aqueduct

Much of the right-of-way along the California Aqueduct remains in a semi-natural state and is home for a variety of plants and animals, some of which are protected by the State and federal endangered species acts. Department employees conducting routine maintenance activities must be concerned that these activities do not result in the illegal taking of listed species. For the past several years, environmental specialists have worked with project operators on a case-by-case basis to provide environmental clearances for maintenance work.

Blanket Permits

To avoid the continued need for individual clearances for maintenance projects, the Department decided to obtain a blanket permit for each field division. The blanket permit would allow maintenance to proceed if proper mitigation measures had been approved by the DFG and the USFWS. Staff started with the San Joaquin Field Division in the southern San Joaquin Valley to obtain the blanket permits, mainly because of the relatively high numbers of listed species along the right-of-way in that area.

Habitat Conservation Plan

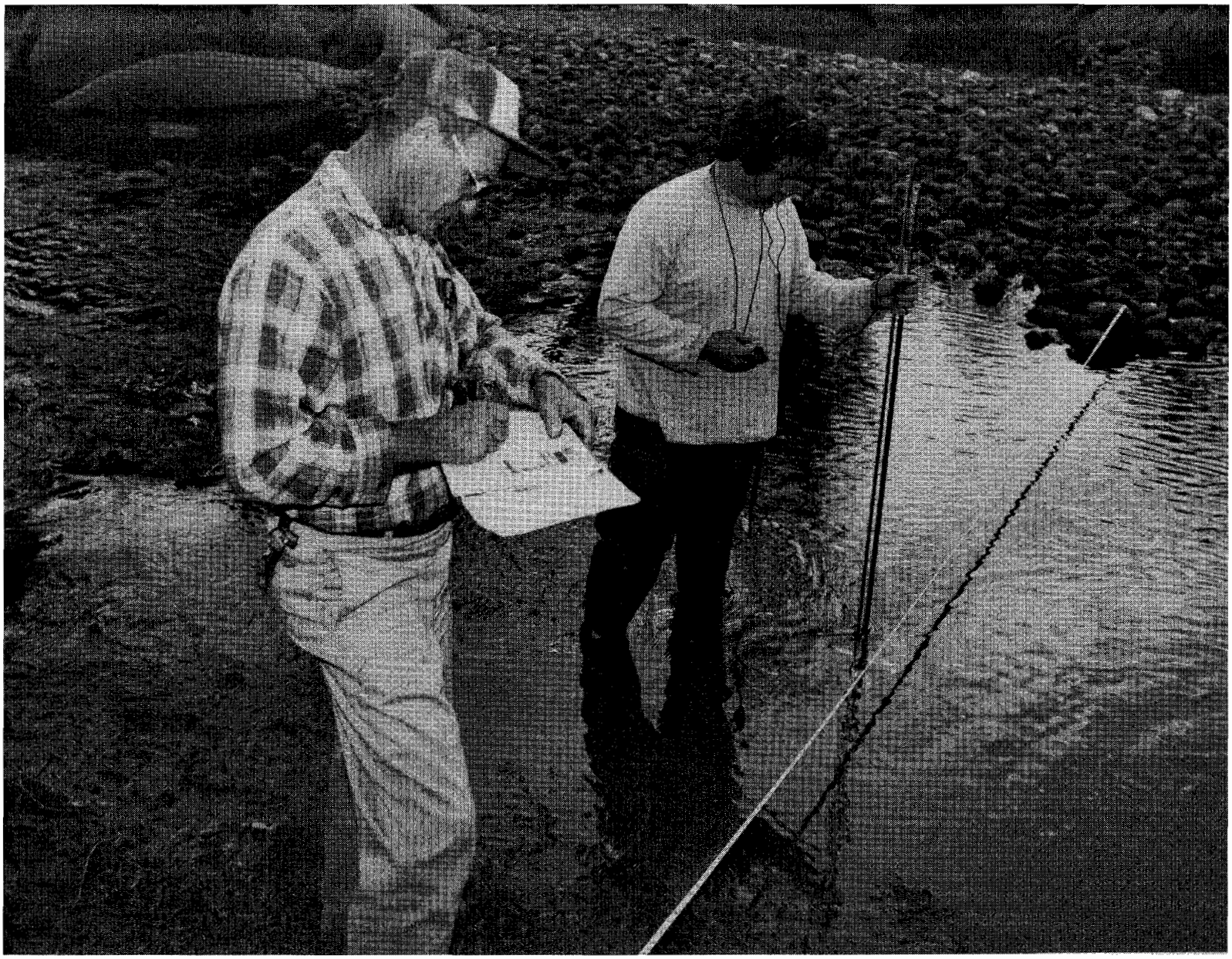
Because there was no federal involvement in the field division area and consequently, no opportunity for Section 7 consultation, the Department sought a Section 10 permit requiring approval of a Habitat Conservation Plan. A draft of the HCP was released for general review in December 1993. As of late 1994, the draft plan, prepared by a private consultant with the help of an interagency technical advisory committee, was under review and being revised to reflect comments and concerns from Kern County Water Agency, other water agencies, and individuals with property along the aqueduct.

Although biological field work has been completed for the San Luis and Delta Field Divisions, the Department will not proceed with formal application for a Section 7 consultation or with Section 10 permits until issues associated with the San Joaquin Field Division HCP have been resolved.

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

Chapter 6

Water Quality Programs



Monitoring water quality, San Joaquin District

Significant Events

- For 1993, a year designated by criteria as "wet" for agricultural, municipal, and industrial purposes and "above normal" for fish and wildlife purposes, under D-1485 the SWP met all operational criteria related to the Delta Outflow Index and Sacramento and San Joaquin River flows. All Decision 1485 and Delta Smelt Opinion water quality criteria (EC and chloride) were also met.

- In June 1993, the Department updated Operations and Maintenance Instruction No. OP-13 to address concerns about stormflows entering the California Aqueduct. The instruction emphasizes preventing or minimizing floodwater inflow into the aqueduct.

- In 1993, sampling from the SWP/Delta Water Pathogen Monitoring Project suggests that SWP/Delta pathogen levels, when compared with recent national pathogen survey results, are approximately six times lower than the national average.

- On April 15, 1993, the Department held a zebra mussel workshop focusing on the potential impacts of the mussel. Although the mussel has not yet been found in California waters, its high rate of spread and its destructiveness make the possibility of its introduction into State waters a cause of concern for the SWP.

- In 1993, the SWP initiated the Western Suisun Marsh Salinity Control Test to evaluate the potential of augmenting flows in Green Valley Creek with water discharged from Cordelia Forebay and Putah South Canal to help meet Decision 1485 standards for channel water salinity in western Suisun Marsh.

- A 1993 survey of the abundance and distribution of the Asian clam found patterns similar to those observed in a 1990 survey.

Approximately 20 million Californians depend on the State Water Project for all or part of the water they use every day. In addition, the SWP supplies water for agriculture, industry, power generation, recreation, and fish and wildlife. The quality of water supplied by the SWP for those beneficial uses is safeguarded through an extensive water quality monitoring program.

Water quality objectives for drinking water resources are set by the State Water Resources Control Board; 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. Water quality in the Delta and Suisun Marsh is protected under State Water Resources Control Board's Water Right Decision 1485 (1978).

To meet all standards, the Department of Water Resources monitors water quality through an automated network of continually operating recorders and laboratory analyses of field samples collected at weekly, quarterly, monthly, or annual intervals. The Department also conducts special studies to investigate water quality at potential problem sites or as a result of unique events. In 1993, these studies included an assessment of the protozoa *Giardia lamblia* and *Cryptosporidium* in SWP and Delta waters.

In addition to meeting water quality standards for the Delta and Suisun Marsh, the Department also takes measures to protect water quality within the California Aqueduct and other SWP facilities. In 1993, the Department revised Project Operations and Maintenance Instruction No. OP-13 specifying guidelines and responsibilities for actions taken during emergency intake of flood waters into the California Aqueduct. The instructions emphasize means to prevent or minimize inflow. They also prescribe procedures and contain policies for monitoring flow rate, volume, and water quality, and for conveying flood waters into and out of the California Aqueduct. The instructions should help ensure coordinated aqueduct operations during flood events and minimize degradation of water quality.

Delta Activities

The Department conducts extensive monitoring activities designed to protect beneficial uses of water in the Delta and Suisun Marsh as required by SWRCB Decision 1485. In December 1992, the SWRCB released new interim standards for the Delta under draft Decision 1630. In April 1993, the Governor ordered SWRCB to discontinue the process of developing interim standards, and the Department continued to operate under Decision 1485.

Figure 6-1 shows water quality monitoring sites throughout the Sacramento-San Joaquin Delta.

The Department meets most Decision 1485 water quality and flow standards through releases from reservoirs, operation of the Delta Cross Channel gates, and reductions in Delta exports. Those operational decisions are based on real-time monitoring data and long-range modeling activities. In 1993, ESA biological opinions set several more stringent operational constraints requiring a more critical and timely operational response by the Department. SWP operations were affected by the federal CVPIA because of joint operations be-

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

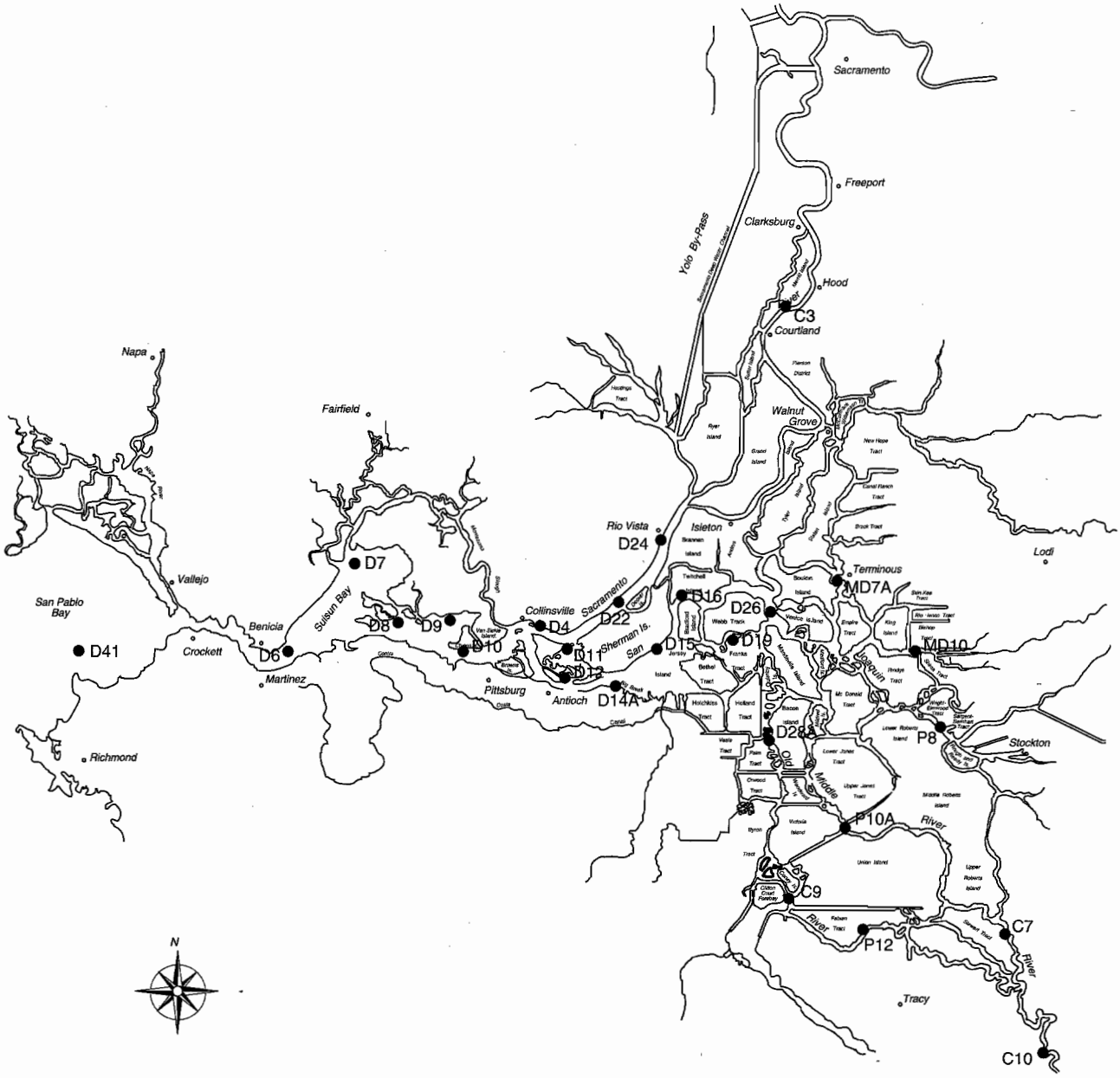


Fig 6-1. Water Quality Monitoring Sites in the Sacramento-San Joaquin Delta

tween the Department and USBR required by the Coordinated Operation Agreement and Decision 1485. Measures in the SWRCB's rescinded Decision 1630 were incorporated into several of the federal operational guidelines.

Decision 1485 Standards

Decision 1485 sets standards for water quality within the Delta and Suisun Marsh as well as for the amount of outflow and 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. In 1993 the Department's May 1 forecast of Sacramento River basin unimpaired runoff, the SRI, was 21.9 million acre-feet. At 119 percent of average, the SRI was the highest since 1986 and more than double the 1992 index of only 8.9 MAF. The 1992-93 water year was declared "wet" for agricultural, municipal, and industrial uses. Because the 1992-93 water year followed a critical 1991-92 water year, it was classified as "above normal" instead of "wet" for fish and wildlife purposes. The 1992-93 water year ended September 30, 1993, with an actual total SRI runoff of 22.2 MAF.

Water Quality Standards

Decision 1485 Delta water quality standards remained in place during most of 1993. An additional delta smelt opinion requirement for eastern Suisun Bay limited electrical conductance [EC] in Mallard Slough to 3 mmhos/cm for a 14-day running average from May 1 to June 30. All Decision 1485 water quality requirements were met as was the delta smelt salinity standard at Mallard Slough, which averaged only 0.4 mmhos/cm during the period.

The Decision 1485 "wet year" municipal and industrial chloride standard at the Contra Costa Canal Intake near Rock Slough of less than 150 mg/L for at least

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.

240 days (66 percent of the year) was met on August 28, 1993, uninterrupted from the start of the year.

Water Supply Conditions

During the 1992-93 water year, the February 1 Sacramento River Index forecast was over 100 percent of average. Winter storms deposited the largest snowpack since 1983, and the snowpack water content was the best in a decade. On February 24, 1993, the Governor officially declared an end to California's six-year drought, the most severe in state history.

Statewide precipitation at over 150 percent of average was sustained through March, then decreased slightly to end the forecast season at 143 percent of average on May 1. Seasonal precipitation in the Sacramento River basin and northern Sierra Nevada was sustained during the forecast season at between 130 and 140 percent of average. Major Northern California flood control reservoirs (Shasta, Oroville, and Folsom) encroached flood reservations; flood water releases from Lake Oroville were made on March 18.

Delta outflow, estimated by the DOI, averaged a flow rate greater than 40,000 cfs during the first four months of calendar year 1993. The five-month period between January 9 and May 16 had an almost uninterrupted daily flow of over 20,000 cfs. Late May and June storms continued to sustain high outflows. The highest mean monthly (47,911) and mean daily (79,375 cfs) DOI of 1993 occurred in February. The lowest mean monthly and mean daily DOI - 4,496 cfs and 965 cfs, respectively - occurred in October 1993.

Decision 1485 and the Biological Opinions

The NMFS biological opinions for winter-run chinook salmon (February 1992 and February 1993) and the USFWS biological opinion for delta smelt (May 1993) set conditions on water project operations to avoid jeopardizing the listed species. The opinions 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; incorporated and expanded in the draft Decision 1630 Qwest index; set minimum limits for Sacramento and San Joaquin river flows; and specified periods of Delta Cross Channel gate closure.

Outflow and Export Standards

Delta water quality 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 and export standards are important because they help to ensure protection of water quality in the Delta and survival of striped bass, salmon, delta smelt, and other important aquatic estuarine species.

During 1993, Decision 1485 DOI standards for an "above normal" water year were in effect. Reasonable and prudent alternatives specified in the delta smelt

opinion required additional outflow consistent with the CVPIA. These included additional minimum DOI flow levels set to transport delta smelt through the Delta and into Suisun Bay during May, June, and July. The May and July minimum DOI equaled the Decision 1485 flow standards (14,000 cfs and 7,700 cfs). The June delta smelt-related DOI was more stringent, with a flow minimum at 12,000 cfs versus the 10,700 cfs standard of Decision 1485. Outflow during May, June, and July 1993 easily exceeded minimum levels, averaging 23,448 cfs, 26,338 cfs, and 9,052 cfs, respectively. All Decision 1485 and ESA related operational criteria for the DOI were met during 1993.

Export Limitations

During May, June, and July, water exports from the Delta through Banks Pumping Plant are limited by Decision 1485 export standards. Decision 1485 export limits during those months were 6,000 cfs, 6,000 cfs, and 9,200 cfs, respectively. However, provisions of the CVPIA and delta smelt biological opinion also required springtime pulse flows from April 26 through May 16. During this period, combined daily exports for the SWP and CVP were limited to 1,500 cfs. A pumping limitation of 65 cfs from May 6 through July 31 at Barker Slough Pumping Plant at the intake to the North Bay Aqueduct was also observed for the benefit of delta smelt.

From April 26 through May 16, the period of the pulse flows, SWP exports at Banks Pumping Plant averaged only 754 cfs; CVP and SWP combined exports averaged 1,515 cfs. At Barker Slough Pumping Plant, restrictions were met in May and most of June. However, the rate of pumping increased to between 66 cfs and 68 cfs from June 28 to July 2 and rose again to 66 cfs for the last six days in July.

Flow Requirements

The delta smelt and winter-run salmon biological opinions and Decision 1485 contain standards for Qwest flows, Sacramento River flows at Freeport and Rio Vista, and San Joaquin River flow at Vernalis in addition to Delta Outflow Index requirements.

Qwest is a discharge calculation that approximates the magnitude of reverse flows in the lower San Joaquin River. It is influenced by Sacramento and San Joaquin River flow, the amount of rainfall, the magnitude of export pumping, and the operational status of the Delta Cross Channel gates. It has a negative value under net reverse flow conditions in the western Delta. The high winter and spring inflow into the Delta helped sustain positive Qwest 14-day running average flows from the start of the calendar year through mid-July. Both the winter-run chinook salmon and the delta smelt biological opinions required minimum Qwest flows (14-day average) during all but September and October 1993. However, the Qwest restrictions imposed by the delta smelt opinion do not apply when combined exports are less than 2,000 cfs. All Qwest minimum flows were met during 1993.

The springtime pulse flow criterion of 4,500 cfs at Vernalis, established by both the CVPIA and the delta smelt opinion, was met for 12 of the 21 required days (April 26 - May 16). For the remainder of those days, Vernalis flow averaged 3,359 cfs.

Minimum Sacramento River flows during this same period were set at Freeport to be 18,000 cfs continuous flow for 14 days and

13,000 cfs flow for 42 days based on a 14-day average. Wet-year hydrologic conditions, augmented by upstream releases, produced a Sacramento River flow at Freeport that was continuously above 18,000 cfs from January 2 (except for three days in July) through the beginning of September.

Rio Vista minimum flows based on 14-day running averages were similar to the 30-day running averages set by Decision 1485 for an "above-normal" water year. Flow rates were identical during the March 16 through June 30 standard period (3,000 cfs) and during July and August (2,000 cfs and 1,000 cfs). During the December 1 through February 15 period, the standard was the same as the Decision 1485 September 1 through February 1 standard. However, Decision 1485 flow minimum continued through March 15, a period not addressed by the CVPIA operational measures. All Decision 1485 standards and 1993 CVP/SWP operational criteria for Rio Vista flow were met in 1993.

Delta Cross Channel Standards

Decision 1485, CVPIA standards, and the winter-run chinook salmon biological opinion require closure of the Delta Cross Channel gates from February 1 through April 30. Additional closures from October 1 through January 31 depend on real-time monitoring for the presence of salmon. The CVPIA also requires gate closure in conjunction with springtime pulse flows during the last two weeks in May. 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 from January 3, with the exception of the last three days in May, until June 18.

Decision 1485 Biotic Community Surveys

The biotic communities of the Delta are regularly monitored by the Department to identify changes potentially related to SWP operations and to assess the effectiveness of efforts to preserve Delta and Suisun Marsh water quality. Decision 1485 requires that a monitoring report on water quality and biotic conditions be submitted annually to the SWRCB. The Decision 1485 compliance monitoring was incorporated into the Interagency Ecological Studies Program beginning in 1990.

Phytoplankton Surveys

The Department's 1993 survey of phytoplankton abundance and community composition in the upper San Francisco Bay estuary was conducted according to the requirements of Decision 1485. Phytoplankton are microscopic plants suspended in the water column and are at the base of the aquatic food web in upper San Francisco Bay. Their standing stock or biomass in the water column is estimated by concentrations of the photosynthetic pigment chlorophyll *a*.

Chlorophyll concentrations throughout the upper estuary in 1993 varied spatially and temporally. The winter (January - March) was characterized by low chlorophyll concentrations (0 to 4 µg/l) throughout most of the upper estuary, except in the southern Delta, where chlorophyll concentrations were 12 to 37 µg/l. Chlorophyll

concentrations generally rose during the spring (April - June) to the highest average concentrations among seasons (2 to 37 µg/l). Among regions, average chlorophyll concentrations were highest for the western and southern Delta and lower San Joaquin River (12 to 37 µg/l), intermediate for Suisun Bay (5 to 11 µg/l), and lowest for the northern Delta and San Pablo Bay (2 to 4 µg/l). Chlorophyll concentrations decreased during the summer (July - September) for Suisun Bay, the western and northern Delta, and the lower Sacramento and San Joaquin rivers by at least a factor of two while remaining high in the eastern and southern Delta. Average concentrations decreased again by at least a factor of two for the fall (October - December), when concentrations throughout most of the upper estuary ranged between 0 µg/l and 2 µg/l. Slightly higher chlorophyll concentrations again persisted in the eastern and southern Delta (2-11 µg/l).

For most regions within the upper estuary, chlorophyll concentrations reached a single-month record or near-record maxima during May 1993. A period of record maximum was reached for the western Delta (46 µg/l), while the second highest maximum was reached for the lower San Joaquin River (50 µg/l) and the eastern Delta (69 µg/l). In addition, chlorophyll concentrations in May for the lower Sacramento River (15 µg/l) and Suisun Bay (15 µg/l), and in April for the northern Delta (3.6 µg/l), were the highest measured since the 1987 drought. Increased chlorophyll concentrations in Suisun Bay during 1993 are of particular interest because chlorophyll concentrations have not increased beyond a few µg/l since 1987. Maximum chlorophyll concentrations in all of these regions in May were associated with a bloom of the chain diatom *Melosira granulata.*

In contrast, the chlorophyll maximum in the southern Delta (50 µg/l) in 1993 was lower than that measured for 1990 through 1992 and more similar to those measured during the mid-1970s to mid-1980s. Maximum chlorophyll concentration in July (44 µg/l) was associated with a bloom of the chain diatoms *Skeletonema potamos* and *Thalassiosira* spp. The chlorophyll maximum in San Pablo Bay during 1993 was similar to that measured during the 1987 through 1992 drought and lower than those commonly measured during the mid-1970s through mid-1980s. It was associated with the green flagellate *Chlamydomonas* spp.

Benthic Monitoring Program

In compliance with Decision 1485, the Department conducts a benthic monitoring program to record abundance and distribution trends in macro-benthic (bottom dwelling) organism populations and to detect and document the introduction of exotic species in the San Francisco Bay-Delta region.

In 1993, the second survey of an intensive study begun in 1990 to determine the abundance and distribution of *Potamocorbula amurensis* was completed. *P. amurensis* is an Asian clam introduced to the San Francisco Bay estuary in 1986. Since 1993 was the first wet year, and subsequently the first season of high outflow since the initial survey in the critically dry year 1990, this second "benthic blitz" was conducted to observe the effects of higher freshwater

outflows on the population dynamics of this exotic species.

Although the number of sites was slightly reduced from the 1990 survey, nearly 190 of the original sites were sampled in August and September 1993. The study area remained unchanged and included San Pablo and Suisun bays, the major sloughs of Suisun Marsh, and the central Delta. Samples were taken in the shoals and in the center of the channels.

The distribution of *P. amurensis* during 1993 was found to be similar to patterns found in the 1990 survey. Clams were found continuously from the southwest end of San Pablo Bay to the western Delta near Antioch, on the San Joaquin River, and Emmaton, on the Sacramento River. Compared to 1990 there appeared to be a slight migration upstream in 1993. Clams were found 1.5 km farther upstream than before in both the Sacramento and San Joaquin rivers. *Potamocorbula amurensis* densities in 1993, however, were higher in the San Pablo Bay region, approaching 43,000 clams/m2, but lower in both the Suisun Bay and Marsh areas with 4,981 and 9,578 clams/m2 respectively. In the Delta, *P. amurensis* population densities were similar to the 1990 survey results, which ranged from 1,200 to 2,700 clams/m2.

In Suisun Bay, *Potamocorbula amurensis* population densities showed a positive correlation to outflow and no significant correlation to specific conductivity. Farther east, in the area of station D4, near Collinsville on the Sacramento River, there was a negative correlation between outflow and density but a positive correlation between specific conductance and the density of *Potamocorbula.*

There were no unexpected results in the population dynamics of other benthic communities observed during 1993.

Rock Barrier Installations

During 1993, three temporary rock barriers were installed in the south Delta on Middle and Old rivers under several agreements or management programs. The barriers were used to enhance water quality, improve water circulation, control water levels during the agricultural irrigation season, and increase the survival of migrating salmon. Two barriers, Middle River and Old River near Tracy, were installed as part of the South Delta Temporary Barriers Project, an experimental program for long-range south Delta planning proposals.

Old River Barrier at Head

As part of a February 1969 joint agreement between the Department, USFWS, USBR, and DFG, the Department installs a temporary rock barrier at the head of Old River during periods of low outflow in the fall. The barrier helps alleviate the dissolved oxygen depression (less that 5 mg/l) that can occur in the Stockton Ship Channel from conditions such as low flows, high water temperatures, dredging, or intermittent reverse flow conditions in the upper San Joaquin River. The improved dissolved oxygen levels help salmon survive their upstream migration.

Fall 1993 flows in the San Joaquin River were augmented by upstream releases to improve net flow conditions in the ship channel and minimize reverse flows at Stockton. As a result, average daily San Joaquin River flows past Vernalis increased

to 3,000 cfs or greater during September, October, and November.

The temporary closure is normally completed at the head of Old River in late summer or early fall. In 1993, installation of the barrier was delayed until November 11 because of the upstream flow augmentation. Even with the augmentation, low dissolved oxygen levels (5.0 mg/l or less) persisted in the Rough and Ready Island area from mid-August through mid-October.

Partial recovery to levels greater than 5.0 mg/l finally occurred at the end of October, but full recovery of dissolved oxygen conditions in the ship channel did not occur until November. In November, the sag was eliminated, and all surface and bottom dissolved oxygen levels exceeded 8.0 mg/l. The barrier was removed December 7, 1993.

Middle River Barrier

The Middle River rock barrier is a tidally controlled temporary barrier near Victoria Canal, about one-half mile south of the confluence of Middle River and Trapper Slough. The barrier was installed on June 14, 1993, during the agricultural irrigation season and removed September 24, 1993, as specified in an October 1986 agreement with the Department, South Delta Water Agency, and USBR. The barrier helped to increase and stabilize water levels for more consistent diversions of agricultural water. It also helped to improve circulation and flush the shallow sloughs and river reaches in the south Delta. The timing of installation was delayed for about one month due to conditions set in the 1993 stream bed alteration permit issued by DFG that restricted installation to periods with flows less than 2,500 cfs. Higher seasonal flows combined with San Joaquin River pulse flow kept flows above this level during May.

Old River Barrier near Tracy

The South Delta Water Management Program Draft Environmental Impact Report was released to the public in 1990. 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 five-year test program will precede construction of the permanent barriers. In 1993 one test barrier was constructed during spring on Old River east of the Delta Mendota Canal intake at Tracy Pumping Plant. A second spring barrier, usually installed at the head of Old River near the San Joaquin River confluence (see Old River Barrier at Head), was not installed in 1993 due to high San Joaquin River spring flows.

Construction of the barrier east of the Delta Mendota Canal intake at Tracy Pumping Plant began May 12, 1993, and was completed June 1, 1993. Under DFG agreements, this 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. Consequently, both barriers became operational about one month later than usual. Removal was completed on October 6. This barrier provides benefits similar to those of the Middle River barrier.

Municipal Water Quality Investigations Program

The number of constituents regulated in drinking water has rapidly increased in response to increased awareness of human health issues associated with the nation's water supplies. The Sacramento-San Joaquin Delta is a source of drinking water to about two-thirds of the State's population. The quality of water obtained from the Delta is, therefore, of great importance.

The Municipal Water Quality Investigations Program focuses on monitoring and evaluating water quality constituents in the Sacramento-San Joaquin Delta that have relevance to drinking water and human health. The program is currently funded at about $1.7 million per year.

As a source of drinking water, the Delta poses some problems. Because the Delta is connected to San Francisco Bay and the Pacific Ocean, salts of sea water origin mix with the fresh waters in the Delta. Bromide, one of the salts present, causes problems in drinking water when disinfectants are used to destroy pathogens during water treatment. When present, bromide reacts to form unwanted disinfection by-product compounds in drinking water.

The Delta is also a significant source of naturally occurring organic compounds, which, like bromide, react with drinking water disinfectants to produce potentially harmful disinfection by-products.

The watershed of the Delta covers about one-third of the land mass of California. Consequently, activities over an extremely wide area can influence Delta water quality. A standard principle of drinking water supply is to control and protect the watershed from which the water supply comes. In the case of the Delta watershed, its size makes complete control impossible. Since land use in the Delta watershed cannot be fully controlled, it is necessary to maintain surveillance over Delta water quality to assure the public is adequately protected.

The Municipal Water Quality Investigations Program is directed at evaluating sources of bromide, organic carbon, pesticides, synthetic organic chemicals, toxic metals, and other constituents that could impact drinking water. The program also focuses on developing recommendations for improving the quality of Delta waters as a drinking water supply. For example, study is under way to identify and control the most important sources of carbon in the Delta. Agricultural drains on Delta islands having peat soils are among the carbon sources being investigated.

The program is designed for flexibility to accommodate new studies when required. As an example, in the Northern California rice industry, demonstration studies are under way to evaluate the benefits of rolling the rice stubble under and inundating the fields to decompose the stubble. This practice would replace annual burning of the fields. Staff of the MWQI are monitoring to determine whether the decomposition of rice stubble into the water would increase the organic carbon content of the water flowing into the Delta.

Water quality constituents planned for future regulation are monitored to provide information necessary for municipal agencies to plan treatment facilities capable of meeting the proposed regulations.

The focus of MWQI studies changes as the drinking water industry evolves as plans for the Delta change. The municipalities sponsoring the program believe there will be continuing evolution in drinking water technology and practice, and that the MWQI Program, changing and adapting to meet these challenges, will continue to be a necessary part of their drinking water supply planning.

Activities Outside the Delta

Activities conducted outside the Delta include scheduled routine water sampling and measurements to characterize the SWP water quality as well as special studies. Many of these special studies are in response to fish and wildlife issues and to water quality issues of importance to the recipients of delivered water, in particular to agencies that provide domestic water supply. These agencies face increasingly stringent regulatory requirements and look to the SWP to deliver a raw water supply of the highest possible quality. Other activities of the SWP include the development of a program to protect water in the California Aqueduct from floodwater runoff, efforts to protect waters from the zebra mussel, and the protection of water quality in Suisun Marsh.

Water Quality Monitoring

Besides the Department's water quality monitoring activities within the Delta, 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 the SWP facilities. Twenty stations are situated south of the Delta at reservoirs, power plants, and check structures of the North Bay, South Bay, Coastal Branch, and main canal of the 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 the 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 Los Angeles, and contracts for other laboratory services.

The Water Quality Program samples and analyzes water monthly at 15 stations 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. Laboratory results of sampling at several representative stations is reported monthly in the *State Water Project Operations Data Report*, available through the Department's Project Records and Reports Section. Results of the sampling program from 1989 through 1991 are detailed in the first water quality division report, *State Water Project Water Quality 1989 to 1991* (December 1992). Reports on subsequent years will be forthcoming. Laboratory results of sampling at several representative stations during 1993 are presented in Table 6-1.

TABLE 6-1

1993 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 20) mean	California Aqueduct at: Highway 119 (Check 29) mean	Tehachapi Afterbay (Check 41) mean	Devil Canyon Near San Bernardino mean	Article 19 Objectives Month/10 Year Average or Maximum
Conductance	mS/cm	5	81	334	398	457	502	587	584	480	N/A
Chlorides	mg/L	1	2	25	58	65	75	81	94	71	110/55
Dissolved Solids	mg/L	1	55	201	231	264	289	344	339	277	440/220
Hardness	mg/L	1	33	107	95	102	110	129	118	107	180/110
Percent Sodium	%	N/A	12	24	28	28	28	27	25	27	50/40
Sulfate	mg/L	1	2	27	42	43	34	74	63	42	110/20
Turbidity	NTU	1	NR (a	10 (b	12	7	11 (c	12 (d	13 (e	NR	N/A
T.O.C	mg/L	0.1	NR	8.0	4.5 (e	5.5 (c	5.1 (f	NR	4.1 (c	3.9 (c	N/A
Alkalinity	mg/L	N/A	38	82	61	69	74	77	78	70	N/A
Arsenic	mg/L	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002 (g	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 (h	0.04	0.14	0.18	0.19 (f	NR	0.25 (c	0.19	N/A
Chromium	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005 (g	N/A
Copper	mg/L	0.005	0.005	0.006	0.005	0.005	0.005	0.007	0.005	0.005 (g	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	11	11	13	14	14	14	12	125 max
Manganese	mg/L	0.005	0.006	0.026	0.030	0.013	0.006	0.006	0.005	0.007 (g	N/A
Selenium	mg/L	0.001/0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001 (g	0.05 max
Zinc	mg/L	0.005	0.005	0.010	0.006	0.006	0.429	0.009	0.006	0.005 (g	15 max

Notes: Turbidity is measured by a continuous recording Nephelometer and expressed as NTU (Nephelometer Turbidity Units). All other selected constituents are the yearly mean of laboratory analytical values sampled monthly. Nondetectable values are assumed equal to reporting limits for calculated mean. Reporting limit changed from 0.002 mg/L to 0.001 mg/L for Tehachapi Afterbay and Devil Canyon samples in May 1993. All other locations reported at 0.001 mg/L for non-detects. Specific conductance is measured by continuous electrical conductivity recorders, except at Thermalito Afterbay and Check 29 which are based on single monthly samples. Values for chlorides, dissolved solids, hardness, percent sodium, and sulfate correlated from specific conductance, except at Thermalito Afterbay and Check 29 which are analytical values.

a) NR = data not collected or recorded at this location.
b) mean of eight values
c) mean of eleven values
d) mean of seven values
e) mean of ten values
f) mean of five values
g) mean of nine values
h) mean of two values

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.

Delta exports are normally the sole source of water for the SWP facilities and reservoirs south of the Delta. Most Delta water is exported south during the winter 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 for the SWP include infrequent, localized storm inflow or more recently, beginning in 1990, non-Project water pumped from ground water basin sources (well water) into the California Aqueduct as part of a drought relief program. In the latter source, the entering ground water volume is quantified and water quality closely monitored for selected minerals, metals, pesticides, and herbicides. During 1993, a wet year, non-Project ground water pump-ins were significant only during January and February (18,624 acre-feet and 8,129 acre-feet) and limited to a monthly average of 1,443 acre-feet from Westlands Water District for the remainder of the calendar year. Natural inflow into several of the Southern California reservoirs was extensive during the storm events of January through March 1993.

Storm Inflows into the California Aqueduct

Project O&M Instruction No. OP-13, *Acceptance, Monitoring, Conveyance, and Disposal of Flood Waters from Drain Inlets*, addresses storm inflows into the California Aqueduct. The California Aqueduct crosses many streams and areas prone to flooding. Much of their seasonal floodwater runoff is either held back by detention dams or directed over or under the aqueduct through a series of chutes and siphons. Along the State and federal joint-use San Luis Canal, the Kern Intertie, and along the East Branch near Hesperia, floodwater is admitted into the aqueduct to prevent downstream flooding and to protect the physical integrity of the aqueduct. Floodwater may enter through gated and ungated drain inlet structures (pipes or flumes), toe drains along maintenance roads, and through permanent sump pumps and at portable pump stations.

The 1993 O&M Instruction No. OP-13, issued in June 1993, superseded instructions last issued in 1982. The instructions emphasize preventing or minimizing floodwater

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.

inflow into the aqueduct. Once admitted, though, floodwater inflow into the aqueduct may be considered additional project supply or directed out, as in the case of Arroyo Pasajero inflows, through downstream wasteways (at miles 216.03 and 292.08) and the Kern River Intertie into Tulare Lake. The O&M instructions specify aqueduct operations to coordinate inflow and outflow and to measure inflow volumes and rates. Water quality sampling instructions are included, as floodwater may add to the concentrations of salts, suspended solids, and other surface runoff pollutants in aqueduct flows.

A large number of small drains convey canal shoulder runoff into the aqueduct when it rains. Others drain stormwater from nearby highways or adjacent range or farm land. At some locations, the ground water is actively pumped into the canal to reduce the pressure of shallow ground water on the lining of the canal. Most of these smaller inflows are not metered.

The most significant storm water inflows into the California Aqueduct occur between O'Neill Forebay and the end of the San Luis Canal near Kettleman City. Inflow sources include Salt Creek, Little Panoche Creek, Cantua Creek, and Arroyo Pasajero. No inflow from the Arroyo Pasajero watershed drainage has entered the aqueduct through the Gale Avenue Arroyo Pasajero drain inlet since 1986, primarily due to the construction of extensive ponding basins.

In 1993, a total of 9,792 acre-feet of storm runoff entered the California Aqueduct during storm events beginning mid-January, during much of February and March, and at the beginning of April. Over 70 percent of the flow entered from Cantua Creek alone; Salt Creek also contributed significant flows.

A report published by the Division of Operation and Maintenance analyzing the effects of floodwater inflow on aqueduct water quality will be available in early 1995.

It is titled *Water Quality Assessment of Floodwater Inflow in the San Luis Canal.*

SWP/Delta Water Pathogen Monitoring Project

Giardia lamblia is the infectious agent of the intestinal disease giardiasis and is endemic in many of California watersheds. Both wild and domestic warm-blooded animals are potential sources for *Giardia, Cryptosporidium,* and enteric viruses that may enter a watershed through insufficiently treated domestic wastewater, urban and farm runoff, and through unregulated creek and river inflow.

The Metropolitan Water District of Southern California initiated a one-year survey for pathogenic protozoans (*Giardia, Cryptosporidium*) and enteric viruses at the request of the State Water Project Sanitary Survey Review Committee. Prior MWD collection efforts detected low but persistent levels of pathogens in both the East and West Branches of the California Aqueduct. More recently, outbreaks of waterborne disease caused by *Cryptosporidium* affected 200,000 to 400,000 individuals in Milwaukee, Wisconsin. A similar outbreak in Medford, Oregon, resulted in a "boil water" order. These outbreaks emphasize the importance of investigating the pathogenic potential of the SWP surface water supply deliveries by quantifying existing pathogen levels.

A pathogen monitoring survey collected and analyzed water samples for the protozoan organisms *Giardia* and *Cryptosporidium* from April 1992 through April 1993. Samples were also screened for enteric viruses and coliform bacteria. Sampling was conducted monthly for one year by Department and Kern County Water Agency personnel for a total of 48 water samples. Samples were collected at the SWP Banks Pumping Plant and Check 29; from the federal Delta Mendota Canal at McCabe Road; and from Greene's Landing in the north Delta. The MWD laboratory at La Verne, California, analyzed the samples for all pathogens except enteric viruses, which were sent to the University of New Hampshire.

Collection sites in the 1992-93 effort were chosen to evaluate possible sources of pathogen loadings. Greene's Landing on the Sacramento River was chosen to represent water as it enters the Delta, while Banks Pumping Plant represents the water supply after passage through the Delta region. Samples collected from the Delta Mendota Canal were used to assess the contribution of CVP water supply introduced into the joint facilities of the aqueduct prior to entry at O'Neill Pumping Plant. The collection site in Kern County at Checkpoint 29 of the California Aqueduct was the site furthest south and represents the water quality prior to entering the Southern California area.

In 1986, the EPA established criteria for *Giardia lamblia*, viruses, and the *Legionellae* bacterium in drinking water under its Surface Water Treatment Rule. In California the SWTR is enforced by the Department of Health Services under more stringent State Surface Treatment Regulations that specify limits for bacteria (coliform and *Legionellae*) and treatment techniques for removal and inactivation of *Giardia* and viruses in surface water sources supplying public water systems. Removal of *Cryptosporidium* is not currently addressed by State or federal rules but may be regulated in the future.

Interpretation of the results of laboratory analysis for pathogens was hampered by interference from high levels of turbidity and organic material in the source waters. However, the results of the survey suggest that the highest level of pathogens was at Greene's Landing, where *Giardia* was found in 42 percent of the samples and *Cryptosporidium* in half the samples. Moreover, two of the three positive enteric viruses were isolated from Greene's Landing samples.

Water supply passing through Banks Pumping Plant had significantly fewer pathogens than at other sites, with no detectable *Giardia* and half the level of *Cryptosporidium* as Greene's Landing (25 percent positive). Banks Pumping Plant, however, was the only other site where enteric viruses were detected (one sample). The Delta Mendota Canal site had only one sample positive for *Giardia*; however, it had the highest detection rate for *Cryptosporidium* (58 percent). No enteric viruses were detected at the Delta Mendota Canal or Checkpoint 29 sites. Checkpoint 29 also had no detectable *Giardia* and the lowest *Cryptosporidium* level, with only one positive sample. The lessening of pathogen detection in areas progressively further from the Delta suggests a possible pathogen die-off during transport through the aqueduct. Mean total coliform/fecal coliform concentrations also reflect this trend as Greene's Landing had the highest level of coliform, while the lowest coliform counts occurred at Checkpoint 29.

MWD also conducted a comprehensive monitoring survey of Southern California reservoirs immediately receiving SWP or Colorado River water. Reservoirs supplied by either source had similar levels of *Giardia* and *Cryptosporidium*, which were approximately 200 to 600 times lower that those observed in the SWP/Delta pathogen survey. However, 12 percent of samples collected from reservoirs receiving SWP water were positive compared to 6 percent in reservoirs receiving Colorado River water. When the SWP/Delta pathogen levels are compared with recent national pathogen survey results, the SWP/Delta values were approximately six times lower than the national average.

MIB Problems in SWP Southern California Reservoirs

Algal blooms in reservoirs can lead to taste and odor problems, increased turbidity, increased concentrations of organic THM (trihalomethane) precursors, and filter clogging in water treatment plants. Bloom-related taste and odor problems in the SWP reservoirs are caused by the chemical compounds 2-methylisoborneol (MIB) and geosmin, which impart an earthy-musty taste and odor to water. Although the aqueduct carries untreated water not intended for direct consumption, objectionable tastes and odors from blooms cannot be removed from water by conventional treatment measures.

The incidence and magnitude of taste and odor problems in the SWP southern reservoirs have increased in recent years. Problems at Lake Perris associated with blooms during summer months were first noted in the summer of 1980. Summer algal blooms and the associated taste and odor continued during much of the 1980s and, after several years absence, returned in 1991. Taste and odor problems at Castaic Lake were first encountered during the mid-1970s but did not return until 1990 and 1993. A very extensive 1993 incident at

Castaic Lake began in August, and a second incident lasted from the end of September through November.

Control measures used at Lake Perris and Castaic Lake include rapid drawdown of the lake water surface to expose the benthic (lake floor) algal growth to sunlight or the application of copper sulfate to the pelagic (opened waters) area of the lake for planktonic (floating or free-swimming) algae. At Lake Perris, downstream contractors often change to alternate water sources other than Lake Perris for summer water supply to avoid the aesthetically unacceptable water.

Taste and odor problems in Castaic Lake water are primarily caused by the filamentous bluegreen algae, *Anabaena* and *Pseudoanabaena* spp. In response to the 1993 Castaic algae problems, water releases from Elderberry Forebay into Castaic Lake were halted from September 24 through 27 and minimized during October and November. Elderberry Forebay inflow occurred only 13 days during this period. Elderberry Forebay releases into the lake are thought to encourage algal growth by introducing fresh nutrients into the lake and mixing water layers. Daily monitoring for the compound MIB was instigated during this period. Castaic Lake is currently tested for algal growth weekly during the summer and bimonthly throughout the rest of the year.

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, see 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 other agencies have acted to preserve Suisun Marsh as a unique environmental resource. As part of its responsibility for protecting Suisun Marsh, the 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, Department of Fish and Game, 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 the SWRCB standards and terms.

Decision 1485 Standards for Suisun Marsh

Salinity standards were set by the SWRCB and included in the Preservation Agreement to help preserve Suisun Marsh as a brackish tidal marsh and to provide optimum source water for the production of plant foods for waterfowl. To accommodate a phased construction schedule for facilities needed to meet the standards, the SWRCB revised Decision 1485 standards for Suisun Marsh in a December 5, 1985, order.

The 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

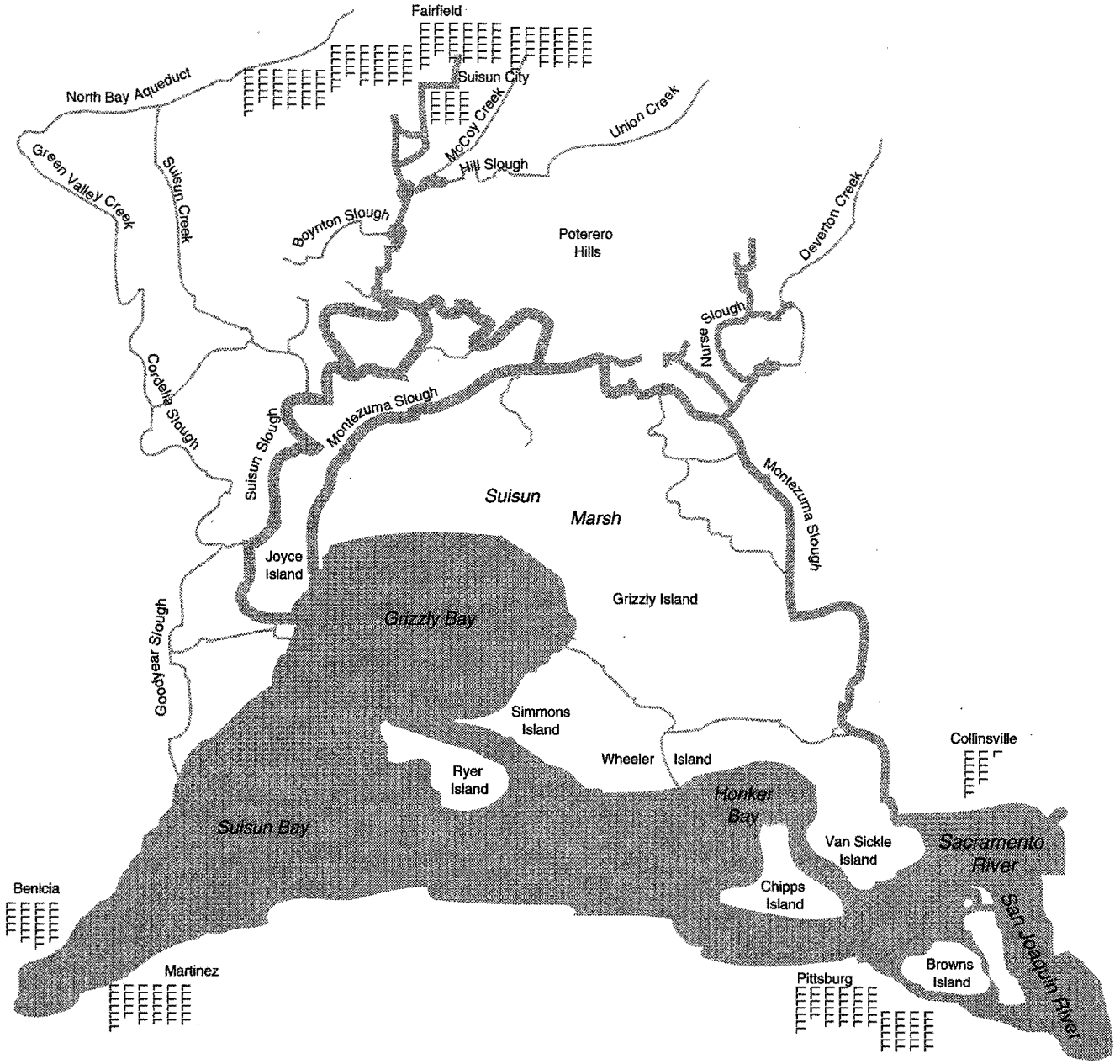


Fig. 6-2. The Suisun Bay and Marsh

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. Contributions were also provided by the USFWS.

Preservation Agreement Standards

In 1986, federal legislation (Public Law 99-546) authorized funds to the USBR for protecting Suisun Marsh. On March 2, 1987, the Department, USBR, DFG, and the SRCD signed the Suisun Marsh Preservation Agreement.

The agreement ensures that channel water salinity in Suisun Marsh will be maintained as prescribed to mitigate for adverse effects of the CVP and SWP on the marsh, as well as effects from other upstream diversions. An important feature of the agreement is the Suisun Marsh Salinity Control Gates facility, which was declared operational November 22, 1989 (about one year after initial operation).

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 responsibility from 50:50 (SWP/CVP) to 75:25 and also directs the SRCD to provide updated ownership management plans to the Department and USBR.

Western Suisun Marsh Salinity Control Project

Initial testing of the Suisun Marsh Salinity Control Gates (formerly referred to as the Montezuma Slough Salinity Control Structure) started in October 1988. For the next two years, the Department and USBR evaluated its effectiveness. The purpose of the evaluation was to determine if SMSCG operation would enable meeting all future channel water salinity standards required by Decision 1485 (December 5, 1985, revision to Table II) and the Suisun Marsh Preservation Agreement in western Suisun Marsh.

The Department and USBR concluded in 1990 that additional actions would be required to meet Decision 1485 salinity standards in the western marsh. Therefore, the Department and USBR began planning, design, and environmental documentation for the Western Suisun Marsh Salinity Control Project (WSCP). The Department and USBR staff used alternative actions proposed in the February 1984 Plan of Protection for the Suisun Marsh as a starting point for considering alternative actions for the western marsh project.

Since 1990, Department staff have developed and distributed a scoping report (August 1991) and a screening report (May 1993). In the screening report, computer model studies and biological field surveys were used to screen approximately 275 alternative actions considered during the

WSCP's scoping process. Nine individual alternative actions and 18 combined alternative actions are described in greater detail in the report.

Western Suisun Marsh Salinity Control Test

The Western Suisun Marsh Salinity Control Test (WSCT) was initiated to evaluate a promising alternative action identified during the screening process of the Western Suisun Marsh Salinity Control Project to help meet Decision 1485 channel water salinity standards in the western marsh. The WSCT includes augmenting Green Valley Creek base flow with North Bay Aqueduct water discharged from Cordelia Forebay and Lake Berryessa water discharged through Putah South Canal, and associated field data collection activities. The WSCT was conducted during the 1993-94 control season (October-May) and will be conducted again during the 1994-95 control season.

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 avoid impacts to sensitive fishery resources was not available 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 on March 8, 1994, to rate the modified spillway at the Cordelia Forebay, no water was discharged into Suisun Marsh during the 1993-1994 WSCT.

Water Quality Monitoring and Compliance

Environmental Services Office staff are continuing to conduct a series of water quality field surveys to document existing channel water quality conditions and fill in gaps in the database. These surveys will add to our knowledge of marsh conditions. Each survey documents field conditions associated with a major activity in the marsh. The first major annual activity occurs in late September and runs through the end of October. During this period, wetland managers fill their ponds in preparation for the migration of wintering waterfowl. The second activity occurs between late October and late January when wetland managers circulate 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. This activity is intended to enhance seed germination of food plants for waterfowl. The fourth activity occurs from June to late September when most of the ponds are dry. During this fourth period, marsh channel water salinity conditions are primarily the result of tidal action.

During 1993, the salinity standards specified in Table II of Decision 1485 were in effect at two locations in Montezuma Slough

(S-49 Beldons Landing and S-64 National Steel) and at two locations in the Sacramento River (C-2 Sacramento River at Montezuma Slough and Mallard Slough). In October 1993 salinity standards became effective at two additional locations (S-21 Chadbourne Slough at Sunrise Club and S-97 Cordelia Slough at Ibis). However, as part of the 1993-94 WSCT, the Department and USBR petitioned the SWRCB and received variances in meeting Decision 1485 salinity standards at S-97 and S-21, for the 1993-94 test. All remaining salinity standards were met.

Marsh-Wide Plant Survey

Overall vegetative composition of the 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 three years. Surveys occurred 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. The Mitigation Agreement

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.

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.

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, the 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 for 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. Preliminary results of the data collected for the biological assessment will be submitted to the 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.

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.

Design and Construction Activities

To discharge North Bay Aqueduct water from Cordelia Forebay for the flow augmentation component of the WSCT, the Department's Design and Construction staff designed a modification to the weir at Cordelia Forebay. The weir was lowered 1.5 feet to facilitate the discharge of water from Cordelia Forebay into the city of Fairfield's storm drain system and into Green Valley Creek. The construction work was performed by Operations and Maintenance staff from Delta Field Division.

Right-of-Way Activities

During 1994, 10 temporary entry permits were obtained by Division of Land and Right-of-Way staff to conduct biological surveys and geologic exploration in privately managed wetlands. The surveys are conducted in support of preliminary engineering and environmental documentation for the Western Suisun Marsh Salinity Control Project. The survey locations lie 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.

Contract Negotiations

During 1994, the State Water Project Analysis Office began negotiating a short-term (two-year) contract with Solano County Water Agency to use Lake Berryessa water for salinity control in the western Suisun Marsh. Provisions in the contract include the purchase of 6,000 acre-feet from the Solano water pool emergency bank. SCWA member agencies purchased the emergency bank water, which is currently held in storage in Lake Berryessa, in 1991. Negotiations also included provisions for the discharge of up to an additional 5,000 acre-feet per year of Lake Berryessa water to be repaid with North Bay Aqueduct water at a 2:1 exchange rate.

Information for this chapter was provided by the Division of Operations and Maintenance Environmental Assessment Branch. The Division of Local Assistance contributed information on the Municipal Water Quality Investigations Program, the Bryte Laboratory, and the Quality Assurance/Quality Control Program. Information on Suisun Marsh was furnished by the Environmental Services Office.

Chapter 7

Local Assistance Programs

Local irrigation, Sacramento-San Joaquin Delta

Significant Events

- Through 1993, $127 million had been disbursed or contracted for loans, grants, and administrative costs under the Davis-Grunsky Act Program.

- In August 1993, a full-time coordinator was appointed to provide a lead role in the implementation of the San Joaquin Valley Drainage Program. The coordinator, jointly funded by agencies participating in the program, will establish liaison with public interest groups, technical groups, and local and agricultural interests.

- The Department's Site Assessment Program is investigating 32 different sites, many on properties associated with the Coastal Branch of the California Aqueduct, to help the Department avoid purchasing properties contaminated with toxic or hazardous substances.

- Over 1,200 environmental documents were screened by the Review of Reports Section of the Division of Local Assistance to identify any activities that present potential public safety or liability issues of concern to the SWP.

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, jointly administered by the Department and the California Water Commission, 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.

Before 1967, loans were made at the current market interest rate. In 1967, to be more equitable to low-income agencies 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 1993, approximately $127 million of the allocated $130 million had been disbursed or contracted for loans, grants, and administrative costs. The remaining $3 million has been allocated for a grant to Littlerock Creek Irrigation District and Palmdale Water District to rehabilitate Littlerock Dam.

Current Activities

The following actions involve funds from the Davis-Grunsky Act. 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, has 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 should occur during last quarter 1994.

Palmdale Water District and Littlerock Creek Irrigation District

Palmdale Water District and Littlerock Creek Irrigation District, Los Angeles County, have signed a contract with the Department

for a $3 million grant to rehabilitate Littlerock Dam.

Strathmore Public Utility District

Strathmore Public Utility District, Tulare County, has received 90 percent of its $1,860,000 loan to upgrade its drinking water system to meet safe drinking water standards. The district will receive the remaining $186,000 after the final site inspection and audit required by the Davis-Grunsky Act have been completed.

San Joaquin Valley Drainage Program

Agricultural drainage, especially on the west side of the San Joaquin Valley, presents two basic problems for farmland irrigated with water supplied by the State Water Project and the Central Valley Project. Those problems involve:

- salt buildup and waterlogging of irrigated lands due to a high ground water table, which adversely affect crops and productivity; and
- toxic or potentially toxic trace elements in the shallow ground water, which when drained and discharged to streams, ponds, or wetlands, can adversely affect fish and wildlife.

To solve those problems or mitigate their effects, the Department continues to work with several federal and State agencies involved in the San Joaquin Valley Drainage Program. The Department entered into a memorandum of understanding with the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Natural Resources Conservation Service, State Water Resources Control Board, Department of Fish and Game, and Department of Food and Agriculture to implement the San Joaquin Valley Drainage Implementation Program, the recommended plan of the SJVDP.

Those agencies have jointly funded a full-time coordinator for two years to provide a lead role in the implementation program and establish liaison with public interest groups, technical groups, and local agricultural and water interests in areas where the drainage problem exists. A coordinator assumed appropriate duties in August 1993. Since then the SJVDIP has developed an immediate action plan, which is being implemented. The SJVDIP also published an annual report in May 1994 and recently adopted a monitoring plan to assess the effectiveness of the implementation actions.

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 five-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 five-year plan has been completed and approved, reviewing accomplishments since 1989 and setting new objectives for the remainder of the century.

The Department is participating in a multiagency feasibility study of wastewater reuse in the San Francisco Bay area. Among the options being reviewed is exporting waste water to the San Joaquin Valley in return for exporting agricultural drainage to the Pacific Ocean. The study, which is just beginning, is to be completed during 1997.

Drainage Monitoring and Evaluation

The USGS and the Department have 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.

During the next three 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 and regulating the San Joaquin River.

Additional activities of the SJVDMP 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 helping 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.

The Department is summarizing the results, findings, conclusions, and recommendations from all completed projects. Summarizing and publishing the findings and recommendations from completed projects have high priority because these results and findings affect future activities.

Starting in the 1994-95 fiscal year, the Department will initiate a process for new multiyear projects related to on-farm irrigation management and drainwater reuse. These activities are consistent with the San Joaquin Valley Drainage Implementation Program. Activities will include demonstration, study, workshops, training, and other educational programs.

Drainage Treatment

The Department continues to participate in the multiagency drainage treatment test facility near Tranquillity 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 Central Valley Regional Water Quality Control Board adopted waste discharge requirements and certified environmental impact reports for 14 evaporation pond operators in 1994. The Department reviewed and commented on the many technical reports required by the Regional Board for each pond system. Interested parties have filed petitions with the State Water Resources Control Board to review the waste discharge requirements.

The Department continues to fund the National Biological Service study (previously conducted by USFWS) on hatching and fledgling success of shorebirds. The final report to the Department will be available in 1995. Department-funded academic studies of alternative habitat selection and the use of dimilin to reduce the prey sources on evaporation ponds have been completed. The final report of the latter study is due in 1995 and is the initial step in evaluating dimilin's effectiveness in a highly saline environment. The information will be evaluated to determine if field-scale or other trials are necessary.

Demonstration Wetlands

The Department, along with the Department of Fish and Game, USFWS, USBR, and Westlake Farms, Inc., initiated a cooperative five-year program to construct and operate a demonstration wetland at Westlake Farms in the Tulare Lake Basin. This project will facilitate study of alternative and compensation habitats. The Department and USBR will provide most of the water through a federal entitlement at the Arroyo Pasajero flood control basin. The Department will also assist in field studies to be conducted under the leadership of the USFWS and the National Biological Service.

Site Assessment Program

The federal Comprehensive Environmental Resource Conservation and Liability Act (CERCLA) provides that owners of properties containing toxic or hazardous substances are liable for these conditions. The "innocent landowner" defense can exempt an owner from liability if the condition existed prior to the owner's assumption of the property and if the new owner exercised due diligence in investigating the presence of such problems.

The Department's Site Assessment Program, which was established by Water Resources Engineering Memorandum No. 59, began in 1992. Funded by the SWP and managed by the Division of Local Assistance, the program is directed at reducing Departmental liability by performing diligent investigations of sites being considered for acquisition.

Currently, 32 sites are under investigation, many on properties associated with the Coastal Branch of the SWP. Beyond enabling an "innocent landowner" defense, the primary benefit of the program has been to enable the Department to avoid purchasing properties with toxic or hazardous substances.

Review of Environmental Impact Documents

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 under which Clearinghouse documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

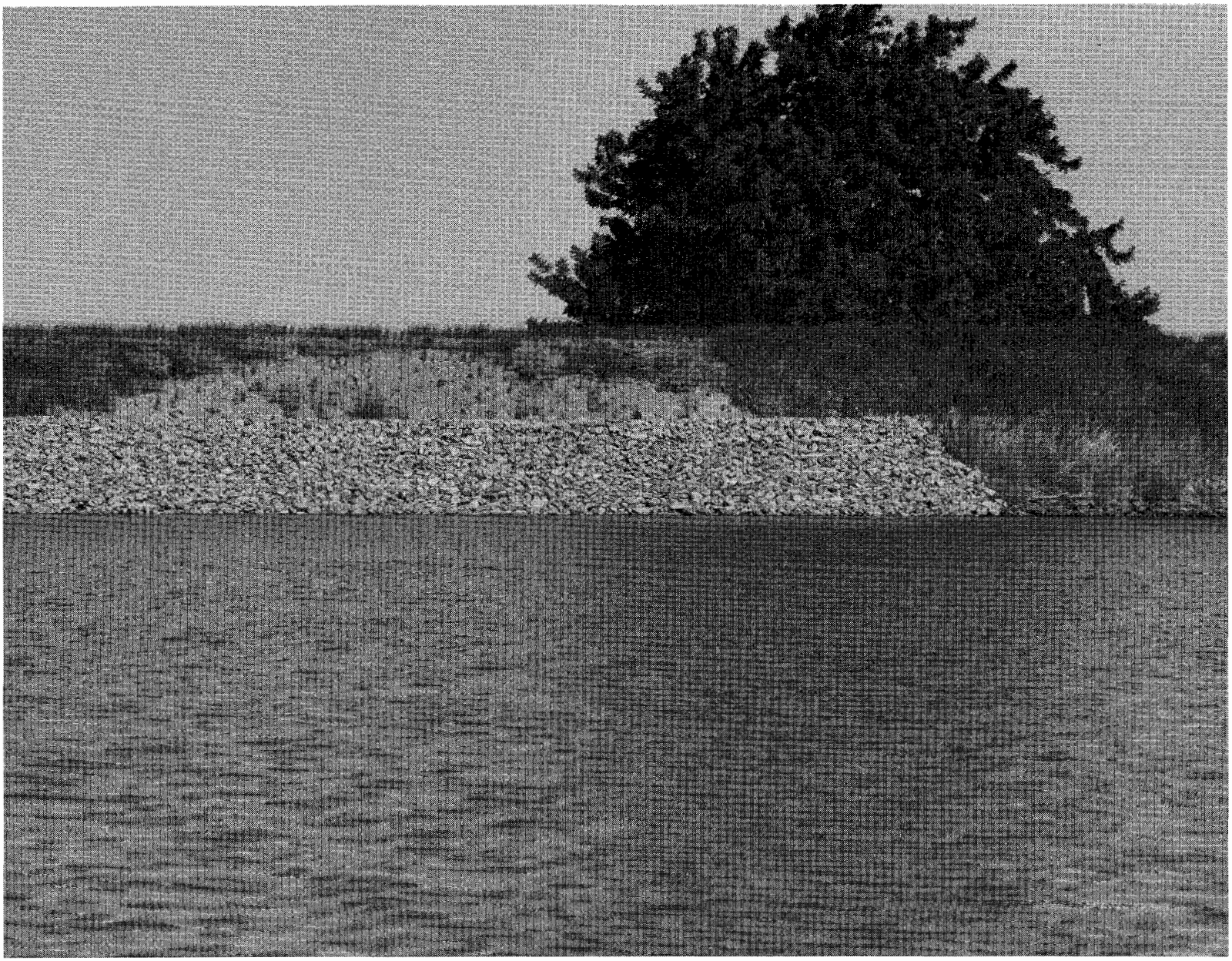
The Review of Reports Section in Division of Local Assistance headquarters screens State Clearinghouse documents and circulates SWP-related materials for review by staff of the Department's four districts and the Divisions of Planning, Operations and Maintenance, and Design and Construction, as appropriate.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

In the first year of operation, 25 environmental documents having significance to the SWP were reviewed. The number has steadily increased. In the most recent year, about 1,200 environmental documents were screened by the Review of Reports Section, and about 100 were referred to appropriate staff for detailed review.

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

Chapter 8

Legislation and Litigation



Sacramento-San Joaquin Delta levees

Significant Events

- The Department is closely following a lawsuit filed in May 1993 by Westlands Water District against the United States. Westlands filed the action to compel federal agencies to comply with the National Environmental Policy Act and the federal Endangered Species Act in implementing the Central Valley Project Improvement Act. The Department is not a party to this lawsuit; however, the outcome of the case has a potentially significant impact on the management of the SWP.

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 as well as manages litigation involving SWP operations.

Legislation

No State or federal legislation of consequence to the SWP was introduced or enacted as of June 30, 1993.

Litigation

As of June 30, 1993, 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.

Valley View Farms v. State of California

This suit was filed on April 20, 1993, in Kings County Superior Court. The Valley View Farms property borders a portion of the San Luis Canal, a joint-use section of the California Aqueduct. Valley View Farms alleged that the state caused flooding on its property as a consequence of the backup of flood water from an inadequate drain into the San Luis Canal. The U.S. Bureau of Reclamation constructed the drain as part of the San Luis Canal, and the Department operates and maintains the canal pursuant to the Joint-Use Facilities Operating Agreement.

Valley View Farms sought damages for the destruction of trees in its orchard. An investigation determined that a flood easement covers the property, precluding the property owner from collecting damages for the flooding. In August 1993, plaintiffs agreed to dismiss the case.

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 that is 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 55 percent of payments made on the claim under the Joint-Use Facilities Operating Agreement for 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 De-

partment 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 State Water Project. In May 1993, plaintiffs filed this action to compel USBR 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 and to compel USBR, USFWS, and National Marine Fisheries Service to comply with NEPA and the Endangered Species Act on the biological opinion for winter-run salmon and delta smelt. Plaintiffs claim that implementation of the CVPIA and the federal ESA resulted in improper reductions of their contractual allocations of the water from the CVP. The CVPIA requires USBR to allocate certain amounts of water from CVP for fisheries and wildlife resources.

In 1993 and 1994, biological opinions under the ESA containing incidental take statements for the endangered winter-run salmon and threatened delta smelt were issued by the defendants for operation of 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. 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 and for fish and wildlife restoration. The court scheduled hearings on ESA and Administrative Procedures Act claims for January and February 1995.

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; the matter is currently pending 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, the USFWS published its proposed listing of

the 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 of critical habitat within two 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; the delay in listing fails to protect the threatened smelt as required by the ESA.

The parties have settled and agreed that by December 15, 1994, USFWS will publish final regulations on critical habitat.

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 USFWS 1994 biological opinion on the delta smelt does not adequately protect the fish as required under the federal ESA. The 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. To assure that the State's and the Department's interest are represented, the Department intervened in the suit. Several SWP water contractors also intervened.

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 that 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, the federal 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 the 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 EPA to propose standards by December 15, 1993. On January 6, 1994, EPA published the proposed standards in the Federal Register, and subsequently the court issued an order granting partial dismissal of the suit. In April 1994, another settlement and order were approved requiring EPA to sign a Notice of Final Rulemaking by December 15, 1994, and to stay proceedings pending EPA completion of this obligation.

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 two years of the six-year drought, which were critically dry according to the classification set forth in Decision 1485. In 1992, the 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 where the court dismissed the claim against the federal defendants for lack of subject matter jurisdiction. In July, the case was remanded to State Superior Court and awaits further action by the plaintiffs.

Information for this chapter was contributed by the Office of the Chief Counsel.

Part III
State Water Project Operations

Chapter 9

Water Storage

Snow survey at Sierra Ski Ranch

Significant Events

- On February 24, 1993, Governor Pete Wilson declared an end to California's six-year drought.
- At the end of the 1992-93 water year, September 30, 1993, storage at major in-state reservoirs was 24 million acre-feet, about 110 percent of average and almost twice the storage at the end of water year 1991-92.
- Statewide, runoff for water year 1992-93 was 125 percent of average, the highest runoff since 1986.
- The Sacramento River Index for water year 1992-93 was 22.2 million acre-feet and classified as "above normal" under Decision 1485 criteria.

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

Precipitation and Runoff

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

Water Year 1992-93

Water year 1992-93 was a welcome contrast to the preceding six years of drought. During the third week of February, after two weeks of dry weather and with reservoir storage only 75 percent of average, a series of storms brought much rain and snow to California. For many of the major reservoirs in the foothills of the Sierra Nevada, flood control became an operational factor for the first time since the fall of 1986, and a heavy snowpack assured a good runoff year. Finally, the Department's concerns about a possible seventh year of drought were relieved. On February 24, 1993, Governor Pete Wilson officially declared the drought over.

By the end of the water year on September 30, 1993, storage at major in-state reservoirs was 24 million acre-feet, about

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 reached 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.

While native flows of the Sacramento River are augmented annually by about 0.9 MAF from the Central Valley Project's Trinity River imports, much of that native flow is used within the Sacramento River basin. Estimated Sacramento River region depletion in a normal year is about 6.0 MAF, while probably another 0.5 MAF is lost to reservoir evaporation. After allowing for use of the Trinity River import supply, the 22.4 MAF of runoff originating within the Sacramento River region is reduced by about 5.6 MAF leaving 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.

110 percent of average and nearly twice the 12.7 MAF (58 percent of average) in storage on September 30, 1992.

Precipitation

Precipitation statewide was about 140 percent of average during water year 1992-93. As in the previous year, the southern portion of California was wetter, receiving a higher percentage of average precipitation than the north. But all regions shared in the bounty with statewide rainfall well above normal. Figure 9-1 shows precipitation in each of the 10 hydrologic regions of the state as a percentage of average.

The water year started out poorly, with precipitation about 20 percent of average during the month of November. But the following four months were wet, especially December and February, when about twice the normal amount of precipitation occurred. By April 1 precipitation was 150 percent of average, compared with 90 percent the previous year. Although June was unseasonably wet, the last three months of the water year were unusually dry, without many of the usual mountain and desert showers.

Snowpack water content in the mountains increased to above-average levels around the end of December 1992, when a major snowstorm hit northern California. By the first of April, the snowpack stood at 150 percent of average–the most since 1983. This large snowpack produced enough snowmelt to refill most of the major reservoirs.

Runoff

Statewide, runoff for water year 1992-93 was 125 percent of average, the most since 1986, the year of the February flood. While runoff was low at the beginning of the water year because of the lingering effects of the 1987-92 drought, in February 1993 runoff increased to near normal. During March, runoff was 160 percent of average. Runoff then remained above average throughout the snowmelt season.

Sacramento River Index runoff during water year 1992-93 was 22.2 million acre-feet, up greatly from the 8.9 million acre-feet in the 1991-92 water year. This classified the 1992-93 water year as "above normal" under the State Water Resources Control Board Decision 1485 criteria for the Delta. If the preceding year had not been defined as "critical," the 1992-93 water year would have been in the "wet" category.

Water Year 1993-94

During fall 1993, at the beginning of the 1993-94 water year, the weather reverted to a drier pattern, with November particularly dry. At the end of December, northern Sierra seasonal precipitation was only 70 percent of average, and the mountain snowpack measured about 50 percent of average for the date.

Runoff during the first three months of the 1993-94 water year was much below average, reflecting the dry fall. During December 1993 monthly runoff dropped to one third of average.

Storage

To collect and store water for future deliveries, SWP operates a complex system of 22 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. It derives its inflow from pumping at Gianelli Pumping-Generating Plant which originates from regulated and

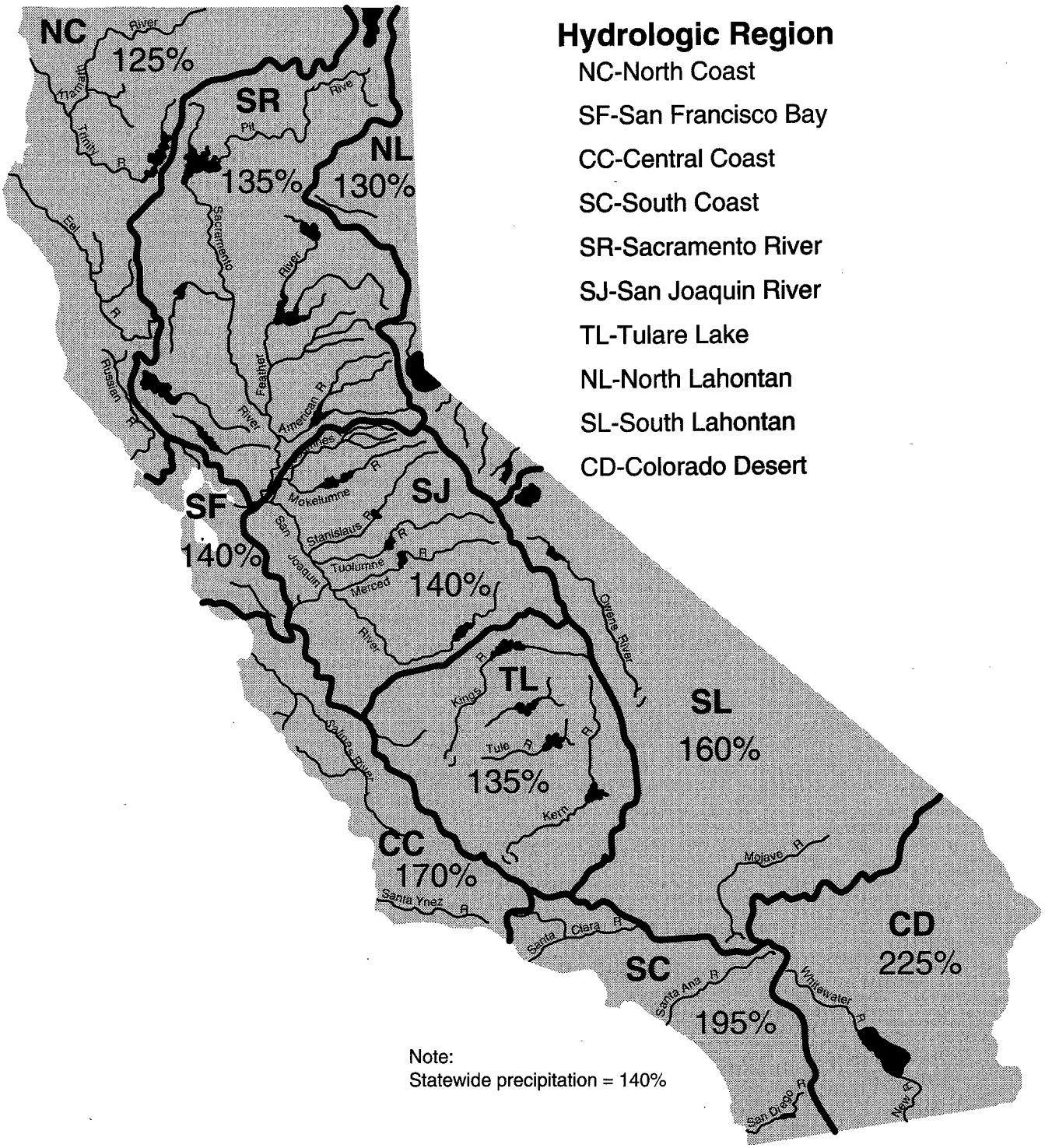


Fig 9-1. Statewide Precipitation by Hydrologic Region, 1992-93 Water Year, in Percentage of Average

uncontrolled flow in the Delta. The remaining 20 reservoirs are used to regulate the conserved supply into water delivery patterns designed to fit local needs.

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 1992-93 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 1992-93 water year totaled about 5.22 million acre-feet, 119 percent of average. Minimum storage occurred December 4, 1992, at 1,278,834 acre-feet, 36 percent of normal maximum operating capacity (3,505,120 acre-feet). Storage peaked on June 6, 1993, at 3,521,797 acre-feet, 100 percent of normal maximum operating capacity. See Figures 9-2 and 9-3 for monthly and cumulative inflow into Lake Oroville.

In 1993, a controlled spill occurred for seven days at the end of March totaling 253,534 acre-feet because Lake Oroville storage had encroached into the flood control storage reservation. The 1993 storage levels were the highest since 1989 when over 8,000 acre-feet in spillway leakage occurred (Figure 9-4).

San Luis Reservoir

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

At the beginning of the 1992-93 water year, San Luis Reservoir contained 24 percent of its normal maximum operating capacity; SWP share was 380,959 acre-feet. By April 22, San Luis Reservoir reached its maximum storage for 1993 at 1,990,471 acre-feet, or 98 percent of normal maximum operating capacity. The highest end-of-month SWP share of storage was also in April at 899,075 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 1992-93 water year, Lake Del Valle held 32,500 acre-feet, about 81 percent of normal maximum operating capacity (39,914 acre-feet). Its highest end-of-month storage occurred in April 1993 at 40,497 acre-feet.

Because of nearly 12 inches of rain in December and January, storage in Lake Del Valle reached a maximum of 42,793 acre-feet, which is 100 percent of normal maximum operating capacity, February 19, 1993. Natural inflow for January and February totaled over 37,000 acre-feet. By the end of the 1992-93 water year, storage in Lake Del Valle dropped to 32,967 acre-feet, 83 percent of normal maximum operating capacity. Releases to Arroyo Valle and South Bay Aqueduct from Lake Del Valle totaled just over 41,500 acre-feet for the 1992-93 water year.

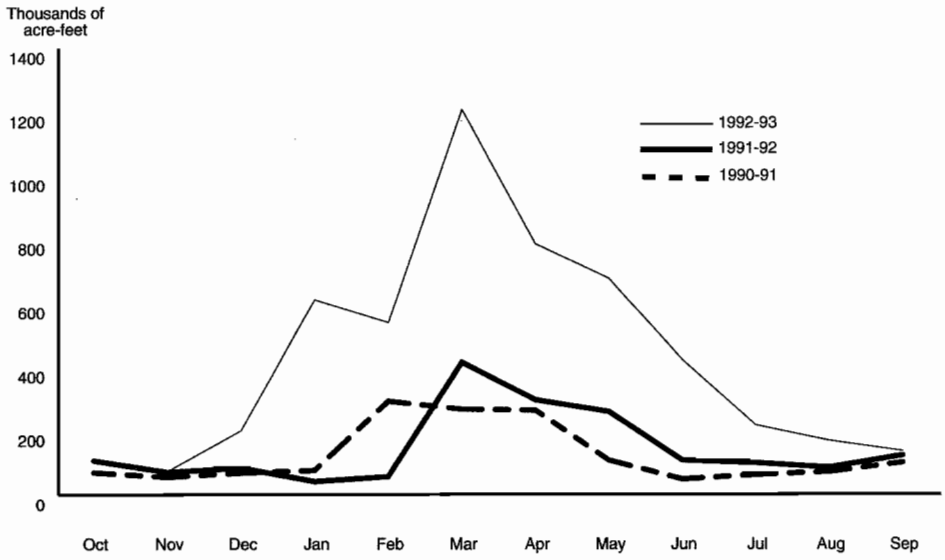


Fig 9-2. Monthly Inflow into Lake Oroville from Feather River, 1991 through 1993 Water Years

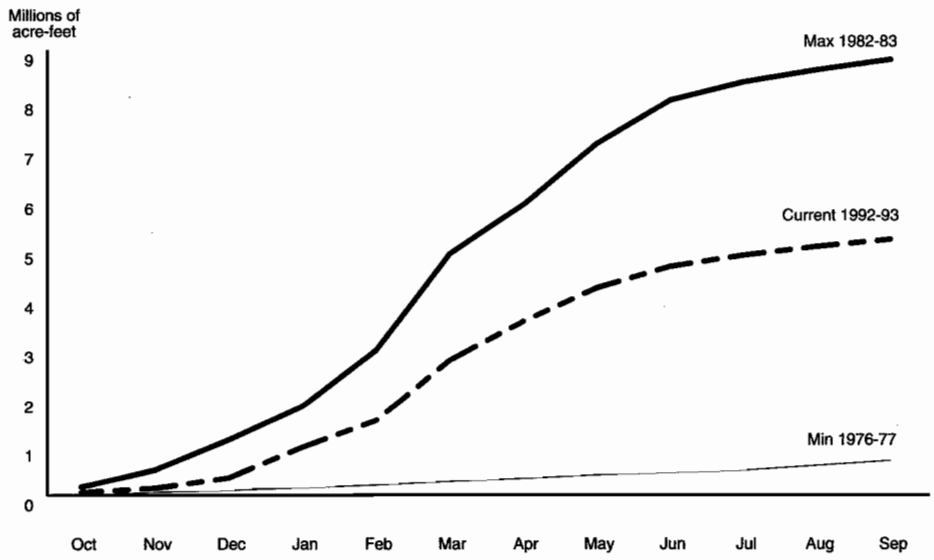


Fig 9-3. Cumulative Inflow into Lake Oroville from Feather River

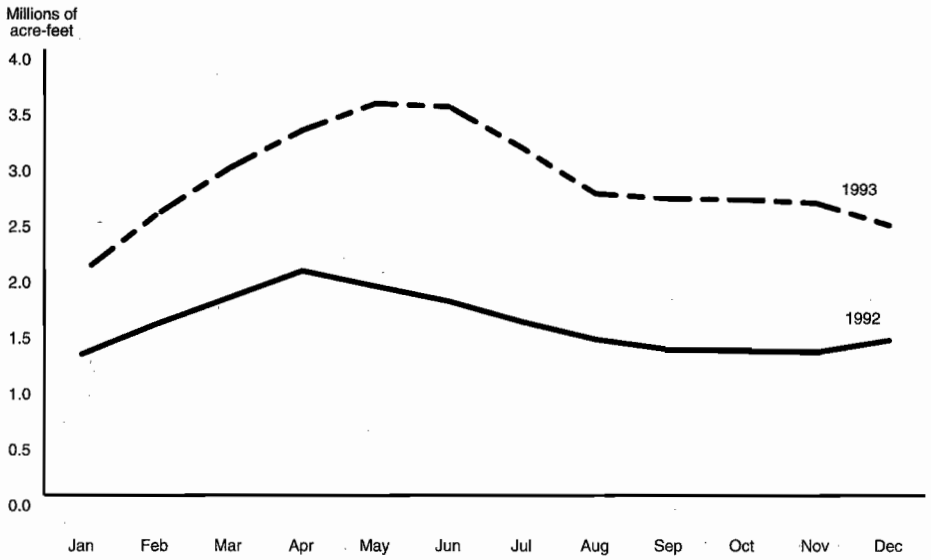


Fig 9-4. End-of-Month Storage in Lake Oroville, 1992 and 1993 Calendar Years

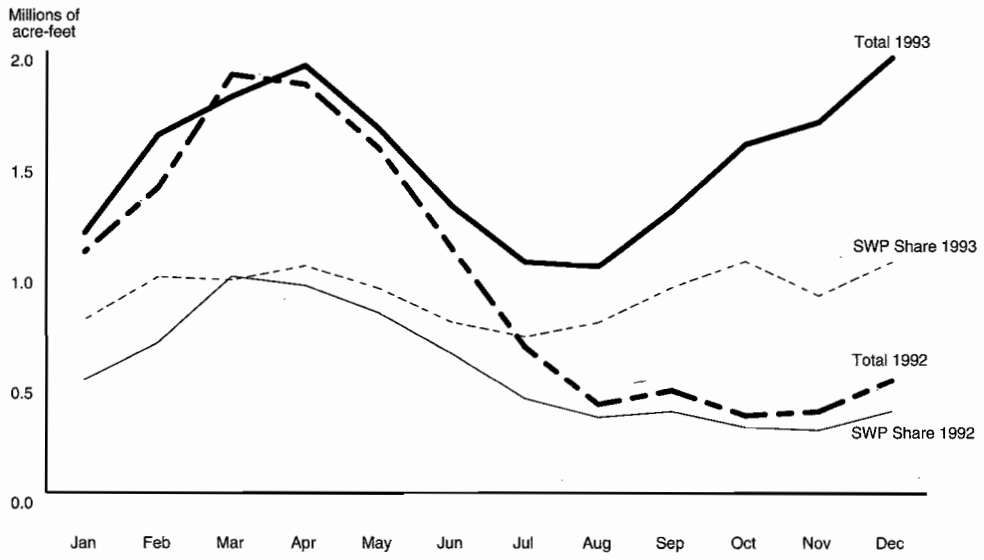


Fig 9-5. End-of-Month Storage in San Luis Reservoir, 1992 and 1993 Calendar Years

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 1992-93 water year, those reservoirs held 601,704 acre-feet, 86 percent of their combined normal maximum operating capacity of 701,321 acre-feet. At the end of the 1992-93 water year, they held 607,206 acre-feet, 87 percent of the combined normal maximum operating capacity.

Diversions from the Delta

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 1993, SWP diverted 3,210,000 acre-feet at Banks Pumping Plant, including 196,169 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 1993.

SWP also diverted 36,000 acre-feet at the Barker Slough Pumping Plant for deliveries through the North Bay Aqueduct for use by the North Bay water contractors.

From Banks Pumping Plant, water is delivered to either 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.

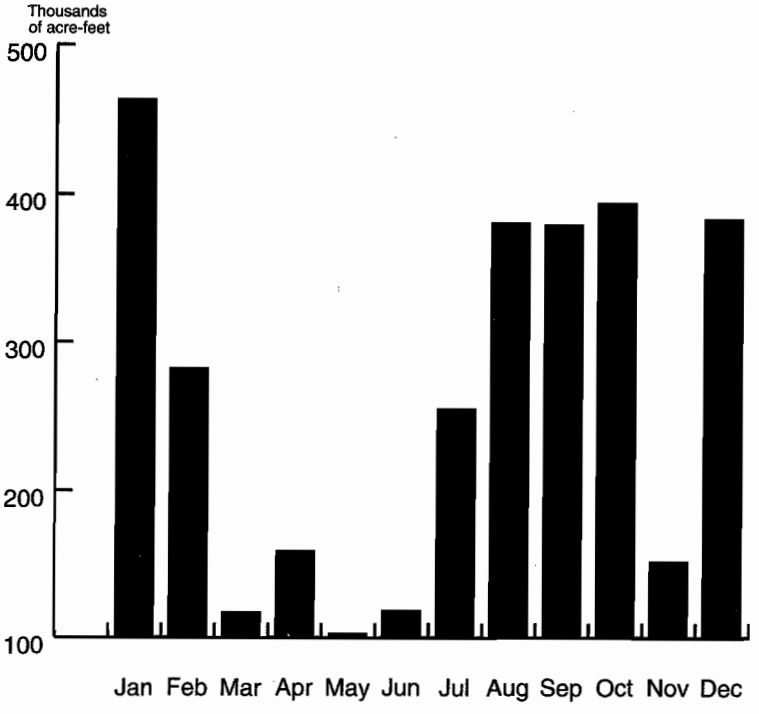


Fig 9-6. Water Pumped at Harvey O. Banks Delta Pumping Plant, Each Month During 1993

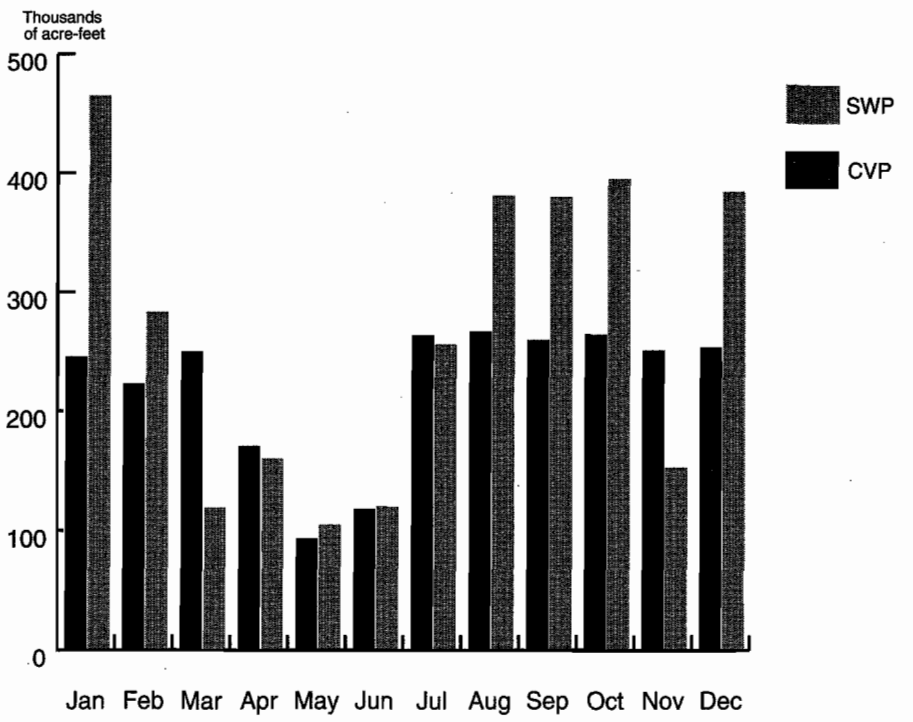


Fig 9-7. Water Diverted from the Sacramento-San Joaquin Delta by State Water Project and Central Valley Project in 1993, by Month

Generally, water is conveyed to the San Joaquin Valley through the San Luis joint-use aqueduct facilities to Kettleman City, then through the California Aqueduct. In 1993, water conveyed to the San Joaquin Valley totaled 1,381,619 acre-feet. Figure 9-8 shows the amount of SWP water conveyed each month.

In 1993, water pumped through Edmonston Pumping Plant for delivery to Southern California totaled 645,369 acre-feet. Figure 9-9 shows the amount of water pumped each month.

1993 Water Delivery Requests and Approvals

While the 1992-1993 water year started out poorly with precipitation only about 20 percent of average during November 1992, precipitation was measured at 150 percent of average by April 1, 1993. This increase in precipitation had a dramatic influence on the Department's approval of water contractor delivery requests.

In December 1992, when the Department first determined its ability to meet 1993 water contractor delivery requests, it could approve only 10 percent of the 3,850,000 acre-feet requested by the water contractors. The above-average rain and snowfall during the ensuing months increased the amounts of storage in Lake Oroville and San Luis Reservoir and the amounts expected to be available throughout the year. As a result, the Department progressively increased its approval amounts to 25 percent, 40 percent, 55 percent and then to 70 percent on March 5, 1993. Ultimately, the favorable water supply conditions throughout the State resulted in a decrease in water contractor delivery requests that allowed the Department to approve 100 percent of some of the revised requests on April 21, 1993. At the end of the water year on September 30, reservoir storage statewide was measured at 24 million acre-feet, 106 percent of average and over 11 million acre-feet more than the previous water year.

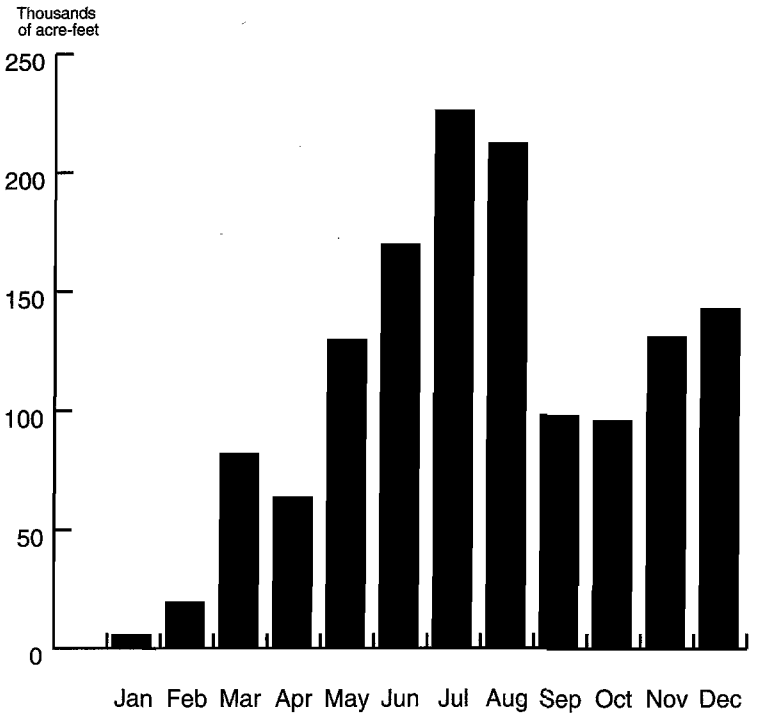


Fig 9-8. SWP Water Conveyed to San Joaquin Valley, Each Month During 1993

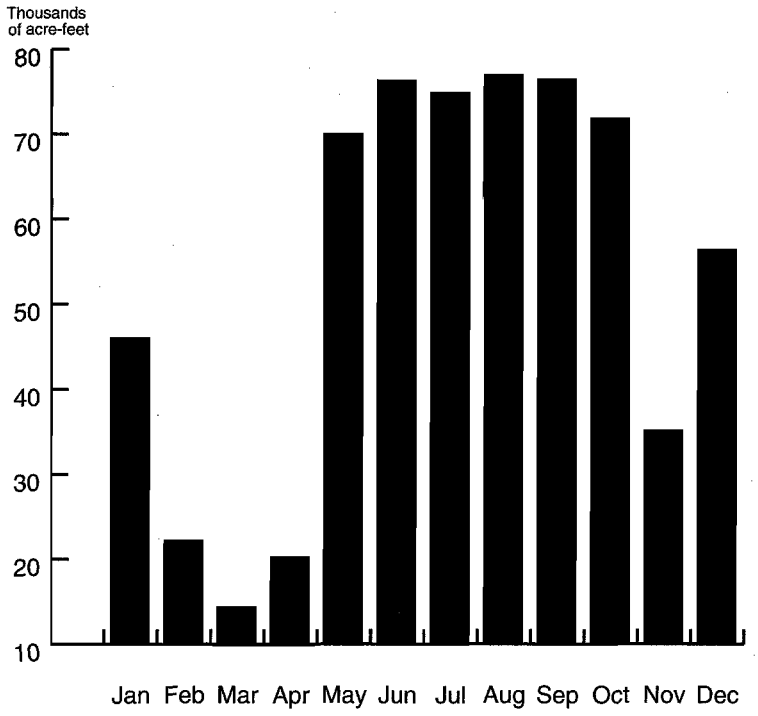
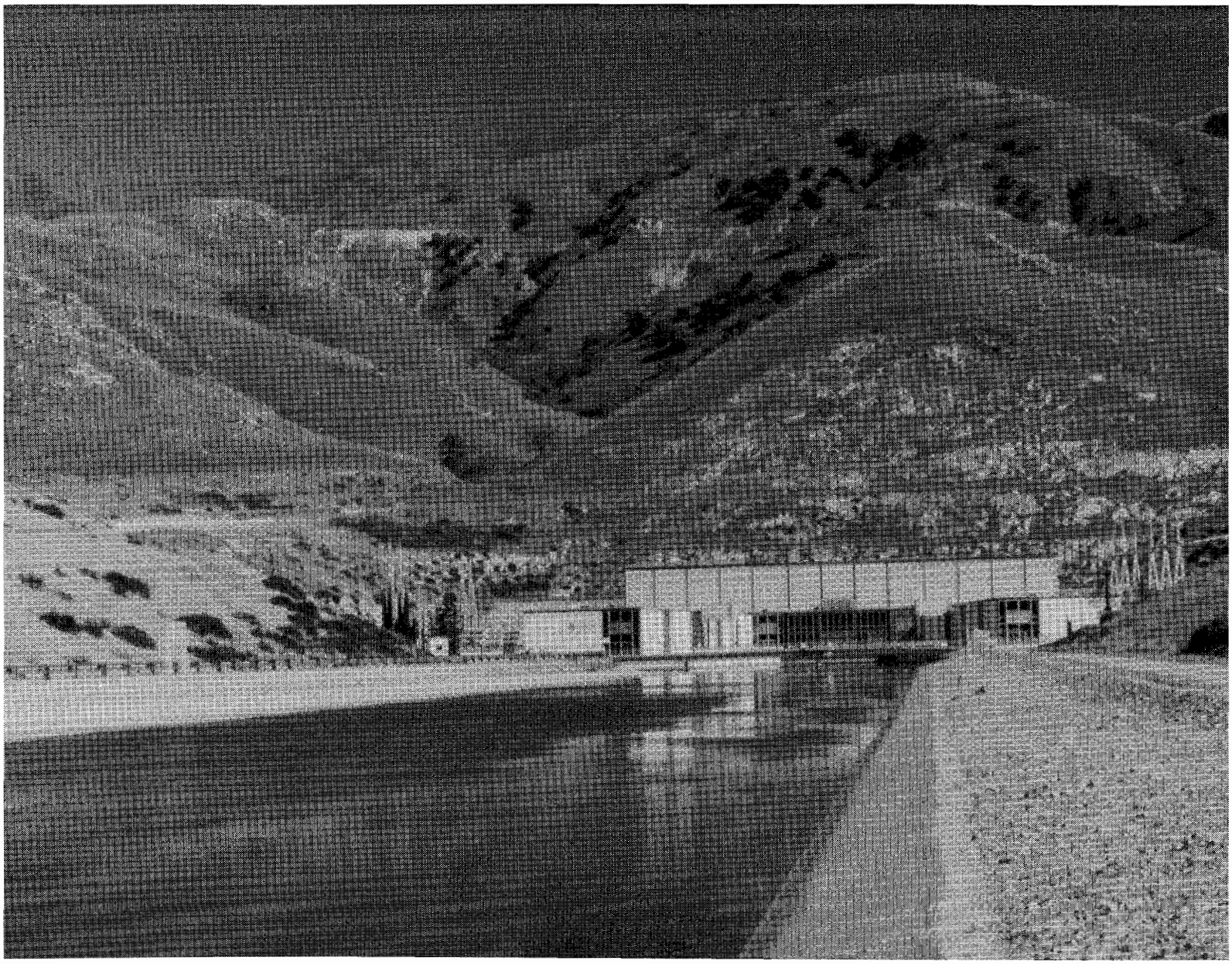


Fig 9-9. Water Pumped at A.D. Edmonston Pumping Plant, Each Month During 1993

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 forecasting water delivery capabilities was provided by the State Water Project Analysis Office.

Chapter 10

Water Deliveries



A.D. Edmonston Pumping Plant

Significant Events

- In 1993, SWP delivered 3,395,287 acre-feet of water to 25 long-term contractors and 25 other agencies.
- SWP delivered 2,315,098 acre-feet of entitlement water and 2,609 acre-feet of water for recreation and fish and wildlife and 1,347 acre-feet of water for operational release water to avoid spillage in 1993.
- To satisfy agreements with SWP contractors and other agencies, SWP delivered 1,076,233 acre-feet of non-entitlement water in 1993.

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.

In addition to delivering water according to the terms of the long-term water supply contracts, the Department also delivers or conveys water according to long-term and short-term agreements with SWP contractors and other agencies for specified arrangements.

Long-Term Contracts and Amendments

All the original contracts signed by the Department and local agencies have been amended to incorporate mutually desired changes.

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

No amendments to the long-term water supply contracts were executed between July 1, 1993, and June 30, 1994.

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 the amounts of entitlement water
2. Enlargement of East Branch and extension of Coastal Branch of California 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 carry over entitlement water [Article 12 (e)]	Amendments to allow contractors to carry over water from one year for delivery in the next year, providing certain 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 of 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 through 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.

Agreements with Long-Term Contractors

During 1993, the Department entered into several agreements with SWP contractors and amended two existing agreements.

Agreements

Agreements were executed with the following long-term contractors listed alphabetically.

Antelope Valley-East Kern Water Agency

An agreement for a temporary water diversion was signed between Antelope Valley-East Kern Water Agency and the Department on February 25, 1993. The agreement provides for a temporary water diversion facility at the Lower Quail Canal to hydrotest a 30-inch natural gas line of Southern California Gas Company.

Crestline-Lake Arrowhead Water Agency

An agreement between Crestline-Lake Arrowhead Water Agency and the Department provides for the Department to operate and maintain the agency's four gauging stations in the Houston Creek watershed. The agency will reimburse the Department for all costs. The agreement became effective July 21, 1993.

Kern County Water Agency

A recent agreement between Kern County Water Agency and the Department converted a temporary facility to a permanent facility. The temporary facility, located at Milepost 242.65 in Kern County, arose from an earlier agreement between the Department and KCWA that allowed 50,000 acre-feet of the agency's 1993 entitlement to be delivered at this location for irrigation.

Mojave Water Agency

An agreement signed April 19, 1993, between Mojave Water Agency and the Department provides for up to 50 cfs of the agency's 1993 entitlement water to be delivered from Silverwood Lake into the Mojave River until the East Branch Enlargement is completed.

San Bernardino Valley Municipal Water District

An agreement between the Department and San Bernardino Valley Municipal Water District provides for the district to deliver 10 cfs of local water to the Devil Canyon Afterbay via the Foothill Feeder Pipeline and simultaneously take 10 cfs from the afterbay via the San Gabriel Pipeline. The agreement, which modifies and extends an existing agreement between the Department and the district to convey and store local water from the Santa Ana River and Mill Creek, was signed June 17, 1993, and was in effect through December 31, 1993.

San Luis Obispo County Flood Control and Water Conservation District, Cuesta Tunnel

An agreement between the Department and San Luis Obispo County Flood Control and Water Conservation District

TABLE 10-2

Amendments to Water Supply Contracts through June 30, 1994, 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."

signed April 5, 1994, provides for the Department to construct the Coastal Branch, Phase II, Pipeline through the Cuesta Tunnel.

The Cuesta Tunnel is located in San Luis Obispo County near Highway 101 approximately 10 miles north of the city of San Luis Obispo. The tunnel was constructed to facilitate the Salinas River Project facilities constructed by the U.S. Army Corps of Engineers in 1941. The tunnel is owned by the city of San Luis Obispo and operated and maintained by San Luis Obispo County.

In addition to the Coastal Branch pipeline construction, the Department must remove and reconstruct a portion of the Salinas River Project facilities and will also construct an auxiliary pipeline for San Luis Obispo County through the Cuesta Tunnel to Highway 101 because any further construction in and around the Cuesta Tunnel will be physically infeasible.

Solano County Water Agency

On June 21, 1993, the Department signed an agreement with Solano County Water Agency to approve the conveyance of up to 600 acre-feet of non-Project water through North Bay Aqueduct facilities. The water was made available to Solano County Water Agency by Alhambra Pacific Joint Venture under a separate transfer agreement.

Amendments to Agreements

The Department amended agreements with the following alphabetically listed agencies.

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.

According to the original operating agreement, water can be extracted from the La Hacienda well field only during years when SWP cannot deliver the total entitlement requested by the long-term contractors and the Department projects storage levels in Lake Oroville to drop below the minimum power pool. This latter criterion, however, proved difficult to interpret to the satisfaction of KCWA and the Department. As a consequence, an interim letter agreement, which applied only to the 1992-93 water year, waived the minimum power pool requirement and allowed the Department to extract ground water under temporary criteria to alleviate water shortages caused by the continuing drought. Negotiations to modify extraction criteria resulted in an amendment to the operating agreement that became effective in December 1993. The amendment provides that up to 30,000 acre-feet of ground water may be extracted each year when entitlement deliveries to SWP agricultural contractors are less than 50 percent of their entitlement requests.

Santa Clara Valley Water District

The Department and the Santa Clara Valley Water District signed an agreement August 19,1989. The agreement provided for construction, operation, maintenance, and removal of a temporary potassium injection facility within the Department's South Bay Aqueduct's right-of-way was amended on

September 27, 1993. The amendment concerns ownership of the facility and insurance provisions.

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.

Central Valley Project Water

The Department regularly enters into agreements for conveying CVP water, such as agreements with contractors receiving water from the USBR 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, the 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

On May 28, 1993, eight CVC contractors requested that the Department change the point of delivery for their CVP water from the CVC turnout to Westlands Water District's turnouts in Reaches 4 through 7 of the California Aqueduct. As a result, the Department and these CVC contractors executed common agreements on August 18 and October 18, 1993. Under these agreements, the Department conveyed 25,421 acre-feet to WWD's turnouts during 1993. These agreements superseded earlier agreements between the Department and CVC contractors to convey CVP water during 1993. No water was conveyed by the Department under the earlier agreements.

U.S. Department of Veterans Affairs

A letter agreement signed August 12, 1993, between the Department and USBR permitted the conveyance of up to 450 acre-feet of CVP water to the U.S. Department of Veterans Affairs San Joaquin Valley National Cemetery during 1993. The Department conveyed 29 acre-feet of CVP water.

Musco Olive Products, Inc.

Two letter agreements between USBR and the Department signed November 9, 1992, and October 19, 1993, permitted the conveyance of CVP water to Musco Olive Products Inc., during 1993. The Department conveyed 179 acre-feet of CVP water.

Miscellaneous Water

A September 17, 1993, agreement between Byron-Bethany Irrigation District and the Department permitted an annual exchange of up to 4,000 acre-feet of water. Under the terms of the agreement, BBID will make the water available to the Department between April 1 and October 31 of each year. The Department will convey to BBID a like amount between November 1 and March 31 of the following year. This agreement is to make water available to BBID for municipal and industrial use between November 1 and March 31. The water will supply lands within portions of BBID whose uses are being changed from agricultural to urban. This agreement shall remain in effect until December 31, 2035.

Water Deliveries

SWP delivers water for a variety of beneficial uses. In addition to delivering entitlement water to long-term water supply contractors, 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 1993, a total of 3,395,287 acre-feet of water was conveyed to 25 long-term contractors and 25 other agencies. That amount includes 2,315,098 acre-feet of entitlement[1] and 3,956 of entitlement-related (recreation, loan, payback, and operational release water) water delivered to long-term SWP contractors as well as 1,076,233 acre-feet of nonentitlement water delivered to satisfy agreements made with SWP contractors and other agencies, including the USBR. Figure 10-1 shows amounts of water delivered to various locations during 1993.

Specific information about water deliveries made to long-term contractors and other agencies during 1993 and historical deliveries from 1962 through 1993 is presented in the following three sections, each with a corresponding table:

1. water delivered and future credits granted to long-term contractors in 1993 (Table 10-3);
2. water delivered in 1993, by month (Table 10-4); and
3. annual water entitlements and water conveyed from 1962 through 1993 (Table 10-5).

The following information about specific columns in Table 10-3 is arranged by column numbers.

1993 Entitlement Water Delivered

Column 1 shows amounts of current-year entitlement water delivered to long-term water supply contractors in 1993. A total of 2,093,317 acre-feet of entitlement water in all categories was delivered, excluding 1992 carryover entitlement and make-up water under Article 12(d) of the long-term water supply contracts.

Carryover Entitlement and Article 12(d) Water Delivered

In some instances, with the Department's approval, contractors may defer delivery of entitlement water to another year (carryover entitlement water) or request delivery of previously acquired entitlement water credits according to provisions of their water supply contracts (Article 12[d] water). Columns 2 and 3 show amounts of carryover and Article 12(d) water delivered, respectively.

In 1993, the SWP delivered 219,782 acre-feet of entitlement water carried over from 1992. The water was delivered to 13 contractors. In addition, the SWP delivered 1,999 acre-feet of Article 12(d) water to Solano County Water Agency (Column 3).

Entitlement Water Delivered

Column 4 shows all entitlement waster delivered in 1993, a total of 2,315,098 acre-feet.

Other Water Deliveries

Column 5 includes water deliveries other than entitlement water to long-term water contractors. Non-Project water is generally defined as water purchased from

[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.

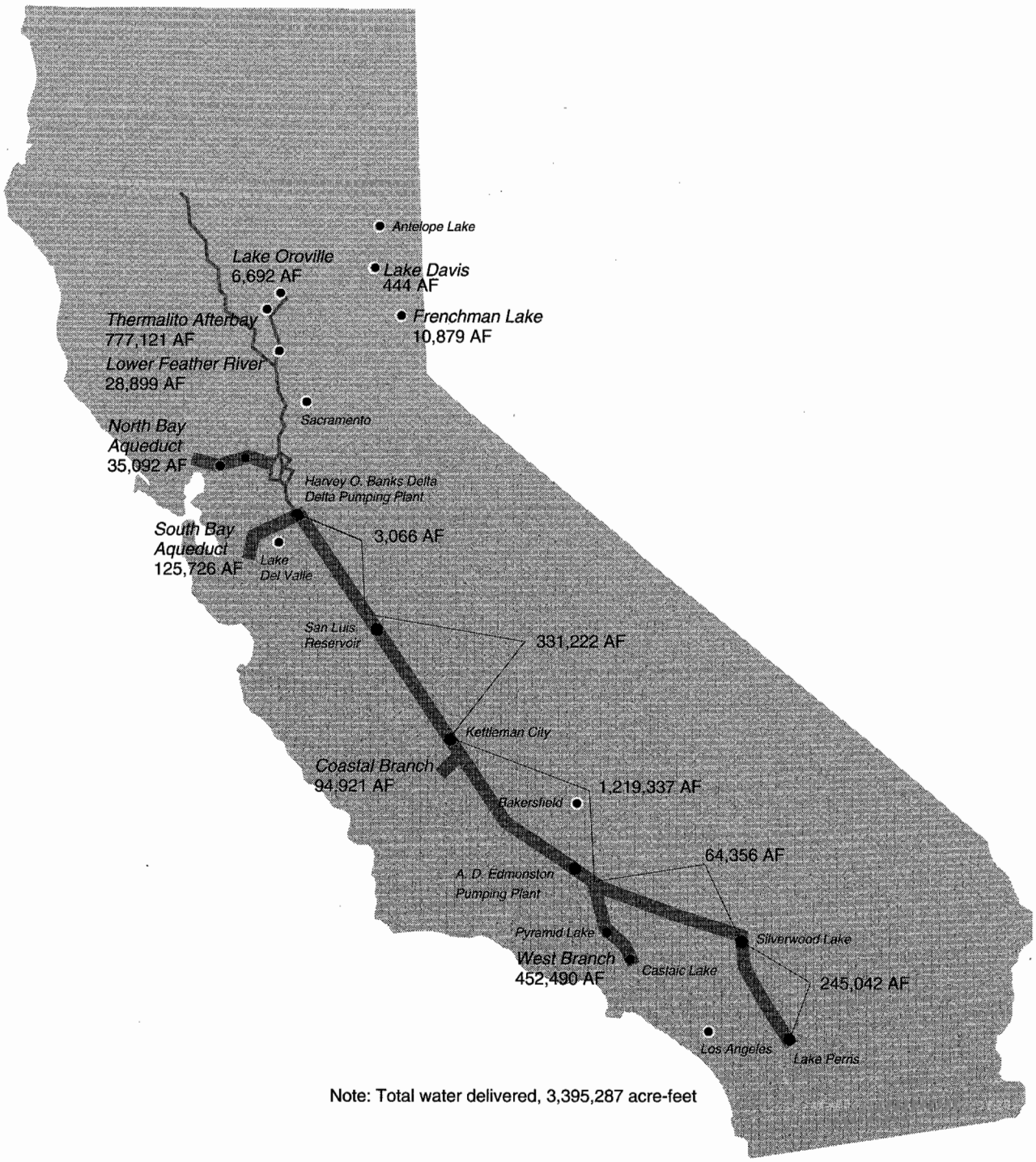


Fig 10-1. Water Delivered in Calendar Year 1993 and Delivery Locations

TABLE 10-3

Water Delivered in 1993 and Credits Granted to Long-Term Contractors through 1993, by Service Area

(Acre-feet)

Long-Term Water Supply Contractor	Water Deliveries in 1993						Future Entitlement Credits as of January 1, 1994				Future Entitlement Reduction Credit per Articles 7 or 45 (11)
	Entitlement Water Deliveries										
	1993 Entitlement (1)	1992 Entitlement Delivered During 1993 (2)	Make-up Water per Article 12(d) (3)	Total Entitlement (4)	Other Water Deliveries (a (5)	Total Deliveries (6)	Make-up Water per Articles 12(d) or 14(b) (7) (b	Wet-Weather Water per Articles 7 or 45 (8)	1993 Carryover Approved for Delivery in 1994 (9)	Total Delivery Credit (10)	
Upper Feather River Area											
City of Yuba City	746			746		746				0	
County of Butte	256			256		256				0	
Plumas County Flood Control and Water Conservation District	444			444		444				0	
North Bay Area											
Napa County Flood Control and Water Conservation District	5,246	40		5,286		5,286				0	
Solano County Water Agency	26,130 (d	1,051	1,999	29,180	626	29,806				0	
South Bay Area											
Alameda County Flood Control and Water Conservation District, Zone 7	32,921	714		33,635	9,755	43,390		111,580		111,580	
Alameda County Water District	10,271			10,271	4,638	14,909		172,088		172,088	
Santa Clara Valley Water District	61,572	493		62,065		62,065				0	
San Joaquin Valley Area											
County of Kings	4,000			4,000		4,000				0	
Dudley Ridge Water District	48,344	2,077		50,421		50,421				0	
Empire West Side Irrigation District	2,741			2,741		2,741			259 (e	259 (e	
Kern County Water Agency	1,127,774	40,353		1,168,127	901	1,169,028					
Oak Flat Water District	4,831	27		4,858		4,858				0	2,466
Tulare Lake Basin Water Storage District	117,708	6,760		124,468	446	124,914				0	
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	42,966(c	1,650		44,616		44,616				0	
Castaic Lake Water Agency	23,039			23,039		23,039				0	
Coachella Valley Water District	23,100			23,100		23,100				0	
Crestline-Lake Arrowhead Water Agency	302			302	644	946				0	
Desert Water Agency	38,100			38,100		38,100				0	
Littlerock Creek Irrigation District	734			734		734				0	
Metropolitan Water District of Southern California	487,381	164,809		652,190		652,190				0	
Mojave Water Agency	10,000			10,000	220	10,220				0	
Palmdale Water District	7,572	189		7,761		7,761				0	
San Bernardino Valley Municipal Water District	2,959	1,402		4,361		4,361				0	
San Gabriel Valley Municipal Water District	14,180	217		14,397		14,397				0	
San Gorgonio Pass Water Agency	0			0		0				0	
Ventura County Flood Control District	0			0		0				0	
Total	2,093,317	219,782	1,999	2,315,098	17,230	2,332,328		283,668	259	283,927	2,466

a) See Table 10-4 for other water deliveries specified by non-entitlement category for each agency.
b) State Water Project long-term contractors and the Department are negotiating amounts of make-up water; exact amounts are not available at this time.
c) This amount includes entitlement water transferred from another agency.
d) This amount includes entitlement water to City of Vallejo and Benicia.
e) This amount includes entitlement water previously classified as Wet Weather Carryover water according to the letter agreement of October 1, 1979.

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 1993, other water deliveries totaled 17,230 acre-feet.

Total Deliveries

Column 6 shows total amounts of water delivered to long-term contractors. In 1993, SWP delivered 2,332,328 acre-feet to 25 long-term contractors. This amount included 2,315,098 acre-feet of entitlement water and 17,230 acre-feet of other SWP and non-Project water.

Make-up Water

Column 7 includes amounts of make-up water credited to contractors according to Article 12(d) and Article 14(b) of the long-term water supply contracts. According to Article 12(d), if in any year as a result of causes beyond the Department's control, water is not available for delivery according to the established schedule for that year, the water may be delivered at a later date. This type of credit is referred to as 12(d) water. 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 1993, long-term contractors earned credits for make-up water according to Article 12(d) and Article 14(b). However, the exact amount of those credits is being negotiated with the Department.

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 also request increased deliveries by an equal amount in later years.

No additional credits for wet-weather water were acquired during 1993. Column 8 includes the total credits acquired in previous years, 283,668 acre-feet.

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 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 did not approve 1993 carryover water for delivery in 1994. However, Column 9 includes 259 acre-feet of 1993 entitlement water approved for delivery to Empire West Side Irrigation District in 1994. This amount of entitlement water 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 Articles 7, 12(d), and 45 of the long-term water supply contract for specific agencies. On January 1, 1994, the total amount of credits was

283,927 acre-feet, including 283,668 acre-feet of wet-weather water and 259 acre-feet of 1993 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 one 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 1993, by Month

During 1993, 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 1993. Information about those deliveries is categorized as "State Water Project Water" and "Non-Project Water."

State Water Project Water

State Water Project water is classified into the following categories:

- entitlement water
  - current year entitlement (1993)
  - carryover entitlement (1992)
  - transfer entitlement
  - Article 12(d) make-up water
  - Article 14(b) water
  - wet-weather water
- surplus water
  - scheduled surplus
  - unscheduled surplus
- recreation and fish and wildlife water
  - enhancement
  - mitigation

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

In 1993, SWP water was delivered in the following classifications and amounts:

Entitlement Water

A total of 2,093,317 acre-feet of 1993 entitlement water was delivered to 25 long-term contractors.

Carryover Entitlement Water

In 1993, SWP delivered 219,782 acre-feet of 1992 carryover entitlement water to the following agencies: Napa County Flood Control and Water Conservation District, Solano County Water Agency, Alameda County Flood Control and Water Conservation District Zone 7, Santa Clara Valley Water District, Dudley Ridge Water District, Kern County Water Agency, Oak Flat Water District, Tulare Lake Basin Water Storage District, Antelope Valley-East Kern Water Agency, Metropolitan Water District of Southern California, Palmdale Water District, San Bernardino Valley Municipal Water District, and San Gabriel Valley Municipal Water District.

TABLE 10-4
Water Delivered in 1993, by Month
(Acre-feet)

Contracting Agency and Type of Service	Month												1993 Total Deliveries	1993 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Feather River Area														
City of Yuba City														
Entitlement water	0	0	0	0	0	0	408	338	0	0	0	0	746	9,600
County of Butte														
Entitlement water	78	49	47	2	34	8	0	2	0	0	0	36	256	1,200
Plumas County Flood Control and Water Conservation District														
Entitlement water	29	17	27	26	30	56	90	75	59	16	7	12	444	1,160
Last Chance Creek Water District														
Regulated delivery of local supply	0	0	0	0	2,424	1,929	2,489	2,821	1,014	202	0	0	10,879	
Thermalito Irrigation District														
Regulated delivery of local supply	89	83	98	105	206	228	307	293	293	166	123	105	2,096	
Oroville-Wyandotte Irrigation District														
Regulated delivery of local supply	131	108	120	108	542	797	1,190	1,160	1,110	697	510	219	6,692	
Western Canal Water District														
Regulated delivery of local supply	36	0	0	416	33,618	29,162	54,843	47,977	15,433	15,490	16,534	9,271	222,780	
Joint Water Districts Board														
Regulated delivery of local supply	3,637	0	0	2,456	93,553	83,849	116,356	106,717	56,791	27,100	29,230	32,300	551,989	
Oswald Water District														
Regulated delivery of local supply	0	0	0	0	18	199	271	868	128	0	0	0	1,484	
Tudor Mutual Water Company														
Regulated delivery of local supply	0	0	0	0	340	1,244	1,393	457	733	17	15	0	4,199	
Garden Highway Water Company														
Regulated delivery of local supply	0	0	0	222	2,042	2,416	5,993	3,744	1,635	644	9	0	16,705	
Plumas Mutual Water Company														
Regulated delivery of local supply	0	0	0	0	580	1,217	1,565	894	1,343	166	0	0	5,765	
SWP	107	66	74	28	64	64	498	415	59	16	7	48	1,446	11,960
Non-SWP	3,893	191	218	3,307	133,323	121,041	184,407	164,931	78,480	44,482	46,421	41,895	822,589	
Area total	4,000	257	292	3,335	133,387	121,262	184,905	165,346	78,539	44,498	46,428	41,943	824,035	11,960
North Bay Area														
Napa County Flood Control and Water Conservation District (NCFCWCD)														
Entitlement water	316	209	78	100	156	647	884	714	159	452	849	722	5,286	8,490
Agency total	316	209	78	100	156	647	884	714	159	452	849	722	5,286	
Solano County Water Agency														
Entitlement water	588	364	0	546	1,592	1,316	973	1,712	2,077	1,448	986	624	12,246	26,130
Carryover entitlement water	0	0	976	75	0	0	0	0	0	0	0	0	1,051	
Vallejo permit water	0	0	0	0	5	0	21	0	0	0	0	0	26	
Article 12(d) M & I water	915	455	0	528	101	0	0	0	0	0	0	0	1,999	
General wheeling (a	0	0	0	0	0	0	27	573	0	0	0	0	600	
Entitlement water to city of Vallejo	0	83	0	417	946	556	668	648	666	212	383	39	4,618	
Entitlement water to city of Benicia	65	346	429	575	789	979	1,068	1,180	1,141	985	844	865	9,266	
Agency total	1,568	1,268	1,405	2,141	3,433	2,851	2,757	4,113	3,884	2,645	2,213	1,528	29,806	
SWP	1,884	1,477	1,483	2,241	3,584	3,498	3,593	4,254	4,043	3,097	3,062	2,250	34,466	34,620
Non-SWP	0	0	0	0	5	0	48	573	0	0	0	0	626	
Area total	1,884	1,477	1,483	2,241	3,589	3,498	3,641	4,827	4,043	3,097	3,062	2,250	35,092	34,620
South Bay Area														
Alameda County Flood Control and Water Conservation District, Zone 7														
Entitlement water	0	0	0	326	2,731	4,207	5,823	5,196	4,510	4,891	3,258	1,979	32,921	38,000
Local water*	1,415	2,514	2,246	1,837	646	283	6	54	183	310	113	148	9,755	
Carryover entitlement	3	364	154	193	0	0	0	0	0	0	0	0	714	
Agency total (*excluded water)	3	364	154	519	2,731	4,207	5,823	5,196	4,510	4,891	3,258	1,979	33,635	

a) General wheeling refers to non-SWP water conveyed by SWP under special agreements.

TABLE 10-4
Water Delivered in 1993, by Month (Continued)
(Acre-feet)

Contracting Agency and Type of Service	Month												1993 Total Deliveries	1993 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
South Bay Area (continued)														
Alameda County Water District														
Entitlement water	0	0	0	0	0	0	0	823	1,213	1,372	3,146	3,717	10,271	41,400
Local water*	635	659	729	730	656	644	585	0	0	0	0	0	4,638	
Agency total (excluded water*)	0	0	0	0	0	0	0	823	1,213	1,372	3,146	3,717	10,271	
Santa Clara Valley Water District														
Carryover entitlement water	493	0	0	0	0	0	0	0	0	0	0	0	493	
Entitlement water	899	2,674	3,181	4,060	7,497	7,755	8,350	7,450	6,849	4,435	4,014	4,408	61,572	98,000
Agency total	1,392	2,674	3,181	4,060	7,497	7,755	8,350	7,450	6,849	4,435	4,014	4,408	62,065	
City of San Francisco														
1992 Drought Water Bank water	4,550	669	0	0	0	0	0	0	0	0	0	0	5,219	
Agency total	4,550	669	0	0	0	0	0	0	0	0	0	0	5,219	
Recreation/fish and wildlife water														
Agency total	2	4	7	5	16	17	26	24	18	12	5	7	143	
SWP	1,395	3,038	3,335	4,579	10,228	11,962	14,173	13,469	12,572	10,698	10,418	10,104	105,478	177,400
Non-SWP	4,552	673	7	5	16	17	26	24	18	12	5	7	5,362	
Area total	5,947	3,711	3,342	4,584	10,244	11,979	14,199	13,493	12,590	10,710	10,423	10,111	111,333	177,400
San Joaquin Valley Area														
SWP water														
Castaic Lake Water Agency														
Entitlement water	0	0	0	0	20	801	1,341	1,114	101	32	0	748	4,157	
Transfer entitlement to Westlands WD	0	0	0	0	0	5,095	0	0	0	0	0	0	5,095	
Agency total (excludes transfer water)	0	0	0	0	20	801	1,341	1,114	101	32	0	748	4,157	
Metropolitan Water District of Southern California														
Carryover entitlement	0	7,458	29,039	13,503	0	0	0	0	0	0	0	0	50,000	
Agency total	0	7,458	29,039	13,503	0	0	0	0	0	0	0	0	50,000	
County of Kings														
Entitlement water	0	0	0	0	500	300	550	550	550	550	550	450	4,000	4,000
Agency total	0	0	0	0	500	300	550	550	550	550	550	450	4,000	
Dudley Ridge Water District														
Entitlement water	0	0	0	424	2,765	2,878	4,240	3,908	1,597	1,709	1,401	2,222	21,144	57,700
Transfer entitlement to Westlands WD	0	0	0	0	0	27,200	0	0	0	0	0	0	27,200	
Transfer carryover entitlement to Kern County WA	0	0	0	197	0	0	0	0	0	0	0	0	197	
Carryover entitlement water	0	385	887	805	0	0	0	0	0	0	0	0	2,077	
Agency total (excludes transferred water)	0	385	887	1,229	2,765	2,878	4,240	3,908	1,597	1,709	1,401	2,222	23,221	
Empire West Side Irrigation District														
Entitlement water	0	149	0	0	0	0	0	0	0	0	644	1,948	2,741	3,000
Agency total	0	149	0	0	0	0	0	0	0	0	644	1,948	2,741	
Kern County Water Agency														
Entitlement water	689	3,282	16,107	35,411	111,774	156,546	195,501	185,394	87,256	77,357	82,901	87,956	1,040,174	1,153,400
Carryover entitlement water	2,141	4,094	28,705	5,216	0	0	0	0	0	0	0	0	40,156	
Transferred entitlement from Dudley Ridge WD	0	0	0	197	0	0	0	0	0	0	0	0	197	
Transfered entitlement water to Westlands WD*	0	0	0	0	0	0	0	10,000	0	0	0	0	10,000	
Exchanged entitlement water to Westlands WD*	0	0	0	0	0	0	0	30,000	17,000	15,000	15,600	0	77,600	
Loan water from SWP*	284	341	0	0	0	0	0	0	0	0	0	0	625	
Payback for loan water*	(625)	0	0	0	0	0	0	0	0	0	0	0	(625)	
93 operational release water*	901	0	0	0	0	0	0	0	0	0	0	0	901	
Agency total (*excluded water)	2,830	7,376	44,812	40,627	111,774	156,546	195,501	185,394	87,256	77,357	82,901	87,956	1,080,527	
Oak Flat Water District														
Entitlement water	0	0	0	93	364	730	798	366	287	171	22	0	2,831	5,700
Carryover entitlement	2	0	7	18	0	0	0	0	0	0	0	0	27	
Transferred entitlement water to Westlands WD	0	0	0	0	0	2,000	0	0	0	0	0	0	2,000	
Agency total (excludes transferred water)	2	0	7	111	364	730	798	366	287	171	22	0	2,858	
Tulare Lake Basin Water Storage District														
Entitlement water	0	0	0	1,106	3,680	751	10,203	12,978	3,191	7,601	35,441	41,133	116,084	118,500
Carryover entitlement water	0	2,675	2,039	2,046	0	0	0	0	0	0	0	0	6,760	
Transferred entitlement water to Westlands WD*	0	0	0	0	0	1,624	0	0	0	0	0	0	1,624	
93 operational release water* (a	446	0	0	0	0	0	0	0	0	0	0	0	446	
Agency total (excludes transferred water)	0	2,675	2,039	3,152	3,680	751	10,203	12,978	3,191	7,601	35,441	41,133	122,844	

a) Operational release water delivered to avoid spillage.

TABLE 10-4
Water Delivered in 1993, by Month (Continued)
(Acre-feet)

Contracting Agency and Type of Service	Month												1993 Total Deliveries	1993 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
San Joaquin Valley Area (continued)														
Westlands Water District														
Transferred entitlement water														
(from Dudley Ridge WD)	0	0	0	0	0	27,200	0	0	0	0	0	0	27,200	
(from Castaic Water Agency)	0	0	0	0	0	5,095	0	0	0	0	0	0	5,095	
(from Tulare Lake Basin WSD)	0	0	0	0	0	1,624	0	0	0	0	0	0	1,624	
(from Oak Flat Water District)	0	0	0	0	0	2,000	0	0	0	0	0	0	2,000	
(from Kern County Water Agency)	0	0	0	0	0	0	0	10,000	0	0	0	0	10,000	
Cross Valley Canal water														
(from Fresno County)	0	0	0	0	0	0	0	562	0	0	0	0	562	
(from Hill Valley Irrigation District)	0	0	0	0	0	0	0	1,673	0	0	0	0	1,673	
(from Kern Tulare Water District)	0	0	0	0	0	0	0	7,487	0	0	0	0	7,487	
(from Rag Gulch Water District)	0	0	0	0	0	0	0	2,490	0	0	0	0	2,490	
(from Tri Valley Water District)	0	0	0	0	0	0	0	571	0	0	0	0	571	
(from Tulare County)	0	0	0	0	0	0	0	994	0	0	0	0	994	
(from Lower Tule River Irrigation District)	0	0	0	0	0	0	5,822	0	0	0	0	0	5,822	
(from Pixley Irrigation District)	0	0	0	0	0	0	5,822	0	0	0	0	0	5,822	
Exchanged Entitlement (from Kern County WA)	0	0	0	0	0	0	0	30,000	17,000	15,000	15,600	0	77,600	
Agency total (excludes transferred water)	0	0	0	0	0	35,919	11,644	53,777	17,000	15,000	15,600	0	148,940	
California Department of Fish & Game														
Recreation/fish and wildlife water	1	34	16	6	82	16	137	139	60	110	67	56	724	
General Wheeling	0	0	0	0	0	0	0	0	0	0	0	0	0	
Agency total	1	34	16	6	82	16	137	139	60	110	67	56	724	
California Department of Parks and Recreation														
Recreation/fish and wildlife water	1	0	1	3	8	1	21	11	12	5	2	1	66	
SWP	2,832	10,585	47,745	45,119	119,083	197,124	222,936	256,973	109,881	102,388	136,559	133,709	1,385,131	1,342,300
Non-SWP	(339)	375	17	9	90	17	158	150	72	115	69	57	790	
Area subtotal (SWP water)	2,493	10,960	47,762	45,128	119,173	197,141	223,094	257,123	109,953	102,503	136,628	133,766	1,385,921	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.	11	10	11	12	12	18	15	16	17	27	17	13	179	
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	0	1	1	1	2	4	4	7	5	1	2	1	29	
Subtotal	11	11	12	13	14	22	19	23	22	28	19	14	208	
Cross Valley Canal Contracts														
Fresno County														
(Transferred to Westlands Water District)	0	0	0	0	0	0	0	562	0	0	0	0	562	
Lower Tule River Irrigation District														
(Transferred to Westlands Water District)	0	0	0	0	0	0	5,822	0	0	0	0	0	5,822	
Pixley Irrigation District														
(Transferred to Westlands Water District)	0	0	0	0	0	0	5,822	0	0	0	0	0	5,822	
Rag Gulch Water District														
(Transferred to Westlands Water District)	0	0	0	0	0	0	0	2,490	0	0	0	0	2,490	
Tulare County														
(Transferred to Westlands Water District)	0	0	0	0	0	0	0	994	0	0	0	0	994	
Kern-Tulare Water District (K-TWD)														
(Transferred to Westlands Water District)	0	0	0	0	0	0	7,487	0	0	0	0	0	7,487	
Hills Valley Irrigation District														
(Transferred to Westlands Water District)	0	0	0	0	0	0	0	1,673	0	0	0	0	1,673	
Tri-Valley Water District														
(Transferred to Westlands Water District)	0	0	0	0	0	0	0	571	0	0	0	0	571	
Subtotal	0	0	0	0	0	0	19,131	6,290	0	0	0	0	25,421	

TABLE 10-4
Water Delivered in 1993, by Month (Continued)
(Acre-feet)

Contracting Agency and Type of Service	Month												1993 Total Deliveries	1993 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 (a	0	120	0	0	0	0	0	0	0	3,888	4,143	4,401	12,552	
Decision 1485 water	0	0	0	0	0	0	0	0	0	69,695	124,021	0	193,716	
Recreation/fish and wildlife water (San Luis)	0	30	13	8	72	15	129	122	59	93	56	48	645	
Subtotal	0	120	0	0	0	0	0	0	0	73,583	128,164	4,401	206,268	
Non-SWP	11	131	12	13	14	22	19,150	6,313	22	73,611	128,183	4,415	231,897	
Area subtotal (CVP water)	11	131	12	13	14	22	19,150	6,313	22	73,611	128,183	4,415	231,897	
SWP	2,832	10,585	47,745	45,119	119,083	197,124	222,936	256,973	109,881	102,388	136,559	133,709	1,385,131	1,342,300
Non-SWP	(328)	506	29	22	104	39	19,308	6,463	94	73,726	128,252	4,472	232,687	
Area Total	2,504	11,091	47,774	45,141	119,187	197,163	242,244	263,436	109,975	176,114	264,811	138,181	1,617,621	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	6	170	1,984	3,373	5,769	5,318	5,734	6,235	5,294	3,676	2,795	1,098	41,452	138,400
Carryover entitlement water	853	797	0	0	0	0	0	0	0	0	0	0	1,650	
Entitlement transferred from Mojave Water Agency	98	82	84	112	117	172	235	177	161	133	54	89	1,514	
Agency total	957	1,049	2,068	3,485	5,886	5,490	5,969	6,412	5,455	3,809	2,849	1,187	44,616	
Castaic Lake Water Agency														
Entitlement water	85	506	659	1,138	1,460	1,393	1,511	1,809	1,625	1,393	1,228	980	13,787	54,200
Transferred entitlement water to Westlands WD*	0	0	0	0	0	5,095	0	0	0	0	0	0	5,095	
Agency total (*excluded water)	85	506	659	1,138	1,460	1,393	1,511	1,809	1,625	1,393	1,228	980	13,787	
Coachella Valley Water District														
Entitlement water	0	0	0	0	2,887	2,887	2,887	2,887	2,887	2,887	2,887	2,891	23,100	23,100
Agency total	0	0	0	0	2,887	2,887	2,887	2,887	2,887	2,887	2,887	2,891	23,100	
Crestline-Lake Arrowhead Water Agency														
Entitlement water	30	19	16	17	22	28	30	38	32	28	20	22	302	5,800
Local water*	64	41	34	37	46	59	64	81	68	59	43	48	644	
Agency total (*excluded water)	30	19	16	17	22	28	30	38	32	28	20	22	302	
Desert Water Agency														
Entitlement water	0	0	0	0	4,762	4,762	4,762	4,762	4,762	4,762	4,762	4,766	38,100	38,100
Agency total	0	0	0	0	4,762	4,762	4,762	4,762	4,762	4,762	4,762	4,766	38,100	
Littlerock Creek Irrigation District														
Entitlement water	0	0	0	0	0	1	161	152	156	125	73	66	734	2,300
Agency total	0	0	0	0	0	1	161	152	156	125	73	66	734	
Metropolitan Water District of Southern California														
Entitlement water	0	0	0	21,108	69,797	51,751	52,499	67,930	73,747	56,267	59,448	34,770	487,317	2,011,500
Carryover entitlement water	35,630	33,838	19,130	26,211	0	0	0	0	0	0	0	0	114,809	
Bypass entitlement water	0	0	0	56	0	0	0	0	8	0	0	0	64	
Agency total	35,630	33,838	19,130	47,375	69,797	51,751	52,499	67,930	73,755	56,267	59,448	34,770	602,190	
Mojave Water Agency														
Entitlement water	0	0	0	0	0	1,966	0	0	656	3,158	2,306	1,914	10,000	50,800
Entitlement water transferred to AVEKWA*	98	82	84	112	117	172	235	177	161	133	54	89	1,514	
Local water*	0	0	0	0	0	220	0	0	0	0	0	0	220	
Agency total (excluded water*)	0	0	0	0	0	1,966	0	0	656	3,158	2,306	1,914	10,000	
Palmdale Water District														
Entitlement water	0	0	0	0	155	632	1,590	1,778	1,380	1,178	675	184	7,572	17,300
Carryover entitlement water	0	0	64	125	0	0	0	0	0	0	0	0	189	
Agency total	0	0	64	125	155	632	1,590	1,778	1,380	1,178	675	184	7,761	

a) Kern National Wildlife Refuge USBR.

TABLE 10-4
Water Delivered in 1993, by Month (Continued)
(Acre-feet)

Contracting Agency and Type of Service	Month												1993 Total Deliveries	1993 Contract Entitlement
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Southern California Area (continued)														
San Bernardino Valley Municipal Water District														
Entitlement water	0	0	0	0	0	0	0	13	127	863	1,061	895	2,959	102,600
Carryover entitlement water	632	552	218	0	0	0	0	0	0	0	0	0	1,402	
Local water in	0	0	0	0	(567)	(575)	(601)	(448)	0	0	0	0	(2,191)	
Local water out	0	0	0	0	565	537	621	468	0	0	0	0	2,191	
Agency total	632	552	218	0	(2)	(38)	20	33	127	863	1,061	895	4,361	
San Gabriel Valley Municipal Water District														
Entitlement water	0	0	0	1,795	2,337	1,657	1,715	1,628	1,755	59	1,992	1,242	14,180	28,800
Carryover entitlement water	0	0	0	217	0	0	0	0	0	0	0	0	217	
Agency total	0	0	0	2,012	2,337	1,657	1,715	1,628	1,755	59	1,992	1,242	14,397	
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
Los Angeles Department of Water and Power														
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	41	60	82	137	170	165	183	229	222	167	130	90	1,676	
SWP	37,152	35,436	21,813	74,684	153,318	118,649	119,897	151,249	162,421	127,088	133,135	80,350	1,210,055	2,510,200
Non-SWP	41	60	82	137	168	127	203	249	222	167	130	90	1,676	
Area total	37,193	35,496	21,895	74,821	153,486	118,776	120,100	151,498	162,643	127,255	133,265	80,440	1,216,868	2,510,200
All Agencies														
Total 1993 entitlement water	2,883	7,970	22,612	70,645	220,184	284,016	302,021	349,857	219,246	190,760	227,347	195,776	2,093,317	
Total 1992 carryover entitlement water	39,754	50,163	81,219	48,646	0	0	0	0	0	0	0	0	219,782	
Total 1993 Article 12(d) M & I water	915	455	0	528	101	0	0	0	0	0	0	0	1,999	
Subtotal (entitlement water delivered)	43,552	58,588	103,831	119,819	220,285	284,016	302,021	349,857	219,246	190,760	227,347	195,776	2,315,098	
Total loan water from SWP	284	341	0	0	0	0	0	0	0	0	0	0	625	
Total payback for loan water	(625)	0	0	0	0	0	0	0	0	0	0	0	(625)	
Recreation/fish and wildlife water	45	98	106	151	276	199	367	403	312	294	204	154	2,609	
93 Operational release water (a	1,347	0	0	0	0	0	0	0	0	0	0	0	1,347	
Subtotal (SWP water)	44,603	59,027	103,937	119,970	220,561	284,215	302,388	350,260	219,558	191,054	227,551	195,930	2,319,054	
Vallejo permit water	0	0	0	0	5	0	21	0	0	0	0	0	26	
Regulated delivery of local supply	6,007	3,405	3,227	5,911	134,671	122,247	185,062	165,066	78,731	44,851	46,577	42,091	837,846	
Total local water in	0	0	0	0	(567)	(575)	(601)	(448)	0	0	0	0	(2,191)	
Total local water out	0	0	0	0	565	537	621	468	0	0	0	0	2,191	
1992 Drought Water Bank water	4,550	669	0	0	0	0	0	0	0	0	0	0	5,219	
General wheeling	0	0	0	0	0	0	27	573	0	0	0	0	600	
Conveying CVP water, annual contract	11	11	12	13	14	22	19	23	22	28	19	14	208	
Conveying CVP water, Cross Valley Canal	0	0	0	0	0	0	11,644	13,777	0	0	0	0	25,421	
Conveying CVP water, Decision 1485	0	0	0	0	0	0	0	0	0	69,695	124,021	0	193,716	
Conveying CVP water, Kern National Wildlife Refuge USBR	0	120	0	0	0	0	0	0	0	3,888	4,143	4,401	12,552	
Conveying CVP water, recreation/fish and wildlife water (San Luis)	0	30	13	8	72	15	129	122	59	93	56	48	645	
Subtotal (other water)	10,568	4,235	3,252	5,932	134,760	122,246	196,922	179,581	78,812	118,555	174,816	46,554	1,076,233	
Grand Total	55,171	63,262	107,189	125,902	355,321	406,461	499,310	529,841	298,370	309,609	402,367	242,484	3,395,287	4,146,966

a) Operational release water delivered to avoid spillage.

Transfers of Entitlement Water and Carryover Entitlement Water

During 1993, a total of 125,033 acre-feet of entitlement water and 197 acre-feet of carryover entitlement water was transferred between six SWP long-term contractors and one non-SWP water agency as follows:

- Dudley Ridge Water District to Westlands Water District, 27,200 acre-feet
- Dudley Ridge Water District to Kern County Water Agency, 197 acre-feet (carryover water)
- Kern County Water Agency to Westlands Water District, 10,000 acre-feet
- Kern County Water Agency to Westlands Water District, 77,600 acre-feet (exchanged water)
- Oak Flat Water District to Westlands Water District, 2,000 acre-feet
- Tulare Lake Basin Water Storage District to Westlands Water District, 1,624 acre-feet
- Castaic Lake Water Agency to Westlands Water District, 5,095 acre-feet
- Mojave Water Agency to Antelope Valley-East Kern Water Agency, 1,514 acre-feet

Make-up Water

A total of 1,999 acre-feet of make-up water was delivered in 1993 to Solano County Water Agency.

Surplus Water — Unscheduled

Unscheduled water is surplus water that is available for only a short period of time when excess water and SWP pumping capabilities are available in the Delta. In 1993, unscheduled water was not delivered to water contractors.

Water for Recreation and Fish and Wildlife

A total of 2,609 acre-feet of SWP water was conveyed for recreational use and enhancement of fish and wildlife:

- *Recreational Use:* SWP delivered 860 acre-feet of water for facilities at Lake Del Valle, O'Neill Forebay, Silverwood Lake, Lake Perris, and Castaic Lake. In addition, 1,025 acre-feet was delivered to Castaic Lagoon, an impoundment downstream from Castaic Lake devoted entirely to recreation.
- *Wildlife Management:* SWP delivered 188 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.

Loans of SWP Water

The SWP loan program provided surface water to agricultural contractors during peak irrigation periods when ground water, pumped at a constant rate from agricultural contractors' wells, could not meet contractors' short-term water supply needs.

In January and February 1993, the SWP loaned 625 acre-feet of water to Kern County Water Agency as an extension of the loan program initiated in 1991. Kern County paid back the 625 acre-feet in early 1993.

Non-Project Water

In 1993, SWP facilities were used to deliver non-Project water for other agencies, including the Central Valley Project. In addition, SWP facilities were used to

deliver water purchased from the 1992 Drought Water Bank. Also included in this category is non-Project water conveyed from one agency to another.

Central Valley Project Water

In 1993, the Department conveyed 233,142 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, 1993, the Department delivered 179 acre-feet of water to Musco Olive Products, Inc.
- *U.S. Fish and Wildlife Service:* The Department conveyed 12,552 acre-feet of CVP water for the USFWS according to provisions of two agreements with USBR. That water was conveyed in February and from October through December 1993 to the Kern National Wildlife Refuge.
- *U.S. Department of Veterans Affairs*: An annual agreement was signed with the USBR to convey CVP water for the USDVA. A long-term agreement is being negotiated. In 1993, 29 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 Tule River, and Pixley Irrigation Districts; Kern-Tulare, Rag Gulch, and Tri-Valley Water Districts; and Fresno and Tulare counties. In 1993, all eight CVC contractors transferred a total of 25,421 acre-feet to Westlands Water District. Of that amount, 23,177 acre-feet was stored in the Department's share of San Luis Reservoir, and 2,244 acre-feet in the USBR share of storage. The water was later released for delivery.

Electrical energy required to convey CVP water through Harvey O. Banks Delta Pumping Plant and Dos Amigos Pumping Plant was supplied as needed by the USBR.

Water Transfers

During 1993, the Department conveyed non-Project water according to terms of several water transfer agreements. Non-Project water includes water purchased through the 1992 Drought Water Bank as well as water purchased by other agencies from non-SWP sources.

- *1992 Drought Water Bank*: In 1993, the Department conveyed 5,219 acre-feet of 1992 Drought Water Bank water to the city of San Francisco.
- *Feather River Area:* Nine non-Project agencies in the Feather River area received 822,589 acre-feet. Those agencies are Last Chance Creek Water District, Thermalito Irrigation District, Oroville-Wyandotte Irrigation District, Western Canal

Water District, Joint Water Districts Board, Tudor Mutual Water Company, Oswald Water District, Garden Highway Water Company, and Plumas Mutual Water Company.

- *North Bay Area*: In the North Bay area, 26 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 for which the city has a recognized water right.

Annual Water Entitlements and Water Delivered Since 1962

Information about annual water entitlements and water conveyed for the past 30 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 each long-term contractor's entitlement water for years 1962 through 1993 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 1993. In 1993, entitlement water delivered to 25 contractors totaled 2,319,054 acre-feet. That amount includes:

- 1992 carryover entitlement water (entitlement water carried over from 1992 and delivered in 1993), 219,782 acre-feet; and
- make-up water under Article 12(d) of the long-term water supply contracts, 1,999 acre-feet.

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 during the year. During 1993, surplus and unscheduled water was not available.

Other Water

Column 10 includes amounts of water classified as other water delivered in 1993, 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; 1992 Drought Water Bank water; and local water released and taken out of the SWP system.

TABLE 10-5

Total Amounts of Annual Water Entitlements and Water Conveyed, by Type, 1962 through 1993

(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	516,481	794,834	4,889	3,701,326	0	(92,850)	3,608,476
1989	5,500	24,615	156,700	1,303,100	56,342	2,411,933	3,958,190	2,853,747	(i 0	487,567	809,250	8,135	4,158,699	0	447,917	4,606,616
1990	6,040	28,190	160,900	1,355,000	70,486	2,487,900	4,108,516	2,582,151	(j 90	457,316	851,247	9,262	3,900,066	0	(528,869)	3,371,197
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	4,912	1,673,992	0	167,435	1,841,427
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	253,644	822,589	2,609	3,395,287	0	726,123	4,121,410
Total	**92,340**	**172,696**	**3,580,638**	**20,759,074**	**498,082**	**34,156,747**	**59,259,577**	**35,672,039**	**5,898,105**	**5,817,117**	**20,665,047**	**93,796**	**68,147,451**	**1,833,697**	**114,091**	**70,095,239**

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).

In 1993, a total of 253,644 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 1993, a total of 822,589 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 1993, a total of 2,609 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

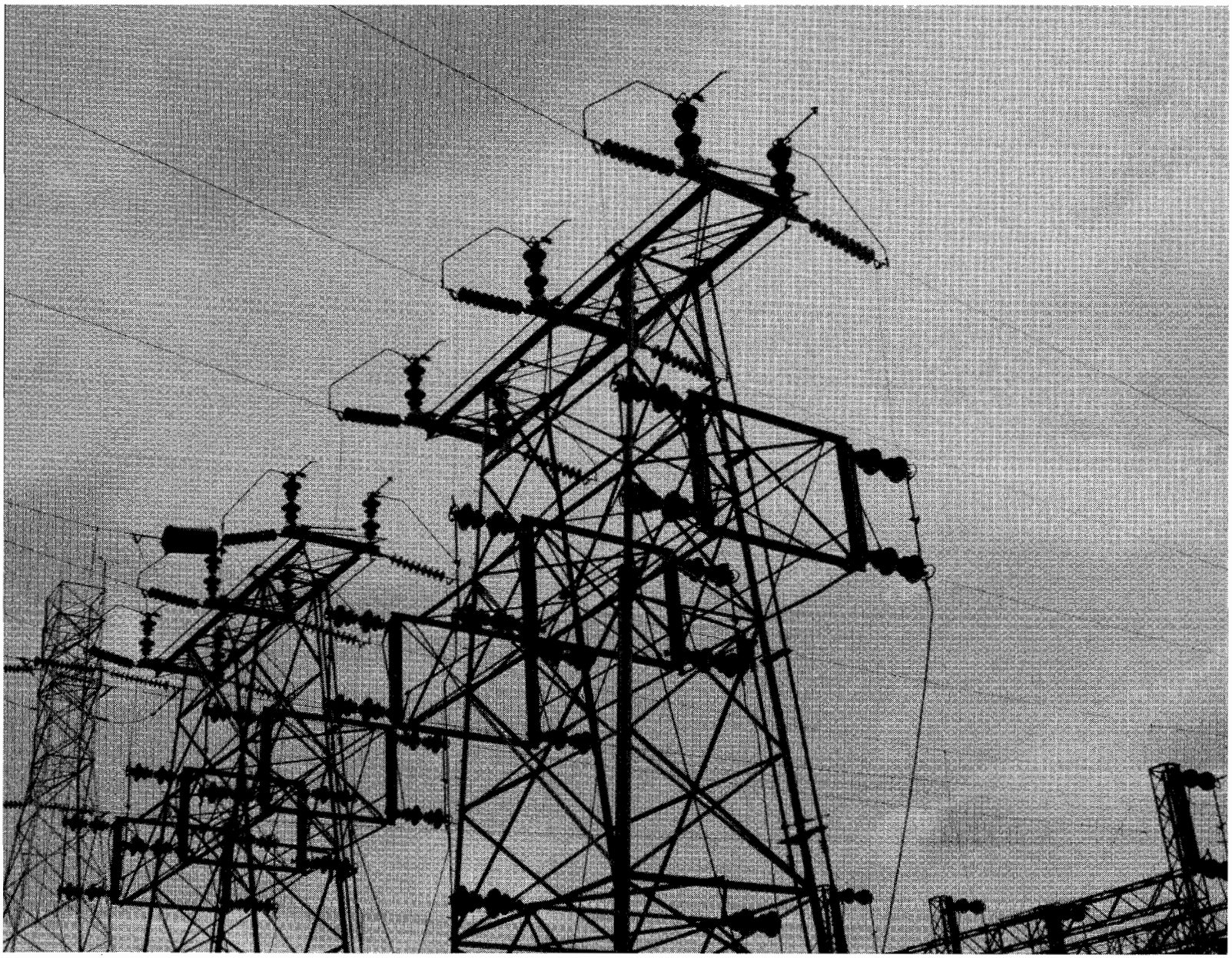
Column 15 includes the total amounts of water lost through evaporation and seepage, net storage changes in reservoirs south of the Delta, and amounts of inflow from local drainage areas, including inflows into San Luis Canal and from the Kern River Intertie. In 1993, that amount totaled 726,123 acre-feet.

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.

Information for this chapter was provided by the State Water Project Analysis Office.

Chapter 11

Power Resources



State Water Project facility power lines

Significant Events

- SWP facilities consumed 4.51 billion kilowatt-hours; this increase of 5.6 percent over 1992 represents the first increase in energy requirement since 1990.
- SWP hydroelectric powerplants generated 3.25 billion kilowatt-hours, while its coal-fired resource generated 1.20 billion kilowatt-hours.
- The Department purchased 1.44 billion kilowatt-hours of energy at a cost of $23.38 million, while additional costs for associated capacity, transmission and dispatching services totaled $22.24 million.
- The Department sold 4.17 billion kilowatt-hours of energy with revenues of $93.47 million and also received $17.59 million in revenue from capacity sales and transmission service arrangements.
- The Department's two major exchange agreements produced about 2.33 billion kilowatt-hours in net energy for the SWP.
- The Department formed a task force to make recommendations for the power resources program when major SWP power contracts begin to expire in 2004.

The State Water Project requires dependable, economical sources of power to deliver affordable water to long-term contractors. Responding to that need, the Department of Water Resources has developed and administers a comprehensive power resources program. Key elements of the program include strategic timing of generation and pumping schedules, purchases of power resources and transmission services, short-term sales of occasional power surpluses, and 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 System 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 the SWP power resources and pumping loads and interconnected utilities. The power resources program also takes advantage of the SWP water storage and conveyance capacities that can allow the Department to operate SWP pumps somewhat independently of water delivery needs. This pumping load and generation control 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–jointly or solely–hydroelectric, coal, and geothermal powerplants. Figure 11-1 shows the names and locations of those facilities.

Hydroelectric

Economical hydroelectric generation provides the largest share of the SWP power resources. The combined 900-megawatt (MW) Edward Hyatt Pumping-Generating Plant and Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt-hours (kWh) 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

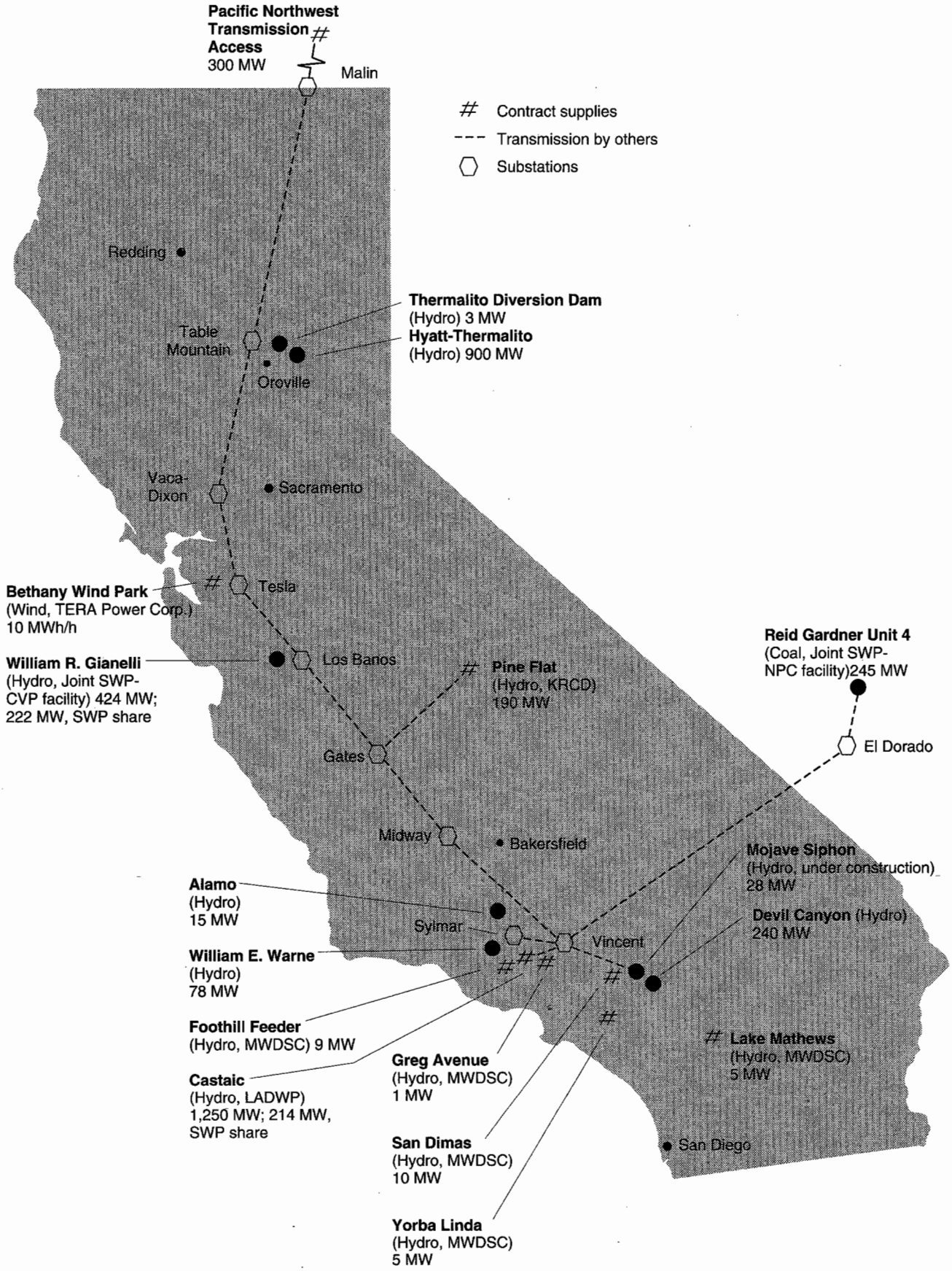


Fig 11-1. Names, Locations, and Generating Capacity of Primary Power Facilities

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 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's 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 the plant's 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 the Department's ownership. The utility is required to give the Department a five-year notice to exercise each year's option (1993 notice for 1998 option).

Nevada Power Company did not give a notice in 1993 to exercise its 1998 option. Therefore, the Department will retain its full output for 1998.

Geothermal

The Department had planned to develop and operate two geothermal power plants, Bottle Rock and South Geysers. The Department constructed Bottle Rock Powerplant in 1985 (and operated it until 1990) and began construction of South Geysers Powerplant 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.

Bottle Rock Powerplant, in the Geysers area of Lake County, is owned and was operated and maintained by the Department from February 1985 until December 1990, when the facility was taken out of service. Because lower-cost energy was available, the Department determined that drilling for additional steam needed to keep the plant operating was uneconomical. The Department is exploring the possibility of leasing or selling this plant.

The Department had 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 resulted in an insufficient supply of steam to support a 55 MW power plant.

In 1985, the Department delayed completion of South Geysers due to the questionable 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.

The Department leases the mineral rights to the Binkley Ranch Club (located north of the Francisco leasehold and Bottle Rock Powerplant) from the federal government. The Department obtained the necessary permits to construct a well pad on the leasehold, which provides a supplemental source of steam for Bottle Rock if the economics of operating geothermal facilities improve.

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 the SWP power requirements and analyzes the type of resource and its cost. A potential power resource may be considered based on the following factors:

- capability for meeting anticipated power requirements for pumping;
- availability of transmission access;
- anticipated water deliveries to contractors;
- cost of the resource;
- availability and cost of financing;
- environmental impacts and costs of mitigation; and
- operating characteristics.

Potential power resources being considered by the Department 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 associated with the proposed Los Banos Grandes Reservoir.

To provide for future increases in water deliveries, other facilities are under development. Devil Canyon Powerplant has been enlarged and will soon be operational; Mojave Siphon Powerplant is being constructed; and San Luis Obispo Powerplant is in the design stage.

Devil Canyon Powerplant Enlargement

Devil Canyon Powerplant was enlarged to accommodate units 3 and 4, which increased the plant's nameplate rating by 160 MW. Commercial operation is scheduled to begin in late 1994 when construction of a second afterbay is completed. Construction of the second afterbay began in 1992.

Mojave Siphon Powerplant

Mojave Siphon Powerplant is under construction on the East Branch of the California Aqueduct. This power plant, with a nameplate rating of 32.4 MW, will be located upstream of Silverwood Lake. The power plant is scheduled to begin commercial operation in 1995.

San Luis Obispo Powerplant

San Luis Obispo Powerplant, a proposed 3.7 MW power recovery facility, is envisioned as part of the Coastal Branch, Phase II. The power plant, upon construction, would be operational 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 provide for 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 the SWP power costs, the Department will continue to use the EHV Intertie and 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 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. Services 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;
- 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, the Department each year 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 provided by the Department.

In addition, SCE waives 75 percent of its charges to the Department for specified firm transmission service provided to the SWP pumping and generating facilities. SCE also makes an annual payment of $900,000 to the Department.

The Department also contracts for the energy output of five hydroelectric plants owned and operated by the Metropolitan

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

Water District of Southern California. The total capacity of those plants is 30 MW. To utilize this resource efficiently, the Department has included it in the exchange arrangements with SCE.

According to terms of the 1979 Power Contract, SCE receives energy from four of these 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 energy from hydroelectric generation developed by others. The output of the 165 MW Pine Flat Powerplant, owned and operated by the Kings River Conservation District, provides the SWP about 400 million kWh of energy in median water years.

The Department also 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 1993, approximately 50 units generate about 4.5 million kWh.

The Department also signed an agreement with PacifiCorp of Portland, Oregon, for the purchase of 100 MW of firm capacity and associated energy. That agreement, effective June 1, 1991, 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 the 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 MWD;
- surplus energy purchases from the Colorado River Aqueduct system; and
- energy exchanges between the Department and MWD.

As of December 1993, the Department also had 26 other agreements for purchasing 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 it is able to acquire generation independently, the Department depends on other sources for transmission services. The PG&E and SCE transmission systems 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 also allows the Department to request and receive additional firm and interruptible transmission service 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 has also arranged for 300 MW of long-term transmission entitlement by 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 (see Table 11-1).

The Department's long-term objectives include acquiring its own transmission facilities between resources and loads where feasible and providing additional interconnections to other potential power sources. To improve and expand its transmission services, the Department continually investigates various alternatives:

- additional transmission capability from the California-Oregon border to the Tracy Substation;
- alternate transmission paths between Department resources and loads to achieve a greater degree of operating flexibility; and
- additional transmission capability to the Southwest.

The Department continues to work with various public and private utilities in California to study the need for transmission reinforcements and additional transmission capacity.

Midway-Wheeler Ridge

The 1982 Extra High Voltage Settlement Agreement with PG&E provided 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 three 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 its Lakeville Substation. In 1984, the Department exercised that option and purchased 165 MW of that 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 transmission needs 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 Northern California Power Agency and the city of Santa Clara in April 1989. Under this agreement, the Department sold to NCPA and Santa Clara a total of 55 MW of transmission service for the life of the facility and another 55 MW through December 31, 1995, and up to 18 MW for an undetermined period.

Reinforcements

As provided in the Comprehensive Agreement with PG&E, the Department requested that the utility add hardware reinforcements to its 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 to cost over $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 on 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.

Capacity

The Department signed two agreements designed to provide transmission capacity. One agreement involves the two original 500-kilovolt transmission lines of the Pacific Northwest Intertie; the other involves a new 500 kV transmission line, known as the California Oregon Transmission Project, which was added to the Pacific Northwest Intertie.

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; 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 to purchase 97 MW of transmission capacity on the third 500 kV transmission line that connects California

with the Pacific Northwest. That option can be exercised during a five-year period beginning in January 2005. The transmission line 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.

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 costs are high—usually during the day. By taking advantage of this flexibility in scheduling the 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 contracts with approximately 30 utilities for the 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 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 1993

Tables 11-2 through 11-5 present statistical information about the SWP power operation for calendar year 1993, including energy consumed and generated, energy exchanged and purchased, and power sold.

Energy Consumed

In 1993, energy used at the 19 SWP pumping and power plants totaled 4.51 billion kilowatt-hours. Table 11-2 shows the amount of energy used each month at the 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 1993, as well as energy purchased for the SWP operations.

Hydroelectric and Coal

The Hyatt-Thermalito power complex, located in Oroville, produces a large amount of SWP energy. In 1993, 2.62 billion kWh of energy was generated at Hyatt-Thermalito. That amount was over three times more than the amount generated in 1992. The increase in generation was due to above-average rainfall in the Feather

TABLE 11-2

Energy Used at Pumping Plants and Power Plants in 1993, 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)	23.40	39.72	32.38	0.09	0.12	0.10	0.04	0.60	0.09	0.15	23.24	0.01	119.94
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	0.34	0.27	0.28	0.41	0.65	0.65	0.67	0.94	0.77	0.58	0.57	0.40	6.53
Cordelia Pumping Plant	0.37	0.29	0.22	0.34	0.51	0.81	0.99	0.95	0.65	0.65	0.81	0.69	7.28
South Bay Pumping Plant	3.11	1.26	1.63	4.33	8.96	10.91	13.14	12.01	6.00	3.97	7.70	8.53	81.55
Bottle Rock Powerplant (required for station service)	0.12	0.09	0.10	0.09	0.08	0.06	0.06	0.05	0.05	0.07	0.10	0.11	0.98
Del Valle Pumping Plant	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.15
Harvey O. Banks Delta Pumping Plant	134.98	82.49	33.94	45.54	29.94	35.08	73.66	109.46	109.12	92.62	7.77	111.92	866.52
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)	5.21	5.92	13.58	12.22	25.61	35.03	40.64	37.74	26.47	23.87	22.96	27.22	276.47
Buena Vista Pumping Plant	11.65	6.14	6.27	7.51	22.07	25.07	26.89	26.12	21.29	19.67	9.73	15.71	198.12
John R. Teerink Wheeler Ridge Pumping Plant	13.39	6.65	4.69	6.90	21.88	23.53	23.43	23.30	22.61	21.39	10.24	16.35	194.36
Ira J. Chrisman Wind Gap Pumping Plant	30.53	14.99	10.39	14.05	46.94	50.99	50.43	51.16	50.47	47.10	23.23	36.70	426.98
A. D. Edmonston Pumping Plant	107.54	52.87	35.07	48.14	162.37	175.45	172.85	176.78	176.10	165.08	81.42	129.39	1,483.06
Alamo Powerplant (station service)	0.06	0.01	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.66
Pearblossom Pumping Plant	11.11	6.45	8.95	12.16	21.52	16.83	14.76	20.96	23.83	22.10	20.50	1.59	180.76
Devil Canyon Powerplant (station service)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.21	0.19	0.17	0.22	0.80
Oso Pumping Plant	8.81	4.01	0.24	0.24	9.34	12.93	12.55	10.77	9.64	9.26	0.80	14.93	93.52
William E. Warne Powerplant (station service)	0.07	0.11	0.13	0.12	0.05	0.00	0.00	0.00	0.02	0.04	0.14	0.03	0.71
Las Perillas Pumping Plant	0.05	0.08	0.37	0.49	1.08	1.22	1.57	1.08	0.56	0.66	0.18	0.44	7.78
Badger Hill Pumping Plant	0.07	0.17	0.95	1.31	2.96	3.34	4.28	2.94	1.44	1.70	0.42	1.12	20.70
Subtotal	465.47	286.35	159.98	186.72	354.25	392.20	437.16	486.19	500.21	451.17	210.03	433.07	4,362.80
High voltage transmission losses	5.92	10.11	12.94	13.59	5.34	7.97	15.71	18.53	13.83	15.60	19.64	12.19	151.37
Total Energy Required	**471.35**	**296.46**	**172.92**	**200.31**	**359.59**	**400.17**	**452.87**	**504.72**	**514.04**	**466.77**	**229.67**	**445.26**	**4,514.13**

TABLE 11-3

Energy Generated and Purchased in 1993, 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	24.47	48.07	357.36	287.33	286.59	296.33	380.55	363.15	107.23	103.55	124.79	241.45	2,620.87
William R. Gianelli Pumping-Generating Plant (SWP share)	0.00	0.00	5.20	2.61	27.15	36.41	13.80	0.47	0.73	0.00	20.84	0.00	107.21
Alamo Powerplant	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.59	1.12	0.00	0.00	0.00	2.12
Devil Canyon Powerplant	18.19	9.39	12.05	21.98	38.62	28.75	27.36	37.05	43.85	32.18	31.87	16.97	318.26
Reid Gardner Unit 4	124.52	101.09	100.20	60.32	13.25	69.44	94.27	99.52	106.19	127.84	149.56	152.16	1,198.36
William E. Warne Powerplant	18.29	7.89	0.00	0.01	20.77	28.52	28.20	23.85	21.23	19.68	1.16	31.93	201.53
Subtotal	185.88	166.44	474.81	372.25	386.38	459.45	544.18	524.63	280.35	283.25	328.22	442.51	4,448.35
Energy Sources from Long-Term Agreements (a													
Castaic Powerplant	33.40	41.54	15.31	11.12	34.51	46.35	45.76	36.84	35.65	29.40	1.43	53.24	384.55
Metropolitan Water District of Southern California small hydroelectric plants	10.15	10.74	8.52	9.41	16.46	13.22	14.79	18.65	18.05	15.14	13.39	13.66	162.18
PacifiCorp	72.50	44.40	51.60	46.80	45.00	46.80	46.80	53.10	51.35	54.55	50.90	58.90	622.70
Pine Flat Powerplant	-0.21	-0.20	7.12	55.25	106.40	131.11	143.29	91.24	42.10	24.34	-0.23	-0.25	599.96
TERA Power Corporation	-0.01	0.00	0.03	0.10	0.24	0.38	0.57	0.61	0.40	0.15	0.03	0.00	2.50
Power exchange delivered to SCE	-67.37	-74.49	-201.09	-170.89	-191.41	-183.76	-204.45	-215.02	-122.46	-124.79	-131.65	-148.77	-1,836.15
Power exchange received from SCE	245.79	185.99	295.32	261.68	208.67	413.96	335.68	450.44	631.21	508.08	232.36	392.73	4,161.91
Power exchange delivered to PG&E	-0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.38
Power exchange received from PG&E	0.34	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.39
Power received from Bonneville Power Administration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.90	0.00	0.00	0.00	0.00	27.90
Power exchange delivered to Bonneville Power Administration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-8.45	-26.66	-12.30	0.00	0.00	-47.41
Power exchange received from City of Vernon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.62	0.71
Power exchange delivered to City of Vernon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.09	-0.62	-0.71
Power system deviations account transactions	1.97	0.46	0.83	0.02	0.14	0.62	2.47	1.61	2.39	-0.74	0.15	-0.79	9.13
Subtotal	296.18	208.47	177.64	213.49	220.01	468.68	384.91	456.94	632.03	493.83	166.38	368.72	4,087.28
Purchases (a													
Arizona Public Services	0.71	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61
Bonneville Power Administration	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09
Los Angeles Department of Water and Power	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30
Montana Power Company	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65
Northern California Power Agency	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56
Pacific Gas and Electric Company	25.38	0.30	0.20	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.97
Puget Sound Power and Light Company	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Sacramento Municipal Utility District	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
Salt River Agricultural Improvement and Power District	10.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.08
Southern California Edison Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.10
Washington Water and Power Company	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Western Area Power Administration, Lower Colorado	2.63	3.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.04
Subtotal	47.62	4.61	0.20	0.00	0.09	0.00	0.09	0.00	0.10	0.00	0.00	0.00	52.71
Total Energy Generated and Purchased	529.68	379.52	652.65	585.74	606.48	928.13	929.18	981.57	912.48	777.08	494.60	811.23	8,588.34
Less Sales (b	(58.33)	(83.06)	(479.73)	(385.43)	(246.89)	(527.96)	(476.31)	(476.85)	(398.44)	(310.31)	(264.93)	(365.97)	(4,074.21)
Total Energy Provided to the SWP	**471.35**	**296.46**	**172.92**	**200.31**	**359.59**	**400.17**	**452.87**	**504.72**	**514.04**	**466.77**	**229.67**	**445.26**	**4,514.13**

a) Amounts show actual energy available for SWP use and include transmission losses, return energy provided for by specific contracts, and other necessary adjustments.
b) Amount does not include energy to NPC from DWR share of upgraded capacity at Unit No. 4.

River watershed during calendar year 1993. The 1993 output of Hyatt-Thermalito generation exceeded the average annual output of 2.20 billion kWh.

Energy generated at the SWP recovery plants – Alamo, Devil Canyon, William R. Gianelli, and William E. Warne – totaled about 629 million kWh in 1993, about 22 percent less than the amount generated in 1992.

In 1993, the SWP share of energy generated at the coal-fired Reid Gardner Unit 4 totaled 1.20 billion kWh.

Contractual Resource Arrangements and Cost

SWP power operations rely on contractual arrangements as well as the SWP facilities. Those contractual arrangements include joint development projects, energy exchanges, purchases, and transmission. Table 11-1 provides detailed information about these contracts.

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 1993, LADWP provided 385 million kWh for the Department's share of energy generated at Castaic Power Plant.

Energy Exchanges

The Department has two agreements with SCE for the purchase and/or exchange of 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 1981 Capacity Exchange Agreement, 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 2.33 billion kWh to the SWP in 1993.

If conditions are favorable, the Department will occasionally enter into energy exchanges with other utilities. In 1993, the Department had exchange agreements with PG&E, the Bonneville Power Administration, and the city of Vernon.

Purchases and Costs

In 1993, the Department purchased 1.44 billion kWh of energy at a cost of $23.38 million. Additionally, associated costs for capacity, transmission, and dispatching services totaled $22.24 million. Other SWP power costs, including those for debt service at Pine Flat Powerplant, totaled $22.95 million. See Table 11-4 for amounts and costs of power, transmission, and other services purchased in 1993.

Long-Term Purchases

According to the Kings River Conservation District contract, the Department receives the total output of the 165 MW Pine Flat Powerplant. The plant provided over 600 million kWh to the SWP in 1993 at a total cost of $12.2 million including debt service.

The Department also has two other contracts for purchasing energy. One contract is with PacifiCorp, from which the Department purchased 623 million kWh in 1993; the

TABLE 11-4

Power, Transmission, and Other Services Purchased in 1993 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	Nonfirm energy	85,000	935		935
Montana Power Company	Nonfirm energy	1,650,000	83,472		83,472
PacifiCorp	Firm and nonfirm energy; capacity	622,698,000	9,930,168	14,313,600	24,243,768
Puget Sound Power and Light Company	Nonfirm energy	450,000	13,500		13,500
Washington Water and Power Company	Nonfirm energy	1,121,000	63,224		63,224
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	609,610,752	4,633,042		4,633,042
PacifiCorp	Nonfirm energy; transmission and capacity	25,967,000	1,074,257	3,909,596	4,983,853
TERA Power Corporation	Wind energy	2,499,319	170,579		170,579
Sacramento Municipal Utility District	Nonfirm energy	1,738,000	80,393		80,393
Northern California Power Agency	Nonfirm energy	2,562,000	104,682		104,682
Southern California Area					
Los Angeles Department of Water and Power	Nonfirm energy	1,296,000	43,130		43,130
Metropolitan Water District of Southern California	Hydroelectric energy	150,067,320	6,756,031		6,756,031
Southern California Edison Company	Nonfirm energy; transmission	100,000	1,800	2,513,187	2,514,987
Southwest Area					
Salt River Agricultural Improvement and Power District	Nonfirm energy	10,076,000	277,128		277,128
Western Area Power Administration, Lower Colorado	Nonfirm energy	6,040,000	112,060		112,060
Arizona Public Service	Nonfirm energy	1,610,000	35,305		35,305
Subtotal		1,437,570,391	23,379,706	22,236,383	45,616,089
Other Purchases					
Kings River Conservation District	Pine Flat operations and maintenance				2,358,837
	Pine Flat debt service				5,052,900
Los Angeles Department of Water and Power	Hydro power plant scheduling				1,150
Nevada Power Company	Reid Gardner Unit 4 operations and maintenance				14,431,951
Pacific Gas and Electric Company	Midway-Wheeler Ridge and Bottle Rock transmission				145,455
	Pine Flat ownership and Lakeville Line operations and maintenance				87,492
Southern California Edison Company	Devil Canyon-Calectric Transmission Line construction				875,000
Subtotal					22,952,785
Total					**68,568,874**

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 1993, providing about 2.5 million kWh of wind-generated energy during the year.

Under the MWDSC Small Hydro Contract, the Department received 150 million kWh of energy in 1993 from five small hydroelectric power plants on the MWD system at a cost of $6.8 million.

The net gain to the SWP during 1993 from its long-term contracts (see Table 11-1) was 4.09 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 the SWP power requirements exceed resources during daily operations, short-term purchases meet the difference.

In 1993, the SWP purchased short-term energy from 12 utilities. The short-term energy purchases totaled 52.71 million kWh (Table 11-3).

Transmission Arrangements

SCE waives 75 percent of its charges to the Department for specified firm transmission service provided to the SWP pumping and generating facilities. In 1993, savings to the Department from SCE waiving 75 percent of its firm transmission charges was $8,266,102.

Sales of Excess Power

In 1993, the Department sold energy to 25 utilities. The Department also extended some contracts to sell surplus firm power to Modesto Irrigation District through 1997, Turlock Irrigation District through 1994, and the city of Riverside indefinitely.

According to terms of these contracts, the Department will provide the utilities with varying amounts of firm power. Amounts vary monthly and are lower in the winter months than in the summer months, with maximum power to be provided in August. Energy sold to 25 utilities in 1993 totaled 4.17 billion kWh, which resulted in revenues of $93.47 million. The Department also received $17.59 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 began to expire. For discussion related to 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.

TABLE 11-5

Energy Sold in 1993 and Revenue from Sales, by Area

Name of Purchaser	Energy Sold (MWh)	Revenue from Energy Sales (Dollars)	Revenue from Capacity and Transmission Sales (Dollars)	Total Power Sales (Dollars)
Pacific Northwest Area				
Bonneville Power Administration	247,988	6,252,599 (a		6,252,599
British Columbia Power Export Corporation	3,825	61,500		61,500
Eugene Water and Electric Board	460	3,680		3,680
PacifiCorp	57,439	1,344,230		1,344,230
Portland General Electric Company	986,082	27,335,106		27,335,106
Seattle City Light	64,320	1,833,128		1,833,128
Washington Water and Power Company	1,130	24,060		24,060
Northern California Area				
Hetch Hetchy Water and Power	213,841	5,296,916	1,260,000	6,556,916
Modesto Irrigation District	248,074	5,052,195	2,392,500	7,444,695
Northern California Power Agency	18,408	403,620	258,760 (b	662,384
Pacific Gas and Electric Company	113,454	1,902,702	19,355 (c	1,922,057
Sacramento Municipal Utility District	800,045	16,263,370	425,000	16,688,370
City of Santa Clara			85,886 (d	85,886
Turlock Irrigation District	70,440	1,799,646	2,205,000	4,004,646
Southern California Area				
City of Anaheim	33,600	475,548		475,548
City of Burbank	2,440	41,260		41,260
City of Glendale	21,639	345,127		345,127
Los Angeles Department of Water and Power	59,227	1,707,113	663,600	2,370,713
Metropolitan Water District of Southern California	141,360	1,809,469		1,809,469
City of Pasadena	665	13,885		13,885
City of Riverside	41,051	868,153	830,400	1,698,553
San Diego Gas and Electric Company	3,880	71,355		71,355
Southern California Edison Company	449,291	4,672,966	900,000	5,572,966
City of Vernon	173,508	5,166,207	6,438,079	11,604,286
Southwest Area				
Nevada Power Company	392,181	10,207,711	2,108,872 (e	12,316,583
Salt River Agricultural Improvement and Power District	29,930	518,040		518,040
Total	**4,174,278**	**93,469,586**	**17,587,452**	**111,057,042**

a) Late payment penalty of $2,488 is not included.
b) Transmission line operations and maintenance charge of $13,279 is not included.
c) Emergency Service
d) Transmission line operations and maintenance charge of $17,152 is not included.
e) Interest of $17,440 is not included.

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 forecast.

Criteria

The Department bases its forecast of electric power primarily on the SWP pumping power requirements to deliver water for the 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 1994 was based on water supply projections made by the Department for the year. When making the forecast, the Department assumed that 1994 water supplies would be sufficient to meet entitlement deliveries of 2.0 million acre-feet. That amount of water represents approval of full deliveries of contractors' needs in 1994.

For 1995 and 1996, 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. Thereafter, hydrology was assumed sufficient to meet up to 4.0 million acre-feet of deliveries.

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 the SWP pumping loads on an hourly basis, maximum SWP pumping is scheduled during the off-peak hours (10 p.m. to 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, which are those hours other than off-peak hours.

Forecasted Loads for 1995 through 2004

Total SWP energy requirements for 1995 are projected at 14,834 million kWh as shown in Table 11-6. The requirements increase to about 14,887 million kWh in 2004.

Transmission losses, included in the forecast, are about 593 million kWh in 1995; 620 million in 1999; and 624 million in 2004. Table 11-6 also includes a forecast of energy to be delivered to Southern California Edison Company as well as the amount of firm energy to be sold to other utilities.

TABLE 11-6

Energy Requirements for 1995, 1999, 2004, and Full Development

(Millions of Kilowatt-Hours)

Type of Requirement	*1995*	*1999*	*2004*	*Average Year Operation After Full Development*
Pumping Plants				
North Bay Aqueduct Plants				
Barker Slough	9.8	9.6	10.4	13.0
Cordelia	12.1	12.6	14.3	20.0
South Bay Aqueduct Plants				
South Bay	152.3	163.0	163.0	163.0
Del Valle	0.8	1.6	1.6	1.6
California Aqueduct Plants				
Harvey O. Banks Delta	1,158.2	1,228.5	1,226.7	1,256.0
William R. Gianelli	267.9	307.0	300.7	299.0
Dos Amigos	509.5	526.7	528.7	544.0
Buena Vista	609.3	640.2	645.6	674.0
John R. Teerink Wheeler Ridge	705.2	731.5	738.1	773.0
Ira J. Chrisman Wind Gap	1,498.5	1,554.7	1,568.8	1,645.0
A. D. Edmonston	5,287.7	5,499.7	5,550.1	5,821.0
East Branch Plants, California Aqueduct				
Pearblossom	803.4	774.9	785.1	835.0
West Branch Plants, California Aqueduct				
Oso	308.7	337.6	336.1	338.0
Coastal Branch Plants, California Aqueduct				
Las Perillas	8.2	16.1	15.5	15.0
Badger Hill	20.2	40.9	39.4	38.0
Devil's Den	0.0	50.0	50.0	50.0
Bluestone	0.0	50.0	50.0	50.0
Polonio Pass	0.0	50.0	50.0	50.0
Casmalia	0.0	(a	(a	(a
Subtotal (b	11,351.8	11,994.6	12,073.8	12,596.6
Transmission losses (c	592.9	620.3	624.3	
Total	11,944.7	12,615.0	12,698.1	
Other				
Energy obligations to Southern California Edison Company (d	2,783.8	2,183.3	2,189.2	
Firm contracts sales	105.8	0.0	0.0	
Grand Total	**14,834.3**	**14,798.3**	**14,887.3**	

a) Future facility; data are not available.
b) 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 1995 are based on delivering 100 percent of entitlement requests.
c) Transmission losses are determined by contractual arrangements with utilities.
d) 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 1995 and 1999

(Thousands of Kilowatts)

Type of Requirement	1995		1999	
	On-Peak	Off-Peak	On-Peak	Off-Peak
Pumping Plants				
North Bay Aqueduct Plants				
Barker Slough	2	2	1	1
Cordelia	2	2	2	2
South Bay Aqueduct Plants				
South Bay	23	21	12	12
Del Valle	0	0	(a	(a
California Aqueduct Plants				
Harvey O. Banks Delta	0	94	250	250
William R. Gianelli	1	1	100	204
Dos Amigos	63	104	34	62
Buena Vista	70	96	57	94
John R. Teerink Wheeler Ridge	88	106	70	105
Ira J. Chrisman Wind Gap	170	221	153	223
A. D. Edmonston	613	736	527	760
East Branch Plants, California Aqueduct				
Pearblossom	150	46	59	150
West Branch Plants, California Aqueduct				
Oso	4	75	41	41
Coastal Branch Plants, California Aqueduct				
Las Perillas	2	2	1	1
Badger Hill	5	5	3	3
Devil's Den	0	0	7	7
Bluestone	0	0	7	7
Polonio Pass	0	0	7	7
Casmalia	0	0	(b	(b
Total Capacity Needed to Pump Entitlement Water	**1,193**	**1,511**	**1,330**	**1,928**
Other				
Firm contract sales	20	20	0	0
Transmission losses	62	79	66	96
Reserve margin	237	237	128	128
Capacity to Southern California Edison Company	700	475	710	485
Total Capacity Requirements	**1,975**	**2,322**	**2,234**	**2,638**

a) Amount is smaller than one thousand kilowatts.
b) Future facility; data are not available.

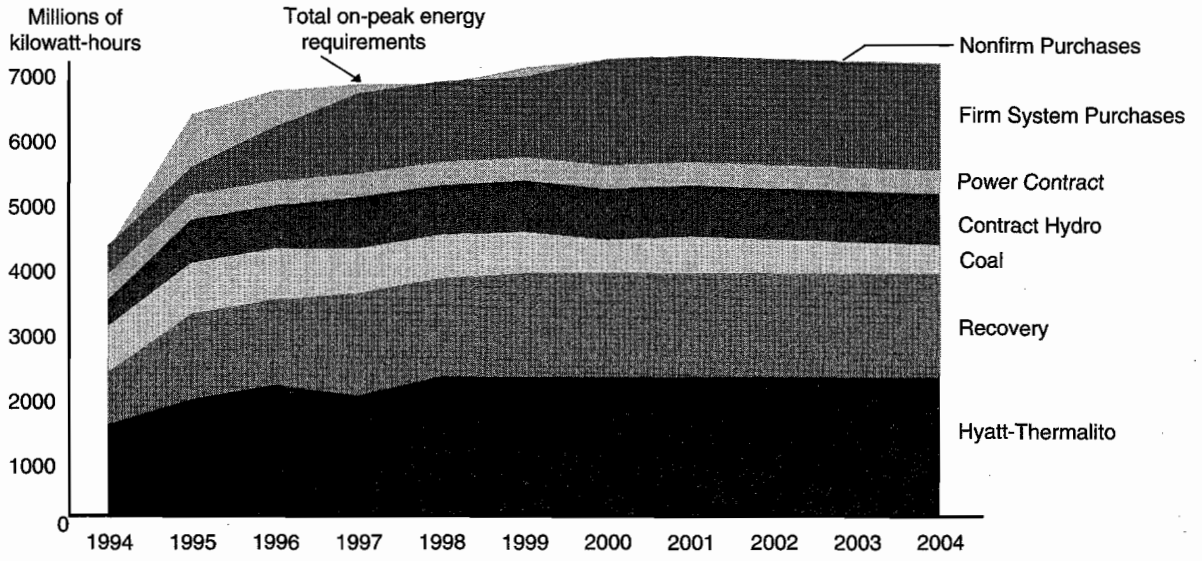


Fig 11-2. Estimated On-Peak Energy Requirements and Resources for 1994 through 2004

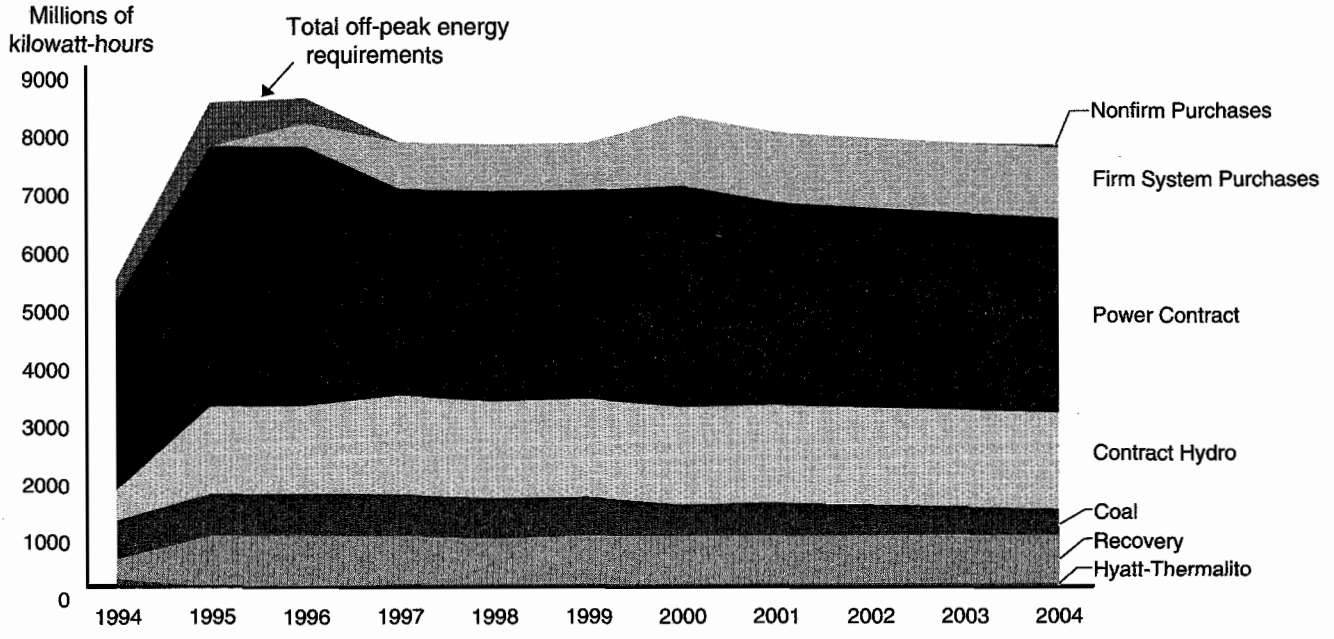


Fig 11-3. Estimated Off-Peak Energy Requirements and Resources for 1994 through 2004

On-Peak

The SWP annual on-peak energy requirements are expected to increase from 6,201 million kWh in 1995 to about 6,991 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 1995 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 and 1996, 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 the 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 1994 through 2004.

Years 1994 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 1994 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 49 percent of en-

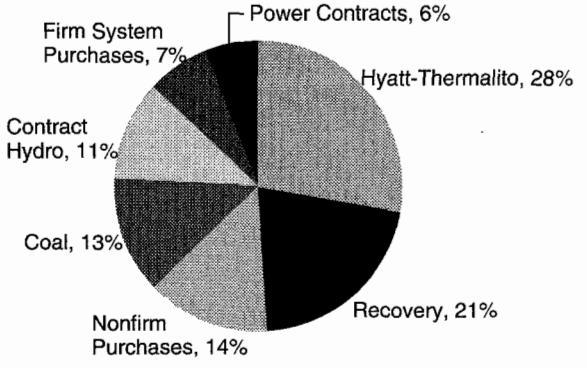


Fig 11-4. Estimated On-Peak Energy Resource Mix for 1995

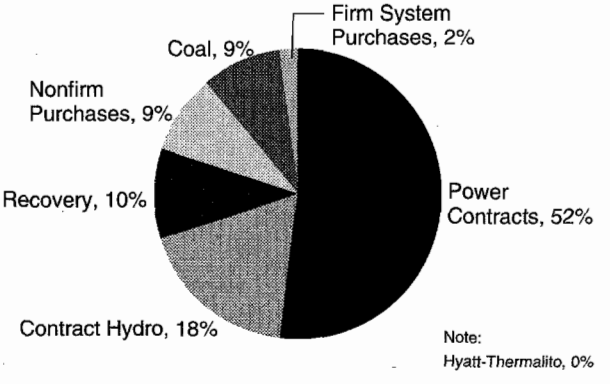


Fig 11-5. Estimated Off-Peak Energy Resource Mix for 1995

ergy requirements forecasted during on-peak periods with Mojave Siphon operation scheduled for September 1995.

Increases in on-peak energy requirements will be met with firm and nonfirm purchases. A firm system purchase is energy that is guaranteed by the seller except in emergency situations and is expected to supply equal amounts during on-peak and off-peak periods.

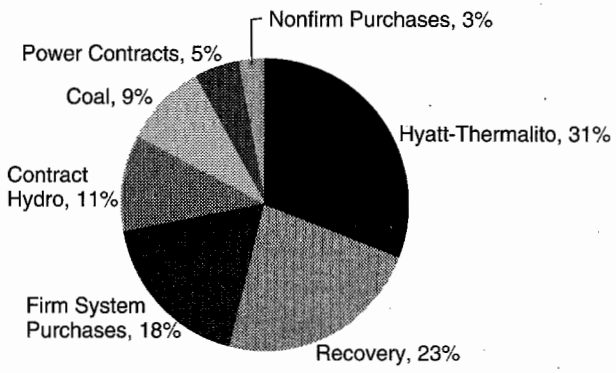


Fig 11-6. Estimated On-Peak Energy Resource Mix for 1999

Off-Peak

Diversity power exchanges with Southern California Edison Company provide a large portion of the off-peak resources. In 1995 those exchanges will provide about 4,547 million kWh or 52 percent of the total off-peak energy used by the SWP; that amount will decrease to 3,441 million kWh in 2004. Power purchases, along with 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 6,917 million kWh (Figure 11-2). As Figure 11-6 indicates, hydroelectric generation is expected to supply the largest amount of energy during this period. Hyatt-Thermalito will provide about 31 percent or 2,105 million kWh, and recovery generation will provide about 23 percent or 1,598 million kWh.

Year 1999 Off-Peak

The annual off-peak energy requirements for 1999 are about 7,881 million kWh (Figure 11-3). As Figure 11-7 shows, power contracts with Southern California Edison Company provide about 46 percent of SWP off-peak energy. In 1999, those exchanges will provide about 3,684 million kWh.

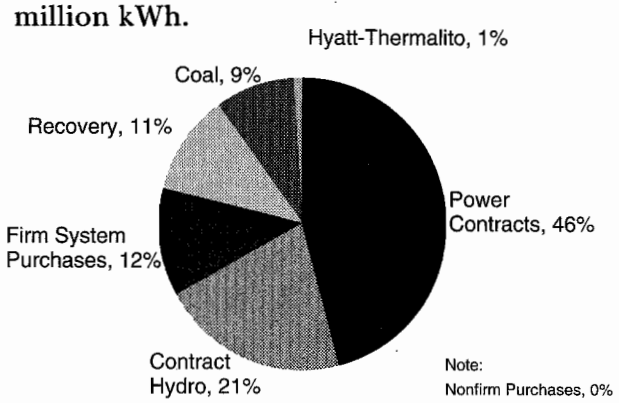


Fig 11-7. Estimated Off-Peak Energy Resource Mix for 1999

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 of SWP's transmission needs and also provide a large portion of energy resources.

To prepare for the expiration of these contracts, the Department has formed a task force composed of specialists within the Division of Operations and Maintenance. The task force is analyzing

TABLE 11-8

Estimates of On-Peak and Off-Peak Energy Produced in 1999, by Type of Resource

(Millions of Kilowatt-Hours)

Type of Resource	*On-Peak*	*Off-Peak*	*Annual*
Hydro			
Hyatt-Thermalito	2,105.3	43.8	2,149.1
Aqueduct Recovery			
Alamo	47.9	62.9	110.8
Devil Canyon	886.1	327.4	1,215.5
William R. Gianelli	224.4	0.7	225.0
Mojave Siphon	39.2	58.4	97.6
San Luis Obispo	19.9	19.9	39.7
Thermalito Diversion Dam	11.5	11.5	23.1
William E. Warne	369.8	362.7	732.5
Subtotal	1,598.7	850.7	2,449.4
Coal			
Reid Gardner	641.2	679.4	1,320.6
Contract Hydro			
Castaic	578.4	578.4	1,156.7
Metropolitan Water District of Southern California small hydro	0.0	251.2	251.2
Metropolitan Water District of Southern California Colorado River Aqueduct	0.0	664.0	664.0
Pine Flat	210.0	210.0	420.0
Subtotal	788.4	1,703.5	2,491.9
SCE Power Contracts			
Alamo additional	0.0	41.0	41.0
Alamo return	0.0	110.8	110.8
Devil Canyon additional	0.0	486.8	486.8
Devil Canyon return	0.0	800.4	800.4
Hyatt additional	0.0	1,292.1	1,292.1
Hyatt return	0.0	859.6	859.6
Subtotal	0.0	3,590.7	3,590.7
Capacity exchange agreement	360.0	93.8	453.8
Firm system purchase	800.0	800.0	1,600.0
Nonfirm purchases	181.9	0.0	181.9
PacifiCorp	438.0	175.2	613.2
TERA Power Corporation	3.2	3.2	6.3
Subtotal	1,783.1	1,072.1	2,855.2
Total	**6,916.6**	**7,940.3**	**14,856.9**

the SWP's expected power requirements for the period beyond 2004 and determining the most cost effective way to meet those requirements.

Forecasting Power Costs

Currently, the Department economically meets the SWP power requirements through a resource mix of the SWP's own power resources and energy obtained through contracts and exchanges. To continue meeting the 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 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 1995, 1999, and 2004 are shown in Tables 11-9 and 11-10. Energy requirements range from 12.32 billion kWh in 1995 to 12.7 billion kWh in 2004. The corresponding unit rates range from 19.62 mills per kWh in 1995 to 33.54 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 and firm system purchases will be met through unspecified sources and that any surplus energy will be sold as nonfirm 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 kilowatt-hour 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).

Composite Resource Costs

The composite resource costs listed in Table 11-10 represent the weighted average unit cost of all the SWP energy resources including power purchases.

TABLE 11-9

Estimated Energy Resources for 1995, 1999, 2004, and Full Development

(Millions of Kilowatt-Hours)

Energy Resources, Requirement, and Sales	*1995*	*1999*	*2004*	*Average Year Operation After Full Development*
SWP Energy Resources				
Alamo Powerplant	48	111	113	123
Bottle Rock Powerplant	0	0	0	
Castaic Powerplant	1,046	1,157	1,152	
Devil Canyon Powerplant	1,234	1,213	1,219	1,282
William R. Gianelli Pumping-Generating Plant	186	225	215	231 (a
Hyatt-Thermalito Powerplants	1,763	2,149	2,149	2,149
Mojave Siphon Powerplant	110	98	100	107
San Luis Obispo Powerplant	0	40	40	30
Thermalito Diversion Dam Powerplant	26	23	23	23
William E. Warne Powerplant	615	733	730	733
Energy Resources from Agreements				
Colorado River Aqueduct energy purchase	664	664	664	
Energy purchase	1,883	182	122	
Firm system purchases	0	1,600	2,400	
Metropolitan Water District of Southern California hydroelectric plants	160	251	226	
PacifiCorp	613	613	613	
Pine Flat Powerplant	307	420	420	
Reid Gardner Powerplant	1,518	1,321	901	1,400 (a
Southern California Edison exchange (b	2,143	1,861	1,612	
TERA Power Corporation	5	6	0	
Total Resources	**12,321**	**12,667**	**12,698**	**6,079**
SWP Energy Requirements and Sales				
SWP energy requirements (c	11,945	12,615	12,698	
Firm energy sales	106	0	0	
Surplus economy energy sales	270	52	0	

a) SWP share.

b) Amounts show net energy gained from Southern California Edison Company under the 1979 Power Contract and 1981 Capacity Exchange Agreement.

c) Requirements are based on 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.

TABLE 11-10

Estimated Average Unit Costs of Power Resources for 1995, 1999, and 2004

(Mills per Kilowatt-Hour)

Power Resources	*1995*	*1999*	*2004*
SWP Power Resources			
Alamo Powerplant	47.00	47.00	47.00
Bottle Rock Powerplant.	0.00	0.00	0.00
Castaic Powerplant	25.00	25.00	25.00
Devil Canyon Powerplant	25.00	25.00	25.00
William R. Gianelli Pumping-Generating Plant	25.00	25.00	25.00
Hyatt-Thermalito Powerplants	13.55	11.51	12.47
Mojave Siphon Powerplant	0.00	56.00	56.00
San Luis Obispo Powerplant	—	37.00	37.00
Thermalito Diversion Dam Powerplant	28.14	32.31	32.56
William E. Warne Powerplant	25.00	25.00	25.00
Power Resources from Agreements			
Colorado River Aqueduct energy purchase	22.00	27.40	36.10
Metropolitan Water District of Southern California hydroelectric plants	47.76	49.19	49.19
Pine Flat Powerplant	35.70	30.96	34.14
Reid Gardner Powerplant	0.00	0.00	0.00
Southern California Edison exchange	—	—	—
PacifiCorp	50.94	51.78	51.78
TERA Power Corporation	70.00	70.00	0.00
Firm system purchases	0.00	46.28	52.01
Energy purchase on-peak	28.80	35.90	47.30
Energy purchase off-peak	22.00	27.40	36.10
Capacity purchases (a	4.00	7.72	9.94
Composite Cost of Resources	17.84	26.63	31.59
Power Credits			
Firm energy sales	48.53	—	—
Value of potential on-peak energy sales	28.80	—	—
Value of potential off-peak energy sales	22.00	—	—
Value of potential capacity sales (a	4.00	7.42	9.94
Net Cost of SWP Power	**17.42**	**26.63**	**31.59**
Transmission cost	2.20	2.04	1.95
Effective Unit Cost (b	**19.62**	**28.67**	**33.54**

a) The unit rate is dollars per kilowatt-month.
b) Costs include an allowance for future cost escalation.

Forecasted Unit Values for Surplus Power Sales

The unit values of potential sales of surplus energy were estimated by escalating the projected 1994 value of 27.3 mills per kWh for on-peak energy sales and 20.8 mills per kWh for off-peak energy sales at rates published in the Wharton Econometric Forecasting Associates long-term forecast of the fourth quarter 1993.

Net Costs

The net cost of SWP energy is the unit cost of the energy actually used for the SWP purposes. The net cost of energy is calculated by adding all the energy resource costs and subtracting any power sales revenues. Unit transmission costs included in Table 11-10 were determined by dividing the total annual expenditures the SWP made for power transmission services by the total SWP annual energy requirements. This calculation does not include the 75 percent of Southern California Edison's 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

Radial gate maintenance at Coalinga Subcenter

Significant Events

- In spring 1994, two separate boards of independent consultants found the dams of the Oroville-Thermalito Complex to be safe for continued operation and recommended only minor repairs.
- A joint State-federal feasibility study of flood control alternatives for Arroyo Pasajero was initiated in January 1994. The study will run through 1997.

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. In addition, engineers from the Division of Safety of Dams inspect SWP dams annually to ensure that each dam is safe. 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 licensed facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock or power plant. Finally, the Department is required to contract periodically with independent consultants to review the safety of SWP dams and power facilities except those in San Luis Field Division and Pearblossom Spill Basin.

Inspection and Maintenance of Project Dams

During fiscal year 1993-94, Department personnel inspected and performed routine and scheduled maintenance on SWP dams. Some inspections were conducted under FERC and California *Water Code* requirements to evaluate SWP dam facilities every five years. Others activities were performed by the Division of Operations and Maintenance as routine inspections.

Upper Feather River Area

Routine inspections were conducted at Frenchman, Antelope, and Grizzly Valley Dams.

Oroville-Thermalito Area

Inspections required by FERC regulations and the California *Water Code* were conducted at the Oroville-Thermalito complex in early 1994. In addition, the Department continued follow-up studies and remediation activities in response to earlier inspections conducted under FERC and *Water Code* requirements.

Five-Year Reviews

In spring 1994, FERC and the Division of Safety of Dams convened separate five-year boards of independent consultants to evaluate facilities at the Oroville-Thermalito complex. Both boards found the dams safe and made only minor recommendations that are being carried out. The boards recommended that:

- cavities and cracks in the concrete spillway chute be repaired;
- spillway gate cables be inspected for corrosion;
- spillway trunnion anchor rods be ultrasound tested;
- the temporary drainage system above the Hyatt Powerplant ceiling be upgraded;
- the outlet structure energy dissipation baffle-ring report be completed;
- the condition of the river outlet works intake structures be evaluated;
- readings on the horizontal-movement devices be continued one more year after grouting is complete;
- seepage readings at Bidwell Canyon Saddle Dam be measured;

- the Palermo outlet-valve impact area be inspected;
- all seepage turbidity data be plotted; and
- a plan of action for blocking the outlet-works intake tunnel be developed.

The review boards concluded that the condition of the Oroville-Thermalito dams and their appurtenances is satisfactory for continued safe operation.

Follow-up Activities

In the five-year review of 1989, the FERC consulting team expressed concern and made specific recommendations regarding broken instrumentation tubing in Oroville Dam. This broken tubing was also an item 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 broken tubing problems.

This investigation resulted in 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. Due to the unique application and the level of control required for this activity, the Department proposes to utilize in-house staff and expertise and a grouting consultant to perform the operations during March 1995.

Delta Field Division

At Clifton Court, Bethany, Patterson, and Del Valle dams, routine inspections were conducted.

San Luis Field Division

In 1993, special investigations were conducted at B.F. Sisk San Luis Dam in addition to routine monitoring at the dam and annual inspections at other facilities.

B.F. Sisk San Luis Dam

In mid-1992, the Division of Operations and Maintenance requested that the Division of Design and Construction's Design Office investigate instrumentation at B.F. Sisk San Luis Dam and test the dam's riprap construction methods. Operations and Maintenance staff initiated actions to determine the reliability of the piezometer readings, which had been erratic; the origin of the seepage in the piezometer vault; and the cause of displacement of the dam's upstream riprap.

In mid-1993, the Design Office completed those studies and published its findings in a report entitled *Performance Evaluation of B.F. Sisk San Luis Dam.* The Design Office concluded that hydraulic piezometer systems had failed, and seepage had resulted from broken hydraulic piezometer tubing behind the vault walls. The Design Office also found that riprap on the upstream slope was distressed due to wave action in San Luis Reservoir. No deep-seated movement of the dam was evident. The dam was deemed safe for continued use.

In addition to performing these studies, a consultant for the Design Office independently evaluated the dam. The consultant confirmed the Design Office's conclusions. Corrective actions recommended by the Design Office and the consultant are now being implemented.

The USBR offices in Denver and Sacramento have reviewed the reports and made only a few minor suggestions.

Department personnel continue to monitor cracks discovered in the dam in 1986. No new cracks have been observed.

Other Facilities

At O'Neill, Los Banos Detention, and Little Panoche dams, routine inspections were conducted.

Southern Field Division

Facilities at Pyramid and Castaic Dams were evaluated during the reporting period of this bulletin, with Castaic Dam receiving scrutiny after the Northridge earthquake.

Pyramid Dam

The soft-shale layer of Pyramid Dam is being evaluated for repair by the Division of Design and Construction. A study conducted by the Design Office concluded that the outlet tower could fail during a major earthquake. However, further studies showed that the reservoir could be safely drawn down in an emergency. No further action was planned.

Castaic Dam

The January 17, 1994, magnitude 6.6 Northridge earthquake caused minor damage to the access bridge to the outlet works tower and moderate damage to the tower jib crane. This damage has not interrupted water deliveries.

Other Facilities

At Cedar Springs and Perris Dams, routine inspections were conducted.

Maintenance of Other Project Facilities

All SWP facilities are monitored continually and repairs and modifications are performed to ensure the safe, reliable delivery of water. Headquarters staff conduct annual inspections of project facilities and complete inspection reports for each field division. Each report lists action items to ensure that follow-up inspections and reports are made.

Maintenance on the Arroyo Pasajero Program was the most significant SWP maintenance activity undertaken in 1993.

Arroyo Pasajero Program

The juncture of the Arroyo Pasajero and the joint-use 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 has been deposited in an alluvial fan with the apex at the eastern margin of Pleasant Valley (Anticline Ridge) and the distal portion of the fan extending nearly to the axis of the San Joaquin Valley trough.

Because the California Aqueduct essentially bisects Arroyo Pasajero's alluvial fan, a retention basin along the aqueduct was included in the USBR design to accomodate the drainage and sediment load. However, conclusions drawn from observing the effects of the floods of 1969 and

later, confirmed by recent studies, led the Department to determine that both the watershed runoff and sediment load were greater than estimated in the original design of the retention basin.

The Department has since developed short-term and long-term actions to minimize impacts both to the aqueduct and surrounding lands.

Short-Term Actions

Since 1969, the Department and USBR, 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 excessive cost of removing sediment from the aqueduct, led the Department to adopt operating procedures that minimize runoff entering the aqueduct.

The Department 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 that must comply with federal safe drinking water standards. These standards restrict the allowable amounts of asbestos in drinking water. The cost of treatment increases as the fiber content increases.

A draft environmental impact report for an Interim Standard Operating Procedure, published 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. The priority given the flood routing first impounds flood waters west of the aqueduct, then allows for flows to the east of the aqueduct via the evacuation culvert if the water level continues to rise. As a last resort, flood routing allows for flood waters to enter the aqueduct via the inlet gates at Gale Avenue.

Public comments on the DEIR are currently being addressed, and a final DEIR for the ISOP is scheduled for completion in 1995. Once approved, the ISOP will govern operations at Arroyo Pasajero, including provisions for protecting the aqueduct from a 100-year-storm flood until a permanent solution can be identified.

Long-Term Actions

At the request of SWP contractors, all studies performed independently by the Department to solve the Arroyo Pasajero drainage and sediment problems have been suspended until the U.S. Army Corps of Engineers completes its investigation of the entire watershed. In the meantime, the Department continues 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., which constitutes approval to proceed with a feasibility study. The objective of a feasibility study is to further evaluate flood control alternatives for Arroyo Pasajero and arrive at the preferred plan.

After signing an initial project management plan and federal 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 $4.66 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 June 1994, the Department:

- contracted for aerial photography covering over 250 square miles;
- coordinated with the U.S. Army Corps of Engineers on public involvement pursuant to the study;
- completed the bulk of a hydrologic analysis of the watershed; and
- further defined the specific parameters governing the alternatives to be investigated.

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.

Independent Reviews

The Department periodically employs consultants to independently review the safety and assess the conditions of SWP dams, power plants, and other SWP 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 and power generation facilities.

In preparing their reports, consultants review surveillance data and other information prepared by Department staff and inspect facilities. 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 five years.

In September 1993, a FERC five-year review board reviewed Quail Lake and Lower Quail Canal and Warne Powerplant. All facilities were found to be in satisfactory condition.

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 dam proposals and review 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 Second Afterbay. During design and construction this board made independent findings about conditions that affect the safety of the dam and reservoir. Since

TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1993, by Month

Month	*Facility*	*Description*
January 1993	Alamo Powerplant	Unit 1 out of service January 4 to August 20 to replace generator and turbine shafts and to replace seal on turbine.
	A. D. Edmonston Pumping Plant	Unit 11 out of service January 25 to January 29 for motor breaker preventive maintenance and stator winding inspection.
	Las Perillas Pumping Plant	Unit 3 out of service January 7 to March 5 to modify unit trash racks. Unit 5 out of service January 19 to April 13 for annual and electric preventive maintenance.
	South Bay Pumping Plant	Unit 5 out of service January 27 to June 25 to replace motor.
	Thermalito Powerplant	Unit 3 out of service January 19 to February 10 for annual preventive maintenance.
February 1993	John R. Teerink Wheeler Ridge Pumping Plant	Unit 5 out of service February 25 to March 11 for annual relay preventive maintenance. Unit 6 out of service February 3 to February 19 for annual relay preventive maintenance. Unit 8 out of service February 26 to March 31 for unit efficiency tests.
	Thermalito Powerplant	Unit 4 out of service February 16 to March 19 for annual preventive maintenance.
	William E. Warne Pumping Plant	Unit 1 out of service February 16 to October 15 for annual maintenance.
March 1993	Ira J. Chrisman Wind Gap Pumping Plant	Unit 4 out of service March 1 to May 20 to replace hot water bypass and back fill line piping and valves.
	Dos Amigos Pumping Plant	Unit 2 out of service March 31 to April 5 to replace vane control panel.
	A. D. Edmonston Pumping Plant	Unit 1 out of service March 29 to April 2 for motor breaker preventive maintenance and stator winding inspection. Unit 4 out of service March 8 to March 17 for annual relay preventive maintenance. Unit 10 out of service March 26 to March 31 to remove trash rack and install new anodes.
	Edward Hyatt Powerplant	Unit 2 out of service March 4 to March 18 for annual preventive maintenance.
	South Bay Pumping Plant	Unit 1 out of service March 5 to March 24 to remedy high vibrations.
	John R. Teerink Wheeler Ridge Pumping Plant	Unit 4 out of service March 17 to March 24 for annual relay preventive maintenance.
April 1993	Dos Amigos Pumping Plant	Unit 1 out of service April 25 to May 5 to replace hub to shaft wedges.
	A. D. Edmonston Pumping Plant	Unit 6 out of service April 27 to May 10 for annual relay preventive maintenance. Unit 8 out of service April 13 to April 23 for annual relay preventive maintenance and April 22 to April 30 to remove trash rack and install new anodes. Unit 12 out of service April 1 to April 7 to remove trash rack and install new anodes.
	Edward Hyatt Powerplant	Unit 1 out of service April 5 to May 23 for annual preventive maintenance.
	Las Perillas Pumping Plant	Unit 6 out of service April 14 to April 20 for annual mechanical maintenance.
	John R. Teerink Wheeler Ridge Pumping Plant	Unit 3 out of service April 20 to May 4 for annual relay preventive maintenance.
May 1993	Harvey O. Banks Delta Pumping Plant	Unit 8 out of service May 22 to June 3 to remedy exciter field ground.
	Del Valle Pumping Plant	Unit 2 out of service May 7 to November 30 to install new mechanical shields on the shaft.
	A.D. Edmonston Pumping Plant	Unit 10 out of service May 3 to May 6 for motor breaker preventive maintenance and stator winding inspection.

TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1993, by Month (Continued)

Month	*Facility*	*Description*
May 1993 (continued)	South Bay Pumping Plant	Unit 3 out of service May 20 to May 26 to replace pump air release valve and shutoff valve.
	John R. Teerink Wheeler Ridge Pumping Plant	Unit 1 out of service May 20 to June 4 for annual relay preventive maintenance. Unit 2 out of service May 5 to May 18 for annual relay preventive maintenance.
June 1993	Harvey O. Banks Delta Pumping Plant	Unit 5 out of service June 1 to June 24 for efficiency testing.
	California Aqueduct	Check 38, Gate 2 out of service June 28 to September 8 to remove, repair, sandblast, recoat, and reinstall gate.
	A.D. Edmonston Pumping Plant	Unit 10 out of service June 21 to July 8 for annual preventive maintenance.
	William R. Gianelli Pumping-Generating Plant	Unit 7 out of service June 10 to June 15 to repack stuffing box.
July 1993	Harvey O. Banks Delta Pumping Plant	Unit 11 out of service July 19 to repair pump case coating.
	California Aqueduct	Check 34, Gate 2 out of service July 7 to September 7 to remove, repair, sandblast, recoat, and reinstall gate.
	Dos Amigos Pumping Plant	Unit 5 out of service July 13 to July 22 to inspect windings, measure between rotor arm and stator.
	Pearblossom Pumping Plant	Units 7 and 8 out of service July 6 to July 31 for coupled, but unwatered test runs.
August 1993	Harvey O. Banks Delta Pumping Plant	Units 1, 2, and 3 out of service August 2 to August 5 to clean and paint transformers.
	California Aqueduct	Check 39 out of service August 9 to August 23 to install and test new remote telemetering unit.
	Ira J. Chrisman Wind Gap Pumping Plant	Units 6 and 7 out of service August 1 to August 5 to install new hot water bypass downstream stop valve.
	A.D. Edmonston Pumping Plant	Unit 3 out of service August 23 to November 5 to rewedge and repair the stator. Units 8 and 10 out of service August 17 to August 19 for annual relay preventive maintenance.
	Lake Oroville	Unit 1 intake was out of service August 16 to August 20 to pull gate and perform annual preventive maintenance.
September 1993	Harvey O. Banks Delta Pumping Plant	Unit 9 out of service September 14 to September 25 to replace upstream seat "O" ring.
	California Aqueduct	Check 25, Gate 1 out of service September 9 to September 17 to install new gate anodes.
	William R. Gianelli Pumping-Generating Plant	Units 1 and 2 out of service September 1 for biennial inspection. Penstock out of service September 1 to replace headgate seal.
	Oso Pumping Plant	Unit 1 out of service September 20 to September 22 to replace rusted cooling water piping on the manifold.
October 1993	California Aqueduct	Check 28, Gate 1 out of service October 22 to October 29 to install new gate anodes.
	Coastal Aqueduct	Check 5 out of service October 18 to October 27 to replace and test remote telemetering unit.
	Edward Hyatt Powerplant	Unit 5 out of service October 6 to December 23 for annual preventive maintenance and to rewedge stator.
	Las Perillas Pumping Plant	Unit 1 out of service October 5 to November 12 for annual preventive maintenance.
	Pearblossom Pumping Plant	Unit 7 out of service October 5 to October 12 to resurface pump extension.
	Thermalito Powerplant	Unit 4 out of service October 5 for annual preventive maintenance.

TABLE 12-1

Outages for Maintenance and Repair of Facilities in 1993, by Month (Continued)

Month	*Facility*	*Description*
November 1993	Harvey O. Banks Delta Pumping Plant	Unit 4 out of service November 20 to December 3 to clear water from discharge valve hydraulic oil system.
	California Aqueduct	Check 28, Gate 3 out of service November 4 to November 11 to install new gate anodes. Pool 53 out of service November 4 to November 19 to repair damaged lining.
	Devil Canyon Powerplant	Unit 1 out of service November 1 to November 19 for annual preventive maintenance.
	A.D. Edmonston Pumping Plant	Units 2,4,6,8,10,12, and 14 out of service November 29 to December 17 for inspection of discharge lines (west units), and to install flow meters.
	Edward Hyatt Powerplant	Unit 5 out of service November 25 for annual preventive maintenance.
	Las Perillas Pumping Plant	Unit 2 out of service November 22 to December 17 for annual electric preventive maintenance.
	Pearblossom Pumping Plant	Unit 9 out of service November 29 to repair leaks in pump extension.
December 1993	Buena Vista Pumping Plant	Unit 1 out of service December 22 to December 30 to measure motor lower guide bearing clearance.
	California Aqueduct	Check 24, all gates out of service December 6 to December 20 to install new anodes.
	Pearblossom Pumping Plant	Units 7 and 8 out of service December 6 to replumb the shaft, seal cold water supply lines, and repaint shaft.
	Pine Flat Powerplant	Unit 2 out of service December 13 to December 30 for annual maintenance.
1993 Completion of 1992 Outages	Buena Vista Pumping Plant	Unit 1 out of service until August 10 for annual preventive maintenance and motor inspection. Unit 4 out of service until October 26 for annual preventive maintenance and to replace impeller.
	A.D. Edmonston Pumping Plant	Unit 2 out of service until March 4 to repair high pressure water leak in fourth stage scroll case.
	Dos Amigos Pumping Plant	Unit 2 out of service until March 5 for biennial maintenance.
	John R. Teerink Wheeler Ridge Pumping Plant	Unit 7 out of service until August 31 to refurbish pump and replace impeller.

February 1990, fifteen consulting board meetings and inspections have been conducted. The final meeting is expected to follow the end of construction, currently scheduled for May 1995. At that time the board will review the safety of the completed structure and the terms and conditions to be included on the Certificate of Approval issued by the Division of Safety of Dams.

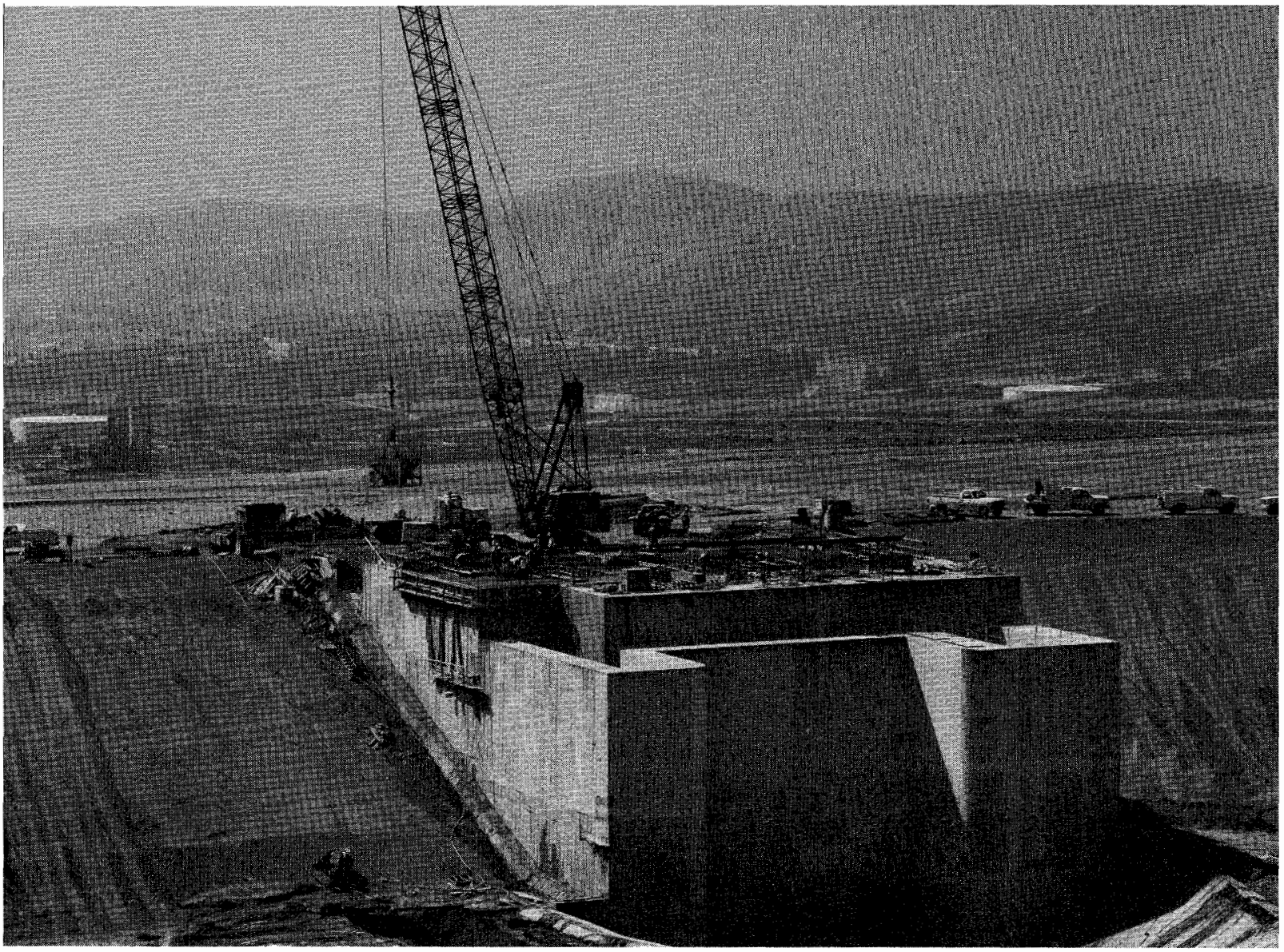
To further comply with the California *Water Code,* the Department is required to retain a review board at least once every five years to review the operational performance of Department-owned dams.

In May 1993, a three-member board inspected and reviewed the performance of Cedar Springs and Perris dams. Both dams were found to be in satisfactory safety condition.

Information for this chapter was contributed by the Division of Operations and Maintenance Civil Maintenance Branch and the Division of Safety of Dams.

Chapter 13

Design, Construction, and Land Management



Construction at Devil Canyon Second Afterbay

Significant Events

- Notice to begin work for the first contract for Coastal Branch, Phase II, construction was issued August 13, 1993, to furnish fiber optics cable.

- During fiscal year 1993-94, awards and notices to begin work were issued for 14 of the 30 contracts required for the Coastal Branch, Phase II work.

- A section of the Mojave Siphon Pipeline No. 1 failed on March 2, 1994. Subsequent inspections confirmed that two other sections needed repairs as well. All repairs were completed and the pipeline returned to service on March 28, 1994.

- The Department's Division of Land and Right-of-Way acquired 20 parcels, obtained easement rights over 32 parcels, and managed 80 leases during fiscal year 1993-94.

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. The first water deliveries from the SWP were made in 1962 from the partially completed South Bay Aqueduct, while in the same year work started on Oroville Dam and the joint-use San Luis facilities.

In 1963, work began on the Governor Edmund G. Brown California Aqueduct; by 1968, SWP was able to deliver water to long-term contractors in the San Joaquin Valley. The initial facilities were completed in 1973, and SWP was able to deliver water to Lake Perris, its southernmost point.

From the early1970s to the late 1980s, design and construction activities centered on building power plants and adding pumping units and turbine-generators that were 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 focus on repairs and replacement of components of existing facilities, construction of Phase II of the Coastal Branch to deliver water to San Luis Obispo and Santa Barbara counties, construction of the Devil Canyon Powerplant Second Afterbay, and the possible extension of the SWP to the San Gorgonio Pass service area.

Design and Construction Activities

Designs for about 40 projects were in progress or completed between July 1993 and June 1994. Table 13-1 lists those projects along with expected or actual completion dates.

The Design Office was actively involved in studies of dams, canal embankments, and other facilities of the SWP during fiscal year 1993-94. Known as deficiency studies, these investigations identified potential problems at Oroville Dam, Thermalito Forebay Dam, Thermalito Diversion Dam, Castaic Dam, Pyramid Dam, Bethany Dam, Perris Dam, Peace Valley Pipeline, and Lower Quail Canal. The investigations will lead to remedial construction contracts in fiscal year 1994-95 for grouting defective instrumentation at Oroville Dam, providing seepage control filters at Lower Quail Canal Embankment, and performing seepage repair for subsurface erosion along Peace Valley Pipeline.

Approximately 75 construction projects were in progress or completed between July 1993 and June 1994. Those projects, along with their cost; the date when notice to begin work was given to the contractor; and the date when work was operationally complete and recommended for acceptance, are listed in Table 13-2. Costs of contracts 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 date work began.

Oroville Division

Design and construction work in the Oroville Division involved the Oroville-Thermalito Complex communication system.

TABLE 13-1

Design Activities, July 1993 through June 1994, by Division

Construction Division and Facility	*Construction Contract*	*Date Design Began*	*Design Completion Date*
North San Joaquin Division			
Harvey O. Banks Delta Pumping Plant	Repair main plant access road slide	May 1993	October 1993
	Furnish seat rings for 54-inch valve	December 1992	May 1993
South Bay Pumping Plant	Furnish 5 kV switchgear	July 1992	January 1994
San Luis Division			
Delta and San Luis Operations and Maintenance Centers, Coalinga Operations and Maintenance Subcenter	Furnish above-ground fuel storage tanks	January 1993	July 1993
Coastal Branch Phase II			
Pipeline Reaches			
Devil's Den to Cholame Valley	Construct pipeline reach number 1	September 1992	August 1993
Cholame Valley to Shedd Canyon	Construct pipeline reach number 2	September 1992	November 1993
Shedd Canyon to Calf Canyon	Construct pipeline reach number 3	January 1993	February 1994
Calf Canyon to Cuesta Tunnel	Construct pipeline reach number 4	June 1993	August 1994
City of San Luis Obispo	Modify Cuesta Tunnel	September 1992	March 1994
Devil's Den, Bluestone, Polonio Pass, and Casmalia Hills Pumping Plants	Furnish pumping units	November 1992	August 1993
Devil's Den, Bluestone, Polonio Pass, Casmalia Hills Pumping Plants and San Luis Obispo Powerplant	Furnish and install bridge cranes	March 1993	May 1994
Devil's Den to Casmalia Hills	Furnish power circuit breakers	November 1992	January 1994
	Furnish power transformers	February 1993	March 1994
Devil's Den to Polonio Pass	Furnish switchgear for pumping plants	January 1993	January 1994
Devil's Den to Phase II terminus	Furnish standby engine/generators	March 1993	October 1994
Devil's Den to Polonio Pass	Construct three pumping plants—initial contract	November 1992	September 1993
Devil's Den to Vandenberg AFB	Furnish ball valves	September 1992	November 1993
	Furnish butterfly and control valves	December 1992	February 1994
	Furnish fiber-optic cable	January 1993	August 1993
	Furnish and install flowmeters	April 1993	February 1995
Polonio Pass	Construct tank 1	September 1992	August 1993
San Luis Obispo Powerplant	Furnish turbine governor and controls	February 1993	September 1994
San Luis Obispo Powerplant and Casmalia Hills Pumping Plant	Furnish switchboards and switchgear	January 1993	July 1994
South San Joaquin Division			
Kern Water Bank	Rehabilitate pumps and motors, Kern Fan Element, stage 1	July 1991	August 1993
	Construct conveyance facility, Kern Fan Element, stage 1	July 1991	August 1993
Tehachapi Division			
A.D. Edmonston Pumping Plant	Furnish rock slope protection for blast/paint facility	February 1994	May 1994
Mojave Division			
California Aqueduct	Repair and upgrade erosion damage at Big Rock Siphon	November 1993	May 1994
	Reconstruct primary operating road, M.P. 367.54 to 399.57	February 1994	May 1994
Pearblossom Pumping Plant	Install remote terminal unit	September 1992	April 1993
Santa Ana Division			
San Bernardino Tunnel	Replace intake structure	May 1991	September 1994
West Branch			
Gorman Creek Canal Modification	Modify channel	July 1993	June 1995
Miscellaneous Activities			
Department of Water Resources Data Center	Modify 7th floor, Resources Building	July 1990	September 1994
Water Operations Center	Construct new building	July 1986	*Project on hold*
Tuolumne River	Restore gravel	March 1994	May 1994
Stanislaus River	Restore gravel	May 1994	July 1994
Lost Hills Operations and Maintenance Subcenter, San Joaquin, Pearblossom, and Southern California Operations and Maintenance Centers, A. D. Edmonston Pumping Plant, Oso Pumping Plant maintenance yard, Cedar Springs Dam maintenance station	Remove underground storage tanks	December 1992	July 1993

TABLE 13-2

Construction Activities, July 1993 through June 1994, by Division

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date	Ending Date	Contract Costs (Thousands of dollars)
Oroville Division				
Oroville Complex	Complete installation of fiber-optic cable, Phase II (93-13)	June 1993	November 1993	265
Delta Facilities				
Miscellaneous Activities	Reconstruct tidal barrier VI, Middle River (92-02)	May 1993	September 1993	27
	Construct rock barrier, Old River at Delta Mendota Canal (93-04)	May 1993	October 1993	176
	Temporarily close, Old River at head, fall 1993 (92-22)	September 1993	December 1993	32
	Temporary rock barriers 194-95, Middle River and Old River (94-01)	March 1994	December 1995	544
North San Joaquin Division				
Harvey O. Banks Delta Pumping Plant	Furnish and install pump discharge valves (88-25)	September 1988	April 1994	4,708
	Complete pumping plant (89-09)	August 1989	February 1994	8,464
	Furnish 480-volt switchgear (92-32)	March 1993	March 1994	339
	Furnish seat rings, 54-inch valves (93-20)	November 1993	April 1994	113
Miscellaneous Activities	Repair slide (93-24)	October 1993	January 1994	335
	Repave intake channel road, Delta Field Division (93-16)	August 1993	September 1993	51
John E. Skinner Delta Fish Protective Facility	Construct new holding tank building and make improvements, Phase II (90-35)	December 1990	December 1994	4,617
	Modify control and vehicle storage buildings, Phase III (92-01)	May 1992	July 1993	313
South Bay Aqueduct	Furnish and install fiber optic communication system (93-05)	April 1993	June 1994	2,540
South Bay Pumping Plant	Furnish pumps (92-18)	October 1992	November 1993	1,400
	Furnish motors (92-19)	October 1992	November 1993	2,000
	Furnish 5kv switchgear (93-32)	January 1994	February 1995	871
San Luis Division				
William R. Gianelli Pumping-Generating Plant	Replace roofing (93-06)	June 1993	November 1993	225
Miscellaneous Activities	Seal coat secondary operating road (93-17)	August 1993	September 1993	130
Coastal Branch				
Badger Hill and Las Perillas Pumping Plants	Modify HVAC system	July 1993	November 1994	130
Phase II Facilities	Furnish fiber optic cable, Devil's Den to Vandenberg AFB	August 1993	May 1995	846
	Construct pipeline Reach 1 (93-14)	December 1993	June 1995	25,700
	Furnish pump units (93-25)	December 1993	December 1996	4,515
	Construct Tank 1 facilities (93-27)	December 1993	July 1996	24,200
	Construct initial pumping plants (93-30)	January 1994	May 1995	12,900
	Construct pipeline Reach 2 (93-33)	March 1994	September 1995	34,500
	Furnish ball valves (93-34)	April 1994	December 1996	3,954
	Construct pipeline Reach 3 (94-05)	June 1994	February 1996	28,100
	Modify Cuesta Tunnel (94-10)	June 1994	December 1995	4,850
	Furnish turbine and generator, San Luis Obispo Powerplant (93-31)	February 1994	February 1996	2,231
South San Joaquin Division				
Buena Vista Pumping Plant	Furnish stator coils	October 1992	December 1993	427
Buena Vista and John R. Teerink Wheeler Ridge Pumping Plants	Furnish replacement pump impellers (88-13)	July 1988	March 1994	6,308
Ira J. Chrisman Wind Gap Pumping Plant	Furnish motor stator coils (92-11)	July 1992	June 1996	582
	Furnish motor stator coils and spare windings (92-12)	October 1992	February 1995	868
Ira J. Chrisman Wind Gap and Oso Pumping Plants	Furnish replacement pump impellers (88-14)	July 1988	June 1994	3,870
John R. Teerink Wheeler Ridge Pumping Plant	Furnish stator coils (92-17)	October 1992	July 1993	(63)
Miscellaneous Activities	Expand facilities conveyance system, civil maintenance shop and warehouse, San Joaquin Operations and Maintenance Center (92-28)	February 1993	December 1993	422

TABLE 13-2

Construction Activities, July 1993 through June 1994, by Division (Continued)

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date	Ending Date	Contract Costs (Thousands of dollars)
Miscellaneous Activities (continued)	Furnish and install above-ground fuel tanks, Lost Hills Operations and Maintenance subcenter, San Joaquin Operations and Maintenance Center, and A.D. Edmonston Pumping Plant			
	(92-29)	March 1993	November 1994	417
	(94-07)	April 1994	April 1995	547
Tehachapi Division				
A. D. Edmonston Pumping Plant	Furnish motor stator coils (93-01)	April 1993	August 1995	962
Mojave Division				
Alamo Powerplant	Furnish and install Kaplan Turbine (80-16)	October 1980	June 1994	2,800
	Furnish and install generator Number 1 (83-14)	August 1983	June 1994	1,784
East Branch Enlargement				
Canals and siphons	Construct second pipeline, Mojave Siphon (91-33)	March 1992	June 1995	52,500
Miscellaneous Activities	Replace roofing, Administrative and Civil Maintenance Buildings, Southern California O & M Center (93-08)	July 1993	October 1993	197
	Seepage repair, Mileposts 329 and 336 (93-29)	November 1993	January 1994	341
Mojave Siphon Powerplant	Furnish and install turbines, generators, and governors (89-13)	August 1989	May 1995	14,482
	Furnish and install 75-ton gantry crane (90-38)	December 1990	December 1993	730
	Furnish control switchboards (91-31)	March 1992	January 1994	769
	Furnish switchgear, and equipment (91-34)	April 1992	January 1994	773
	Furnish power transformer (92-15)	December 1992	February 1994	451
	Complete Mojave Siphon Powerplant (92-30)	February 1993	September 1995	6,817
	Install acoustic velocity flowmeters (93-18)	October 1993	October 1995	437
Mojave Siphon and Devil Canyon Powerplants	*Furnish butterfly valves (91-15)*	August 1991	July 1994	4,451
Pearblossom Pumping Plant Enlargement, Phase II	Install vertical centrifugal pumps (87-04)	May 1987	December 1994	2,800
	Install motors (87-48)	June 1988	December 1994	9,600
	Install pump discharge valve units (88-18)	July 1988	December 1994	1,523
	Complete pumping plant (89-36)	November 1989	November 1993	10,914
Santa Ana Division				
East Branch Enlargement				
Devil Canyon Powerplant	Install turbines, governors, and valves (87-15)	July 1987	December 1994	10,200
	Install generators (88-47)	May 1989	October 1993	9,500
	Install butterfly valve (91-15)	August 1991	December 1994	1,508
	Construct Devil Canyon Second Afterbay (92-16)	November 1992	April 1995	49,100
	HVAC modifications (93-21)	September 1993	November 1993	47
Miscellaneous Activities	Modifications to Santa Ana Valley pipeline, North Park Blvd. and Sugarloaf Mountain (93-10)	July 1993	April 1994	600
West Branch	Construct Vista del Lago Visitors Center - Pyramid Lake Liebre Peninsula (91-16)	July 1991	January 1994	3,500
Miscellaneous Activities	Furnish multiplant acoustic flowmeters: Oroville, Delta, San Luis, San Joaquin, and Southern Field Divisions (89-28)	September 1989	March 1994	5,082
	Remodel DWR Data Center 1416 Ninth Street, 7th floor Resources Building (93-09)	June 1993	September 1994	1,284
	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	October 1994	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

Oroville-Thermalito Complex Communication System

Installation of the fiber-optic cable for the fiber-optic communication system network is being performed through two primary contracts and a completion contract. The completion contract was awarded in June 1993 and completed in June 1994.

The communication system serves to operate all major components of the Oroville-Thermalito Complex.

Delta Facilities

Several design projects for present and future facilities in Suisun Marsh were active in fiscal year 1993-94. Design was completed to modify the spillway at Cordelia Forebay to allow releases of North Bay Aqueduct water into Green Valley Creek. These releases will help improve salinity levels in western Suisun Marsh to meet required water quality standards. The modifications were completed by the Delta Field Division in December 1993.

Preliminary designs for installing rock barriers at Chadbourne and Goodyear sloughs in Suisun Marsh were completed. However, environmental issues forced the cancellation of these projects. Final design for maintenance dredging of the Morrow Island Distribution System in Suisun Marsh was also completed in fiscal year 1993-94. However, environmental issues related to dredge disposal resulted in the Department's not obtaining environmental permits and the postponement of this work until 1995.

The design and initial drilling of deep boreholes for the installation of downhole seismographs in the Delta was completed in fiscal year 1993-94. This project is intended to determine the potential for the soft soils in the Sacramento-San Joaquin Delta either to amplify or attenuate earthquake motions and, consequently, help define the seismic risk for Delta levees. Installation of the seismographs is scheduled for November 1994.

Rock Barriers at Old River and Middle River

The annual temporary barriers at Old River and Middle River were constructed and removed as required under various agreements. These activities alternately raise and stabilize water levels associated with agricultural water diversions during the irrigation season. They also increase fall flows in the lower San Joaquin River to help migrating salmon and steelhead trout survive. A new contracting method was employed that includes several barrier installations in a single contract.

North San Joaquin Division

Design and construction activities in the North San Joaquin Division involved the Harvey O. Banks Delta Pumping Plant, John E. Skinner Delta Fish Protective Facility, South Bay Aqueduct, South Bay Pumping Plant, and various miscellaneous projects.

Harvey O. Banks Delta Pumping Plant

Construction work at Banks Pumping Plant included final inspections and administrative closeout of the contracts for furnishing and installing four vertical centrifugal pumps, motors, discharge valves, transformers, and appurtenant electrical and mechanical equipment. The four new pumping units became operational in early 1992. Punch list work and closeout of the contracts continue with a target completion date of February 1994. With completion of

the enlargement, the plant has a pumping capacity of 10,300 cubic feet per second.

A construction contract awarded in March 1993 for furnishing 480-volt switchgear equipment continues. This contract is one of several contracts intended to enhance the operational capabilities of the plant's peripheral electrical systems.

Repair of the landslide along the intake channel for the pumping plant was performed by contract and completed in January 1994. A contract to repave the intake channel road was let in August 1993 and completed in September 1993.

John E. Skinner Delta Fish Protective Facility

All original contract work at the site was completed in February 1994. However, the contractor was directed to furnish three wedge gate valves to replace existing units. Delivery of those units is expected in late 1994.

South Bay Aqueduct

The contract awarded in April 1993 to furnish and install fiber-optic cables along the aqueduct for upgrading the communication and control system was completed in June 1994.

South Bay Pumping Plant

All contract work awarded in October 1992 for furnishing spare pumps and pump motors has been completed, with the exception of the contractor's providing technical assistance during installation and testing of the new units. Installation cannot be performed until November 1994 because of water delivery scheduling. The new pumps and motors will allow removal of existing units for major repairs and maintenance.

A contract to furnish 5 kV switchgear equipment for South Bay Pumping Plant was let in January 1994 with completion expected in early 1995.

San Luis Division

Design studies evaluating settlement problems along the California Aqueduct were completed. Repair alternatives will be evaluated in fiscal year 1994-95.

The construction contract to replace the roofing at William R. Gianelli Pumping-Generating Plant was completed on November 1993. A construction contract to seal coat operating roads was awarded in August 1993 and completed in September 1993.

A construction contract to install above-ground fuel storage tanks for the San Luis Operations and Maintenance Coalinga Subcenter were let in May 1994 with completion in spring 1995.

Coastal Branch

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 is scheduled for completion in November 1994.

Contract administration of the Coastal Branch Phase II facilities is under the jurisdiction of the Coastal Project Headquarters in San Luis Obispo during the construction period. This addition to the Construction Office organization opened for business on July 1, 1993. Supporting the Project Office in San Luis Obispo are field offices in Shandon and Santa Maria.

A soils/concrete laboratory adjacent to the Shandon Field Office is also operational.

Environmental protection has become a primary concern for the construction of Phase II. For example, in Reach 1, a low sheet steel fence was constructed between Devil's Den and Bluestone Pumping Plants to keep the endangered blunt-nosed leopard lizard out of the construction areas. This six-mile-long fence was erected prior to start of construction. Compliance with environmental requirements has increased the cost of the project.

Thirty construction contracts will be required for this project. These contracts will be awarded over a period of 18 to 24 months. The project is scheduled to be operational in late 1996.

Through the end of June 1994, construction contracts were let and awarded for Pipeline Reaches 1, 2, and 3; three pumping plants initial contract; pumping units; Tank Site No. 1; furnishing a turbine and generator for San Luis Obispo Powerplant; valves; and modification of Cuesta Tunnel.

South San Joaquin Division

Projects in the San Joaquin Division involved Buena Vista, Ira J. Chrisman Wind Gap, Oso, and John R. Teerink Wheeler Ridge Pumping Plants and San Joaquin Operations and Maintenance Center.

Buena Vista, Chrisman, and Teerink Pumping Plants

Two construction contracts for furnishing and replacing pump impellers, scheduled to be completed in late 1992, were actually completed in June 1994 because of unexpected construction delays.

Construction contracts to furnish and replace stator coils for the three plants were awarded in October 1992 and are scheduled for completion in 1995 and 1996.

San Joaquin Operations and Maintenance Center

Two construction contracts were awarded in March 1993 for modifying the civil maintenance shop and warehouse and for furnishing and installing above-ground fuel storage tanks. A third contract included similar tank installations at Lost Hills Operations and Maintenance Subcenter and A.D. Edmonston Pumping Plant. The first contract was completed in December 1993. Work on the fuel tank contracts continues.

Tehachapi Division

A contract to furnish rock slope protection behind Edmonston Pumping Plant was prepared. This work will protect the future blast/paint facility from falling rocks. Design work associated with the contract to provide the blast/paint facility continued.

Division activities included rewinding several pumping unit motors at Edmonston Pumping Plant. The work was completed during this reporting period. Also, a construction contract to furnish stator coils was awarded in April 1993 with a completion date in 1995.

Mojave Division

Activities in the Mojave Division involved Alamo Powerplant, the California Aqueduct, Mojave Siphon Powerplant, Pearblossom Pumping Plant, and the Pearblossom Operations and Maintenance Subcenter.

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. The new shaft assembly arrived at the job site for installation in late July 1993. After reassembly the unit will undergo extensive testing.

California Aqueduct

Design of a repair of erosion damage at Big Rock Siphon was completed. Design was also completed for reconstruction of the primary operating road from milepost 367.54 to milepost 399.57.

A construction contract for enlarging Mojave Siphon was let in March 1992 with completion scheduled for April 1995. This work will provide three new 12-foot-diameter pipelines to supply the generating units at Mojave Siphon Powerplant and discharge into Silverwood Lake.

Mojave Siphon Powerplant

Construction of the initial Mojave Siphon Powerplant structure and fabrication of a gantry crane were started in fall 1990 and completed in summer 1993. Construction of the plant's final phase is scheduled for completion in 1995.

Manufacturing the three vertical Francis turbines, generators, and governor for the new Mojave Siphon Powerplant is well under way at various overseas manufacturing facilities. Installation of this equipment is being performed under the completion contract, which was awarded in February 1993 with a completion date in September 1995.

Pearblossom Pumping Plant and Subcenter

Enlargement of Pearblossom Pumping Plant, which includes adding three pumping units now and providing for two additional units in the future, began in October 1990. The three new units became operational in March 1994. Completion contract work associated with furnishing and installing appurtenant equipment and other related work for completing the enlargement of the plant was completed in April 1994.

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 continues for completing contract drawings to replace the existing San Bernardino Tunnel Intake with a more earthquake resistant structure. Construction of the new facility was scheduled to begin in November 1994 but has now been scheduled for spring 1995.

Devil Canyon Powerplant and Second Afterbay

Construction work for enlarging Devil Canyon Powerplant was completed. The work involved expanding the plant structure for two additional units and a service bay; constructing a second penstock; and installing two turbines, governors and valves, bypass equipment, generators, switch-

gear, switchboards, 115 kV power circuit breakers, and a penstock butterfly valve.

The 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 is currently in progress. The new generating units are scheduled to begin commercial operation in 1994.

Work began in November 1992 for the construction of an 800-acre-foot capacity second afterbay adjacent to Devil Canyon Powerplant to permit full use of the new generating units and to improve downstream water delivery capabilities. Construction is scheduled for completion in early 1995.

Santa Ana Pipeline

Construction of two vaults to house a new control valve at North Park Boulevard and a removable bulkhead at Sugarloaf Mountain began in June 1993. This work is scheduled for completion in fall 1994.

West Branch

Design work to repair landslides and other minor damage at the Vaquero Recreation Area continued. Design work also continued on modifications to Gorman Creek to pass large potential flood flows. Final design will be completed in fiscal year 1994-95.

Construction work for Vista del Lago Visitors Center was completed in June 1994. Administrative closeout of the contract continues.

Land Management Activities

In fiscal year 1993-94 the Department spent $6.8 million in excess of credits for earlier sales of surplus property and return of condemnation deposits to acquire land and easement rights. Twenty parcels (approximately 3,600 acres) were acquired during this fiscal year for a total purchase price of $6,419,483. Easement rights over 32 parcels (251.31 acres) were also acquired for a total purchase price of $441,365. No excess land was sold during this fiscal year.

The total net amount spent to acquire rights-of-way and mitigation lands for the SWP through June 30, 1994, was $216.6 million. The Department also managed 80 leases, which resulted in a revenue of $245,123 during the 1993-94 fiscal year.

The Department's land and right-of-way program for fiscal year 1993-94 included actions involving the following projects: Coastal Branch, Phase II; Devil Canyon Second Afterbay; Los Banos Grandes; Mojave Siphon Second Pipeline; California Aqueduct Repair; West Delta - Sherman Island; and the Los Banos Demonstration Desalting Plant.

Coastal Branch, Phase II

To date, the Department has secured rights for construction activities on Reaches 1, 2, and 3; Tank Site 1 and 2; Cuesta Tunnel; and Devil's Den, Bluestone, and Polonio Pass Pumping plants. In addition, a 40-acre parcel was acquired for environmental mitigation. As of June 30, 1994, pipeline and access road easement (240.16 acres) had been obtained over 30 parcels for $261,065. Eight parcels (915.14 acres) were acquired in fee for $764,241. Resolutions of Necessity were approved by the California Water Commission for 19 parcels in fiscal year 1993-94. Eight parcels are located in Reach 2, nine parcels in Reach 3, and two parcels within the

Cuesta Tunnel project area. The Department has also obtained 231 temporary entry permits to perform geological, archaeological, and environmental studies as well as surveys necessary for project design and regulatory permits.

Los Banos Grandes

The Department purchased a 1,715-acre parcel for mitigation and possible future dam site at Los Banos Grandes for $1,615,000. The Department now owns 3,418 acres at a cost of $11.7 million.

Mojave Division

Right-of-way acquisition for the Mojave Siphon Second Pipeline was completed with the acquisition of an easement over an 11-acre parcel at a cost of $178,800.

West Delta - Sherman Island

During the 1993-94 fiscal year, the Department purchased eight parcels of land on Sherman Island for the West Delta Program. The total cost was $2,914,970 for 852.92 acres. The Department now owns 3,575 acres of the 10,300± acre island. Further negotiations to purchase additional parcels from willing sellers continue.

Devil Canyon Second Afterbay

The Department purchased one parcel of land for a hang gliding landing site totaling 14 acres for $358,600. This site was purchased to comply with the Federal Energy Regulatory Commission permit, which required Department assistance in relocating the hang gliding activities that would be impacted by the Second Afterbay project.

Los Banos Demonstration Desalting Plant

The Department terminated its monthly lease arrangement for the site of its decommissioned Los Banos Demonstration Desalting Plant and purchased the 86.28-acre parcel for $750,000. This purchase allows the Department to economically assess long-term options for the site, including sale of the property.

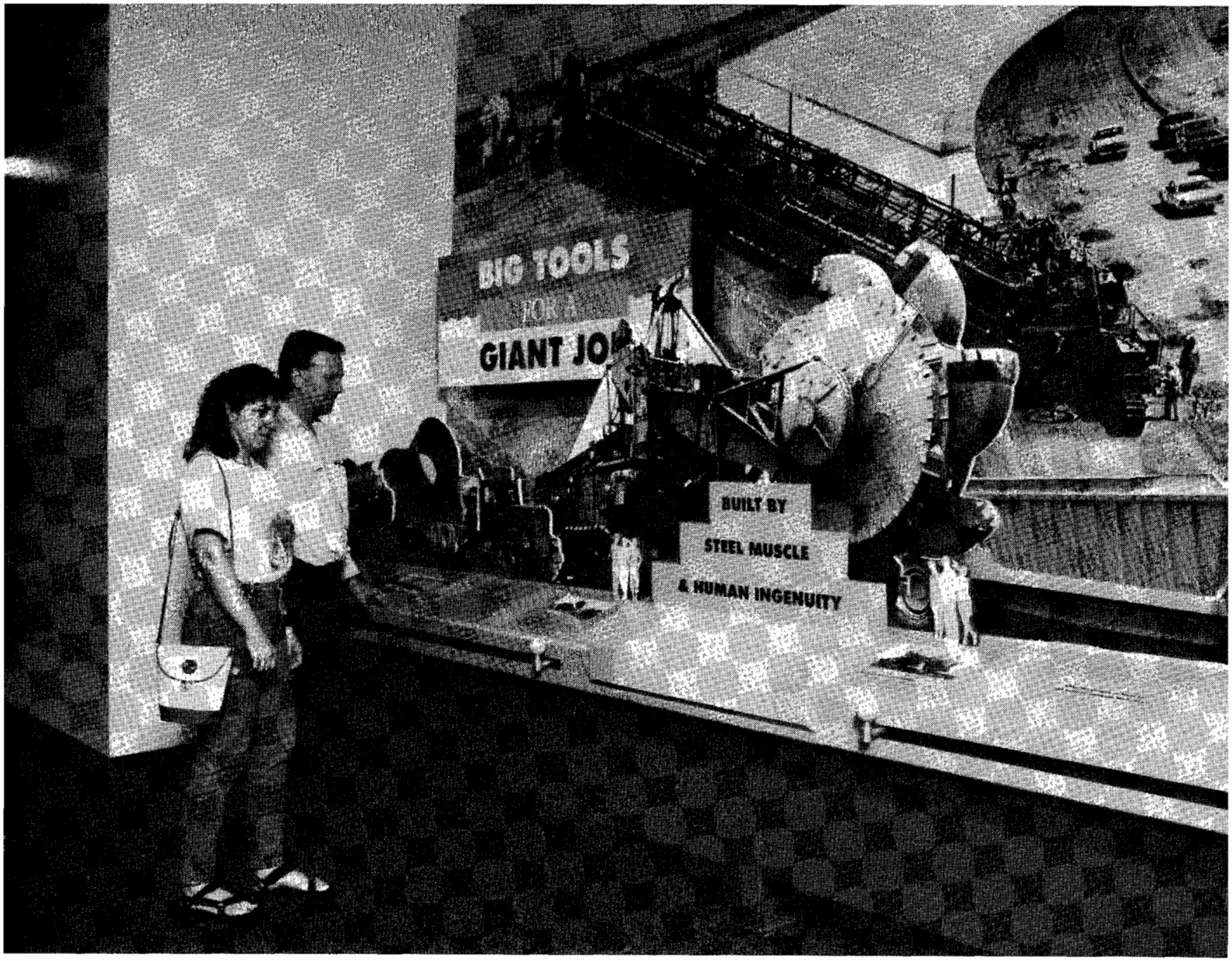
California Aqueduct Repair

One parcel (2.49 acres) was acquired in fee at the request of the Division of Operations and Maintenance. The parcel is adjacent to the California Aqueduct and will be used in conjunction with aqueduct stabilization activities. The parcel was acquired at a cost of $16,672.

Information for this chapter was provided by the Divisions of Design and Construction and Land and Right-of-Way.

Chapter 14

Recreation Programs



Vista del Lago Visitors Center

Significant Events

- On November 15, 1993, the Department opened Vista del Lago Visitors Center to the public.
- Use at SWP visitors centers increased 3 percent over 1992 totals. Recreation use along the California Aqueduct also increased in 1993.
- More than 127 million recreation-days have been recorded at SWP recreation facilities since the project began delivering water in 1962.

The State Water Project is a multipurpose project designed to provide many benefits to California residents. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP provides extensive and varied recreational opportunities–tours, sight-seeing, and areas or sites that include facilities for 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. Most sites are located along the California Aqueduct. Figure 14-1 shows the names and locations of each area.

Use of Facilities

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. A recreation-day is counted when one person uses the recreational facilities for camping, boating, bicycling, swimming, or some other recreational activity for any part of a day.

Visitor-Days

SWP facilities received 430,300 visitor-days of use in 1993, a 3 percent increase over the visitor-days recorded in 1992 (Table 14-1).

TABLE 14-1
Visitor-Days Recorded in 1993, by Location

Location	*Visitor-Days*
Project Operation Control Center, Sacramento	100
Oroville Field Division	162,100
Delta Field Division	1,200
San Luis Field Division	197,200
San Joaquin Field Division	5,400
Southern Field Division (Castaic Visitors Center 1/1/93 through 9/30/93 Vista Del Lago 11/15/93 through 12/31/93)	64,300
Total	**430,300**

Recreation-Days

In 1993, SWP facilities received 5.40 million recreation-days of use, a decrease from the 5.52 million recreation-days recorded in 1992 (Table 14-2). However, recreation use at the 17 developed fishing access sites and along the California Aqueduct Bikeway increased from 66,300 recreation-days in 1992 to 68,500 recreation-days in 1993.

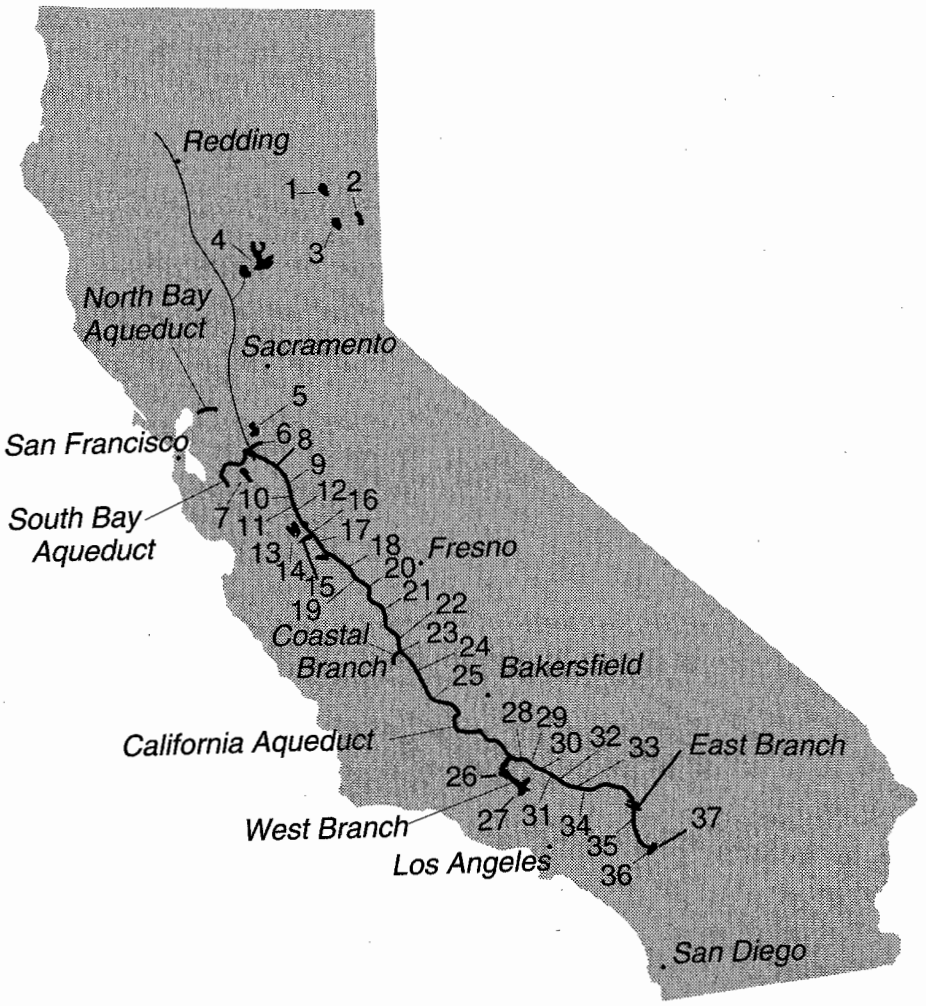
Most SWP recreation and visitor use was concentrated at the major reservoirs, where well developed facilities accommodate the public. Fifty-three percent of the total SWP recreation use in 1993 occurred at the four major reservoirs in Southern California: Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris.

Since SWP first began delivering water in 1962, more than 127 million recreation-days have been recorded at SWP recreational facilities.

New Facilities

On November 15, 1993, the Department opened the Vista del Lago Visitors Center to the public. Overlooking Pyramid Lake on Interstate 5, the center features innovative exhibits that educate viewers about the State Water Project and current water issues.

[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.



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

Construction continued on the recreation facilities under development at Liebre Peninsula on Pyramid Lake. Those facilities should be completed in mid-1995.

Improvements to Facilities

In 1993, the California Department of Boating and Waterways improved SWP recreation facilities at Lake Oroville.

Concrete overlays from elevation 883 to elevation 847 were completed at the boat launching ramp in the Bidwell Canyon area.

Facility Closures

Recreational use at Castaic Lake continued to decline in 1993 because of the closure of Castaic Lagoon, an impoundment dedicated to recreational use. The lagoon was closed to swimming in August 1992 when Los Angeles County Department of Health Services personnel detected E. coli bacteria in the water and will remain closed indefinitely. Because of the closure of Castaic Lagoon, recreational use of Castaic Lake in 1993 dropped 26 percent from 1992 use.

Oroville Recreation Plan

On October 1, 1992, the Federal Energy Regulatory Commission issued order 2100-052, which required the Department of Water Resources to prepare a revised recreation plan for Lake Oroville. The new plan will replace the original Oroville Reservoir, Thermalito Forebay and Afterbay Recreation Report (Bulletin 117-6), which was prepared in December 1966 but never fully implemented. The new plan, submitted on June 1, 1993, and approved on September 22, 1994, in FERC order 2100-054, includes additional recreation facilities and addresses concerns raised by local residents regarding recreation and fishery related issues.

TABLE 14-2
Recreation-Days Recorded in 1993, by Division and Facility

Division	*Number of Days*
Oroville Field Division	
Frenchman Lake	200,000
Antelope Lake	68,400
Lake Davis	246,000
Lake Oroville and Thermalito Forebay	630,400
Thermalito Afterbay and Oroville Wildlife Area	187,200
Total	**1,332,000**
Delta Field Division	
Lake Del Valle	501,300
Bethany Reservoir	22,200
Fishing Access Sites	
Niels Hansen	100
Cottonwood Road	100
California Aqueduct	
Walk-in fishing	26,900
Bikeway	1,100
White Slough Wildlife Area	11,700
Total	**563,400**
San Luis Field Division	
San Luis Reservoir	207,400
O'Neill Forebay	305,100
Los Banos Reservoir	54,300
California Aqueduct	
Walk-in fishing	13,800
Wildlife areas	20,400
Total	**601,000**
San Joaquin Field Division	
Fishing Access Sites	
Kettleman City	5,600
Lost Hills	5,300
Buttonwillow	5,800
California Aqueduct	
Walk-in fishing	6,500
Total	**23,200**
Southern Field Division	
Silverwood Lake	515,000
Lake Perris	1,329,500
Pyramid Lake	318,400
Castaic Lake	709,700
Fishing Access Sites	
77th Street East	600
Longview Road	100
California Aqueduct	
Walk-in fishing	2,300
Bikeway	300
Total	**2,875,900**
Grand Total	**5,395,500**

TABLE 14-3
Fish Planted in 1993
(Thousands)

Location and Size	Trout				Chinook Salmon	Total
	Eagle Lake	Rainbow	Brown	Brook		
Antelope Reservoir						
Catchable		9.5		11.5		21.0
Subcatchable				17.7		17.7
Lake Davis						
Catchable	58.1					58.1
Fingerling			122.4			122.4
Frenchman Reservoir						
Subcatchable		54.4				54.4
Fingerling	126.0	100.0				226.0
Lake Oroville						
Catchable			44.3		60.6	104.9
Subcatchable			97.1			97.1
Fingerling					102.5	102.5
Thermalito Forebay						
Catchable		32.2	7.4	14.6		54.2
Lake Del Valle						
Catchable		46.9				46.9
Los Banos Reservoir						
Catchable		10.3				10.3
Pyramid Lake						
Catchable		23.7				23.7
Castaic Lake						
Catchable		86.5				86.5
Castaic Lagoon						
Catchable		34.5				34.5
Silverwood Lake						
Catchable		28.5				28.5
Lake Perris						
Catchable		61.5				61.5
Lake Skinner (a						
Catchable		45.4				45.4
California Aqueduct		No Fish Planted				
Total	**184.1**	**533.4**	**271.2**	**43.8**	**163.1**	**1,195.6**

a) Included in SWP fish planting program, but not an SWP facility.

The Department's revised recreation plan calls for several improvements and expansions of existing facilities and programs as well as the addition of new facilities and programs. The new plan requires the Department to:

- construct additional recreation facilities;
- construct a campground at Lime Saddle Marina;
- make improvements to the Thermalito Afterbay and South Forebay Recreation Areas;
- expand the Feather River Fish Hatchery;
- develop a fishery management plan and improve fish habitat in Lake Oroville;
- establish a recreation advisory committee; and
- collect data on recreation use and file annual reports with FERC.

Most recreation facilities should be completed by 1998, with certain elements of the new plan requiring time extensions for successful implementation.

Fish Plantings

In 1993, the Department of Fish and Game continued fish-planting activities at twelve SWP facilities and one facility owned by the Metropolitan Water District of Southern California (Lake Skinner). Total plantings of trout and chinook salmon increased 43 percent in 1993 (Table 14-3).

At the Feather River Fish Hatchery and the Thermalito Afterbay rearing ponds, 13,481,400 fish were produced in 1993, down 14 percent from 1992 totals. That figure includes 13,026,600 chinook salmon and 454,800 yearling steelhead trout. Of the chinook salmon reared, 7,666,800 were fingerlings, and 5,359,800 were advanced fingerlings.

Safety

Safe use of facilities at all 37 recreational areas is important to the Department. However, safety at the 24 sites along the California Aqueduct, a 444-mile-long open canal, is particularly important. Recreationists use those sites for fishing and biking. In 1993, approximately 67,000 people fished and 1,400 people rode bicycles along the aqueduct.

Because the aqueduct is an open canal, water flowing in it is clearly visible and often appears to be shallow and calm. However, the calm surface is deceptive. The water is as much as 30 feet deep in some places and can start to flow rapidly without warning, creating turbulence and strong currents.

Turbulent currents created by siphons used to carry water under roadways, streams, and railroad crossings are not visible from the surface. Also, the concrete sides of the aqueduct are steep and slippery, making it difficult if not impossible to climb out of the canal without help.

To minimize risks to recreationists, the Department posted multilingual safety notices along the aqueduct and installed float lines and safety ladders at regular intervals. Through various media, including brochures available at recreational facilities, the Department regularly notifies visitors of safety precautions to take while fishing or walking along the aqueduct.

Also, staff from the Department's field divisions regularly visit schools, churches, and other community organizations to discuss safety precautions and provide brochures, posters, and videocassettes describing potential hazards along the California Aqueduct.

Methods of Financing

Recreational facilities are financed according to legislation enacted by the Davis-Dolwig Act (1961), Assembly Bill 12 (1966), and Assembly Bill 1442 (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 Californians and that 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.

These appropriations were made annually, beginning in 1967, through the

1982-83 fiscal year, resulting in over $16 million of reimbursements to 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 purposes. Although no appropriations have been made since 1986, the Department received approximately $90 million since passage of the bill in 1966 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 California 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 development. This report to the legislature is published annually by the Department.

Information on recreation use at SWP facilities was provided by the Division of Local Assistance, Central District. Material on safety was contributed by the Division of Operations and Maintenance, Water Operations Branch. The State Water Project Analysis Office furnished information on recreation financing.

Chapter 15

Financial Analysis

Feasibility/cost sharing agreement meeting including DWR, USACE, and USBR

Significant Events

- In March 1993, documentation was completed for a commercial paper program that allows the Department to borrow up to $150,000,000 for capital expenditures. The program is designed to be an ongoing source of interim financing prior to permanent financing from the sale of revenue bonds.
- On December 9, 1993, the Department sold $190 million of Water System Revenue Bonds, Series M.
- On April 4, 1994, all outstanding Oroville Bonds were retired.

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 1994 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, 1994, are presented in Tables 15-1 and 15-2.

Future conditions may necessitate changes in the financial analysis. Contingencies that could result in a change in 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 $713 million. Special capital requirements for revenue bond financing of these construction costs are projected at $81 million for a total capital requirement of $794 million. This projection includes construction and financing costs for the following significant SWP facilities planned for completion by 2010:

- Mojave Siphon Powerplant facilities;
- Coastal Branch of the California Aqueduct, Phase II;
- Suisun Marsh salinity control facilities;
- East Branch Enlargement of the California Aqueduct;
- 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 $616 million of revenue bonds. The remaining $178 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 the year 2010. Estimates of future capital expenditures include allowances for escalation of costs at 5 percent per year from 1994 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 that were 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 December 1996 at a cost of $324 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 and $6.3 million for a proposed bypass at Warne Powerplant.

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 concurrently 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 planning additional conservation facilities. Specific planning activities and projected spending amounts for 1996 through 2010 are shown in Table 15-6. 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 and evaluating drainage, reducing drainage, 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.

Also included in Line 12 are projected costs for completing monitoring and control systems and implementing flood protection at Arroyo Pasajero in the San Luis reach of the California Aqueduct.

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, 1993, the Department had disbursed $127 million (including $9 million for administration) in grants and

loans for 114 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 has been 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 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 34 percent of the expenditures through 1993 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

TABLE 15-1

Capital Requirements and Financing as of June 30, 1994

(Thousands of dollars)

Line Number	Line Item	Calendar year 1952-1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	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	0	2,202,316
2.	North Bay Aqueduct - Phase II	89,415	616	1,019	10	10	2	0	0	0	0	0	0	0	0	0	0	0	0	1,657	91,072
3.	Delta and Suisun Marsh facilities	194,940	15,516	29,020	40,371	39,677	25,163	1,947	1,876	0	0	0	0	0	0	0	0	0	0	153,570	348,510
4.	Final four units at Banks Delta Pumping Plant	47,413	1,232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,232	48,645
5.	Coastal Branch Aqueduct, Phase II	24,261	103,064	151,829	41,527	1,308	601	626	657	0	0	0	0	0	0	0	0	0	0	299,612	323,873
6.	West Branch Aqueduct	179,342	574	6,242	9,667	32	14	0	0	0	0	0	0	0	0	0	0	0	0	16,529	195,871
7.	East Branch Enlargement	380,586	48,510	3,255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51,756	432,351
8.	East Branch improvements	118,544	6,716	28,910	2,190	73	19	0	0	0	0	0	0	0	0	0	0	0	0	37,908	156,363
9.	Power generation and transmission facilities	654,699	6,617	1,232	7	7	6	0	0	0	0	0	0	0	0	0	0	0	0	7,869	662,568
10.	Additional conservation facilities	120,448	3,429	4,529	9,353	14,099	14,804	15,544	16,321	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	105,949	226,397
11.	San Joaquin drainage facilities	45,432	2,509	2,509	2,509	2,509	2,509	2,509	2,509	0	0	0	0	0	0	0	0	0	0	17,563	62,995
12.	Other costs	133,794	10,871	6,141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17,012	150,806
13.	**Total Project Construction Expenditures**	**4,191,101**	**199,654**	**234,686**	**105,634**	**57,715**	**43,118**	**20,626**	**21,363**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**710,666**	**4,901,767**
14.	Davis-Grunsky Act Program costs	127,816	2,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,184	130,000
15.	Special capital requirements under revenue bond financing	503,260	688	50,823	11,875	7,794	5,391	1,883	2,146	0	0	0	0	0	0	0	0	0	0	80,600	583,860
16.	**Total Capital Requirements**	**4,822,177**	**202,526**	**285,509**	**117,509**	**65,509**	**48,509**	**22,509**	**23,509**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**793,450**	**5,615,627**
17.	Less power facilities capital requirements	1,177,809	40,780	3,077	7	7	6	0	0	0	0	0	0	0	0	0	0	0	0	43,877	1,221,686
18.	**Water facilities capital requirements**	**3,644,368**	**161,746**	**282,432**	**117,502**	**65,502**	**48,503**	**22,509**	**23,509**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**749,5732**	**4,393,941**
	Financing of Capital Requirements																				
	Power revenue bond proceeds																				
19.	Power bonds through Series H	1,161,857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,161,857
20.	Future power revenue bonds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21.	*Subtotal, power revenue bonds*	1,161,857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,161,857
	Water Revenue Bond Proceeds																				
22.	East Branch Enlargement, current bonds	341,644	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	341,644
23.	East Branch Enlargement, future bonds	0	0	104,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104,000	104,000
24.	Water system facilities, current bonds	730,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	730,920
25.	Water system facilities, future bonds	0	0	280,000	90,000	61,000	44,000	18,000	19,000	0	0	0	0	0	0	0	0	0	0	512,000	512,000
26.	*Subtotal, water revenue bonds*	*1,072,564*	*0*	*384,000*	*90,000*	*61,000*	*44,000*	*18,000*	*19,000*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*616,000*	*1,688,564*
	Other Capital Financing																				
27.	Initial project facilities bond proceeds	1,452,459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,452,459
28.	Davis-Grunsky Act Program bond proceeds	127,816	2,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,184	130,000
29.	Application of California Water Fund monies (tideland oil revenues)	509,860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509,860
30.	Application of capital resources revenues to construction	456,671	197,833	(101,000)	25,000	2,000	2,000	2,000	2,000	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	157,703	614,374
31.	Revenue transfers applied	40,950	2,509	2,509	2,509	2,509	2,509	2,509	2,509	0	0	0	0	0	0	0	0	0	0	17,563	58,513
32.	*Subtotal, other capital financing*	*2,587,756*	*202,526*	*(98,491)*	*27,509*	*4,509*	*4,509*	*4,509*	*4,509*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*2,787*	*177,450*	*2,765,206*
33.	**Total Financing of Capital Requirements**	**4,822,177**	**202,526**	**285,509**	**117,509**	**65,509**	**48,509**	**22,509**	**23,509**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**2,787**	**793,450**	**5,615,627**

TABLE 15-2

State Water Project Revenues and Expenses, June 30, 1994

(Thousands of dollars)

Line Number	Line Item	Calendar year 1952-1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total 1993-2010	Total 1952-2010
	Project Revenues																				
1.	Capital resources revenues	770,492	3,000	3,000	2,000	2,000	2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	24,000	794,492
	Water Contractor Payments																				
2.	Transportation capital	1,985,383	101,639	108,496	120,840	125,014	125,100	125,139	123,173	125,210	125,225	125,244	125,223	125,222	125,222	125,221	124,221	125,220	125,219	2,083,608	4,068,991
3.	Transportation minimum	2,282,674	239,735	211,786	243,697	239,429	237,785	233,678	222,552	221,982	216,908	211,740	237,712	199,818	196,562	192,065	186,030	181,059	178,282	3,620,820	5,908,494
4.	Transportation variable	956,805	83,097	130,846	161,655	171,477	163,065	168,215	200,176	197,346	197,180	197,592	198,618	234,254	232,514	235,191	234,402	238,745	239,636	3,284,009	4,240,814
5.	Delta water charge	886,580	82,756	86,725	92,969	93,889	95,298	96,889	98,400	100,473	102,006	102,703	103,409	104,115	104,828	105,556	106,299	107,053	107,821	1,691,189	2,577,769
6.	East Branch Enlargement payments	106,290	31,672	41,747	41,655	43,361	43,303	43,281	44,236	44,277	44,045	44,060	42,677	42,696	42,736	42,792	46,609	42,902	42,964	725,013	831,303
7.	Water revenue bond surcharge	67,967	23,906	29,500	35,152	35,882	36,803	37,518	37,102	37,336	37,073	37,009	38,036	38,089	38,181	38,271	38,335	38,426	38,513	615,132	683,099
8.	*Subtotal water contractor payments under long-term water supply contracts*	*6,285,699*	*562,805*	*609,100*	*695,968*	*709,052*	*701,354*	*704,720*	*727,639*	*726,624*	*722,437*	*718,328*	*715,675*	*744,194*	*740,043*	*739,096*	*736,896*	*733,405*	*732,435*	*12,019,771*	*18,305,470*
9.	Revenue bond cover adjustments	0	(22,485)	(28,112)	(32,581)	(32,558)	(32,542)	(32,481)	(32,474)	(32,454)	(32,449)	(32,346)	(32,352)	(32,277)	(32,059)	(32,097)	(32,125)	(32,900)	(32,170)	(536,462)	(536,462)
	Other Revenues																				
10.	Federal payments for project operating costs	99,280	8,810	9,221	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	158,800	258,080
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	0	16,657
12.	Local agency payments under Davis-Grunsky Loan repayment contracts	29,044	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	2,000	34,000	63,044
13.	Revenue bond proceeds	386,399	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	386,399
14.	Interest earnings on operating revenues	388,874	7,439	7,325	6,920	7,035	7,155	7,285	7,420	7,565	7,720	7,885	8,055	8,240	8,435	8,640	8,860	9,090	9,335	134,404	523,278
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	0	249,279
16.	Miscellaneous revenues	103,416	75,739	8,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83,739	187,155
17.	*Subtotal other revenues*	*1,272,949*	*93,988*	*26,546*	*18,265*	*18,402*	*18,526*	*18,673*	*18,808*	*18,956*	*19,111*	*19,276*	*19,446*	*19,631*	*19,826*	*20,031*	*20,251*	*20,481*	*20,726*	*410,943*	*1,683,892*
18.	***Total Operating Revenues***	***7,558,648***	***634,308***	***607,534***	***681,652***	***694,896***	***687,338***	***690,912***	***713,973***	***713,126***	***709,099***	***705,258***	***702,769***	***731,548***	***727,810***	***727,030***	***725,022***	***720,986***	***720,991***	***11,894,252***	***19,452,900***
19.	**Total Operating Revenues and Capital Resources Revenues**	**8,329,140**	**637,308**	**610,534**	**683,652**	**696,896**	**689,338**	**691,912**	**714,973**	**714,126**	**710,099**	**706,258**	**703,769**	**732,548**	**728,810**	**728,030**	**726,022**	**721,986**	**721,991**	**11,918,252**	**20,247,392**
	Project Expenses																				
20.	Project operation, maintenance, and power costs	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	6,514,588	9,610,020
21.	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	125,252	273,260
22.	Deposits to special reserves under revenue bond financing	609,873	(189,206)	108,469	(23,023)	(16)	(61)	(1,007)	(1,020)	(1,792)	(1,890)	(1,781)	(1,862)	(2,005)	(1,749)	(1,759)	(1,012)	(2,517)	(1,757)	(123,988)	485,885
23	Capital resources expenditures and miscellaneous operating expenditures	456,671	201,602	(96,671)	29,523	6,750	12,987	13,237	13,498	13,921	12,921	12,291	12,291	11,921	11,921	12,921	12,921	11,921	12,921	308,136	764,807
	Payments of Debt Service																				
24.	Principal repayments on bonds sold through June 30, 1994 (current bonds)	729,265	100,224	69,894	73,150	75,016	77,120	80,431	83,690	87,425	91,370	96,250	101,660	105,730	110,910	116,570	122,945	129,700	136,100	1,658,185	2,387,450
25.	Interest on bonds sold through June 30, 1994 (current bonds)	3,036,733	168,043	164,766	161,037	157,197	153,344	149,418	145,266	140,968	136,049	131,226	125,874	120,164	114,310	108,108	101,553	94,832	87,767	2,259,922	5,296,655
26.	Future East Branch Enlargement bond principal repayments	0	0	755	800	845	900	950	1,010	1,070	1,135	1,200	1,275	1,350	1,430	1,515	1,610	1,705	1,805	19,355	19,355
27.	Future East Branch Enlargement bond interest payments	0	0	5,040	4,995	4,946	4,895	4,841	4,783	4,727	4,660	4,593	4,521	4,444	4,362	4,276	7,186	4,089	3,987	76,345	76,345
28.	Future Water Bond principal repayments	0	0	0	3,350	4,430	5,295	5,855	6,405	6,820	7,050	7,495	7,955	8,425	8,920	9,425	9,750	10,300	11,060	112,535	112,535
29.	Future Water Bond interest payments	0	0	0	15,280	20,501	23,919	26,268	27,022	27,806	27,417	27,013	26,584	26,128	25,646	25,135	24,595	24,034	23,442	370,790	370,790
30.	**Total Principal**	**729,265**	**100,224**	**70,649**	**77,300**	**80,291**	**83,315**	**87,236**	**91,105**	**95,315**	**99,555**	**104,945**	**110,890**	**115,505**	**121,260**	**127,510**	**134,305**	**141,705**	**148,965**	**1,790,075**	**2,519,340**
31.	**Total Interest**	**3,036,733**	**168,043**	**169,806**	**181,312**	**182,644**	**182,158**	**180,527**	**177,071**	**173,501**	**168,126**	**162,832**	**156,979**	**150,736**	**144,318**	**137,519**	**133,334**	**122,955**	**115,196**	**2,707,057**	**5,743,790**
32.	*Subtotal Debt Service*	*3,765,998*	*268,267*	*240,455*	*258,612*	*262,935*	*265,473*	*267,763*	*268,176*	*268,816*	*267,681*	*267,777*	*267,869*	*266,241*	*265,578*	*265,029*	*267,639*	*264,660*	*264,161*	*4,497,132*	*8,263,130*
33.	**Total Operating Expenses and Debt Service**	**8,075,982**	**606,077**	**600,934**	**647,970**	**658,557**	**659,638**	**661,536**	**683,818**	**680,321**	**673,309**	**668,961**	**666,179**	**694,538**	**689,433**	**688,116**	**684,889**	**678,690**	**678,154**	**11,321,120**	**19,397,102**
34.	Net revenues	253,158	31,231	9,600	35,682	38,339	29,700	30,376	31,155	33,805	36,790	37,297	37,590	38,010	39,377	39,914	41,133	43,296	43,837	597,132	850,290
	Application of Net Revenue																				
35.	California Water Fund repayment	176,457	48,000	25,000	25,000	19,896	0	0	0	0	0	0	0	0	0	0	0	0	0	117,896	294,353
36.	Revenues used for capital expenditures	40,950	2,509	2,509	2,509	2,509	2,509	2,509	2,509	0	0	0	0	0	0	0	0	0	0	17,563	58,513
37.	Revenues available for capital expenditures	35,751	(19,278)	(17,909)	8,173	15,934	27,191	27,867	28,646	33,805	36,790	37,297	37,590	38,010	39,377	39,914	41,133	43,296	43,837	461,673	497,424

TABLE 15-3

Allocation of Capital Expenditures

(Thousands of dollars)

Facilities and Construction Divisions	*Expenditures Incurred Through 1993*	*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 River Division	17,703	0	17,703	1,182	0	16,521	0
Oroville Division	549,691	199	549,890	463,282	70,661	15,947	0
North Bay Aqueduct	93,382	1,657	95,039	95,039	0	0	0
Delta Facilities	324,195	153,275	477,470	410,624	0	66,846	0
South Bay Aqueduct	76,504	162	76,666	55,050	7,512	14,104	0
California Aqueduct							
North San Joaquin Division	248,220	12,235	260,455	251,600	0	8,855	0
San Luis Division	230,889	387	231,276	219,350	0	11,926	0
South San Joaquin Division	291,388	321	291,709	275,082	0	16,627	0
Tehachapi Division	316,447	80	316,527	298,485	0	18,042	0
Mojave Division	313,586	5,265	318,851	300,676	0	18,175	0
Santa Ana Division	212,367	33,739	246,106	232,078	0	14,028	0
West Branch	525,517	16,529	542,046	511,149	0	30,897	0
Coastal Branch	38,628	299,892	338,520	338,520	0	0	0
Subtotal, California Aqueduct	2,177,042	368,448	2,545,490	2,426,940	0	118,550	0
Small hydroelectric power generating facilities	78,274	6,773	85,047	85,047	0	0	0
Off-aqueduct power generating facilities	439,294	0	439,294	439,294	0	0	0
East Branch Enlargement	380,586	51,765	432,351	432,351	0	0	0
San Joaquin drainage facilities	45,432	17,563	62,995	0	0	0	62,995
Planning and preoperations	8,693	105,949	114,642	114,642	0	0	0
Unassigned	305	4,875	5,180	0	0	0	5,180
Subtotal, Project Construction Expenditures	4,191,101	710,666	4,901,767	4,523,451	78,173	231,968	68,175
Other Capital Requirements							
Davis-Grunsky Act Program	127,816	2,184	130,000	0	0	0	130,000
Total	**4,318,917**	**712,850**	**5,031,767**	**4,523,451**	**78,173**	**231,968**	**198,175**

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.

TABLE 15-4

Estimated Costs for East Branch Enlargement

Facility	*Dollar Amounts (in millions)*
Aqueduct and siphons	$132.9
Pearblossom Pumping Plant	64.3
Alamo Powerplant	5.0
Mojave Siphon Powerplant	42.0
Devil Canyon Powerplant and Second Afterbay	188.1
Total	**$432.4**

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	$261.6
Bottle Rock	120.9
South Geysers	49.7
Devil Canyon	36.8
William E. Warne	84.5
Alamo	43.6
Mojave Siphon	34.3
Thermalito Diversion Dam	13.6
Subtotal	$645.0
Transmission Lines	
Midway-Wheeler Ridge	$10.7
Geysers-Lakeville	6.9
Total	**$662.6**

TABLE 15-6

Estimated Costs for Planning Additional Conservation Facilities

Activity	*Projected Expenditures (millions)*
Los Banos Grandes project	$88
Kern Water Bank project	18
Total	**$106**

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, 1994, the Department had sold $3.9 billion of revenue bonds. That amount includes $190 million of Water System Revenue Bonds, Series M, sold December 9, 1993. 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, water revenue 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 $342 million of Water System Revenue Bond proceeds have been applied to the East Branch Enlargement project through December 31, 1993. Of this total amount, $309 million was used for construction expenditures and $33 million for bond discounts, interest costs, and debt service reserves.

Line 23, East Branch Enlargement, Future Bonds, shows the Department's estimate that $104 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, 1993, $731 million of proceeds from Water System Revenue Bonds, Series A through Series M, were applied to SWP projects other than the East Branch Enlargement. Of this total amount, $585 million was used to pay for construction expenditures and $146 million to pay for bond discounts,

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
Subtotal	1,773.4	2.6	209.6	14.8	1,893.4	2,120.4	3,893.8
Future water system facilities bonds	455.7	0.0	15.4	0.0	40.9	56.3	512.0
Future East Branch Enlargement bonds	90.6	0.0	3.0	0.0	10.4	13.4	104.0
Total	**2,319.7**	**2.6**	**228.0**	**14.8**	**1,944.7**	**2,190.1**	**4,509.8**

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 Power Facilities Revenue bonds and Water System Revenue bonds.

capitalized interest, and debt service reserve requirements.

Line 25, Water System Facilities, Future, shows that future water revenue bonds are needed to provide $445 million for construction of SWP water system facilities and $67 million for bond discounts, interest costs, and debt service reserve requirements.

Line 26, Subtotal, Water Revenue Bonds, is the total of Lines 20 through 25.

Line 27, Initial Project Facilities Bond Proceeds, shows the amount of general obligation bonds sold to provide for 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 1995.

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, 1993, was used to finance a total of $510 million of SWP costs.

Line 30, Application of Capital Resources Revenues to Construction, presents the Capital Resources Revenues applied for capital expenditures.

Line 31, Revenue Transfers Applied, shows monies assumed to be transferred to the California Water Fund according to provisions of the Burns-Porter Act and sub-

sequently reappropriated to construction (see Line 36 in Table 15-2). Projected amounts for 1994 through 2010 include funds to finance expenditures for San Joaquin drainage facilities, as indicated in Line 11 of Table 15-1.

Line 32, Subtotal, Other Capital Financing, is the total of Lines 27 through 31.

Line 33, Total Financing of Capital Requirements, is the total of Lines 21, 26, and 32.

Annual Revenues and Expenditures

After 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. These funds will meet all repayment obligations on funds used to finance SWP construction and other authorized costs from 1994 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 first is the Central Valley Water Project Revenue Fund, in which all revenues pledged to revenue bonds are placed. The second is 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 Revenues. 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 1995 water charges billed July 1, 1994. Information about significant differences between the sum of future charges included in Lines 2 through 7 of Table 15-2 and the substantiation of 1995 charges included in Appendix B are as follows:

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 1993. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-1994 charges in Appendix B represent charges as they should have been according to currently known conditions. Pre-1994 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 1994 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-1994 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch

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.

Enlargement share of the Series A through Series M bonds. Charges in Table 15-2 also include amounts of the debt service and cover for assumed future bonds.

- The water bond revenue surcharge in Appendix B applies only to the Series B through Series M bonds. Surcharge values included in Table 15-2 apply to Series B through Series M 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 one 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 and the Department provide their own power to pump their water through the joint facilities.)

The percentage paid by USBR is reviewed every five 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 USBR was completed in 1987 and resulted in a federal share of 44.09 percent for calendar years 1987 through 1992. The amounts in Line 10 are based on the assumption that the federal share will continue at 44.09 percent for calendar years 1994 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

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 nterest 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	11/09/71	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	10/23/79	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	11/16/82	2,720,045	255,744	9.402	
$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds (d	11/16/82	837,769	84,587	10.097	4.666
$ 37,500,000 South Geysers Project, Series D Revenue Bonds	11/16/82	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	12/01/87	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	11/29/88	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	12/01/93	3,911,846	194,981	4.984	
Total		**$144,684,327**	**$8,743,351**		
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

recreational purposes. No appropriations are indicated for 1994 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 million of loans disbursed as of December 31, 1993.

The amounts for future years listed on Line 12 are based on loans currently outstanding. 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 1952-1993 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. State Water Project 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.

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 1996. 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, 1993, $40.8 million had been spent for replacement costs; the balance of the replacement reserve as of that date was $106.8 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 reserves 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; and
- water contractor payments for revenue bond cover requirements.

The 1952-1993 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 and Miscellaneous Operating 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. 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.

Lines 24 and 25, Payment of Debt Service on Bonds Sold through June 30, 1994, show the total principal and interest payments on bonds sold to date. Table 15-11 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 December 9, 1993, were the Series M Water System Revenue Bonds. Proceeds from the Series M 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. Assumptions about the service on these future bonds are as follows:

- interest costs for the water revenue bonds are estimated to 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 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 service costs.

Line 35, California Water Fund Repayment, shows repayments according to the Burns-Porter Act. The Act requires that after operation, maintenance, replacement, and bond service requirements have been satisfied, SWP revenues be transferred to the California Water Fund. The revenues reimburse

TABLE 15-12
Retirement Schedule of Oroville Revenue Bonds 1978 through 1994

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

the fund for monies expended to construct the State Water Resources Development System.

In 1982 and 1983, the Department transferred $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, 1993, reimbursements to the California Water Fund totaled $358 million. Of this total, approximately $176 million was direct repayments and $182 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. 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 1995 and 2000. The unit rates in Table 15-13 include costs of existing and future SWP facilities accounted for in Tables 15-1 and Table 15-7. The unit charges are based on the assumption that in 1995 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 1993 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 1994 through 2010. The escalation rates for future power sources vary, depending on the source of energy.

TABLE 15-13

Estimated Unit Water Charges for 1995 and 2000, by Service Area

(Dollars per Acre-Foot)

	1995		*2000*	
Service Area and Charge	*Unescalated*	*Escalated*	*Unescalated*	*Escalated*
Feather River Area				
Capital; Operations, Maintenance, and Replacement (OM&R)	61	61	40	40
North Bay Area				
Capital; OM&R	180	180	157	157
Power	14	14	14	16
Total	**194**	**194**	**171**	**173**
South Bay Area				
Capital; OM&R	73	73	72	72
Power	34	34	38	42
Total	**107**	**107**	**110**	**114**
Coastal Area				
Capital; OM&R	N/A	N/A	374	374
Power	N/A	N/A	74	86
Total	**N/A**	**N/A**	**448**	**460**
San Joaquin Area				
Capital; OM&R	46	46	46	46
Power	15	15	18	19
Total	**61**	**61**	**64**	**65**
Southern California Area				
Capital; OM&R	114	114	110	110
Power	91	91	106	125
Total	**205**	**205**	**216**	**235**

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, 1994

(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	0	0	0	0	0	0	0	0	0	0	0	0	0	22,935	93,553
1982	19,250	66,162	17,920	10,968	0	7,708	0	7,292	0	7,972	0	0	0	0	0	0	0	0	0	0	0	0	37,170	100,102
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	9,875	710	11,037	44,855	157,881
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	1,565	11,592	295	4,298	1,077	10,104	1,148	14,368	76,979	154,893
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	1,677	11,491	320	4,279	1,134	10,048	1,227	19,554	54,254	159,330
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	1,791	11,376	335	4,257	1,197	16,856	2,129	27,568	58,704	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	1,850	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	30,570	72,081	166,622
1994	35,075	51,274	35,225	934	1,705	6,799	1,575	5,633	9,490	26,273	1,588	4,072	930	2,735	3,374	8,270	780	3,274	4,567	19,797	5,915	38,982	100,224	168,043
1995	36,210	49,653	0	0	1,810	6,684	1,630	5,569	10,175	25,575	1,695	4,005	1000	2,681	3,521	8,133	805	3,242	4,981	20,588	8,067	38,636	69,894	164,766
1996	37,450	47,980	0	0	1,920	6,561	1,685	5,496	10,940	24,805	1,808	3,930	1085	2,620	3,682	7,974	845	3,207	4,542	20,304	9,193	38,160	73,150	161,037
1997	37,145	46,326	0	0	2,035	6,432	1,760	5,417	11,775	23,959	1,945	3,848	1145	2,552	3,861	7,802	895	3,168	5,473	20,069	8,982	37,624	75,016	157,197
1998	37,225	44,704	0	0	2,155	6,295	1,835	5,332	12,570	23,143	2,065	3,759	1230	2,480	4,030	7,613	930	3,124	5,707	19,786	9,373	37,108	77,120	153,344
1999	38,150	43,103	0	0	2,285	6,160	1,915	5,238	13,455	22,263	2,216	3,658	1335	2,401	4,240	7,412	985	3,077	5,981	19,500	9,869	36,606	80,431	149,418
2000	39,440	41,451	0	0	2,420	6,040	2,000	5,137	14,380	21,309	2,095	3,547	910	2,312	4,470	7,191	1,035	3,025	7,053	19,191	9,887	36,063	83,690	145,266
2001	40,530	39,737	0	0	2,565	5,912	2,100	5,027	15,385	20,279	2,205	3,432	970	2,257	4,720	6,950	1,090	2,969	7,422	18,852	10,438	35,553	87,425	140,968
2002	41,670	37,976	0	0	2,720	5,773	2,200	4,910	16,480	19,166	2,325	3,307	1005	2,197	4,990	6,691	1,155	2,908	7,813	18,279	11,012	34,842	91,370	136,049
2003	43,520	36,159	0	0	2,885	5,626	2,310	4,786	17,720	17,962	2,475	3,173	980	2,134	5,285	6,411	1,220	2,843	8,227	17,881	11,628	34,251	96,250	131,226
2004	45,660	34,249	0	0	3,055	5,470	2,430	4,652	19,205	16,443	2,620	3,029	1080	2,073	5,610	6,110	1,295	2,773	7,545	17,455	13,160	33,620	101,660	125,874
2005	46,950	32,255	0	0	3,240	5,305	2,540	4,509	19,930	14,796	2,750	2,873	1135	2,005	5,950	5,784	1,375	2,697	7,962	17,055	13,898	32,885	105,730	120,164
2006	48,240	30,201	0	0	3,435	5,130	2,675	4,359	21,545	13,190	2,920	2,711	1,180	1,938	6,325	5,433	1,450	2,616	8,422	16,628	14,718	32,104	110,910	114,310
2007	49,730	28,081	0	0	3,640	4,945	2,825	4,199	23,255	11,442	3,100	2,536	1,250	1,867	6,730	5,054	1,540	2,529	8,914	16,181	15,586	31,274	116,570	108,108
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	9,435	15,708	16,485	30,394	122,945	101,553
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	9,997	15,181	17,468	29,437	129,700	94,832
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	10,605	14,624	18,520	28,423	136,100	87,767
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	11,246	14,022	19,609	27,340	142,575	80,314
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	11,931	13,378	20,829	26,141	149,540	72,386
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	12,648	12,698	22,112	24,868	123,030	64,109
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	13,417	11,967	23,438	23,567	124,360	57,985
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	14,230	11,192	24,825	22,196	113,385	51,698
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	15,089	10,377	26,296	20,751	106,225	46,029
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	16,005	9,510	27,855	19,219	99,565	40,543
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	16,988	8,587	29,487	17,590	90,485	35,343
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	18,024	7,605	31,246	15,765	85,875	30,268
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	19,131	6,564	33,084	14,040	90,390	25,533
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	20,280	5,500	35,030	12,138	85,850	20,744
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	21,503	4,373	37,042	10,176	83,640	16,210
2023	50	2	0	0	0	0	0	0	0	0	240	59	0	0	1,200	293	0	0	16,781	3,172	43,394	8,086	61,665	11,612
2024	0	0	0	0	0	0	0	0	0	0	576	46	0	0	2,855	227	0	0	18,356	2,227	36,327	5,249	58,114	7,749
2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,964	1,119	22,561	2,863	36,525	3,982
2026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,547	288	14,988	1,528	18,535	1,816
2027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,201	69	11,069	636	12,270	705
Total	1,581,000	2,385,997	244,995	246,522	139,165	283,872	106,510	205,144	422,465	655,168	74,855	118,657	47,980	85,116	156,770	232,447	59,335	106,365	379,012	535,371	678,289	974,574	3,890,376	5,829,233

a) Principal and interest schedule has been adjusted to reflect early redemption of bonds.

Appendix B

Data and Computations Used in Determining Water Charges for 1995

Appendix B

Data and Computations Used in Determining Water Charges for 1995

Contents

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Tables (Text)

Tables for Determining 1995 Water Charges

Appendix B

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 1995. The information is based on established data about the SWP, both known and projected, as of June 30, 1994.

The computational procedures and interrelationships between tabulations in this appendix are outlined in Figure 1 and Figure 2. All tables referenced in Figures 1 and 2 are included in this appendix. Tables listed with a "text" designation may be found in this introductory section of the appendix. Tables listed without the text designation may be found in the section entitled "Tables for Determining 1995 Water Charges," which follows 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

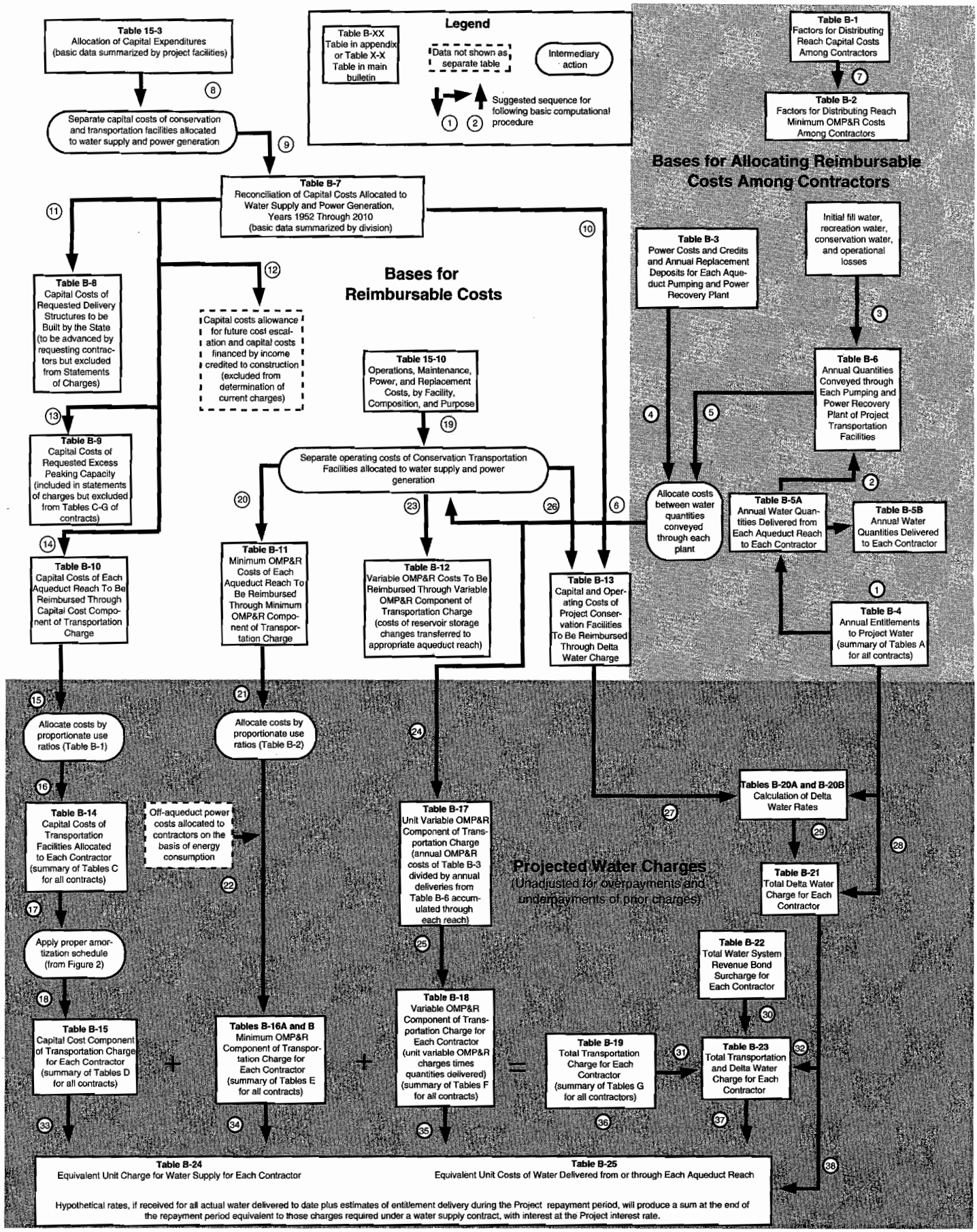


Fig. 1. Relationships of Data Used to Substantiate Statement of Charges

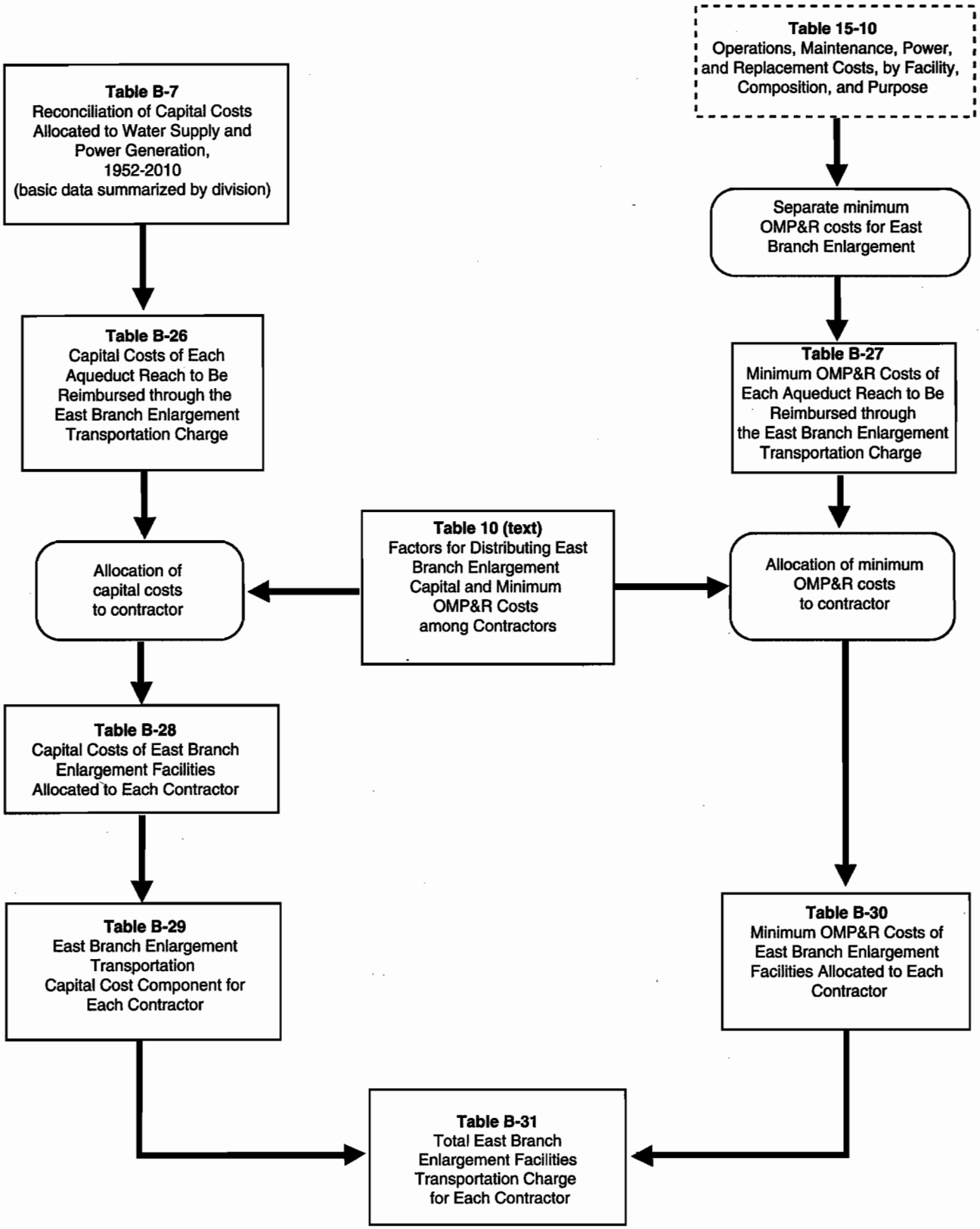


Fig. 2. Relationships of Data Used to Substantiate East Branch Enlargement Charges

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 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; 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 will 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 Table 1, 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 the project repayment period. This appendix includes a redetermination of the Delta Water Rate for 1995.

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

TABLE 1

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 operation
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. Water Project Contract 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 and so forth) 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. Water Project Contract 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" Transmission 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 and 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

Charges for prior years through 1993 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 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 Statement of Charges.

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. 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 Figure 1, upper right). 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 3 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 of that reach by respective contractors under planned conditions of full development.

Information about 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 the Coastal Branch, 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 are 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.

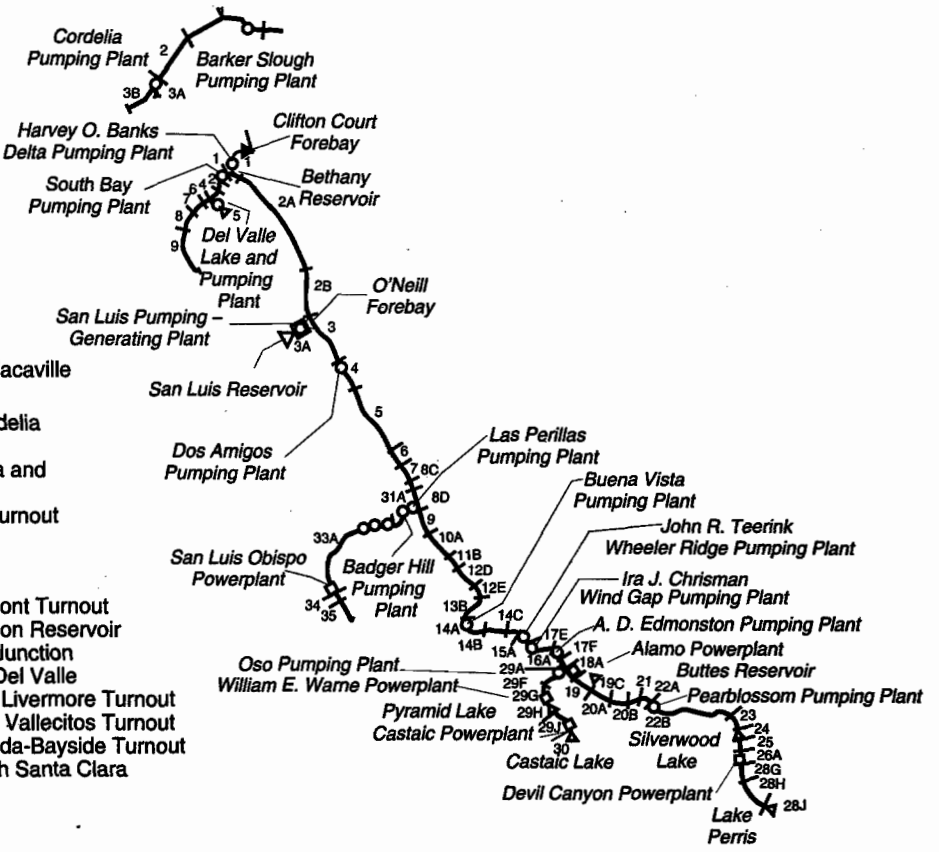
Table B-2 presents corresponding ratios for reimbursable minimum OMP&R costs. Requested excess capacity is omitted when deriving ratios applicable to capital costs because the capital costs for the excess capacity are paid on an incremental-cost basis and not a proportionate-use basis. However, requested 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 powerplant. Those variable costs consist of:

- Costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service



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. 3. Repayment Reaches and Descriptions

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 years 1962 through 1979 were based on a schedule determined in 1970. Sinking fund payments for years 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 surplus and unscheduled water charges 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 1994 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 powerplant 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

TABLE 2
Cost Allocation Factors (Percentages)

Project Facilities	Water Supply and Power Generation		All Other Purposes (Nonreimbursable)	
	Capital Costs	Minimum OMP&R Costs	Capital Costs	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.

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 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 Table 2. 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, 1993; 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 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 powerplants 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 5 percent per year for 1994, 4 percent for 1995, and 5 percent for 1996.

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 (1) the Delta Water Charge; (2) Oroville power sales; and (3) 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 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 Metropolitan Water District of Southern California's Amendment 7, are included as negative capital costs in Table B-14 and Table C of MWDSC's statement of charges for 1994. 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 Table 3 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 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, 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 (see Table 4).

TABLE 3

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
Metropolitan Water District of Southern California	1963
Mojave Water Agency	1964
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(f
Santa Clara Valley Water District	1963
Solano County Water Agency	1973
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 and Butte County 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.

TABLE 4
Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County WaterAgency 1969 through 1996

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	138,501	1990	136,680
1977	120,749	1991	159,973
1978	157,638	1992	182,922
1979	121,207	1993	198,952
1980	150,715	1994	378,936
1981	74,759	1995	357,380
1982	82,774	1996	316,233
Total			**$4,082,597**

TABLE 5
Off-Aqueduct Power Facility Charges and Credits for 1993

Facility	Amount
Charges	
Reid Gardner Powerplant	$90,849,958
Bottle Rock Powerplant	15,651,873
South Geysers Powerplant	6,227,548
Subtotal	112,729,379
Credits	
Off-Aqueduct Power sales	11,438,699
Miscellaneous water	
Solano County Water Agency	2,902
Kern County Water Agency	109
City and County of San Francisco	131,874
Total	**$101,155,795**

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.

Table 5 is a summary of Off-Aqueduct Power Facility charges and credits for 1993.

Table 6 shows projected charges for Off-Aqueduct Power Facilities and an amount equal to 25 percent of annual bond service for 1993 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 kilowatt-hour per acre-foot factors for the pumping plants upstream from the delivery turnouts. The factors are listed in Table 7. The amounts include 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 powerplant 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.

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 Table 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 listed in Tables 8 and 9.

The unit rates shown in Table B-17 constitute the rates for the pumping plants and powerplants 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 powerplants. Extra peaking service costs are excluded.

TABLE 6

Amounts of Projected Charges for Off-Aqueduct Power Facilities 1994 Through 2024

Year	Direct Charge Annual Cost	25 Percent Bond Service
1994	$127,233,794	$13,267,016
1995	116,176,834	13,275,867
1996	120,079,329	13,284,866
1997	121,004,135	13,297,744
1998	118,044,438	13,294,763
1999	113,195,681	13,310,756
2000	104,596,627	13,248,080
2001	102,442,105	13,242,511
2002	97,238,450	13,239,514
2003	92,031,171	13,256,593
2004	87,830,086	13,254,311
2005	79,283,207	13,020,670
2006	76,229,952	13,031,152
2007	71,922,329	13,029,162
2008	65,716,813	13,026,994
2009	61,478,303	13,017,627
2010	54,895,013	13,017,503
2011	51,001,925	13,020,220
2012	47,102,753	13,079,921
2013	11,019,956	4,426,708
2014	23,189,365	4,443,298
2015	9,854,365	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

TABLE 7

kWh Per Acre-Foot Factors for Pumping Plants

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 8

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	Total
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	1,981
1977	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	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	3,306
1980	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	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,535	3,506	144	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	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	76,878
1986	0	0	0	0	1,881	871	0	291	353	767	2,682	0	6,845
1987	0	0	0	606	17,475	7,998	1,161	2,295	1,806	3,460	11,058	0	45,859
1988	639	65	287	891	43,469	20,079	1,863	5,790	4,362	8,268	25,885	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	76,614
1990	46	0	18	325	18,506	8,571	0	143	136	295	610	0	28,650
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	49	0	19	0	1,760	820	0	1,139	1,389	3,009	0	0	8,185
1993	0	0	0	2,601	13,628	5,903	2,121	8,983	10,951	23,720	24,946	7,235	100,088
Total	3,225	1,031	1,807	8,105	248,511	271,520	68,410	37,700	28,762	54,097	97,328	7,235	827,731

TABLE 9

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	Kings County	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella Valley	Water Agency	Desert 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	68	0	0	0	0	0	0	7,581	536	0	0	0	0	0	0	0	0	0	8,185
1993	0	0	3,568	0	0	0	0	43,923	2,454	0	0	0	0	17,687	29,130	0	3,326	0	100,088
Total	4,500	1,562	5,001	2,590	3,523	15,836	1,955	583,526	4,668	1,326	12,877	123,044	8,196	17,687	29,130	2,100	9,788	422	827,731

ACWD = Alameda County Water District
AVEK = Antelope Valley East Kern Water Agency
LCID = Littlerock Creek Irrigation District
SCVWD=Santa Clara Valley Water District
SGVMWD = San Gabriel Valley Municipal Water District

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 1995 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 future Delta Water Charges shown in Table B-21.

Table B-20B shows each component of the 1995 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 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 L. 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 have 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 (1) for extra service (such as for delivery of entitlements down-aqueduct from a contractor's turnout); and (2) for wheeling service to entities other than the long-term water supply contractors. An explanation of wheeling services in the California Aqueduct may be found at the end of this appendix.

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 Silver wood 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 Table 10).

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

TABLE 10

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

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).

Surplus and Other Water Services

Table B-32 shows the quantities of surplus and unscheduled water delivered to long-term contractors from May 1, 1973, through December 31, 1992. Surplus and unscheduled water has been delivered from 1968 through 1992, except during the drought years 1977, 1988, and 1989.

Table B-33 shows the costs for power that have been incurred by the State at each pumping plant associated with surplus and unscheduled water deliveries included in Table B-32.

Table B-34 shows the actual charges to each contractor for delivery surplus and unscheduled water quantities included in Table B-32. The method of determining those charges is described in Bulletin 132-77, page 117.

Wheeling Services in the California Aqueduct

When the SWP has additional capability to move nonproject water through the California Aqueduct, services can include pumping, transporting (wheeling), and, if needed temporarily, storing in San Luis Reservoir for delivery at a later time. For example, through separate annual agreements, the SWP has provided wheeling to temporary federal water contractors, with the federal Central Valley Project providing the water and electrical power required for making these deliveries. Nine San Joaquin Valley districts signed 20-year agreements during 1975 and 1976. Those agreements provide for wheeling CVP water through SWP facilities to the Cross Valley Canal in Kern County. Additional agreements provide for temporary storage, generally in cases when water cannot be wheeled directly to the user on a demand basis.

For the most part, rates for wheeling and storing water are developed from information included in Appendix B. Wheeling rates are calculated from Appendix B tables used in developing contractors' charges for the year the water is wheeled. Wheeling rates for 1993 were developed from Appendix B tables in Bulletin 132-92.

Annual wheeling rates are developed from four sources:

1. *Table B-25*. Capital and minimum OMP&R equivalent unit transportation costs of water for the aqueduct reaches used.
2. *Table B-20B*. That portion of the Delta Water Rate associated with capital and minimum costs of

California Aqueduct reaches 1, 2A, 2B, and 3. For SWP purposes, a portion of costs for these reaches is allocated to SWP contractors as part of the Delta Water Rate. Those costs are added to wheeling rates because they reflect the total costs of constructing and maintaining these reaches, regardless of the SWP repayment system.

3. *Variable replacement costs.* The Department charges a fixed rate for every acre-foot of water going through SWP pumping plants to provide funds for eventual replacement of equipment.
4. *Fish agreement costs.* On December 30, 1986, the Department of Water Resources and the Department of Fish and Game entered into an agreement to provide a means to offset specific fish losses at Banks Pumping Plant. Specific fish losses are calculated each year; those calculations are used to develop payment amounts for a fund to pay fishery program costs. Those costs are then recalculated on an acre-foot basis by the Department of Water Resources and are allocated to water users based on acre-feet of pumped water. Wheeling charges are based on estimates of the maximum number of fish likely to be lost each year due to pumping from the Delta.

The SWP operates under Delta export limitations as a condition of water right permits and DFG agreements. When deliveries from the California Aqueduct are requested during key summer months, some Cross Valley Canal contractors or contractors with annual wheeling agreements may be allowed to use the SWP share of water stored in San Luis Reservoir.

Advance deliveries are made from SWP water stored in San Luis Reservoir provided that the U.S. Bureau of Reclamation agrees to replace the water later in the year. The San Luis Reservoir use charge is equal to the San Luis Reservoir portion of the Delta Water Rate as indicated in Table B-20B plus the estimated value of the net energy costs to replace water in the San Luis Reservoir.

Surplus and Unscheduled Water Administrative Charges

The costs associated with administering the surplus and unscheduled water programs are divided into the five following categories. The costs are updated annually, and both programs are administered separately.

Category 1, Setup Costs. Activities include setting up the initial surplus or unscheduled water program, receiving and verifying surplus water requests, preparing annual surplus or unscheduled water contracts, and determining availability of surplus water.

Category 2, Determination of Costs. Activities include either preparing letters notifying all surplus water contractors or verbally notifying all unscheduled water contractors of the maximum charge for water each month and determining final delivery amounts and charges.

Category 3, Schedule Revision Costs. This cost is applicable only to the surplus water program. Activities include analyzing revised operation studies and preparing revised delivery schedules.

Category 4, Delivery Billing Costs. Activities include analyzing delivery data from Division of Operations and Maintenance field divisions, updating data summaries, and preparing monthly bills. The multiple scheduling each month for unscheduled water is included in the delivery billing costs.

Category 5, Computer Program Development Costs. Activities include developing computer programs to allocate available surplus water or unscheduled water among contractors and determining the power charge for pumping surplus or unscheduled water. Those costs are not incurred annually.

Tables for Determining 1995 Water Charges

Tables B-1 through B-34

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 Teerink Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Teerink 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	So. 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 Pwp.	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		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	
				Municipal and Industrial	Agricultural				
	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									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				0.14947726	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		South Bay Area				Total
		Napa County FC&WCD	Solano County Water Agency	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor	
	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	0.492377	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		Southern California Area				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	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 Teerink Pumping Plant			0.04732690	0.01872938	0.00855917	0.00216459	0.01411577
15A	Teerink 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	So. 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 Pwp.	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	0.0068038	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	5,370,124	2,608,546	2,288,359	2,320,323	4,583,116	15,035,581
1988	17,867	38,092	23,987	914,733	5,928,304	2,700,388	2,646,118	2,679,795	5,329,296	17,534,056
1989	26,415	94,620	6,676	1,115,184	11,287,947	4,112,138	4,102,531	4,177,761	8,772,301	29,234,292
1990	58,957	138,734	43,103	1,897,883	9,851,194	4,762,459	5,989,171	6,328,450	14,254,226	50,140,948
1991	25,010	99,673	2,122	565,797	2,397,884	1,013,372	899,059	867,671	2,162,622	7,670,502
1992	24,442	75,403	11,628	333,114	2,978,691	1,276,113	1,394,100	1,464,668	2,947,509	9,869,131
1993	(21,764)	(22,090)	(6,328)	(172,031)	(149,309)	264,628	(90,459)	(111,799)	(626,269)	(2,301,732)
1994	69,190	54,850	55,148	781,771	6,529,308	3,645,273	3,547,974	4,066,282	8,011,573	27,081,776
1995	160,556	109,246	94,052	2,671,419	22,998,139	9,994,331	11,291,533	13,053,377	27,073,337	94,376,025
1996	195,387	123,527	215,251	2,991,118	25,609,241	11,205,727	12,803,928	14,831,910	30,875,294	107,846,898
1997	186,557	125,405	123,374	3,576,512	28,166,526	12,522,697	14,430,011	16,736,927	34,961,546	122,378,750
1998	184,796	125,165	126,199	3,456,179	28,341,274	11,856,728	13,468,551	15,591,625	32,500,362	113,633,154
1999	194,543	125,677	136,757	3,553,559	29,611,125	12,473,247	14,487,209	16,551,120	34,516,514	120,944,391
2000	217,506	138,614	157,665	3,868,649	31,776,434	13,580,662	15,931,991	18,220,342	38,077,327	133,563,798
2001	219,029	137,820	164,225	3,846,474	31,787,906	13,487,720	15,806,074	18,073,319	37,762,739	132,447,314
2002	224,073	139,380	172,541	3,890,032	32,047,911	13,629,997	15,981,562	18,274,472	38,190,923	133,963,124
2003	229,393	140,811	181,984	3,929,941	32,353,528	13,755,835	16,134,287	18,448,998	38,561,973	135,275,772
2004	234,453	142,045	191,128	3,964,411	32,652,410	13,836,217	16,216,077	18,538,557	38,749,831	135,936,283
2005	263,820	161,591	212,499	4,237,154	35,005,898	14,961,219	17,765,806	20,348,182	42,622,515	149,682,116
2006	266,146	161,433	218,388	4,233,031	35,087,896	14,900,143	17,664,197	20,225,585	42,357,587	148,737,058
2007	271,816	163,037	228,070	4,275,082	35,384,413	15,081,574	17,912,563	20,516,184	42,979,762	150,946,040
2008	277,445	164,270	238,887	4,307,384	35,637,966	15,134,266	17,948,820	20,550,858	43,049,192	151,184,210
2009	283,354	165,914	248,924	4,350,495	35,911,125	15,348,387	18,253,269	20,909,351	43,818,363	153,917,739
2010	292,181	169,815	260,486	4,413,256	36,728,546	15,633,007	18,648,045	21,372,345	44,810,420	157,440,991
2011	296,998	170,416	271,352	4,428,866	36,857,468	15,668,814	18,684,002	21,411,630	44,892,701	157,730,104
2012	321,225	182,326	299,280	4,738,406	39,278,985	16,732,505	20,027,397	22,958,928	48,190,482	169,411,963
2013	321,309	180,137	306,769	4,681,487	38,762,890	16,529,013	19,766,251	22,657,148	47,546,699	167,130,342
2014	328,811	182,012	321,105	4,730,237	39,192,436	16,785,192	20,135,745	23,093,403	48,483,325	170,460,033
2015	334,046	183,417	332,116	4,721,826	39,126,027	16,627,332	19,869,681	22,771,412	47,787,207	167,976,915
2016	337,991	183,557	343,210	4,725,414	39,219,865	16,710,105	20,010,633	22,942,281	48,156,679	169,295,361
2017	354,112	190,073	366,921	4,893,191	40,455,478	17,250,922	20,675,013	23,702,996	49,775,572	175,024,870
2018	357,217	189,630	377,681	4,881,761	40,340,998	17,230,394	20,659,013	23,686,854	49,742,349	174,909,874
2019	361,261	189,563	389,401	4,880,063	40,386,419	17,180,152	20,572,637	23,582,089	49,515,798	174,101,472
2020	360,244	186,996	396,639	4,813,947	39,877,986	17,065,503	20,485,762	23,495,631	49,340,020	173,493,417
2021	360,689	186,831	398,284	4,809,696	39,871,582	16,901,010	20,200,592	23,148,995	48,589,824	170,815,966
2022	361,018	187,001	398,647	4,814,083	39,930,852	17,005,442	20,378,723	23,365,029	49,057,103	172,483,319
2023	360,792	186,884	398,398	4,811,075	39,855,185	17,001,180	20,376,407	23,363,094	49,053,315	172,471,233
2024	360,759	186,866	398,361	4,810,624	39,872,960	16,993,466	20,363,519	23,347,613	49,019,701	172,351,244
2025	360,621	186,795	398,209	4,808,793	39,907,417	17,009,693	20,395,627	23,387,298	49,106,293	172,660,498
2026	360,057	186,503	397,586	4,801,263	39,820,059	16,975,521	20,348,335	23,331,801	48,987,435	172,238,204
2027	360,066	186,508	397,597	4,801,394	39,820,131	16,975,955	20,348,874	23,332,420	48,988,753	172,242,870
2028	358,847	185,877	396,250	4,785,130	39,693,478	16,922,232	20,282,148	23,255,832	48,825,687	171,665,525
2029	358,829	185,868	396,230	4,784,897	39,684,460	16,916,178	20,271,791	23,243,231	48,798,387	171,568,261
2030	358,821	185,863	396,222	4,784,791	39,668,051	16,947,593	20,328,025	23,311,780	48,947,099	172,099,221
2031	358,836	185,871	396,238	4,784,987	39,714,191	16,936,478	20,307,668	23,286,930	48,893,079	171,906,379
2032	358,778	185,841	396,174	4,784,218	39,753,374	16,932,879	20,302,721	23,281,106	48,880,495	171,861,758
2033	358,686	185,792	396,072	4,782,983	39,625,102	16,901,072	20,248,297	23,215,046	48,737,789	171,352,487
2034	358,845	185,875	396,248	4,785,111	39,713,377	16,945,933	20,324,229	23,307,098	48,936,760	172,062,407
2035	358,910	185,909	396,319	4,785,968	40,478,376	16,903,741	20,247,623	23,213,405	48,733,573	171,336,781
Total	12,668,940	7,405,443	12,766,611	197,139,347	1,583,133,288	675,718,407	795,204,522	907,602,219	1,900,975,397	6,668,647,556

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)

Calendar Year	California Aqueduct (continued)									Grand Total (20)
	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 29A	Reach 29G	Reach 29J	Reach 31A	Reach 33A	
	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)	
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	6,765,086
1988	(767,246)	2,426,127	0	(14,655,710)	1,490,282	(7,385,651)	(12,678,838)	235,508	0	6,477,108
1989	(778,167)	4,369,096	0	(19,092,290)	2,148,429	(8,720,204)	(14,653,369)	311,766	0	26,515,126
1990	(845,641)	6,818,741	0	(21,336,948)	3,032,949	(11,692,826)	(19,863,014)	467,835	0	50,046,221
1991	(444,319)	788,673	0	(7,847,817)	537,166	(6,723,014)	(11,401,799)	(100,112)	0	(9,487,510)
1992	(974,183)	1,284,014	0	(9,773,109)	788,279	(5,666,779)	(9,522,877)	125,570	0	(3,364,286)
1993	(58,141)	(395,292)	0	(7,502,549)	145,212	(5,106,586)	(10,041,358)	(65,414)	0	(26,261,281)
1994	67,663	4,125,840	0	(16,086,090)	1,921,954	(7,460,171)	(13,267,100)	135,617	0	23,280,858
1995	(2,164,837)	14,336,614	0	(30,559,340)	5,938,484	(15,287,921)	(26,781,100)	479,250	0	127,783,165
1996	(2,178,937)	16,717,899	(6,529,600)	(29,996,840)	6,581,073	(15,465,421)	(27,091,100)	529,999	817,731	150,083,085
1997	(5,165,082)	17,416,237	(4,952,416)	(30,317,140)	7,977,977	(18,379,371)	(29,708,550)	865,562	1,104,430	172,049,952
1998	(5,013,695)	16,464,356	(5,308,184)	(29,485,315)	7,282,534	(17,391,421)	(28,062,250)	835,674	1,028,653	159,634,385
1999	(5,137,775)	17,036,033	(5,464,088)	(30,040,840)	7,844,168	(18,228,371)	(29,512,600)	1,211,146	1,771,774	172,073,589
2000	(5,319,524)	19,043,036	(5,801,488)	(29,999,340)	8,455,468	(18,166,296)	(29,386,200)	1,270,901	2,059,210	197,688,755
2001	(5,300,395)	18,823,083	(5,610,472)	(30,136,490)	8,410,584	(18,165,521)	(29,387,550)	1,263,616	2,038,984	195,668,459
2002	(5,302,557)	19,043,716	(5,591,824)	(30,157,315)	8,499,796	(18,167,346)	(29,381,500)	1,277,926	2,078,719	198,813,630
2003	(5,298,844)	19,222,617	(5,606,832)	(30,196,615)	8,581,384	(18,167,321)	(29,381,300)	1,291,036	2,115,124	201,571,771
2004	(5,250,669)	19,231,295	(5,583,536)	(30,177,140)	8,651,781	(18,166,371)	(29,381,200)	1,302,360	2,146,570	203,234,502
2005	(5,511,989)	21,476,360	(5,867,736)	(30,989,690)	9,243,874	(18,223,696)	(29,493,000)	1,353,281	2,395,378	229,643,582
2006	(5,467,527)	21,210,402	(5,725,384)	(31,096,490)	9,234,765	(18,223,121)	(29,491,000)	1,351,964	2,391,616	228,036,689
2007	(5,506,631)	21,628,423	(5,800,592)	(31,193,715)	9,329,234	(18,235,421)	(29,512,700)	1,365,394	2,429,977	232,262,510
2008	(5,446,988)	21,524,408	(5,722,360)	(31,077,540)	9,392,069	(18,230,221)	(29,501,550)	1,375,711	2,459,446	233,266,273
2009	(5,547,756)	22,125,217	(5,783,232)	(31,099,265)	9,477,938	(18,225,196)	(29,493,100)	1,389,480	2,498,773	238,549,780
2010	(5,650,686)	22,404,419	(5,684,560)	(31,660,615)	9,633,354	(18,266,271)	(29,575,450)	1,409,525	2,556,025	244,934,833
2011	(5,634,659)	22,460,511	(5,837,608)	(31,489,565)	9,624,010	(18,203,496)	(29,447,150)	1,414,511	2,570,266	245,869,171
2012	(5,671,930)	24,186,313	(5,930,512)	(31,569,065)	10,284,046	(18,238,171)	(29,521,350)	1,513,373	2,852,641	270,046,842
2013	(5,650,968)	23,846,816	(5,881,344)	(31,561,765)	10,155,117	(18,221,296)	(29,486,300)	1,495,195	2,800,717	265,378,217
2014	(5,724,664)	24,544,239	(5,904,808)	(31,625,415)	10,272,487	(18,248,021)	(29,536,850)	1,510,764	2,845,189	271,845,220
2015	(5,602,417)	23,882,399	(5,637,296)	(31,639,315)	10,233,527	(18,216,596)	(29,473,850)	1,508,078	2,837,515	267,622,024
2016	(5,658,676)	24,241,880	(5,780,544)	(31,771,965)	10,251,267	(18,232,071)	(29,504,000)	1,509,224	2,840,788	269,820,999
2017	(5,656,467)	25,024,776	(5,759,880)	(31,720,640)	10,595,782	(18,230,771)	(29,503,950)	1,562,808	2,993,842	281,994,648
2018	(5,682,646)	25,048,564	(5,759,096)	(31,729,990)	10,575,409	(18,235,471)	(29,512,600)	1,559,159	2,983,417	281,622,517
2019	(5,627,703)	24,824,844	(5,703,376)	(31,662,240)	10,565,787	(18,226,071)	(29,495,200)	1,558,616	2,981,866	280,375,378
2020	(5,727,296)	24,990,957	(5,781,776)	(31,905,515)	10,443,505	(18,246,846)	(29,533,800)	1,537,499	2,921,551	278,214,424
2021	(5,619,384)	24,232,431	(5,750,696)	(31,818,090)	10,418,009	(18,222,821)	(29,486,100)	1,536,142	2,917,675	273,490,635
2022	(5,715,311)	24,697,261	(6,028,512)	(31,715,490)	10,436,383	(18,235,571)	(29,512,500)	1,537,543	2,921,677	276,366,697
2023	(5,734,957)	24,726,730	(6,070,008)	(31,706,690)	10,424,010	(18,226,596)	(29,495,000)	1,536,582	2,918,932	276,250,566
2024	(5,723,583)	24,676,855	(6,023,136)	(31,686,515)	10,429,247	(18,234,996)	(29,512,400)	1,536,438	2,918,521	276,085,544
2025	(5,742,806)	24,787,119	(5,994,072)	(31,925,340)	10,423,842	(18,234,146)	(29,508,000)	1,535,854	2,916,850	276,480,545
2026	(5,741,537)	24,704,545	(5,956,888)	(31,817,415)	10,407,001	(18,232,221)	(29,504,000)	1,533,448	2,909,983	275,749,680
2027	(5,741,537)	24,705,213	(5,956,888)	(31,817,415)	10,407,271	(18,232,221)	(29,504,000)	1,533,491	2,910,103	275,758,585
2028	(5,741,537)	24,622,555	(5,956,888)	(31,817,415)	10,373,870	(18,232,221)	(29,504,000)	1,528,296	2,895,265	274,538,931
2029	(5,734,534)	24,593,925	(5,953,696)	(31,804,090)	10,373,392	(18,232,046)	(29,503,950)	1,528,221	2,895,052	274,370,406
2030	(5,724,288)	24,761,586	(5,832,064)	(31,884,565)	10,371,831	(18,228,896)	(29,500,100)	1,528,188	2,894,956	275,414,114
2031	(5,713,525)	24,727,790	(5,870,144)	(31,886,565)	10,361,578	(18,215,146)	(29,469,600)	1,528,250	2,895,136	275,128,431
2032	(5,691,764)	24,658,289	(5,802,720)	(31,937,590)	10,383,994	(18,247,071)	(29,538,250)	1,528,004	2,894,431	274,984,667
2033	(5,669,063)	24,538,649	(5,754,112)	(31,932,965)	10,369,431	(18,231,971)	(29,504,200)	1,527,610	2,893,306	274,040,011
2034	(5,715,405)	24,752,823	(5,871,992)	(31,888,065)	10,370,705	(18,227,046)	(29,495,100)	1,528,290	2,895,247	275,365,340
2035	(5,724,664)	24,638,818	(6,072,304)	(31,527,190)	10,326,822	(18,160,971)	(29,363,850)	1,528,564	2,896,030	275,181,860
Total	(227,516,622)	959,401,326	(231,902,664)	(1,447,803,674)	411,299,468	(819,523,724)	(1,364,447,879)	61,016,823	102,093,366	10,203,878,150

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-SWP water from June 1962 through November 1967. Actual delivery quantities of project water are shown for 1967.
b) District's Table A quantities exclude amounts from 1968 through 1987 that are assumed to be supplied by non-SWP 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				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	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	9,726	5,392	15,118	0	222	8,302	4,681	0	189
1989	486	10	17,246	3,819	21,075	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	425	14,709	14,471	5,286	34,466	0	190	5,843	8,178	0	6,077
1994	635	11,150	16,930	5,685	33,765	0	515	4,900	7,930	0	472
1995	1,250	16,900	17,340	9,780	44,020	0	515	8,104	11,215	0	552
1996	1,304	20,050	17,750	10,425	48,225	0	515	8,288	11,760	0	840
1997	1,352	20,100	18,150	11,065	49,315	0	515	8,479	12,565	0	840
1998	1,400	20,150	18,560	11,710	50,420	0	515	8,630	11,318	0	840
1999	1,469	20,772	18,393	12,330	51,495	0	828	7,800	6,711	0	2,610
2000	1,522	21,012	18,608	13,050	52,670	0	828	7,800	6,711	0	2,610
2001	1,577	21,012	18,608	13,665	53,285	0	828	7,800	6,711	0	2,610
2002	1,632	21,012	18,608	14,185	53,805	0	828	7,800	6,711	0	2,610
2003	1,690	21,012	18,608	14,800	54,420	0	828	7,800	6,711	0	2,610
2004	1,766	21,012	18,608	15,400	55,020	0	828	7,800	6,711	0	2,610
2005	1,827	22,012	19,488	16,000	57,500	0	828	7,800	6,711	0	2,610
2006	1,890	22,012	19,488	16,450	57,950	0	828	7,800	6,711	0	2,610
2007	1,954	22,012	19,488	17,000	58,500	0	828	7,800	6,711	0	2,610
2008	2,020	22,012	19,488	17,650	59,150	0	828	7,800	6,711	0	2,610
2009	2,112	22,012	19,488	18,200	59,700	0	828	7,800	6,711	0	2,610
2010	2,183	22,144	19,356	18,750	60,250	0	828	7,800	6,711	0	2,610
2011	2,256	22,144	19,356	19,400	60,900	0	828	7,800	6,711	0	2,610
2012	2,332	22,144	19,356	19,950	61,450	0	828	7,800	6,711	0	2,610
2013	2,410	22,144	19,356	20,600	62,100	0	828	7,800	6,711	0	2,610
2014	2,449	22,144	19,356	21,250	62,750	0	828	7,800	6,711	0	2,610
2015	2,515	22,276	19,724	21,900	63,900	0	828	7,800	6,711	0	2,610
2016	2,580	22,276	19,724	22,500	64,500	0	828	7,800	6,711	0	2,610
2017	2,642	22,276	19,724	23,100	65,100	0	828	7,800	6,711	0	2,610
2018	2,700	22,276	19,724	23,700	65,700	0	828	7,800	6,711	0	2,610
2019	2,700	22,276	19,724	24,300	66,300	0	828	7,800	6,711	0	2,610
2020	2,700	22,276	19,724	24,900	66,900	0	828	7,800	6,711	0	2,610
2021	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2022	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2023	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2024	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2025	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2026	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2027	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2028	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2029	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2030	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2031	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2032	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2033	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2034	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
2035	2,700	22,276	19,724	25,000	67,000	0	828	7,800	6,711	0	2,610
Total	102,429	932,372	878,961	954,077	2,765,410	53,844	50,665	452,596	393,759	8,749	121,445

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	101,055	3,084	0	0	0	0	0	0	0	0
1969	0	813	0	62,264	69,712	3,016	0	0	0	0	0	0	0	0
1970	0	0	0	80,311	89,560	5,911	0	0	0	0	0	0	0	0
1971	0	5,961	0	87,606	98,584	7,212	0	0	0	0	0	0	0	0
1972	0	26,182	0	100,266	138,426	8,166	0	0	0	0	0	0	0	0
1973	0	2,521	0	88,582	94,078	3,214	0	0	0	0	0	0	0	0
1974	0	0	4	88,000	89,318	3,471	0	0	0	0	0	0	0	0
1975	714	393	593	88,000	93,604	3,576	0	0	0	0	0	0	0	0
1976	5,461	13,774	7,526	88,000	126,431	4,112	0	0	0	0	0	0	0	0
1977	5,206	11,284	7,556	76,220	107,704	1,472	0	0	0	0	0	0	0	0
1978	2,348	854	5,009	95,727	112,574	3,906	0	0	0	0	0	0	0	0
1979	5,341	3,430	7,444	91,991	122,190	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	129,507	4,300	0	0	0	0	0	0	0	0
1982	4,571	1,776	4,540	87,261	106,700	3,838	0	0	0	0	0	0	0	0
1983	111	0	3,157	86,733	94,656	3,822	0	0	0	0	0	0	0	0
1984	126	0	3,338	88,000	98,122	5,700	0	0	0	0	0	0	0	0
1985	7,537	11,203	7,813	88,000	122,088	5,433	0	0	0	0	0	0	0	0
1986	2,083	5,311	7,068	88,000	110,988	5,107	0	0	0	0	0	0	0	0
1987	12,993	15,488	9,902	88,000	136,796	5,625	0	0	0	0	0	0	0	0
1988	12,436	24,259	9,205	87,961	147,255	4,412	0	0	0	0	0	0	0	0
1989	10,974	17,340	8,702	90,000	142,269	6,091	300	0	602	12,647	1,898	0	0	0
1990	15,678	22,149	9,554	91,800	156,537	2,922	0	200	0	0	0	1,500	0	0
1991	1,945	9,155	3,493	28,200	50,259	141	0	0	0	0	0	0	0	0
1992	6,933	12,621	6,532	42,839	76,661	2,239	0	0	0	0	0	0	0	0
1993	13,348	3,442	6,829	62,065	105,972	2,858	0	0	0	0	0	0	5,095	1,624
1994	8,542	17,582	4,476	54,409	98,826	2,919	0	0	0	0	0	0	0	0
1995	21,617	17,582	24,419	100,000	184,004	5,700	0	0	0	0	0	0	0	0
1996	22,598	21,985	20,015	100,000	186,001	5,700	0	0	0	0	0	0	0	0
1997	23,601	22,396	19,603	100,000	187,999	5,700	0	0	0	0	0	0	0	0
1998	24,698	13,660	28,339	100,000	188,000	5,700	0	0	0	0	0	0	0	0
1999	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2000	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2001	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2002	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2003	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2004	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2005	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2006	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2007	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2008	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2009	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2010	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2011	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2012	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2013	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2014	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2015	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2016	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2017	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2018	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2019	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2020	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2021	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2022	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2023	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2024	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2025	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2026	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2027	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2028	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2029	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2030	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2031	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2032	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2033	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2034	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
2035	28,051	11,011	30,989	100,000	188,000	5,700	0	0	0	0	0	0	0	0
Total	1,260,154	752,677	1,366,982	6,364,993	10,825,864	348,096	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)	DRWD (31)	TLBWSD (32)	EWSID (33)	CK (34)	KCWA (Ag) (35)	DRWD (36)	CK (37)	TLBWSD (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	25,100	1,978	900	0	26,360	0	0
1969	0	0	0	0	0	0	7,081	56	100	0	31,375	0	0
1970	0	0	0	0	0	0	0	3,942	0	0	40,407	0	3,408
1971	0	0	0	0	0	0	80,906	5,990	3,700	0	41,053	0	41,579
1972	0	0	0	0	0	0	144,843	5,795	1,400	0	42,443	0	113,550
1973	0	0	0	0	0	0	26,317	3,000	1,500	1,500	22,057	0	24,147
1974	0	0	0	0	0	0	32,603	3,000	1,500	0	33,390	0	39,686
1975	0	0	0	0	0	0	41,536	3,000	1,600	0	40,555	0	44,722
1976	0	0	0	0	0	0	26,595	3,000	1,600	0	41,421	0	32,216
1977	0	0	0	0	0	0	12,984	738	1,530	0	11,153	0	5,097
1978	0	0	0	0	0	0	3,934	454	2,070	0	51,747	0	8,119
1979	0	0	0	0	0	0	74,758	1,739	2,000	0	38,544	0	80,363
1980	0	0	0	0	0	0	35,140	894	2,200	0	41,000	0	34,104
1981	0	0	0	0	0	0	50,888	5,859	2,300	0	41,000	0	32,550
1982	0	0	0	0	0	0	4,405	361	1,536	0	41,000	214	14,146
1983	0	0	0	0	0	0	1,001	0	3,550	0	42,900	0	5
1984	0	0	0	0	0	0	3,677	0	3,100	0	45,100	0	2,066
1985	0	0	0	0	0	0	68,638	5,197	3,400	0	46,251	0	41,153
1986	0	0	0	0	0	0	40,017	1,170	3,700	0	50,249	0	39,338
1987	0	0	0	0	0	0	30,359	2,525	4,000	0	46,288	0	62,725
1988	0	0	0	0	0	0	47,831	3,775	4,000	0	47,994	0	48,035
1989	18,831	0	0	8,260	5,262	2,391	63,703	3,000	4,000	0	52,158	0	63,947
1990	0	0	0	0	0	0	23,504	1,279	2,000	161	36,296	0	32,066
1991	0	0	0	0	0	0	1,697	221	0	0	927	0	483
1992	0	10,823	0	0	0	280	15,982	1,354	1,806	0	12,667	0	30,746
1993	0	27,200	2,000	10,000	0	0	57,112	2,741	4,000	0	23,221	0	65,732
1994	0	0	0	0	0	0	15,020	3,552	2,000	0	30,108	0	71,090
1995	0	0	0	0	0	0	47,390	3,000	4,000	0	57,700	0	71,110
1996	0	0	0	0	0	0	47,390	3,000	4,000	0	57,700	0	71,110
1997	0	0	0	0	0	0	47,390	3,000	4,000	0	57,700	0	71,110
1998	0	0	0	0	0	0	47,390	3,000	4,000	0	57,700	0	71,110
1999	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2000	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2001	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2002	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2003	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2004	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2005	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2006	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2007	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2008	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2009	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2010	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2011	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2012	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2013	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2014	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2015	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2016	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2017	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2018	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2019	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2020	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2021	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2022	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2023	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2024	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2025	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2026	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2027	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2028	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2029	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2030	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2031	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2032	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2033	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2034	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
2035	0	0	0	0	0	0	47,400	3,000	4,000	0	57,700	0	71,100
Total	18,831	38,023	2,000	18,260	5,262	2,671	2,878,991	187,620	223,492	1,661	3,343,364	214	3,846,213

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

	California Aqueduct (continued)										
	South San Joaquin Division										
	Reach 9				Reach 10A			Reach 11B		Reach 12E	
Calendar Year	DRWD (39)	KCWA (M&I) (40)	KCWA (Ag) (41)	TLBWSD (42)	KCWA (M&I) (43)	KCWA (Ag) (44)	TLBWSD (45)	KCWA (M&I) (46)	KCWA (Ag) (47)	KCWA (M&I) (48)	KCWA (Ag) (49)
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	30,951	0	0	0	0	0	24,776	0	0
1969	0	0	24,489	0	0	0	2,842	0	64,682	0	0
1970	0	0	46,114	1,855	0	158	4,315	0	72,279	0	9,279
1971	0	0	58,356	0	0	9,973	0	0	63,773	0	28,056
1972	0	0	75,464	0	0	5,876	0	0	72,358	0	62,342
1973	0	0	54,583	0	0	22,948	0	0	67,544	0	13,082
1974	0	0	63,814	0	10,019	22,719	0	0	87,476	2,651	4,248
1975	0	0	50,021	0	2,791	72,121	0	0	85,675	0	10,787
1976	0	0	53,465	0	74	50,444	0	0	85,067	37,519	20,555
1977	0	0	24,668	0	201	34,451	0	3,981	29,603	20,280	1,737
1978	0	0	72,231	0	0	161,889	0	0	88,753	47,133	15,011
1979	0	0	74,524	0	285	153,245	0	484	108,379	50,740	61,567
1980	0	0	79,946	0	3,780	131,836	0	3,112	103,207	32,039	22,252
1981	0	0	76,508	0	341	133,500	0	494	104,395	59,917	58,470
1982	0	0	76,877	0	4,700	164,832	0	798	99,081	36,139	75,587
1983	0	2,217	84,573	0	0	146,493	0	2,069	94,117	0	10,950
1984	0	4,100	85,732	0	6,910	150,302	0	2,349	124,819	63,941	39,929
1985	0	0	67,696	0	6,495	153,473	0	10,666	118,646	69,839	84,117
1986	0	0	79,943	0	5,065	198,099	0	8,673	124,836	62,109	51,540
1987	0	0	97,732	0	900	226,521	0	13,074	111,877	95,297	86,223
1988	0	1,100	83,858	0	8,229	213,795	0	13,509	114,031	86,390	123,249
1989	0	0	91,134	0	21,038	251,971	0	9,986	127,058	83,965	146,544
1990	0	0	83,108	0	25,189	47,472	0	9,319	104,107	82,164	38,973
1991	0	13,683	601	0	1,142	6,820	0	6,099	118	8,842	303
1992	0	28	40,183	0	3,685	89,390	0	7,419	35,093	47,181	57,048
1993	197	0	53,466	0	775	232,274	0	2,250	66,013	84,569	277,935
1994	0	0	49,193	0	750	140,585	0	7,500	66,900	79,573	137,073
1995	0	0	97,970	0	1,500	280,634	0	15,000	133,096	113,400	203,850
1996	0	0	97,970	0	1,500	280,634	0	15,000	133,096	113,400	203,850
1997	0	0	97,970	0	1,500	280,634	0	15,000	133,096	113,400	203,850
1998	0	0	97,970	0	1,500	280,634	0	15,000	133,096	113,400	203,850
1999	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2000	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2001	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2002	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2003	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2004	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2005	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2006	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2007	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2008	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2009	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2010	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2011	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2012	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2013	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2014	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2015	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2016	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2017	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2018	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2019	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2020	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2021	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2022	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2023	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2024	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2025	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2026	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2027	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2028	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2029	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2030	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2031	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2032	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2033	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2034	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
2035	0	0	91,200	0	2,600	245,053	0	20,000	129,059	113,400	173,588
Total	197	21,128	5,445,510	1,855	204,569	13,010,684	7,157	901,782	7,552,230	5,699,688	8,675,013

TABLE B-5A

Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(Acre-Feet)

Calendar Year	California Aqueduct (continued)							
	South San Joaquin Division (continued)							
	Reach 13B		Reach 14A		Reach 14B		Reach 14C	
	KCWA (M&I) (50)	KCWA (Ag) (51)	KCWA (M&I) (52)	KCWA (Ag) (53)	KCWA (M&I) (54)	KCWA (Ag) (55)	KCWA (M&I) (56)	KCWA (Ag) (57)
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	4,891	0	0	0	3	0	0
1971	0	0	0	23,844	0	49,929	0	24,187
1972	0	17,388	0	26,621	0	77,034	0	35,016
1973	0	9,297	0	15,328	0	47,040	0	19,043
1974	8,038	4,246	0	7,794	0	32,356	0	12,601
1975	8,538	7,059	0	10,306	0	27,736	0	12,783
1976	5,626	8,855	0	268	0	35,296	0	9,005
1977	0	5,024	0	8,299	0	13,539	0	3,757
1978	21,773	7,601	0	34,029	0	72,351	0	24,542
1979	5,663	17,766	3,012	27,356	0	59,413	0	22,372
1980	0	22,515	4,312	16,876	0	40,513	0	19,953
1981	7,844	14,037	4,511	13,007	8	42,753	7	18,729
1982	0	25,553	5,373	22,602	184	57,739	0	26,479
1983	0	3,491	1,168	20,302	0	57,922	0	26,613
1984	12,117	26,178	137	35,369	10	79,179	2	34,996
1985	0	67,711	206	33,103	0	72,855	0	31,758
1986	0	66,551	180	26,384	0	70,864	0	34,566
1987	5,609	40,374	610	30,098	9	67,710	9	31,019
1988	9,298	47,167	604	32,796	4	75,983	0	37,166
1989	5,504	57,114	721	29,292	7	82,201	5	37,800
1990	7,645	20,423	673	26,800	13	81,076	9	34,174
1991	0	0	768	0	0	0	0	0
1992	789	17,449	673	16,238	464	41,143	0	18,084
1993	12,798	87,493	629	16,045	0	55,591	0	26,422
1994	2,494	23,196	400	10,450	0	33,765	0	15,450
1995	0	41,750	800	23,300	0	61,100	0	33,800
1996	0	41,750	800	23,300	0	61,100	0	33,800
1997	0	41,750	800	23,300	0	61,100	0	33,800
1998	0	41,750	800	23,300	0	61,100	0	33,800
1999	0	35,500	800	35,075	0	80,000	0	44,000
2000	0	35,500	800	35,075	0	80,000	0	44,000
2001	0	35,500	800	35,075	0	80,000	0	44,000
2002	0	35,500	800	35,075	0	80,000	0	44,000
2003	0	35,500	800	35,075	0	80,000	0	44,000
2004	0	35,500	800	35,075	0	80,000	0	44,000
2005	0	35,500	800	35,075	0	80,000	0	44,000
2006	0	35,500	800	35,075	0	80,000	0	44,000
2007	0	35,500	800	35,075	0	80,000	0	44,000
2008	0	35,500	800	35,075	0	80,000	0	44,000
2009	0	35,500	800	35,075	0	80,000	0	44,000
2010	0	35,500	800	35,075	0	80,000	0	44,000
2011	0	35,500	800	35,075	0	80,000	0	44,000
2012	0	35,500	800	35,075	0	80,000	0	44,000
2013	0	35,500	800	35,075	0	80,000	0	44,000
2014	0	35,500	800	35,075	0	80,000	0	44,000
2015	0	35,500	800	35,075	0	80,000	0	44,000
2016	0	35,500	800	35,075	0	80,000	0	44,000
2017	0	35,500	800	35,075	0	80,000	0	44,000
2018	0	35,500	800	35,075	0	80,000	0	44,000
2019	0	35,500	800	35,075	0	80,000	0	44,000
2020	0	35,500	800	35,075	0	80,000	0	44,000
2021	0	35,500	800	35,075	0	80,000	0	44,000
2022	0	35,500	800	35,075	0	80,000	0	44,000
2023	0	35,500	800	35,075	0	80,000	0	44,000
2024	0	35,500	800	35,075	0	80,000	0	44,000
2025	0	35,500	800	35,075	0	80,000	0	44,000
2026	0	35,500	800	35,075	0	80,000	0	44,000
2027	0	35,500	800	35,075	0	80,000	0	44,000
2028	0	35,500	800	35,075	0	80,000	0	44,000
2029	0	35,500	800	35,075	0	80,000	0	44,000
2030	0	35,500	800	35,075	0	80,000	0	44,000
2031	0	35,500	800	35,075	0	80,000	0	44,000
2032	0	35,500	800	35,075	0	80,000	0	44,000
2033	0	35,500	800	35,075	0	80,000	0	44,000
2034	0	35,500	800	35,075	0	80,000	0	44,000
2035	0	35,500	800	35,075	0	80,000	0	44,000
Total	113,736	2,081,879	56,777	1,874,182	699	4,478,391	32	2,319,715

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) (58)	KCWA (Ag) (59)	KCWA (M&I) (60)	KCWA (Ag) (61)	AVEKWA (62)	AVEKWA (63)	AVEKWA (64)	PWD (65)	MWA (66)	AVEKWA (67)
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	2,478	8,863	0	0	13,330	128	1,514	23,662
1994	0	20,200	1,901	9,400	0	144	18,700	0	0	32,163
1995	0	41,700	3,900	19,100	0	144	17,540	0	0	34,309
1996	0	41,700	3,900	19,100	0	144	17,970	0	0	36,504
1997	0	41,700	3,900	19,100	0	144	18,400	0	0	38,929
1998	0	41,700	3,900	19,100	0	144	18,850	0	0	41,329
1999	0	45,075	2,200	17,850	0	144	25,976	0	0	44,574
2000	0	45,075	2,200	17,850	0	120	29,733	0	0	50,997
2001	0	45,075	2,200	17,850	0	120	29,733	0	0	50,997
2002	0	45,075	2,200	17,850	0	120	29,733	0	0	50,997
2003	0	45,075	2,200	17,850	0	120	29,733	0	0	50,997
2004	0	45,075	2,200	17,850	0	120	29,733	0	0	50,997
2005	0	45,075	2,200	17,850	0	144	35,934	0	0	61,619
2006	0	45,075	2,200	17,850	0	144	35,934	0	0	61,619
2007	0	45,075	2,200	17,850	0	144	35,934	0	0	61,619
2008	0	45,075	2,200	17,850	0	144	35,934	0	0	61,619
2009	0	45,075	2,200	17,850	0	144	35,934	0	0	61,619
2010	0	45,075	2,200	17,850	0	168	42,132	0	0	72,244
2011	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2012	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2013	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2014	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2015	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2016	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2017	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2018	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2019	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2020	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2021	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2022	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2023	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2024	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2025	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2026	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2027	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2028	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2029	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2030	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2031	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2032	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2033	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2034	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
2035	0	45,075	2,200	17,850	0	168	42,873	0	0	73,519
Total	10	2,560,197	150,926	974,130	2,000	21,778	2,030,347	8,366	4,215	2,910,754

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 (68)	AVEKWA (69)	LCID (70)	PWD (71)	AVEKWA (72)	MWDSC (d (73)	CVWD (d (74)	AVEKWA (e (75)	DWA (d (76)	MWA (77)
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	7,444	996	734	189	5,098	(61,200)	23,100	0	38,100	0
1994	8,798	965	1,150	0	5,420	(36,085)	13,621	0	22,464	0
1995	15,560	1,175	2,300	0	5,635	0	0	0	0	0
1996	17,280	1,415	2,300	0	5,875	0	0	0	0	0
1997	17,300	1,700	2,300	0	6,135	0	0	0	0	0
1998	17,300	2,025	2,300	0	6,400	0	0	0	0	0
1999	17,300	6,560	2,300	0	6,700	0	0	0	0	0
2000	17,300	7,510	2,300	0	7,640	0	0	0	0	0
2001	17,300	7,510	2,300	0	7,640	0	0	0	0	0
2002	17,300	7,510	2,300	0	7,640	0	0	0	0	0
2003	17,300	7,510	2,300	0	7,640	0	0	0	0	0
2004	17,300	7,510	2,300	0	7,640	0	0	0	0	0
2005	17,300	9,072	2,300	0	9,231	0	0	0	0	0
2006	17,300	9,072	2,300	0	9,231	0	0	0	0	0
2007	17,300	9,072	2,300	0	9,231	0	0	0	0	0
2008	17,300	9,072	2,300	0	9,231	0	0	0	0	0
2009	17,300	9,072	2,300	0	9,231	0	0	0	0	0
2010	17,300	10,634	2,300	0	10,822	0	0	0	0	0
2011	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2012	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2013	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2014	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2015	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2016	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2017	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2018	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2019	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2020	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2021	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2022	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2023	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2024	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2025	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2026	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2027	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2028	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2029	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2030	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2031	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2032	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2033	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2034	17,300	10,824	2,300	0	11,016	0	0	0	0	0
2035	17,300	10,824	2,300	0	11,016	0	0	0	0	0
Total	750,564	384,808	105,426	2,538	435,755	(750,501)	287,910	313	462,591	22,675

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)

Calendar Year	California Aqueduct (continued)									
	Mojave Division (continued)			Santa Ana Division						
	Reach 23	Reach 24		Reach 26A						Reach 28G
	MWA (78)	CLAWA (79)	MWA (80)	MWDSC (f (81)	SBVMWD (g (82)	SGVMWD (83)	SGPWA (84)	CVWD (f (85)	DWA (f (86)	MWDSC (87)
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	0	10,000	157,321	4,361	14,397	0	0	0	0
1994	0	1,950	20,018	320,285	51,300	14,400	0	0	0	0
1995	0	2,050	50,800	546,900	33,000	14,000	0	23,100	38,100	0
1996	0	2,150	50,800	521,900	36,000	14,000	7,200	23,100	38,100	0
1997	0	2,250	50,800	496,900	39,000	14,000	9,600	23,100	38,100	0
1998	0	2,400	50,800	471,900	42,000	14,000	5,570	23,100	38,100	0
1999	0	2,600	50,800	471,900	55,000	18,000	5,570	23,100	38,100	0
2000	0	3,000	50,800	471,900	60,000	20,000	6,350	23,100	38,100	0
2001	0	3,000	50,800	471,900	60,000	20,000	6,350	23,100	38,100	0
2002	0	3,000	50,800	471,900	60,000	20,000	6,350	23,100	38,100	0
2003	0	3,000	50,800	471,900	60,000	20,000	6,350	23,100	38,100	0
2004	0	3,000	50,800	471,900	60,000	20,000	6,350	23,100	38,100	0
2005	0	3,825	50,800	471,900	90,000	21,300	8,450	23,100	38,100	0
2006	0	3,825	50,800	471,900	90,000	21,300	8,450	23,100	38,100	0
2007	0	3,825	50,800	471,900	90,000	21,300	8,450	23,100	38,100	0
2008	0	3,825	50,800	471,900	90,000	21,300	8,450	23,100	38,100	0
2009	0	3,825	50,800	471,900	90,000	21,300	8,450	23,100	38,100	0
2010	0	4,750	50,800	471,900	102,600	22,500	10,550	23,100	38,100	0
2011	0	4,750	50,800	471,900	102,600	22,500	10,550	23,100	38,100	0
2012	0	4,750	50,800	471,900	102,600	22,500	10,550	23,100	38,100	0
2013	0	4,750	50,800	471,900	102,600	22,500	10,550	23,100	38,100	0
2014	0	4,750	50,800	471,900	102,600	22,500	10,550	23,100	38,100	0
2015	0	5,300	50,800	471,900	102,600	23,800	13,550	23,100	38,100	0
2016	0	5,300	50,800	471,900	102,600	23,800	13,550	23,100	38,100	0
2017	0	5,300	50,800	471,900	102,600	23,800	13,550	23,100	38,100	0
2018	0	5,300	50,800	471,900	102,600	23,800	13,550	23,100	38,100	0
2019	0	5,300	50,800	471,900	102,600	23,800	13,550	23,100	38,100	0
2020	0	5,700	50,800	471,900	102,600	25,000	16,650	23,100	38,100	0
2021	0	5,700	50,800	471,900	102,600	25,000	17,300	23,100	38,100	0
2022	0	5,700	50,800	471,900	102,600	25,000	17,300	23,100	38,100	0
2023	0	5,700	50,800	471,900	102,600	25,000	17,300	23,100	38,100	0
2024	0	5,700	50,800	471,900	102,600	25,000	17,300	23,100	38,100	0
2025	0	5,800	50,800	471,900	102,600	26,300	17,300	23,100	38,100	0
2026	0	5,800	50,800	471,900	102,600	26,300	17,300	23,100	38,100	0
2027	0	5,800	50,800	471,900	102,600	26,300	17,300	23,100	38,100	0
2028	0	5,800	50,800	471,900	102,600	26,300	17,300	23,100	38,100	0
2029	0	5,800	50,800	471,900	102,600	26,300	17,300	23,100	38,100	0
2030	0	5,800	50,800	471,900	102,600	27,500	17,300	23,100	38,100	0
2031	0	5,800	50,800	471,900	102,600	27,500	17,300	23,100	38,100	0
2032	0	5,800	50,800	471,900	102,600	27,500	17,300	23,100	38,100	0
2033	0	5,800	50,800	471,900	102,600	27,500	17,300	23,100	38,100	0
2034	0	5,800	50,800	471,900	102,600	27,500	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	214,857	2,124,154	24,115,112	3,901,422	1,095,335	498,590	947,100	1,562,100	18,942

f) 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 provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

g) Includes 1,650 AF recaptured from ground water storage in 1982, 10,000 AF in 1987, and 8,749 AF in 1988. This water was stored under DWR's Ground Water Demonstration Program.

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 (88)	MWDSC (89)	AVEKWA (90)	VCFCD (91)	MWDSC (h (92)	VCFCD (93)	CLWA (94)	SBCFC&WCD (95)
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	106,781	5,270	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	437,563	0	13,694	0
1994	198,450	17,400	0	10,000	505,700	0	20,750	0
1995	396,900	34,800	0	5,000	1,032,900	0	27,100	0
1996	396,900	34,800	0	5,000	1,057,900	0	29,098	0
1997	396,900	34,800	0	5,000	1,082,900	0	31,100	0
1998	396,900	34,800	0	5,000	1,107,900	0	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	48,796	0
2001	396,900	34,800	0	5,000	1,107,900	15,000	48,796	0
2002	396,900	34,800	0	5,000	1,107,900	15,000	48,796	0
2003	396,900	34,800	0	5,000	1,107,900	15,000	48,796	0
2004	396,900	34,800	0	5,000	1,107,900	15,000	48,796	0
2005	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2006	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2007	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2008	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2009	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2010	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2011	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2012	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2013	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2014	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2015	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2016	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2017	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2018	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2019	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2020	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2021	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2022	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2023	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2024	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2025	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2026	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2027	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2028	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2029	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2030	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2031	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2032	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2033	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2034	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
2035	396,900	34,800	0	5,000	1,107,900	15,000	54,200	0
Total	17,949,441	2,246,300	165	220,824	52,807,951	555,000	2,280,786	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)						Total (102)	Grand Total (103)
	Coastal Branch							
	Reach 31A		Reach 33A	Reach 34	Reach 35			
	KCWA (Ag) (96)	CLWA (97)	SLOCFC&WCD (98)	SLOCFC&WCD (99)	SLOCFC&WCD (100)	SBCFC&WCD (101)		
1962	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	56,763
1968	71,657	7,382	0	0	0	0	192,188	294,457
1969	52,094	9,970	0	0	0	0	195,705	268,104
1970	71,910	11,739	0	0	0	0	276,211	369,459
1971	98,481	12,490	0	0	0	0	553,081	654,250
1972	107,850	13,905	0	0	0	0	895,006	1,037,584
1973	69,227	9,418	0	0	0	0	638,930	737,479
1974	68,474	9,700	0	0	0	0	783,984	878,820
1975	74,516	10,700	0	0	0	0	1,129,728	1,230,577
1976	78,358	11,700	0	0	0	0	1,245,662	1,379,597
1977	35,504	5,075	0	0	0	0	465,442	581,675
1978	81,242	11,362	0	0	0	0	1,339,268	1,458,154
1979	104,017	19,138	0	0	0	0	1,537,075	1,666,155
1980	97,497	13,882	0	0	0	0	1,407,163	1,529,989
1981	97,054	12,700	0	0	0	0	1,779,479	1,918,342
1982	83,076	12,700	0	0	0	0	1,641,571	1,749,789
1983	87,859	12,659	0	0	0	0	1,089,626	1,186,831
1984	119,098	12,741	0	0	0	0	1,486,406	1,587,723
1985	110,124	12,099	0	0	0	0	1,863,544	1,989,925
1986	118,298	13,301	0	0	0	0	1,882,290	1,998,514
1987	116,259	11,821	0	0	0	0	1,974,569	2,121,060
1988	109,435	11,534	0	0	0	0	2,213,089	2,375,985
1989	102,156	14,645	0	0	0	0	2,686,830	2,850,660
1990	103,362	6,440	0	0	0	0	2,398,121	2,581,277
1991	780	716	0	0	0	0	489,492	548,523
1992	73,748	5,887	0	0	0	0	1,374,520	1,470,440
1993	84,651	4,137	0	0	0	0	2,005,202	2,146,065
1994	41,250	7,239	0	0	0	0	1,999,601	2,132,827
1995	82,500	12,700	0	0	0	0	3,636,313	3,865,587
1996	82,500	12,700	1,827	796	0	19,030	3,675,089	3,910,619
1997	82,500	12,700	2,436	2,388	0	42,486	3,711,668	3,950,334
1998	82,500	12,700	2,436	2,388	0	42,486	3,716,228	3,956,048
1999	118,000	12,700	10,000	5,000	10,000	45,486	3,794,111	4,035,075
2000	118,000	5,404	10,000	5,000	10,000	45,486	3,815,436	4,057,628
2001	118,000	5,404	10,000	5,000	10,000	45,486	3,815,436	4,058,298
2002	118,000	5,404	10,000	5,000	10,000	45,486	3,815,436	4,058,873
2003	118,000	5,404	10,000	5,000	10,000	45,486	3,815,436	4,059,546
2004	118,000	5,404	10,000	5,000	10,000	45,486	3,815,436	4,060,222
2005	118,000	0	10,000	5,000	10,000	45,486	3,869,661	4,116,988
2006	118,000	0	10,000	5,000	10,000	45,486	3,869,661	4,117,501
2007	118,000	0	10,000	5,000	10,000	45,486	3,869,661	4,118,115
2008	118,000	0	10,000	5,000	10,000	45,486	3,869,661	4,118,831
2009	118,000	0	10,000	5,000	10,000	45,486	3,869,661	4,119,473
2010	118,000	0	10,000	5,000	10,000	45,486	3,906,486	4,156,919
2011	118,000	0	10,000	5,000	10,000	45,486	3,908,886	4,160,042
2012	118,000	0	10,000	5,000	10,000	45,486	3,908,886	4,160,668
2013	118,000	0	10,000	5,000	10,000	45,486	3,908,886	4,161,396
2014	118,000	0	10,000	5,000	10,000	45,486	3,908,886	4,162,085
2015	118,000	0	10,000	5,000	10,000	45,486	3,913,736	4,168,151
2016	118,000	0	10,000	5,000	10,000	45,486	3,913,736	4,168,816
2017	118,000	0	10,000	5,000	10,000	45,486	3,913,736	4,169,478
2018	118,000	0	10,000	5,000	10,000	45,486	3,913,736	4,170,136
2019	118,000	0	10,000	5,000	10,000	45,486	3,913,736	4,170,736
2020	118,000	0	10,000	5,000	10,000	45,486	3,918,436	4,176,036
2021	118,000	0	10,000	5,000	10,000	45,486	3,919,086	4,176,786
2022	118,000	0	10,000	5,000	10,000	45,486	3,919,086	4,176,786
2023	118,000	0	10,000	5,000	10,000	45,486	3,919,086	4,176,786
2024	118,000	0	10,000	5,000	10,000	45,486	3,919,086	4,176,786
2025	118,000	0	10,000	5,000	10,000	45,486	3,920,486	4,178,186
2026	118,000	0	10,000	5,000	10,000	45,486	3,920,486	4,178,186
2027	118,000	0	10,000	5,000	10,000	45,486	3,920,486	4,178,186
2028	118,000	0	10,000	5,000	10,000	45,486	3,920,486	4,178,186
2029	118,000	0	10,000	5,000	10,000	45,486	3,920,486	4,178,186
2030	118,000	0	10,000	5,000	10,000	45,486	3,921,686	4,179,386
2031	118,000	0	10,000	5,000	10,000	45,486	3,921,686	4,179,386
2032	118,000	0	10,000	5,000	10,000	45,486	3,921,686	4,179,386
2033	118,000	0	10,000	5,000	10,000	45,486	3,921,686	4,179,386
2034	118,000	0	10,000	5,000	10,000	45,486	3,921,686	4,179,386
2035	118,000	0	10,000	5,000	10,000	45,486	3,922,986	4,180,686
Total	6,953,977	375,600	376,699	190,572	370,000	1,786,984	194,342,013	208,035,716

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	9,726	15,118	25,830	33,464	87,961	147,255	0	0	0
1989	3,819	17,256	21,075	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	33,636	10,271	62,065	105,972	0	0	0
1994	5,685	28,080	33,765	22,359	22,058	54,409	98,826	0	0	0
1995	9,780	34,240	44,020	42,003	42,001	100,000	184,004	0	0	0
1996	10,425	37,800	48,225	44,001	42,000	100,000	186,001	2,623	19,030	21,653
1997	11,065	38,250	49,315	46,000	41,999	100,000	187,999	4,824	42,486	47,310
1998	11,710	38,710	50,420	46,001	41,999	100,000	188,000	4,824	42,486	47,310
1999	12,330	39,165	51,495	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	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	41,500	57,500	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	954,077	1,811,333	2,765,410	2,278,619	2,182,252	6,365,193	10,826,064	937,271	1,788,224	2,725,495

a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.
b) For the period June 1962 through November 1967, deliveries were supplied by non-SWP water.

TABLE B-5B

Annual Water Quantities Delivered to Each Contractor

(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	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	1,022,158	1,146,054	4,000	6,091	127,950	1,344,144
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	103,499	946,750	1,050,249	4,000	4,858	124,468	1,236,934
1994	30,108	3,552	92,618	547,462	640,080	2,000	2,919	86,110	764,769
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	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2000	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2001	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2002	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2003	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2004	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2005	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2006	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2007	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2008	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2009	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2010	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2011	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2012	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2013	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2014	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2015	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2016	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2017	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2018	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2019	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2020	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2021	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2022	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2023	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2024	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2025	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2026	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2027	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2028	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2029	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2030	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2031	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2032	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2033	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2034	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
2035	57,700	3,000	139,000	1,014,400	1,153,400	4,000	5,700	118,500	1,342,300
Total	3,386,755	187,620	7,149,347	55,982,569	63,131,916	223,706	350,096	6,737,640	74,017,733

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	1,126	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	43,092	22,926	23,100	0	38,100	734	11,514	7,761	4,361	14,397
1994	57,392	27,989	13,621	1,950	22,464	1,150	20,018	8,798	51,300	14,400
1995	58,803	39,800	23,100	2,050	38,100	2,300	50,800	15,560	33,000	14,000
1996	61,908	41,798	23,100	2,150	38,100	2,300	50,800	17,280	36,000	14,000
1997	65,308	43,800	23,100	2,250	38,100	2,300	50,800	17,300	39,000	14,000
1998	68,748	45,800	23,100	2,400	38,100	2,300	50,800	17,300	42,000	14,000
1999	83,954	53,101	23,100	2,600	38,100	2,300	50,800	17,300	55,000	18,000
2000	96,000	54,200	23,100	3,000	38,100	2,300	50,800	17,300	60,000	20,000
2001	96,000	54,200	23,100	3,000	38,100	2,300	50,800	17,300	60,000	20,000
2002	96,000	54,200	23,100	3,000	38,100	2,300	50,800	17,300	60,000	20,000
2003	96,000	54,200	23,100	3,000	38,100	2,300	50,800	17,300	60,000	20,000
2004	96,000	54,200	23,100	3,000	38,100	2,300	50,800	17,300	60,000	20,000
2005	116,000	54,200	23,100	3,825	38,100	2,300	50,800	17,300	90,000	21,300
2006	116,000	54,200	23,100	3,825	38,100	2,300	50,800	17,300	90,000	21,300
2007	116,000	54,200	23,100	3,825	38,100	2,300	50,800	17,300	90,000	21,300
2008	116,000	54,200	23,100	3,825	38,100	2,300	50,800	17,300	90,000	21,300
2009	116,000	54,200	23,100	3,825	38,100	2,300	50,800	17,300	90,000	21,300
2010	136,000	54,200	23,100	4,750	38,100	2,300	50,800	17,300	102,600	22,500
2011	138,400	54,200	23,100	4,750	38,100	2,300	50,800	17,300	102,600	22,500
2012	138,400	54,200	23,100	4,750	38,100	2,300	50,800	17,300	102,600	22,500
2013	138,400	54,200	23,100	4,750	38,100	2,300	50,800	17,300	102,600	22,500
2014	138,400	54,200	23,100	4,750	38,100	2,300	50,800	17,300	102,600	22,500
2015	138,400	54,200	23,100	5,300	38,100	2,300	50,800	17,300	102,600	23,800
2016	138,400	54,200	23,100	5,300	38,100	2,300	50,800	17,300	102,600	23,800
2017	138,400	54,200	23,100	5,300	38,100	2,300	50,800	17,300	102,600	23,800
2018	138,400	54,200	23,100	5,300	38,100	2,300	50,800	17,300	102,600	23,800
2019	138,400	54,200	23,100	5,300	38,100	2,300	50,800	17,300	102,600	23,800
2020	138,400	54,200	23,100	5,700	38,100	2,300	50,800	17,300	102,600	25,000
2021	138,400	54,200	23,100	5,700	38,100	2,300	50,800	17,300	102,600	25,000
2022	138,400	54,200	23,100	5,700	38,100	2,300	50,800	17,300	102,600	25,000
2023	138,400	54,200	23,100	5,700	38,100	2,300	50,800	17,300	102,600	25,000
2024	138,400	54,200	23,100	5,700	38,100	2,300	50,800	17,300	102,600	25,000
2025	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	26,300
2026	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	26,300
2027	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	26,300
2028	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	26,300
2029	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	26,300
2030	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	27,500
2031	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	27,500
2032	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	27,500
2033	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	27,500
2034	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	27,500
2035	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
Total	5,785,920	2,661,481	1,235,010	214,857	2,024,691	105,426	2,151,316	761,468	3,901,422	1,095,335

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	454,218	0	566,207	108	177	272	557	0	1,588,008
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	2,376,673
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,851,363
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	602,283	0	768,268	0	262	425	687	0	2,146,327
1994	0	1,005,750	10,000	1,234,832	2,000	462	635	3,097	0	2,135,289
1995	0	2,011,500	5,000	2,294,013	2,900	1,158	1,250	5,308	0	3,869,645
1996	7,200	2,011,500	5,000	2,311,136	3,200	1,187	1,304	5,691	0	3,915,006
1997	9,600	2,011,500	5,000	2,322,058	3,700	1,200	1,352	6,252	0	3,955,234
1998	5,570	2,011,500	5,000	2,326,618	3,700	1,200	1,400	6,300	0	3,960,948
1999	5,570	2,011,500	20,000	2,381,325	3,700	1,200	1,469	6,369	0	4,039,975
2000	6,350	2,011,500	20,000	2,402,650	5,500	1,200	1,522	8,222	0	4,064,328
2001	6,350	2,011,500	20,000	2,402,650	5,500	27,500	1,577	34,577	0	4,091,298
2002	6,350	2,011,500	20,000	2,402,650	5,500	27,500	1,632	34,632	0	4,091,873
2003	6,350	2,011,500	20,000	2,402,650	5,500	27,500	1,690	34,690	0	4,092,546
2004	6,350	2,011,500	20,000	2,402,650	5,500	27,500	1,766	34,766	0	4,093,222
2005	8,450	2,011,500	20,000	2,456,875	7,500	27,500	1,827	36,827	0	4,151,988
2006	8,450	2,011,500	20,000	2,456,875	7,500	27,500	1,890	36,890	0	4,152,501
2007	8,450	2,011,500	20,000	2,456,875	7,500	27,500	1,954	36,954	0	4,153,115
2008	8,450	2,011,500	20,000	2,456,875	7,500	27,500	2,020	37,020	0	4,153,831
2009	8,450	2,011,500	20,000	2,456,875	7,500	27,500	2,112	37,112	0	4,154,473
2010	10,550	2,011,500	20,000	2,493,700	9,600	27,500	2,183	39,283	0	4,194,019
2011	10,550	2,011,500	20,000	2,496,100	9,600	27,500	2,256	39,356	0	4,197,142
2012	10,550	2,011,500	20,000	2,496,100	9,600	27,500	2,332	39,432	0	4,197,768
2013	10,550	2,011,500	20,000	2,496,100	9,600	27,500	2,410	39,510	0	4,198,496
2014	10,550	2,011,500	20,000	2,496,100	9,600	27,500	2,449	39,549	0	4,199,185
2015	13,550	2,011,500	20,000	2,500,950	9,600	27,500	2,515	39,615	0	4,205,251
2016	13,550	2,011,500	20,000	2,500,950	9,600	27,500	2,580	39,680	0	4,205,916
2017	13,550	2,011,500	20,000	2,500,950	9,600	27,500	2,642	39,742	0	4,206,578
2018	13,550	2,011,500	20,000	2,500,950	9,600	27,500	2,700	39,800	0	4,207,236
2019	13,550	2,011,500	20,000	2,500,950	9,600	27,500	2,700	39,800	0	4,207,836
2020	16,650	2,011,500	20,000	2,505,650	9,600	27,500	2,700	39,800	0	4,213,136
2021	17,300	2,011,500	20,000	2,506,300	9,600	27,500	2,700	39,800	0	4,213,886
2022	17,300	2,011,500	20,000	2,506,300	9,600	27,500	2,700	39,800	0	4,213,886
2023	17,300	2,011,500	20,000	2,506,300	9,600	27,500	2,700	39,800	0	4,213,886
2024	17,300	2,011,500	20,000	2,506,300	9,600	27,500	2,700	39,800	0	4,213,886
2025	17,300	2,011,500	20,000	2,507,700	9,600	27,500	2,700	39,800	0	4,215,286
2026	17,300	2,011,500	20,000	2,507,700	9,600	27,500	2,700	39,800	0	4,215,286
2027	17,300	2,011,500	20,000	2,507,700	9,600	27,500	2,700	39,800	0	4,215,286
2028	17,300	2,011,500	20,000	2,507,700	9,600	27,500	2,700	39,800	0	4,215,286
2029	17,300	2,011,500	20,000	2,507,700	9,600	27,500	2,700	39,800	0	4,215,286
2030	17,300	2,011,500	20,000	2,508,900	9,600	27,500	2,700	39,800	0	4,216,486
2031	17,300	2,011,500	20,000	2,508,900	9,600	27,500	2,700	39,800	0	4,216,486
2032	17,300	2,011,500	20,000	2,508,900	9,600	27,500	2,700	39,800	0	4,216,486
2033	17,300	2,011,500	20,000	2,508,900	9,600	27,500	2,700	39,800	0	4,216,486
2034	17,300	2,011,500	20,000	2,508,900	9,600	27,500	2,700	39,800	0	4,216,486
2035	17,300	2,011,500	20,000	2,510,200	9,600	27,500	2,700	39,800	0	4,217,786
Total	498,590	96,387,245	775,824	117,598,585	336,493	977,208	102,429	1,416,130	0	209,349,417

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	34,492	35,646	0	0	14,497	14,497	0	1	5,286	5,287
1994	0	51	33,765	33,816	0	5	13,480	13,485	0	5	5,685	5,690
1995	0	51	44,020	44,071	0	5	17,340	17,345	0	5	9,780	9,785
1996	0	51	48,225	48,276	0	5	17,750	17,755	0	5	10,425	10,430
1997	0	51	49,315	49,366	0	5	18,150	18,155	0	5	11,065	11,070
1998	0	51	50,420	50,471	0	5	18,560	18,565	0	5	11,710	11,715
1999	0	51	51,495	51,546	0	5	18,393	18,398	0	5	12,330	12,335
2000	0	51	52,670	52,721	0	5	18,608	18,613	0	5	13,050	13,055
2001	0	51	53,285	53,336	0	5	18,608	18,613	0	5	13,665	13,670
2002	0	51	53,805	53,856	0	5	18,608	18,613	0	5	14,185	14,190
2003	0	51	54,420	54,471	0	5	18,608	18,613	0	5	14,800	14,805
2004	0	51	55,020	55,071	0	5	18,608	18,613	0	5	15,400	15,405
2005	0	51	57,500	57,551	0	5	19,488	19,493	0	5	16,000	16,005
2006	0	51	57,950	58,001	0	5	19,488	19,493	0	5	16,450	16,455
2007	0	51	58,500	58,551	0	5	19,488	19,493	0	5	17,000	17,005
2008	0	51	59,150	59,201	0	5	19,488	19,493	0	5	17,650	17,655
2009	0	51	59,700	59,751	0	5	19,488	19,493	0	5	18,200	18,205
2010	0	51	60,250	60,301	0	5	19,356	19,361	0	5	18,750	18,755
2011	0	51	60,900	60,951	0	5	19,356	19,361	0	5	19,400	19,405
2012	0	51	61,450	61,501	0	5	19,356	19,361	0	5	19,950	19,955
2013	0	51	62,100	62,151	0	5	19,356	19,361	0	5	20,600	20,605
2014	0	51	62,750	62,801	0	5	19,356	19,361	0	5	21,250	21,255
2015	0	51	63,900	63,951	0	5	19,724	19,729	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	11,83	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	1,939	(996)	105,961	143	107,047	0	156,936	(15,824)	2,278,844	2,581	2,422,537	841,923	3,264,460
1994	0	3,108	(2,577)	98,826	400	99,757	0	82,449	(61,825)	2,098,427	8,649	2,127,700	(388,870)	1,738,830
1995	0	3,018	(9,946)	184,004	400	177,476	0	80,140	(8,317)	3,820,317	8,649	3,900,789	(364,395)	3,536,394
1996	0	6,081	(9,954)	186,001	400	182,528	0	136,643	34,202	3,861,090	8,649	4,040,584	(410,956)	3,629,628
1997	0	3,359	0	187,999	400	191,758	0	106,847	13,995	3,899,667	8,649	4,029,158	(71,337)	3,957,821
1998	0	3,340	0	188,000	400	191,740	0	107,698	24,926	3,904,228	8,649	4,045,501	20,364	4,065,865
1999	0	3,340	0	188,000	400	191,740	0	108,076	9,169	3,982,111	8,210	4,107,566	(16,709)	4,090,857
2000	0	3,340	0	188,000	400	191,740	0	108,127	(16,935)	4,003,436	8,210	4,102,838	36,966	4,139,804
2001	0	3,340	0	188,000	400	191,740	0	108,127	(1,139)	4,003,436	8,210	4,118,634	4,568	4,123,202
2002	0	3,340	0	188,000	400	191,740	0	108,135	1	4,003,436	8,210	4,119,782	5,414	4,125,196
2003	0	3,340	0	188,000	400	191,740	0	108,142	349	4,003,436	8,210	4,120,137	11,168	4,131,305
2004	0	3,340	0	188,000	400	191,740	0	108,114	2,196	4,003,436	8,210	4,121,956	(1,959)	4,119,997
2005	0	3,340	0	188,000	400	191,740	0	108,114	4,105	4,057,661	8,210	4,178,090	(7,613)	4,170,477
2006	0	3,340	0	188,000	400	191,740	0	108,097	2,733	4,057,661	8,210	4,176,701	(4,778)	4,171,923
2007	0	3,340	0	188,000	400	191,740	0	108,097	1	4,057,661	8,210	4,173,969	5,415	4,179,384
2008	0	3,340	0	188,000	400	191,740	0	108,096	1,400	4,057,661	8,210	4,175,367	12,231	4,187,598
2009	0	3,340	0	188,000	400	191,740	0	108,037	(6,528)	4,057,661	8,210	4,167,380	6,299	4,173,679
2010	0	3,340	0	188,000	400	191,740	0	108,033	28,304	4,094,486	8,210	4,239,033	(31,184)	4,207,849
2011	0	3,340	0	188,000	400	191,740	0	107,996	(17,744)	4,096,886	8,210	4,195,348	28,436	4,223,784
2012	0	3,340	0	188,000	400	191,740	0	108,038	1,495	4,096,886	8,210	4,214,629	4,751	4,219,380
2013	0	3,340	0	188,000	400	191,740	0	108,029	2	4,096,886	8,210	4,213,127	5,414	4,218,541
2014	0	3,340	0	188,000	400	191,740	0	108,016	6,892	4,096,886	8,210	4,220,004	2,952	4,222,956
2015	0	3,340	0	188,000	400	191,740	0	107,967	(9,504)	4,101,736	8,210	4,208,409	12,548	4,220,957
2016	0	3,340	0	188,000	400	191,740	0	107,950	(766)	4,101,736	8,210	4,217,130	5,415	4,222,545
2017	0	3,340	0	188,000	400	191,740	0	107,954	623	4,101,736	8,210	4,218,523	5,416	4,223,939
2018	0	3,340	0	188,000	400	191,740	0	107,951	(997)	4,101,736	8,210	4,216,900	5,415	4,222,315
2019	0	3,340	0	188,000	400	191,740	0	107,949	4,727	4,101,736	8,210	4,222,622	1,275	4,223,897
2020	0	3,340	0	188,000	400	191,740	0	107,932	(14,368)	4,106,436	8,210	4,208,210	15,484	4,223,694
2021	0	3,340	0	188,000	400	191,740	0	107,878	562	4,107,086	8,210	4,223,736	4,326	4,228,062
2022	0	3,340	0	188,000	400	191,740	0	107,888	(421)	4,107,086	8,210	4,222,763	6,135	4,228,898
2023	0	3,340	0	188,000	400	191,740	0	107,888	1	4,107,086	8,210	4,223,185	5,414	4,228,599
2024	0	3,340	0	188,000	400	191,740	0	107,885	143	4,107,086	8,210	4,223,324	4,046	4,227,370
2025	0	3,340	0	188,000	400	191,740	0	107,923	5,691	4,108,486	8,210	4,230,310	(660)	4,229,650
2026	0	3,340	0	188,000	400	191,740	0	107,893	(843)	4,108,486	8,210	4,223,746	10,321	4,234,067
2027	0	3,340	0	188,000	400	191,740	0	107,906	(96)	4,108,486	8,210	4,224,506	7,791	4,232,297
2028	0	3,340	0	188,000	400	191,740	0	107,909	(1,043)	4,108,486	8,210	4,223,562	4,187	4,227,749
2029	0	3,340	0	188,000	400	191,740	0	107,916	(177)	4,108,486	8,210	4,224,435	11,638	4,236,073
2030	0	3,340	0	188,000	400	191,740	0	107,872	(1,502)	4,109,686	8,210	4,224,266	(3,234)	4,221,032
2031	0	3,340	0	188,000	400	191,740	0	107,857	0	4,109,686	8,210	4,225,753	5,414	4,231,167
2032	0	3,340	0	188,000	400	191,740	0	107,857	0	4,109,686	8,210	4,225,753	5,414	4,231,167
2033	0	3,340	0	188,000	400	191,740	0	107,863	3,017	4,109,686	8,210	4,228,776	3,036	4,231,812
2034	0	3,340	0	188,000	400	191,740	0	107,829	(5,182)	4,109,686	8,210	4,220,543	9,023	4,229,566
2035	0	3,340	0	188,000	400	191,740	0	108,097	5,959	4,110,986	8,210	4,233,252	87,060	4,320,312

b) For the period June 1962 through November 1967, deliveries were supplied by non-SWP water.

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					
	Initial Fill Water (27)	Operational Losses (28)	Reservoir Storage Changes (29)	Deliveries: Water Supply (30)	Deliveries: Recreation (31)	Total (32)	Initial Fill Water (33)	Operational Losses (34)	Reservoir Storage Changes (35)	Deliveries: Water Supply (36)	Deliveries: 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	137,127	(15,151)	2,170,025	1,836	2,293,837	0	15,061	(15,148)	907,751	1,676	909,340
1994	0	66,280	(59,248)	1,996,682	8,010	2,011,724	0	44,384	(59,248)	1,319,159	7,010	1,311,305
1995	0	64,061	1,629	3,630,613	8,010	3,704,313	0	42,165	1,629	2,465,013	7,010	2,515,817
1996	0	89,128	44,156	3,669,389	8,010	3,810,683	0	67,232	44,156	2,482,136	7,010	2,600,534
1997	0	62,905	13,995	3,705,968	8,010	3,790,878	0	41,009	13,995	2,493,058	7,010	2,555,072
1998	0	63,305	24,926	3,710,528	8,010	3,806,769	0	41,409	24,926	2,497,618	7,010	2,570,963
1999	0	63,365	9,169	3,788,411	7,120	3,868,065	0	41,469	9,169	2,593,625	7,010	2,651,273
2000	0	63,492	(16,935)	3,809,736	7,120	3,863,413	0	41,596	(16,935)	2,622,246	7,010	2,653,917
2001	0	63,479	(1,139)	3,809,736	7,120	3,879,196	0	41,583	(1,139)	2,622,246	7,010	2,669,700
2002	0	63,494	1	3,809,736	7,120	3,880,351	0	41,598	1	2,622,246	7,010	2,670,855
2003	0	63,496	349	3,809,736	7,120	3,880,701	0	41,600	349	2,622,246	7,010	2,671,205
2004	0	63,488	2,196	3,809,736	7,120	3,882,540	0	41,592	2,196	2,622,246	7,010	2,673,044
2005	0	63,479	4,105	3,863,961	7,120	3,938,665	0	41,583	4,105	2,681,875	7,010	2,734,573
2006	0	63,493	2,733	3,863,961	7,120	3,937,307	0	41,597	2,733	2,681,875	7,010	2,733,215
2007	0	63,492	1	3,863,961	7,120	3,934,574	0	41,596	1	2,681,875	7,010	2,730,482
2008	0	63,492	1,400	3,863,961	7,120	3,935,973	0	41,596	1,400	2,681,875	7,010	2,731,881
2009	0	63,403	(6,528)	3,863,961	7,120	3,927,956	0	41,507	(6,528)	2,681,875	7,010	2,723,864
2010	0	63,556	28,304	3,900,786	7,120	3,999,766	0	41,660	28,304	2,718,700	7,010	2,795,674
2011	0	63,529	(17,744)	3,903,186	7,120	3,956,091	0	41,633	(17,744)	2,721,100	7,010	2,751,999
2012	0	63,569	1,495	3,903,186	7,120	3,975,370	0	41,673	1,495	2,721,100	7,010	2,771,278
2013	0	63,560	2	3,903,186	7,120	3,973,868	0	41,664	2	2,721,100	7,010	2,769,776
2014	0	63,538	6,892	3,903,186	7,120	3,980,736	0	41,642	6,892	2,721,100	7,010	2,776,644
2015	0	63,516	(9,504)	3,908,036	7,120	3,969,168	0	41,620	(9,504)	2,725,950	7,010	2,765,076
2016	0	63,510	(766)	3,908,036	7,120	3,977,900	0	41,614	(766)	2,725,950	7,010	2,773,808
2017	0	63,517	623	3,908,036	7,120	3,979,296	0	41,621	623	2,725,950	7,010	2,775,204
2018	0	63,518	(997)	3,908,036	7,120	3,977,677	0	41,622	(997)	2,725,950	7,010	2,773,585
2019	0	63,515	4,727	3,908,036	7,120	3,983,398	0	41,619	4,727	2,725,950	7,010	2,779,306
2020	0	63,458	(14,368)	3,912,736	7,120	3,968,946	0	41,562	(14,368)	2,730,650	7,010	2,764,854
2021	0	63,466	562	3,913,386	7,120	3,984,534	0	41,570	562	2,731,300	7,010	2,780,442
2022	0	63,474	(421)	3,913,386	7,120	3,983,559	0	41,578	(421)	2,731,300	7,010	2,779,467
2023	0	63,474	1	3,913,386	7,120	3,983,981	0	41,578	1	2,731,300	7,010	2,779,889
2024	0	63,471	143	3,913,386	7,120	3,984,120	0	41,575	143	2,731,300	7,010	2,780,028
2025	0	63,485	5,691	3,914,786	7,120	3,991,082	0	41,589	5,691	2,732,700	7,010	2,786,990
2026	0	63,489	(843)	3,914,786	7,120	3,984,552	0	41,593	(843)	2,732,700	7,010	2,780,460
2027	0	63,495	(96)	3,914,786	7,120	3,985,305	0	41,599	(96)	2,732,700	7,010	2,781,213
2028	0	63,494	(1,043)	3,914,786	7,120	3,984,357	0	41,598	(1,043)	2,732,700	7,010	2,780,265
2029	0	63,464	(177)	3,914,786	7,120	3,985,193	0	41,568	(177)	2,732,700	7,010	2,781,101
2030	0	63,436	(1,502)	3,915,986	7,120	3,985,040	0	41,540	(1,502)	2,733,900	7,010	2,780,948
2031	0	63,421	0	3,915,986	7,120	3,986,527	0	41,525	0	2,733,900	7,010	2,782,435
2032	0	63,421	0	3,915,986	7,120	3,986,527	0	41,525	0	2,733,900	7,010	2,782,435
2033	0	63,427	3,017	3,915,986	7,120	3,989,550	0	41,531	3,017	2,733,900	7,010	2,785,458
2034	0	63,395	(5,182)	3,915,986	7,120	3,981,319	0	41,499	(5,182)	2,733,900	7,010	2,777,227
2035	0	63,469	5,959	3,917,286	7,120	3,993,834	0	41,573	5,959	2,735,200	7,010	2,789,742

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	28,037	(15,152)	798,694	1,676	813,255	0	29,497	(15,156)	770,697	1,676	786,714
1994	0	40,754	(59,248)	1,259,094	7,010	1,247,610	0	40,504	(59,248)	1,238,894	7,010	1,227,160
1995	0	38,535	1,629	2,346,013	7,010	2,393,187	0	38,285	1,629	2,304,313	7,010	2,351,237
1996	0	63,602	44,156	2,363,136	7,010	2,477,904	0	63,352	44,156	2,321,436	7,010	2,435,954
1997	0	37,379	13,995	2,374,058	7,010	2,432,442	0	37,129	13,995	2,332,358	7,010	2,390,492
1998	0	37,779	24,926	2,378,618	7,010	2,448,333	0	37,529	24,926	2,336,918	7,010	2,406,383
1999	0	37,839	9,169	2,433,750	7,010	2,487,768	0	37,589	9,169	2,388,675	7,010	2,442,443
2000	0	37,966	(16,935)	2,462,371	7,010	2,490,412	0	37,716	(16,935)	2,417,296	7,010	2,445,087
2001	0	37,953	(1,139)	2,462,371	7,010	2,506,195	0	37,703	(1,139)	2,417,296	7,010	2,460,870
2002	0	37,968	1	2,462,371	7,010	2,507,350	0	37,718	1	2,417,296	7,010	2,462,025
2003	0	37,970	349	2,462,371	7,010	2,507,700	0	37,720	349	2,417,296	7,010	2,462,375
2004	0	37,962	2,196	2,462,371	7,010	2,5095,39	0	37,712	2,196	2,417,296	7,010	2,464,214
2005	0	37,953	4,105	2,522,000	7,010	2,571,068	0	37,703	4,105	2,476,925	7,010	2,525,743
2006	0	37,967	2,733	2,522,000	7,010	2,569,710	0	37,717	2,733	2,476,925	7,010	2,524,385
2007	0	37,966	1	2,522,000	7,010	2,566,977	0	37,716	1	2,476,925	7,010	2,521,652
2008	0	37,966	1,400	2,522,000	7,010	2,568,376	0	37,716	1,400	2,476,925	7,010	2,523,051
2009	0	37,877	(6,528)	2,522,000	7,010	2,560,359	0	37,627	(6,528)	2,476,925	7,010	2,515,034
2010	0	38,030	28,304	2,558,825	7,010	2,632,169	0	37,780	28,304	2,513,750	7,010	2,586,844
2011	0	38,003	(17,744)	2,561,225	7,010	2,588,494	0	37,753	(17,744)	2,516,150	7,010	2,543,169
2012	0	38,043	1,495	2,561,225	7,010	2,607,773	0	37,793	1,495	2,516,150	7,010	2,562,448
2013	0	38,034	2	2,561,225	7,010	2,606,271	0	37,784	2	2,516,150	7,010	2,560,946
2014	0	38,012	6,892	2,561,225	7,010	2,613,139	0	37,762	6,892	2,516,150	7,010	2,567,814
2015	0	37,990	(9,504)	2,566,075	7,010	2,601,571	0	37,740	(9,504)	2,521,000	7,010	2,556,246
2016	0	37,984	(766)	2,566,075	7,010	2,610,303	0	37,734	(766)	2,521,000	7,010	2,564,978
2017	0	37,991	623	2,566,075	7,010	2,611,699	0	37,741	623	2,521,000	7,010	2,566,374
2018	0	37,992	(997)	2,566.075	7,010	2,610,080	0	37,742	(997)	2,521,000	7,010	2,564,755
2019	0	37,989	4,727	2,566,075	7,010	2,615,801	0	37,739	4,727	2,521,000	7,010	2,570,476
2020	0	37,932	(14,368)	2,570,775	7,010	2,601,349	0	37,682	(14,368)	2,525,700	7,010	2,556,024
2021	0	37,940	562	2,571,425	7,010	2,616,937	0	37,690	562	2,526,350	7,010	2,571,612
2022	0	37,948	(421)	2,571,425	7,010	2,615,962	0	37,698	(421)	2,526,350	7,010	2,570,637
2023	0	37,948	1	2,571,425	7,010	2,616,384	0	37,698	1	2,526,350	7,010	2,571,059
2024	0	37,945	143	2,571,425	7,010	2,616,523	0	37,695	143	2,526,350	7,010	2,571,198
2025	0	37,959	5,691	2,572,825	7,010	2,623,485	0	37,709	5,691	2,527,750	7,010	2,578,160
2026	0	37,963	(843)	2,572,825	7,010	2,616,955	0	37,713	(843)	2,527,750	7,010	2,571,630
2027	0	37,969	(96)	2,572,825	7,010	2,617,708	0	37,719	(96)	2,527,750	7,010	2,572,383
2028	0	3,7968	(1,043)	2,572,825	7,010	2,616,760	0	37,718	(1,043)	2,527,750	7,010	2,571,435
2029	0	37,938	(177)	2,572,825	7,010	2,617,596	0	37,688	(177)	2,527,750	7,010	2,572,271
2030	0	37,910	(1,502)	2,574,025	7,010	2,617,443	0	37,660	(1,502)	2,528,950	7,010	2,572,118
2031	0	37,895	0	2,574,025	7,010	2,618,930	0	37,645	0	2,528,950	7,010	2,573,605
2032	0	37,895	0	2,574,025	7,010	2,618,930	0	37,645	0	2,528,950	7,010	2,573,605
2033	0	37,901	3,017	2,574,025	7,010	2,621,953	0	37,651	3,017	2,528,950	7,010	2,576,628
2034	0	37,869	(5,182)	2,574,025	7,010	2,613,722	0	37,619	(5,182)	2,528,950	7,010	2,568,397
2035	0	37,943	5,959	2,575,325	7,010	2,626,237	0	37,693	5,959	2,530,250	7,010	2,580,912

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)	80,6514	1,995	776,886	0	17,913	(15,862)	370,853	423	373,327
1993	0	12,826	(15,153)	759,036	1,676	758,385	0	9,707	(1,189)	307,773	443	316,734
1994	0	38,954	(59,248)	1,227,593	7,010	1,214,309	0	22,383	(23,904)	691,143	1,630	691,252
1995	0	36,735	1,629	2,281,313	7,010	2,326,687	0	21,153	(30,728)	1,216,313	1,630	1,208,368
1996	0	61,802	44,156	2,298,436	7,010	2,411,404	0	34,338	50,449	1,206,438	1,630	1,292,855
1997	0	35,579	13,995	2,309,358	7,010	2,365,942	0	20,928	(30,144)	1,190,358	1,630	1,182,772
1998	0	35,979	24,926	2,313,918	7,010	2,381,833	0	20,822	(1,294)	1,167,918	1,630	1,189,076
1999	0	36,039	9,169	2,368,625	7,010	2,420,843	0	20,846	17,550	1,200,324	1,630	1,240,350
2000	0	36,166	(16,935)	2,397,246	7,010	2,423,487	0	20,954	(18,670)	1,220,550	1,630	1,224,464
2001	0	36,153	(1,139)	2,397,246	7,010	2,439,270	0	20,954	(765)	1,220,550	1,630	1,242,369
2002	0	36,168	1	2,397,246	7,010	2,440,425	0	20,965	0	1,220,550	1,630	1,243,145
2003	0	36,170	349	2,397,246	7,010	2,440,775	0	20,965	349	1,220,550	1,630	1,243,494
2004	0	36,162	2,196	2,397,246	7,010	2,442,614	0	20,957	2,196	1,220,550	1,630	1,245,333
2005	0	36,153	4,105	2,456,875	7,010	2,504,143	0	20,942	4,467	1,274,775	1,630	1,301,814
2006	0	36,167	2,733	2,456,875	7,010	2,502,785	0	20,957	2,733	1,274,775	1,630	1,300,095
2007	0	36,166	1	2,456,875	7,010	2,500,052	0	20,956	1	1,274,775	1,630	1,297,362
2008	0	36,166	1,400	2,456,875	7,010	2,501,451	0	20,958	1,400	1,274,775	1,630	1,298,763
2009	0	36,077	(6,528)	2,456,875	7,010	2,493,434	0	20,869	(6,528)	1,274,775	1,630	1,290,746
2010	0	36,230	28,304	2,493,700	7,010	2,565,244	0	21,024	27,554	1,311,600	1,630	1,361,808
2011	0	36,203	(17,744)	2,496,100	7,010	2,521,569	0	21,017	(16,996)	1,314,000	1,630	1,319,651
2012	0	36,243	1,495	2,496,100	7,010	2,540,848	0	21,021	1,495	1,314,000	1,630	1,338,146
2013	0	36,234	2	2,496,100	7,010	2,539,346	0	21,012	2	1,314,000	1,630	1,336,644
2014	0	36,212	6,892	2,496,100	7,010	2,546,214	0	20,985	6,059	1,314,000	1,630	1,342,674
2015	0	36,190	(9,504)	2,500,950	7,010	2,534,646	0	20,963	(11,398)	1,318,850	1,630	1,330,045
2016	0	36,184	(766)	2,500,950	7,010	2,543,378	0	20,956	697	1,318,850	1,630	1,342,133
2017	0	36,191	623	2,500,950	7,010	2,544,774	0	20,957	249	1,318,850	1,630	1,341,686
2018	0	36,192	(997)	2,500,950	7,010	2,543,155	0	20,958	(249)	1,318,850	1,630	1,341,189
2019	0	36,189	4,727	2,500,950	7,010	2,548,876	0	20,962	6,129	1,318,850	1,630	1,347,571
2020	0	36,132	(14,368)	2,505,650	7,010	2,534,424	0	20,913	(14,885)	1,323,550	1,630	1,331,208
2021	0	36,140	562	2,506,300	7,010	2,550,012	0	20,928	562	1,324,200	1,630	1,347,320
2022	0	36,148	(421)	2,506,300	7,010	2,549,037	0	20,924	(795)	1,324,200	1,630	1,345,959
2023	0	36,148	1	2,506,300	7,010	2,549,459	0	20,924	1	1,324,200	1,630	1,346,755
2024	0	36,145	143	2,506,300	7,010	2,549,598	0	20,923	516	1,324,200	1,630	1,347,269
2025	0	36,159	5,691	2,507,700	7,010	2,556,560	0	20,945	4,843	1,325,600	1,630	1,353,018
2026	0	36,163	(843)	2,507,700	7,010	2,550,030	0	20,950	(94)	1,325,600	1,630	1,348,086
2027	0	36,169	(96)	2,507,700	7,010	2,550,783	0	20,955	(844)	1,325,600	1,630	1,347,341
2028	0	36,168	(1,043)	2,507,700	7,010	2,549,835	0	20,944	46	1,325,600	1,630	1,348,220
2029	0	36,138	(177)	2,507,700	7,010	2,550,671	0	20,916	(162)	1,325,600	1,630	1,347,984
2030	0	36,110	(1,502)	2,508,900	7,010	2,550,518	0	20,887	(1,758)	1,326,800	1,630	1,347,559
2031	0	36,095	0	2,508,900	7,010	2,552,005	0	20,872	0	1,326,800	1,630	1,349,302
2032	0	36,095	0	2,508,900	7,010	2,552,005	0	20,872	0	1,326,800	1,630	1,349,302
2033	0	36,101	3,017	2,508,900	7,010	2,555,028	0	20,879	2,643	1,326,800	1,630	1,351,952
2034	0	36,069	(5,182)	2,508,900	7,010	2,546,797	0	20,850	(5,556)	1,326,800	1,630	1,343,724
2035	0	36,143	5,959	2,510,200	7,010	2,559,312	0	20,964	12,616	1,328,100	1,630	1,363,310

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) — Mojave Division (continued) — Pearblossom Pumping Plant						Mojave Siphon Powerplant					
				Deliveries						Deliveries		
	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	9,169	(175)	254,678	443	264,115	0	0	0	0	0	0
1994	0	17,033	(23,904)	623,803	1,430	618,362	0	0	0	0	0	0
1995	0	15,803	(30,728)	1,139,650	1,430	1,126,155	0	0	0	0	0	0
1996	0	28,988	50,449	1,124,950	1,430	1,205,817	0	25,518	50,449	1,124,950	1,430	1,202,347
1997	0	15,578	(30,144)	1,105,450	1,430	1,092,314	0	12,108	(30,144)	1,105,450	1,430	1,088,844
1998	0	15,472	(1,294)	1,079,570	1,430	1,095,178	0	12,002	(1,294)	1,079,570	1,430	1,091,708
1999	0	15,496	17,550	1,096,770	1,430	1,131,246	0	12,026	17,550	1,096,770	1,430	1,127,776
2000	0	15,604	(18,670)	1,104,950	1,430	1,103,314	0	12,134	(18,670)	1,104,950	1,430	1,099,844
2001	0	15,604	(765)	1,104,950	1,430	1,121,219	0	12,134	(765)	1,104,950	1,430	1,117,749
2002	0	15,615	0	1,104,950	1,430	1,121,995	0	12,145	0	1,104,950	1,430	1,118,525
2003	0	15,615	349	1,104,950	1,430	1,122,344	0	12,145	349	1,104,950	1,430	1,118,874
2004	0	15,607	2,196	1,104,950	1,430	1,124,183	0	12,137	2,196	1,104,950	1,430	1,120,713
2005	0	15,592	4,467	1,139,175	1,430	1,160,664	0	12,122	4,467	1,139,175	1,430	1,157,194
2006	0	15,607	2,733	1,139,175	1,430	1,158,945	0	12,137	2,733	1,139,175	1,430	1,155,475
2007	0	15,606	1	1,139,175	1,430	1,156,212	0	12,136	1	1,139,175	1,430	1,152,742
2008	0	15,608	1,400	1,139,175	1,430	1,157,613	0	12,138	1,400	1,139,175	1,430	1,154,143
2009	0	15,519	(6,528)	1,139,175	1,430	1,149,596	0	12,049	(6,528)	1,139,175	1,430	1,146,126
2010	0	15,674	27,554	1,156,000	1,430	1,200,658	0	12,204	27,554	1,156,000	1,430	1,197,188
2011	0	15,667	(16,996)	1,156,000	1,430	1,156,101	0	12,197	(16,996)	1,156,000	1,430	1,152,631
2012	0	15,671	1,495	1,156,000	1,430	1,174,596	0	12,201	1,495	1,156,000	1,430	1,171,126
2013	0	15,662	2	1,156,000	1,430	1,173,094	0	12,192	2	1,156,000	1,430	1,169,624
2014	0	15,635	6,059	1,156,000	1,430	1,179,124	0	12,165	6,059	1,156,000	1,430	1,175,654
2015	0	15,613	(11,398)	1,160,850	1,430	1,166,495	0	12,143	(11,398)	1,160,850	1,430	1,163,025
2016	0	15,606	697	1,160,850	1,430	1,178,583	0	12,136	697	1,160,850	1,430	1,175,113
2017	0	15,607	249	1,160,850	1,430	1,178,136	0	12,137	249	1,160,850	1,430	1,174,666
2018	0	15,608	(249)	1,160,850	1,430	1,177,639	0	12,138	(249)	1,160,850	1,430	1,174,169
2019	0	15,612	6,129	1,160,850	1,430	1,184,021	0	12,142	6,129	1,160,850	1,430	1,180,551
2020	0	15,563	(14,885)	1,165,550	1,430	1,167,658	0	12,093	(14,885)	1,165,550	1,430	1,164,188
2021	0	15,578	562	1,166,200	1,430	1,183,770	0	12,108	562	1,166,200	1,430	1,180,300
2022	0	15,574	(795)	1,166,200	1,430	1,182,409	0	12,104	(795)	1,166,200	1,430	1,178,939
2023	0	15,574	1	1,166,200	1,430	1,183,205	0	12,104	1	1,166,200	1,430	1,179,735
2024	0	15,573	516	1,166,200	1,430	1,183,719	0	12,103	516	1,166,200	1,430	1,180,249
2025	0	15,595	4,843	1,167,600	1,430	1,189,468	0	12,125	4,843	1,167,600	1,430	1,185,998
2026	0	15,600	(94)	1,167,600	1,430	1,184,536	0	12,130	(94)	1,167,600	1,430	1,181,066
2027	0	15,605	(844)	1,167,600	1,430	1,183,791	0	12,135	(844)	1,167,600	1,430	1,180,321
2028	0	15,594	46	1,167,600	1,430	1,184,670	0	12,124	46	1,167,600	1,430	1,181,200
2029	0	15,566	(162)	1,167,600	1,430	1,184,434	0	12,096	(162)	1,167,600	1,430	1,180,964
2030	0	15,537	(1,758)	1,168,800	1,430	1,184,009	0	12,067	(1,758)	1,168,800	1,430	1,180,539
2031	0	15,522	0	1,168,800	1,430	1,185,752	0	12,052	0	1,168,800	1,430	1,182,282
2032	0	15,522	0	1,168,800	1,430	1,185,752	0	12,052	0	1,168,800	1,430	1,182,282
2033	0	15,529	2,643	1,168,800	1,430	1,188,402	0	12,059	2,643	1,168,800	1,430	1,184,932
2034	0	15,500	(5,556)	1,168,800	1,430	1,180,174	0	12,030	(5,556)	1,168,800	1,430	1,176,704
2035	0	15,614	12,616	1,170,100	1,430	1,199,760	0	12,144	12,616	1,170,100	1,430	1,196,290

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	2,3816	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	5,600	5,595	244,678	364	256,237	0	3,144	(13,957)	451,263	1,233	441,683
1994	0	9,616	1,196	601,835	1,250	613,897	0	16,521	(35,344)	536,450	5,380	523,007
1995	0	9,471	(4,876)	1,086,800	1,250	1,092,645	0	15,532	32,357	1,065,000	5,380	1,118,269
1996	0	17,995	(5,049)	1,072,000	1,250	1,086,196	0	27,414	(6,293)	1,091,998	5,380	1,118,499
1997	0	8,423	(6,866)	1,052,400	1,250	1,055,207	0	14,601	44,139	1,119,000	5,380	1,183,120
1998	0	8,420	126	1,026,370	1,250	1,036,166	0	15,107	26,220	1,146,000	5,380	1,192,707
1999	0	8,451	(2,676)	1,043,370	1,250	1,050,395	0	15,143	(8,381)	1,168,301	5,380	1,180,443
2000	0	8,424	(432)	1,051,150	1,250	1,060,392	0	15,162	1,735	1,176,696	5,380	1,198,973
2001	0	8,438	(725)	1,051,150	1,250	1,060,113	0	15,149	(374)	1,176,696	5,380	1,196,851
2002	0	8,446	0	1,051,150	1,250	1,060,846	0	15,153	1	1,176,696	5,380	1,197,230
2003	0	8,446	1,452	1,051,150	1,250	1,062,298	0	15,155	0	1,176,696	5,380	1,197,231
2004	0	8,431	3,008	1,051,150	1,250	1,063,839	0	15,155	0	1,176,696	5,380	1,197,231
2005	0	8,447	659	1,084,550	1,250	1,094,906	0	15,161	(362)	1,182,100	5,380	1,202,279
2006	0	8,454	1,258	1,084,550	1,250	1,095,512	0	15,160	0	1,182,100	5,380	1,202,640
2007	0	8,454	1	1,084,550	1,250	1,094,255	0	15,160	0	1,182,100	5,380	1,202,640
2008	0	8,462	0	1,084,550	1,250	1,094,262	0	15,158	0	1,182,100	5,380	1,202,638
2009	0	8,429	(2,639)	1,084,550	1,250	1,091,590	0	15,158	0	1,182,100	5,380	1,202,638
2010	0	8,430	812	1,100,450	1,250	1,110,942	0	15,156	750	1,182,100	5,380	1,203,386
2011	0	8,435	(2,293)	1,100,450	1,250	1,107,842	0	15,136	(748)	1,182,100	5,380	1,201,868
2012	0	8,431	1,088	1,100,450	1,250	1,111,219	0	15,172	0	1,182,100	5,380	1,202,652
2013	0	8,425	2	1,100,450	1,250	1,110,127	0	15,172	0	1,182,100	5,380	1,202,652
2014	0	8,423	2,523	1,100,450	1,250	1,112,646	0	15,177	833	1,182,100	5,380	1,203,490
2015	0	8,434	(561)	1,104,750	1,250	1,113,873	0	15,177	1,894	1,182,100	5,380	1,204,551
2016	0	8,432	(529)	1,104,750	1,250	1,113,903	0	15,178	(1,463)	1,182,100	5,380	1,201,195
2017	0	8,431	0	1,104,750	1,250	1,114,431	0	15,184	374	1,182,100	5,380	1,203,038
2018	0	8,431	0	1,104,750	1,250	1,114,431	0	15,184	(748)	1,182,100	5,380	1,201,916
2019	0	8,440	2,897	1,104,750	1,250	1,117,337	0	15,177	(1,402)	1,182,100	5,380	1,201,255
2020	0	8,421	(1,968)	1,109,050	1,250	1,116,753	0	15,169	517	1,182,100	5,380	1,203,166
2021	0	8,427	192	1,109,700	1,250	1,119,569	0	15,162	0	1,182,100	5,380	1,202,642
2022	0	8,416	(2,343)	1,109,700	1,250	1,117,023	0	15,174	374	1,182,100	5,380	1,203,028
2023	0	8,417	2	1,109,700	1,250	1,119,369	0	15,174	0	1,182,100	5,380	1,202,654
2024	0	8,422	1,228	1,109,700	1,250	1,120,600	0	15,172	(373)	1,182,100	5,380	1,202,279
2025	0	8,415	855	1,111,000	1,250	1,121,520	0	15,164	848	1,182,100	5,380	1,203,492
2026	0	8,422	249	1,111,000	1,250	1,120,921	0	15,163	(749)	1,182,100	5,380	1,201,894
2027	0	8,423	0	1,111,000	1,250	1,120,673	0	15,164	748	1,182,100	5,380	1,203,392
2028	0	8,422	(1,905)	1,111,000	1,250	1,118,767	0	15,174	(1,089)	1,182,100	5,380	1,201,565
2029	0	8,423	2,773	1,111,000	1,250	1,123,446	0	15,172	(15)	1,182,100	5,380	1,202,637
2030	0	8,445	(964)	1,112,200	1,250	1,120,931	0	15,173	256	1,182,100	5,380	1,202,909
2031	0	8,443	0	1,112,200	1,250	1,121,893	0	15,173	0	1,182,100	5,380	1,202,653
2032	0	8,443	0	1,112,200	1,250	1,121,893	0	15,173	0	1,182,100	5,380	1,202,653
2033	0	8,446	(499)	1,112,200	1,250	1,121,397	0	15,172	374	1,182,100	5,380	1,203,026
2034	0	8,420	(2,221)	1,112,200	1,250	1,119,649	0	15,169	374	1,182,100	5,380	1,203,023
2035	0	8,412	(8,977)	1,113,500	1,250	1,114,185	0	15,129	(6,657)	1,182,100	5,380	1,195,952

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) / West Branch, California Aqueduct (continued) / Warne Powerplant						Castaic Powerplant					
	Initial Fill Water (87)	Operational Losses (88)	Reservoir Storage Changes (89)	Deliveries: Water Supply (90)	Deliveries: Recreation (91)	Total (92)	Initial Fill Water (93)	Operational Losses (94)	Reservoir Storage Changes (95)	Deliveries: Water Supply (96)	Deliveries: 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	(13,487)	451,257	1,233	440,925	0	21,959	(12,565)	451,257	1,211	461,862
1994	0	14,611	(35,344)	536,450	5,380	521,097	0	9,114	(35,344)	526,450	2,330	502,550
1995	0	13,622	32,357	1,065,000	5,380	1,116,359	0	8,125	32,357	1,060,000	2,330	1,102,812
1996	0	25,504	(6,293)	1,091,998	5,380	1,116,589	0	13,809	(11,195)	1,086,998	2,330	1,091,942
1997	0	12,691	44,139	1,119,000	5,380	1,181,210	0	6,406	44,139	1,114,000	2,330	1,166,875
1998	0	13,197	26,220	1,146,000	5,380	1,190,797	0	6,912	26,220	1,141,000	2,330	1,176,462
1999	0	13,233	(8,381)	1,168,301	5,380	1,178,533	0	6,948	(8,381)	1,163,301	2,330	1,164,198
2000	0	13,252	1,735	1,176,696	5,380	1,197,063	0	6,967	1,735	1,171,696	2,330	1,182,728
2001	0	13,239	(374)	1,176,696	5,380	1,194,941	0	6,954	(374)	1,171,696	2,330	1,180,606
2002	0	13,243	1	1,176,696	5,380	1,195,320	0	6,958	1	1,171,696	2,330	1,180,985
2003	0	13,245	0	1,176,696	5,380	1,195,321	0	6,960	0	1,171,696	2,330	1,180,986
2004	0	13,245	0	1,176,696	5,380	1,195,321	0	6,960	0	1,171,696	2,330	1,180,986
2005	0	13,251	(362)	1,182,100	5,380	1,200,369	0	6,966	(362)	1,177,100	2,330	1,186,034
2006	0	13,250	0	1,182,100	5,380	1,200,730	0	6,965	0	1,177,100	2,330	1,186,395
2007	0	13,250	0	1,182,100	5,380	1,200,730	0	6,965	0	1,177,100	2,330	1,186,395
2008	0	13,248	0	1,182,100	5,380	1,200,728	0	6,963	0	1,177,100	2,330	1,186,393
2009	0	13,248	0	1,182,100	5,380	1,200,728	0	6,963	0	1,177,100	2,330	1,186,393
2010	0	13,246	750	1,182,100	5,380	1,201,476	0	6,961	750	1,177,100	2,330	1,187,141
2011	0	13,226	(748)	1,182,100	5,380	1,199,958	0	6,941	(748)	1,177,100	2,330	1,185,623
2012	0	13,262	0	1,182,100	5,380	1,200,742	0	6,977	0	1,177,100	2,330	1,186,407
2013	0	13,262	0	1,182,100	5,380	1,200,742	0	6,977	0	1,177,100	2,330	1,186,407
2014	0	13,267	833	1,182,100	5,380	1,201,580	0	6,982	833	1,177,100	2,330	1,187,245
2015	0	13,267	1,894	1,182,100	5,380	1,202,641	0	6,982	1,894	1,177,100	2,330	1,188,306
2016	0	13,268	(1,463)	1,182,100	5,380	1,199,285	0	6,983	(1,463)	1,177,100	2,330	1,184,950
2017	0	13,274	374	1,182,100	5,380	1,201,128	0	6,989	374	1,177,100	2,330	1,186,793
2018	0	13,274	(748)	1,182,100	5,380	1,200,006	0	6,989	(748)	1,177,100	2,330	1,185,671
2019	0	13,267	(1,402)	1,182,100	5,380	1,199,345	0	6,982	(1,402)	1,177,100	2,330	1,185,010
2020	0	13,259	517	1,182,100	5,380	1,201,256	0	6,974	517	1,177,100	2,330	1,186,921
2021	0	13,252	0	1,182,100	5,380	1,200,732	0	6,967	0	1,177,100	2,330	1,186,397
2022	0	13,264	374	1,182,100	5,380	1,201,118	0	6,979	374	1,177,100	2,330	1,186,783
2023	0	13,264	0	1,182,100	5,380	1,200,744	0	6,979	0	1,177,100	2,330	1,186,409
2024	0	13,262	(373)	1,182,100	5,380	1,200,369	0	6,977	(373)	1,177,100	2,330	1,186,034
2025	0	13,254	848	1,182,100	5,380	1,201,582	0	6,969	848	1,177,100	2,330	1,187,247
2026	0	13,253	(749)	1,182,100	5,380	1,199,984	0	6,968	(749)	1,177,100	2,330	1,185,649
2027	0	13,254	748	1,182,100	5,380	1,201,482	0	6,969	748	1,177,100	2,330	1,187,147
2028	0	13,264	(1,089)	1,182,100	5,380	1,199,655	0	6,979	(1,089)	1,177,100	2,330	1,185,320
2029	0	13,262	(15)	1,182,100	5,380	1,200,727	0	6,977	(15)	1,177,100	2,330	1,186,392
2030	0	13,263	256	1,182,100	5,380	1,200,999	0	6,978	256	1,177,100	2,330	1,186,664
2031	0	13,263	0	1,182,100	5,380	1,200,743	0	6,978	0	1,177,100	2,330	1,186,408
2032	0	13,263	0	1,182,100	5,380	1,200,743	0	6,978	0	1,177,100	2,330	1,186,408
2033	0	13,262	374	1,182,100	5,380	1,201,116	0	6,977	374	1,177,100	2,330	1,186,781
2034	0	13,259	374	1,182,100	5,380	1,201,113	0	6,974	374	1,177,100	2,330	1,186,778
2035	0	13,219	(6,657)	1,182,100	5,380	1,194,042	0	6,934	(6,657)	1,177,100	2,330	1,179,707

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	94,901	104,183	0	0	0
1994	0	802	48,489	49,291	0	0	0
1995	0	802	95,200	96,002	0	0	0
1996	0	802	116,853	117,655	212	21,653	21,865
1997	0	802	142,510	143,312	212	47,310	47,522
1998	0	802	142,510	143,312	212	47,310	47,522
1999	0	802	201,186	201,988	212	70,486	70,698
2000	0	802	193,890	194,692	212	70,486	70,698
2001	0	802	193,890	194,692	212	70,486	70,698
2002	0	802	193,890	194,692	212	70,486	70,698
2003	0	802	193,890	194,692	212	70,486	70,698
2004	0	802	193,890	194,692	212	70,486	70,698
2005	0	802	188,486	189,288	212	70,486	70,698
2006	0	802	188,486	189,288	212	70,486	70,698
2007	0	802	188,486	189,288	212	70,486	70,698
2008	0	802	188,486	189,288	212	70,486	70,698
2009	0	802	188,486	189,288	212	70,486	70,698
2010	0	802	188,486	189,288	212	70,486	70,698
2011	0	802	188,486	189,288	212	70,486	70,698
2012	0	802	188,486	189,288	212	70,486	70,698
2013	0	802	188,486	189,288	212	70,486	70,698
2014	0	802	188,486	189,288	212	70,486	70,698
2015	0	802	188,486	189,288	212	70,486	70,698
2016	0	802	188,486	189,288	212	70,486	70,698
2017	0	802	188,486	189,288	212	70,486	70,698
2018	0	802	188,486	189,288	212	70,486	70,698
2019	0	802	188,486	189,288	212	70,486	70,698
2020	0	802	188,486	189,288	212	70,486	70,698
2021	0	802	188,486	189,288	212	70,486	70,698
2022	0	802	188,486	189,288	212	70,486	70,698
2023	0	802	188,486	189,288	212	70,486	70,698
2024	0	802	188,486	189,288	212	70,486	70,698
2025	0	802	188,486	189,288	212	70,486	70,698
2026	0	802	188,486	189,288	212	70,486	70,698
2027	0	802	188,486	189,288	212	70,486	70,698
2028	0	802	188,486	189,288	212	70,486	70,698
2029	0	802	188,486	189,288	212	70,486	70,698
2030	0	802	188,486	189,288	212	70,486	70,698
2031	0	802	188,486	189,288	212	70,486	70,698
2032	0	802	188,486	189,288	212	70,486	70,698
2033	0	802	188,486	189,288	212	70,486	70,698
2034	0	802	188,486	189,288	212	70,486	70,698
2035	0	802	188,486	189,288	212	70,486	70,698

Table B-7 Follows

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							Capital Costs Allocated to Other Purposes (8)	Total State Water Project Capital Cost (9)
	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)		
Conservation Facilities									
Upper Feather Division									
Frenchman Dam & Lake	0	0	0	0	774	0	774	2,879	3,653
Grizzly Valley Dam & Lake Davis	0	0	0	0	67	0	67	7,364	7,431
Antelope Dam & Lake	0	0	0	0	0	0	0	5,523	5,523
Abbey Bridge Dam & Reservoir	0	0	0	0	0	0	0	519	519
Dixie Refuge Dam & Reservoir	0	0	0	0	0	0	0	236	236
Total, Upper Feather Division	0	0	0	0	841	0	841	16,521	17,362
Oroville Division									
Multipurpose Facilities	172	22	0	0	367,544	0	367,738	88,391	456,129
Specific Power Facilities	30	3	0	0	106,451	0	106,484	897	107,381
Total, Oroville Division	202	25	0	0	473,995	0	474,222	89,288	563,510
California Aqueduct									
North San Joaquin Division	3,564	100	0	0	74,198	0	77,862	2,844	80,706
San Luis Division	108	38	0	0	108,509	0	108,655	4,497	113,152
Total, California Aqueduct	3,672	138	0	0	182,707	0	186,517	7,341	193,858
Delta Facilities	39,147	15,941	0	0	317,926	0	373,014	60,760	433,774
Planning and Preoperation	2,324	43,096	0	0	203,126	0	248,546	0	248,546
Total, Conservation Facilities	45,345	59,200	0	0	1,178,595	0	1,283,140	173,910	1,457,050
Transportation Facilities									
Upper Feather Division									
Grizzly Valley Pipeline	0	0	179	0	0	162	341	0	341
North Bay Aqueduct	10	24	678	0	0	94,327	95,039	0	95,039
South Bay Aqueduct	1,114	10	1,552	0	0	52,374	55,050	21,616	76,666
California Aqueduct									
North San Joaquin Division	309	50	67	0	0	172,992	173,418	6,330	179,748
San Luis Division	87	0	5	0	0	110,972	111,064	6,851	117,915
South San Joaquin Division	258	28	3,257	2,065	0	269,474	275,082	16,627	291,709
Tehachapi Division	13	7	4	5,229	0	293,232	298,485	18,042	316,527
Mojave Division	503	82	625	0	0	371,968	373,178	26,320	399,498
Santa Ana Division	222	462	3,317	9,710	0	218,367	232,078	14,028	246,106
West Branch	35,716	239	2,907	37	0	472,250	511,149	30,897	542,046
Coastal Branch	94	4,755	230	0	0	333,441	338,520	0	338,520
Total, California Aqueduct	37,202	5,623	10,412	17,041	0	2,242,696	2,312,974	119,095	2,432,069
Total Transportation Facilities	38,326	5,657	12,821	17,041	0	2,389,559	2,463,404	140,711	2,604,115
East Branch Enlargement	0	258	0	0	0	432,093	432,351	0	432,351
San Joaquin Drainage Facilities	0	0	0	0	0	0	0	45,432	45,432
Off-Aqueduct Power Generation Facilities	0	0	0	0	0	439,294	439,294	0	439,294
Land purchase-Kern Water Bank	0	0	0	0	34,686	0	34,686	0	34,686
Unassigned and Davis-Grunsky	0	0	0	0	0	0	0	135,181	135,181
Total through 2010	83,671	65,115	12,821	17,041	1,213,281	3,260,946	4,652,875	495,234	5,148,109

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, 1993.
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.
f) The planning and preoperation costs of conservation facilities include $44,456,000 of planning costs financed from Systems Revenue and not included in Table 30.
g) See Table B-10. Projected costs for Mojave Division include $16,000,000 for small hydro.

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
	1952–1991 (1)	1992 (2)	1993 (3)	1994 (4)	1995 (5)	1996 (6)	(7)
Feather River Area							
County of Butte	107,512	4,932	15,768	7,000	0	0	135,212
Plumas County Flood Control and Water Conservation District	0	0	0	0	0	0	0
Thermalito Irrigation District (b	43,939	0	0	0	0	0	43,939
Subtotal	151,451	4,932	15,768	7,000	0	0	179,151
North Bay Area							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	652,769	2,300	5,244	4,000	0	0	664,313
Subtotal	666,359	2,300	5,244	4,000	0	0	677,903
South Bay Area							
Alameda County Flood Control and Water Conservation District, Zone 7	225,839	2,086	10,820	8,000	2,000	0	248,745
Alameda County Water District	181,304	37,984	12,423	3,000	0	0	234,711
Santa Clara Valley Water District	421	3,584	10,072	1,000	0	0	15,077
San Francisco Water Department (b	1,023,320	16,155	3,787	10,000	0	0	1,053,262
Subtotal	1,430,884	59,809	37,102	22,000	2,000	0	1,551,795
Central Coastal Area							
San Luis Obispo County Flood Control and Water Conservation District	0	0	0	0	0	0	0
Santa Barbara County Flood Control and Water Conservation District	0	0	35,222	65,000	30,000	0	130,222
Subtotal	0	0	35,222	65,000	30,000	0	130,222
San Joaquin Valley Area							
Castaic Lake Water Agency	77,557	0	5,010	0	0	0	82,567
Dudley Ridge Water District	289,412	0	0	0	0	0	289,412
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	0	0	0	0	2,709,182
Oak Flat Water District	13,753	31,683	1,446	10,000	0	0	56,882
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	3,383,407	31,683	6,456	10,000	0	0	3,431,546
Southern California Area							
Antelope Valley-East Kern Water Agency	373,738	403	182	0	0	0	374,323
Castaic Lake Water Agency	349,710	2,035	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
Metropolitan Water District of Southern California	4,779,958	0	0	8,000	0	0	4,787,958
Mojave Water Agency	71,113	43,806	24,748	5,000	0	0	144,667
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	792,582	0	9,087	5,000	0	0	806,669
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
Ventura County Flood Control District	79,699	0	0	0	0	0	79,699
Subtotal	6,752,028	46,244	34,017	18,000	0	0	6,850,289
Total	12,384,129	144,968	98,587	61,000	2,000	0	12,820,906

a) Approximate only, not to be construed as invoice amounts.
b) Not an SWP water supply contractor.
c) Not an 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 (Percentage) (b January–June (4)	Annual Surplus Money Investment Fund Interest Rate (Percentage) (b July–December (5)	Net Overpayment or Underpayment with Interest (c (6)
			Metropolitan Water District of Southern California			
1965	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
Current Adjustment														
8C through 25	1. Advance payments applied to incremental costs Amendment 2 (d													
	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													
										(1,532,433)			(10,104,646)	(11,637,079)
28J	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)	43,157	610,692	(145,428)	3,600	6,533	12,448
1982	11	934,812	357,720	(7,165)	134,408	1,419,775	(44,778)	18,971	7,451	37,824
1983	19	1,091,091	1,076,627	2,628	517,615	2,687,961	429,225	73,925	38,185	72,415
1984	26	1,875,968	2,317,661	3,290	1,068,363	5,265,282	506,951	36,354	9,610	92,846
1985	29	2,248,491	7,849,886	27,815	3,416,370	13,542,562	34,103	2,822	5,034	27,138
1986	31	16,420,238	10,020,277	1,309,599	1,819,354	29,569,468	85,773	14,720	17,151	13,988
1987	32	11,873,772	7,214,307	1,628,901	1,670,798	22,387,778	126,268	15,869	28,305	33,220
1988	56	3,287,340	1,648,060	1,013,327	686,930	6,635,657	291,552	36,876	51,962	25,143
1989	52	1,058,600	952,178	274,402	376,268	2,661,448	143,605	18,489	37,738	13,459
1990	38	493,842	537,996	215,980	71,940	1,319,758	252,154	30,038	97,986	39,300
1991	54	76,935	17,241	89,126	70,738	254,040	1,154,058	27,018	53,820	22,791
1992	43	58,013	7,287	73,879	38,338	177,517	408,329	53,704	62,943	54,605
1993	37	103,559	25,007	30,212	81,821	240,599	313,118	52,129	77,600	36,734
1994	0	581,000	2,000	0	25,000	608,000	5,000	6,000	3,000	5,544
1995	0	825,000	2,000	0	178,000	1,005,000	5,000	4,000	4,000	3,780
1996	0	5,000	2,000	0	2,000	9,000	5,000	4,000	4,000	3,780
1997	0	5,000	2,000	0	2,000	9,000	5,000	3,000	4,000	2,016
1998	0	1,000	0	0	1,000	2,000	3,000	0	1,000	252
1999	0	0	0	0	0	0	0	0	0	0
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	341,030	42,928,712	32,920,268	4,680,518	13,797,030	94,326,528	18,281,778	1,634,099	4,776,824	11,094,426

TABLE B-10

Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost 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)
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	5,077	(114,604)	(502,923)	1,487,516	191,339	1,175,932
1982	716	1,561	1,746	6,074	29,565	700,735	46,501	22,308	769,544
1983	407	5,721	8,143	23,367	651,388	706,115	84,435	252,642	1,043,192
1984	269	1,853	1,667	13,301	662,851	1,559,539	41,349	48,477	1,649,365
1985	402	1,657	2,129	6,750	80,035	677,949	24,812	65,166	767,927
1986	1,119	2,746	3,316	12,239	151,052	398,886	63,850	35,427	498,163
1987	1,514	3,106	3,597	22,219	234,098	804,585	90,150	42,123	936,858
1988	5,729	6,714	7,631	33,822	459,429	2,932,806	(127,629)	(56,297)	2,748,880
1989	2,919	4,182	5,091	15,689	241,172	6,931,215	351,932	175,924	7,459,071
1990	5,100	19,911	36,633	86,697	567,819	13,453,629	112,312	2,410,673	15,976,614
1991	1,965	5,168	7,496	32,004	1,304,320	13,917,900	134,423	115,681	14,168,004
1992	1,312	2,386	2,790	36,426	622,495	6,279,853	246,231	242,317	6,768,401
1993	3,673	6,097	8,924	40,618	538,893	2,513,167	257,941	176,847	2,947,955
1994	0	1,000	2,000	4,000	26,544	2,108,933	11,331	3,999	2,124,263
1995	0	1,000	3,000	5,000	25,780	3,012,760	12,664	4,666	3,030,090
1996	0	1,000	3,000	5,000	25,780	2,877,453	12,664	4,666	2,894,783
1997	0	1,000	3,000	5,000	23,016	9,998	12,664	4,666	27,328
1998	0	0	0	1,000	5,252	7,332	3,333	1,333	11,998
1999	0	0	0	0	0	0	0	0	0
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	542,745	3,865,990	4,896,523	8,834,048	53,926,433	110,218,520	41,775,127	23,098,391	175,092,038

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	29,084	(2,245,368)	(40,584)	(14,260)	855,810	(1,415,318)	1,145	9,687	9,541
1982	100,629	(1,616,569)	20,184	10,359	3,525,738	2,040,341	2,469	8,283	6,956
1983	75,600	33,689	11,733	6,613	1,807,932	1,935,567	7,955	13,785	11,090
1984	31,746	87,083	26,710	12,753	3,053,662	3,211,954	26,489	10,111	6,267
1985	52,718	56,013	13,534	6,846	575,208	704,319	7,220	9,762	7,688
1986	73,990	201,558	50,681	19,228	1,282,573	1,628,030	8,902	25,033	20,506
1987	(7,299)	119,489	40,860	16,395	519,114	688,559	12,857	19,340	56,458
1988	(149,149)	225,772	(406,043)	(137,179)	924,349	457,750	9,897	(119,480)	(60,430)
1989	42,340	615,011	236,882	82,077	589,583	1,565,893	6,091	94,739	280,668
1990	24,185	236,766	76,701	28,255	448,579	814,486	5,815	41,326	2,012,496
1991	4,916,712	399,868	99,886	36,215	513,014	5,965,695	4,633	43,603	41,705
1992	(754,555)	555,140	215,486	78,615	433,070	527,756	3,888	105,298	110,832
1993	106,388	701,733	181,348	69,374	727,184	1,786,027	15,159	102,081	88,940
1994	5,641	16,974	10,373	3,772	5,658	42,418	0	4,715	3,772
1995	6,347	16,974	13,202	4,715	6,601	47,839	0	4,715	4,715
1996	6,347	16,974	13,202	4,715	6,601	47,839	0	4,715	4,715
1997	6,347	16,974	12,259	4,715	6,601	46,896	0	4,715	4,715
1998	2,116	9,430	2,829	943	1,886	17,204	0	1,886	943
1999	0	0	0	0	0	0	0	0	0
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	19,156,437	29,419,917	22,144,693	5,725,140	33,525,816	109,972,003	807,108	12,790,727	10,868,320

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	10,309	15,334	28,253	21,885	25,515	(1,074,560)	28,987	34,617	(1,142,332)
1982	8,237	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)
1983	14,488	9,820	14,285	13,107	35,872	419,753	17,478	24,992	116,008
1984	7,532	29,138	93,958	52,372	22,731	60,234	80,334	66,263	64,859
1985	9,215	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782
1986	22,340	16,799	16,541	25,304	20,488	141,184	26,387	14,192	154,251
1987	17,161	13,854	12,684	20,485	15,708	104,150	20,921	8,854	229,858
1988	(159,162)	(73,513)	(150,919)	(51,204)	(119,863)	162,440	(75,101)	(75,153)	145,715
1989	72,638	66,934	64,896	123,406	76,005	2,795,936	121,772	38,598	2,968,908
1990	32,894	27,395	25,436	45,108	34,275	622,095	42,270	14,671	476,553
1991	37,284	32,608	30,505	55,441	34,671	425,650	50,730	12,420	449,693
1992	105,273	101,165	99,095	193,979	100,102	1,003,968	187,211	10,346	462,086
1993	89,403	69,223	62,370	116,302	80,861	647,387	108,713	39,385	976,416
1994	4,715	2,829	3,772	2,829	3,772	10,373	2,829	2,829	7,544
1995	5,658	2,829	3,772	3,772	3,772	9,430	3,772	2,829	6,601
1996	5,658	2,829	3,772	3,772	3,772	9,430	3,772	2,829	5,658
1997	4,715	2,829	3,772	3,772	3,772	9,430	3,772	2,829	5,658
1998	1,886	943	943	943	943	5,658	943	943	4,715
1999	0	0	0	0	0	0	0	0	0
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	9,342,978	12,390,405	11,067,983	7,982,650	15,871,716	63,099,856	8,865,842	7,028,469	44,458,187

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 (continued)		Tehachapi Division			Mojave Division			
	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	(2,526,104)	(4,557,723)	(3,848,206)	6,903	(3,841,303)	1,226,519	845,702	4,498	48,625
1982	(1,850,736)	(3,296,600)	11,370,111	6,054	11,376,165	7,054,354	746,900	3,920	33,869
1983	166,301	864,934	8,862,914	8,269	8,871,183	11,038,206	64,660	2,596	40,793
1984	123,150	643,438	3,227,937	31,701	3,259,638	8,382,266	309,491	3,124	17,504
1985	82,117	165,866	1,926,289	10,460	1,936,749	5,269,457	252,781	3,885	72,697
1986	186,740	678,667	1,382,062	33,791	1,415,853	2,093,803	2,324,864	4,261	2,510,926
1987	198,211	730,541	676,903	13,911	690,814	1,349,548	55,071	4,684	624,694
1988	264,196	(302,577)	1,412,737	(49,687)	1,363,050	848,257	(84,201)	13,409	(63,864)
1989	5,978,527	12,689,118	554,301	65,264	619,565	380,259	235,837	50,954	152,941
1990	545,670	3,926,004	758,414	26,320	784,734	200,385	(377,730)	35,292	(585,538)
1991	682,731	1,901,674	699,872	34,857	734,729	273,802	61,913	81,604	(164,624)
1992	682,369	3,165,612	778,365	26,738	805,103	624,699	420,840	86,545	230,195
1993	773,460	3,169,700	1,168,938	36,126	1,205,064	1,097,906	246,732	55,834	92,315
1994	12,259	62,238	15,088	1,886	16,974	1,028,813	4,715	0	3,772
1995	11,316	63,181	12,259	1,886	14,145	943	5,658	0	4,715
1996	11,316	62,238	12,259	1,886	14,145	943	5,658	0	4,715
1997	11,316	61,295	12,259	1,886	14,145	943	5,658	0	4,715
1998	6,601	27,347	9,430	0	9,430	0	943	0	943
1999	0	0	0	0	0	0	0	0	0
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	70,899,895	275,474,136	240,549,967	54,481,663	295,031,630	50,068,398	23,440,657	561,149	18,081,328

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	32,214	13,223	6,458	(774,614)	160,862	203,941	1,767,428	5,861	69,031
1982	77,988	13,158	14,459	432,274	437,307	79,819	8,894,048	9,224	159,280
1983	58,714	25,900	10,363	451,428	2,199,973	58,989	13,951,622	4,304	528,764
1984	35,377	845,422	6,052	(38,439)	1,369,400	34,764	10,964,961	3,850	270,455
1985	(201,541)	(432,054)	1,985,548	667,645	974,482	51,634	8,644,534	5,555	97,740
1986	(1,918,875)	(1,245,487)	3,328,852	1,209,695	235,591	52,013	8,595,643	9,926	233,174
1987	(306,443)	78,590	67,209	4,588,697	161,279	92,042	6,715,371	4,922	265,242
1988	(48,431)	45,024	353,897	1,332,252	600,393	198,205	3,194,941	7,376	680,034
1989	187,662	176,016	539,725	4,840,901	1,577,426	438,733	8,580,454	8,311	177,202
1990	(393,913)	(584,968)	(86,667)	9,910,321	1,564,466	345,009	10,026,657	177,489	201,006
1991	879	(122,944)	(11,722)	9,168,866	3,980,862	140,723	13,409,359	203,041	414,689
1992	342,148	(260,347)	76,343	5,410,427	9,245,212	133,581	16,309,643	333,672	(838,971)
1993	146,072	114,506	45,790	2,136,717	17,289,001	160,064	21,384,937	1,517,132	4,895,049
1994	2,829	1,886	1,886	711,965	7,912,713	2,829	9,671,408	2,806,368	5,658
1995	3,772	2,829	1,886	64,124	1,389,982	2,829	1,476,738	26,615,232	4,715
1996	3,772	2,829	1,886	18,860	943	2,829	42,435	1,885,057	4,715
1997	3,772	2,829	1,886	18,860	943	2,829	42,435	943	3,772
1998	0	0	0	5,658	0	1,886	9,430	0	2,829
1999	0	0	0	0	0	0	0	0	0
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	17,589,383	8,445,538	12,864,645	123,674,202	53,327,476	50,915,255	358,968,031	58,319,431	44,879,569

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)								
	Santa Ana Division (continued)				West Branch				
	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	28,815	22,647	61,349	187,703	(711,751)	2,699,873	19,806,531	94,944	28,852
1982	16,069	58,900	55,841	299,314	(465,217)	351,251	17,964,617	215,678	42,587
1983	18,213	89,581	(264,804)	376,058	100,394	180,971	6,751,649	220,150	24,295
1984	14,461	12,258	49,547	350,571	71,759	68,930	2,870,259	335,942	17,285
1985	17,816	11,481	54,070	186,662	142,244	25,386	2,126,670	102,366	21,971
1986	31,572	25,041	86,812	386,525	133,971	62,300	274,718	142,041	36,154
1987	17,380	8,198	46,549	342,291	16,456	454,210	714,093	193,181	28,018
1988	42,053	21,219	91,213	841,895	429,007	118,145	1,657,002	204,061	96,244
1989	30,727	13,947	56,997	287,184	225,275	432,384	585,888	251,738	101,263
1990	27,687	13,223	56,361	475,766	196,606	312,513	355,953	814,234	56,493
1991	142,830	16,178	64,673	841,411	220,905	345,191	403,843	1,134,278	57,939
1992	36,219	15,081	75,097	(378,902)	551,264	297,085	402,553	4,406,167	51,726
1993	45,561	27,530	164,542	6,649,814	468,025	305,925	528,554	3,349,716	76,395
1994	2,829	3,772	4,715	2,823,342	5,658	1,886	497,904	3,772	1,886
1995	3,772	4,715	3,772	26,632,206	4,715	1,886	5,717,409	2,829	2,829
1996	3,772	4,715	3,772	1,902,031	4,715	1,886	9,028,282	2,829	2,829
1997	3,772	4,715	3,772	16,974	4,715	1,886	3,772	2,829	2,829
1998	0	0	2,829	5,658	3,772	943	943	1,886	0
1999	0	0	0	0	0	0	0	0	0
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	24,008,898	23,476,323	53,682,479	204,366,700	34,923,682	30,882,712	134,785,760	61,654,245	74,905,836

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)								
	West Branch (continued)		Coastal Branch						
	Reach 30 (65)	Subtotal (66)	Reach 31A (67)	Reach 33A (68)	Reach 34 (69)	Reach 35 (70)	Subtotal (71)	Total (72)	Grand Total (73)
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	275,460	22,193,909	19,897	(214,426)	0	1,254	(193,275)	15,317,353	15,813,475
1982	351,376	18,460,292	(16,381)	(167,229)	0	442	(183,168)	38,359,936	39,809,287
1983	566,630	7,844,089	85,496	9,225	0	654	95,375	34,982,020	38,321,388
1984	1,118,954	4,483,129	28,568	6,794	0	570	35,932	24,598,988	30,527,147
1985	284,243	2,702,880	36,834	16,371	0	1,452	54,657	15,163,594	28,786,220
1986	213,476	862,660	82,394	150,211	0	13,472	246,077	14,311,618	44,032,169
1987	159,728	1,565,686	55,224	975,376	0	87,488	1,118,088	12,788,208	35,410,116
1988	222,735	2,727,194	184,901	1,056,072	0	94,543	1,335,516	12,366,649	19,461,791
1989	156,017	1,752,565	97,674	819,912	0	73,372	990,958	33,944,808	36,847,480
1990	121,773	1,857,572	127,746	1,004,455	0	89,486	1,221,687	35,083,520	36,971,135
1991	233,430	2,395,586	165,592	1,541,058	0	117,805	1,824,455	41,240,913	42,799,327
1992	215,326	5,924,121	189,559	2,905,906	3,414	153,697	3,252,576	36,374,310	37,174,365
1993	296,791	5,025,406	345,026	10,224,456	1,027,996	1,033,746	12,631,224	54,800,127	55,579,656
1994	17,917	529,023	9,000	77,621,453	19,110,773	5,499,848	102,241,074	117,510,740	118,145,284
1995	13,202	5,742,870	9,000	83,357,494	34,953,399	31,641,431	149,961,324	186,968,393	187,999,173
1996	13,202	9,053,743	8,000	16,221,962	3,383,923	20,553,087	40,166,972	54,184,186	54,218,966
1997	9,430	25,461	8,000	796,302	71,188	237,510	1,113,000	1,347,534	1,379,550
1998	2,829	10,373	4,000	357,159	31,898	94,244	487,301	578,741	585,993
1999	0	0	0	357,159	31,898	94,244	483,301	483,301	483,301
2000	0	0	0	357,233	31,904	94,263	483,400	483,400	483,400
2001	0	0	0	147,800	13,200	39,000	200,000	200,000	200,000
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	135,097,278	472,249,513	16,710,422	198,723,887	58,659,593	59,966,830	334,060,732	2,225,214,783	2,373,808,774

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	1,833,720	285,911	305,155	158,961
1987	2,595	0	0	0	309,138	309,138	2,099,152	163,719	400,563	282,218
1988	2,600	0	0	0	329,867	329,867	2,072,074	186,324	300,007	369,651
1989	2,672	467,483	178,186	233,909	371,179	1,250,757	2,160,356	163,551	320,844	495,200
1990	2,687	548,655	244,901	120,244	423,365	1,337,165	2,212,244	251,423	354,988	565,790
1991	2,730	646,055	302,482	204,145	425,242	1,577,924	1,788,123	152,492	95,768	91,654
1992	2,774	440,737	190,248	261,006	276,649	1,168,640	2,509,721	449,945	504,957	505,058
1993	2,912	430,122	223,952	213,998	279,855	1,147,927	3,942,379	596,180	499,950	453,730
1994	3,058	766,760	206,119	355,710	307,055	1,635,644	5,737,190	548,318	526,276	428,190
1995	3,211	859,928	244,255	400,745	355,441	1,860,369	3,407,887	478,656	560,737	435,718
1996	3,372	882,574	259,282	424,414	370,645	1,936,915	3,267,592	416,262	595,780	464,735
1997	3,372	901,007	250,739	428,239	366,019	1,946,004	3,406,866	415,029	624,243	530,519
1998	3,372	901,302	250,833	428,679	366,296	1,947,110	3,411,490	415,204	624,722	530,489
1999	3,372	906,459	252,315	431,205	368,163	1,958,142	3,429,204	417,688	628,320	536,971
2000	3,372	907,733	252,323	431,870	368,505	1,960,431	3,430,298	417,792	628,612	538,449
2001	3,372	907,883	252,422	431,935	368,545	1,960,785	3,430,773	417,951	628,848	538,778
2002	3,372	908,060	252,423	432,027	368,592	1,961,102	3,430,926	417,965	628,888	538,983
2003	3,372	908,221	252,425	432,111	368,635	1,961,392	3,431,064	417,980	628,925	539,174
2004	3,372	908,361	252,426	432,185	368,673	1,961,645	3,431,185	417,993	628,965	539,369
2005	3,372	909,464	252,433	432,760	368,970	1,963,627	3,432,137	418,088	629,229	540,711
2006	3,372	909,447	252,433	432,751	368,965	1,963,596	3,432,123	418,088	629,228	540,707
2007	3,372	909,618	252,434	432,840	369,012	1,963,904	3,432,270	418,101	629,266	540,901
2008	3,372	909,748	252,435	432,909	369,048	1,964,140	3,432,381	418,112	629,296	541,053
2009	3,372	909,923	252,436	432,999	369,094	1,964,452	3,432,533	418,127	629,342	541,279
2010	3,372	910,177	252,439	433,131	369,162	1,964,909	3,432,752	418,150	629,404	541,598
2011	3,372	910,241	252,439	433,165	369,181	1,965,026	3,432,805	418,154	629,416	541,656
2012	3,372	911,491	252,447	433,819	369,517	1,967,274	3,433,887	418,264	629,723	543,215
2013	3,372	911,262	252,446	433,699	369,456	1,966,863	3,433,688	418,243	629,664	542,919
2014	3,372	911,460	252,447	433,801	369,509	1,967,217	3,433,857	418,261	629,713	543,165
2015	3,372	911,425	252,447	433,783	369,499	1,967,154	3,433,828	418,257	629,706	543,125
2016	3,372	911,440	252,447	433,791	369,504	1,967,182	3,433,842	418,259	629,710	543,151
2017	3,372	912,118	252,451	434,145	369,687	1,968,401	3,434,426	418,318	629,874	543,979
2018	3,372	912,072	252,451	434,121	369,676	1,968,320	3,434,386	418,314	629,862	543,919
2019	3,372	912,066	252,452	434,117	369,673	1,968,308	3,434,380	418,314	629,862	543,918
2020	3,372	911,799	252,450	433,977	369,602	1,967,828	3,434,150	418,290	629,797	543,587
2021	3,372	911,782	252,450	433,969	369,598	1,967,799	3,434,134	418,289	629,792	543,564
2022	3,372	911,799	252,451	433,978	369,603	1,967,831	3,434,150	418,290	629,797	543,589
2023	3,372	911,787	252,450	433,971	369,599	1,967,807	3,434,140	418,289	629,793	543,566
2024	3,372	911,785	252,450	433,971	369,599	1,967,805	3,434,138	418,289	629,792	543,568
2025	3,372	911,778	252,450	433,967	369,597	1,967,792	3,434,132	418,289	629,792	543,564
2026	3,372	911,748	252,450	433,951	369,589	1,967,738	3,434,105	418,285	629,783	543,515
2027	3,372	911,748	252,450	433,951	369,589	1,967,738	3,434,106	418,285	629,783	543,519
2028	3,372	911,682	252,450	433,917	369,571	1,967,620	3,434,050	418,280	629,768	543,444
2029	3,372	911,681	252,450	433,917	369,571	1,967,619	3,434,048	418,279	629,766	543,428
2030	3,372	911,681	252,450	433,917	369,571	1,967,619	3,434,048	418,281	629,770	543,449
2031	3,372	911,681	252,450	433,917	369,571	1,967,619	3,434,048	418,280	629,768	543,441
2032	3,372	911,678	252,450	433,915	369,570	1,967,613	3,434,047	418,281	629,768	543,444
2033	3,372	911,673	252,450	433,913	369,569	1,967,605	3,434,042	418,278	629,763	543,420
2034	3,372	911,682	252,450	433,917	369,571	1,967,620	3,434,050	418,280	629,769	543,444
2035	3,372	911,685	252,450	433,919	369,572	1,967,626	3,434,051	418,279	629,767	543,434
Total	186,365	40,540,961	11,691,169	19,107,320	19,573,883	90,913,333	180,551,783	21,662,441	32,200,230	26,914,460

TABLE B-11

Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R 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)
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	363,354	3,036,663	5,372,130	995,309	391,351	6,758,790
1987	15,273	25,182	37,949	416,375	3,440,431	5,154,862	998,049	380,389	6,533,300
1988	30,214	41,049	49,157	335,477	3,383,953	5,135,313	841,967	369,148	6,346,428
1989	9,740	54,865	114,259	179,358	3,498,173	5,551,948	853,165	910,818	7,315,931
1990	31,158	69,387	119,277	247,718	3,851,985	6,772,013	1,082,175	892,047	8,746,235
1991	22,422	(18,755)	99,510	261,979	2,493,193	6,832,210	1,099,404	599,948	8,531,562
1992	37,820	384,326	102,762	186,630	4,681,219	9,511,638	1,445,945	686,072	11,643,655
1993	35,285	232,456	120,354	290,894	6,171,228	10,207,090	1,436,282	863,887	12,507,259
1994	67,020	60,760	73,495	342,276	7,783,525	10,322,155	1,840,438	595,217	12,757,810
1995	70,253	63,797	77,463	446,554	5,541,065	10,625,392	2,072,645	653,901	13,351,938
1996	75,004	67,994	82,755	473,244	5,443,366	10,845,718	2,089,394	697,407	13,632,519
1997	78,611	71,322	86,598	374,006	5,587,194	11,117,585	2,102,287	726,720	13,946,592
1998	78,751	71,276	86,229	373,978	5,592,139	11,130,941	2,103,311	726,915	13,961,167
1999	79,218	71,699	86,736	376,011	5,625,847	11,184,351	2,115,431	730,450	14,030,232
2000	79,218	71,699	86,736	376,011	5,628,815	11,189,849	2,117,723	731,152	14,038,724
2001	79,249	71,728	86,769	376,160	5,630,256	11,187,797	2,118,662	731,429	14,037,888
2002	79,249	71,728	86,769	376,160	5,630,668	11,188,559	2,118,971	731,524	14,039,054
2003	79,249	71,728	86,769	376,160	5,631,049	11,189,257	2,119,300	731,626	14,040,183
2004	79,249	71,728	86,769	376,160	5,631,418	11,189,871	2,119,793	731,775	14,041,439
2005	79,249	71,728	86,769	376,160	5,634,071	11,194,654	2,122,246	732,525	14,049,425
2006	79,249	71,728	86,769	376,160	5,634,052	11,194,587	2,122,333	732,552	14,049,472
2007	79,249	71,728	86,769	376,160	5,634,444	11,195,318	2,122,626	732,642	14,050,586
2008	79,249	71,728	86,769	376,160	5,634,748	11,195,883	2,122,856	732,712	14,051,451
2009	79,249	71,728	86,769	376,160	5,635,187	11,196,642	2,123,348	732,863	14,052,853
2010	79,249	71,728	86,769	376,160	5,635,810	11,197,748	2,124,000	733,062	14,054,810
2011	79,249	71,728	86,769	376,160	5,635,937	11,198,014	2,123,986	733,057	14,055,057
2012	79,249	71,728	86,769	376,160	5,638,995	11,203,453	2,127,041	733,991	14,064,485
2013	79,249	71,728	86,769	376,160	5,638,420	11,202,451	2,126,410	733,798	14,062,659
2014	79,249	71,728	86,769	376,160	5,638,902	11,203,306	2,126,891	733,946	14,064,143
2015	79,249	71,728	86,769	376,160	5,638,822	11,203,160	2,126,832	733,927	14,063,919
2016	79,249	71,728	86,769	376,160	5,638,868	11,203,226	2,126,930	733,958	14,064,114
2017	79,249	71,728	86,769	376,160	5,640,503	11,206,168	2,128,446	734,422	14,069,036
2018	79,249	71,728	86,769	376,160	5,640,387	11,205,967	2,128,324	734,384	14,068,675
2019	79,249	71,728	86,769	376,160	5,640,380	11,205,940	2,128,362	734,395	14,068,697
2020	79,249	71,728	86,769	376,160	5,639,730	11,204,777	2,127,733	734,203	14,066,713
2021	79,249	71,728	86,769	376,160	5,639,685	11,204,704	2,127,674	734,184	14,066,562
2022	79,249	71,728	86,769	376,160	5,639,732	11,204,782	2,127,739	734,205	14,066,726
2023	79,249	71,728	86,769	376,160	5,639,694	11,204,727	2,127,648	734,177	14,066,552
2024	79,249	71,728	86,769	376,160	5,639,693	11,204,719	2,127,684	734,188	14,066,591
2025	79,249	71,728	86,769	376,160	5,639,683	11,204,689	2,127,700	734,193	14,066,582
2026	79,249	71,728	86,769	376,160	5,639,594	11,204,553	2,127,541	734,144	14,066,238
2027	79,249	71,728	86,769	376,160	5,639,599	11,204,556	2,127,561	734,151	14,066,268
2028	79,249	71,728	86,769	376,160	5,639,448	11,204,272	2,127,458	734,119	14,065,849
2029	79,249	71,728	86,769	376,160	5,639,427	11,204,263	2,127,349	734,086	14,065,698
2030	79,249	71,728	86,769	376,160	5,639,454	11,204,269	2,127,504	734,133	14,065,906
2031	79,249	71,728	86,769	376,160	5,639,443	11,204,268	2,127,443	734,114	14,065,825
2032	79,249	71,728	86,769	376,160	5,639,446	11,204,259	2,127,492	734,130	14,065,881
2033	79,249	71,728	86,769	376,160	5,639,409	11,204,229	2,127,325	734,078	14,065,632
2034	79,249	71,728	86,769	376,160	5,639,449	11,204,272	2,127,461	734,120	14,065,853
2035	79,249	71,728	86,769	376,160	5,639,437	11,204,283	2,127,355	734,088	14,065,726
Total	3,589,129	4,182,887	4,622,640	20,296,953	294,020,523	561,068,269	104,802,277	39,188,270	705,058,816

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	420,831	2,988,446	485,455	255,934	616,571	4,767,237	93,875	502,053	610,518
1987	381,953	3,084,747	440,504	241,015	463,016	4,611,235	115,896	429,649	452,656
1988	372,382	2,971,396	465,967	234,708	649,643	4,694,096	97,773	388,019	425,358
1989	262,885	3,158,273	394,919	333,614	634,383	4,784,074	83,305	388,814	400,033
1990	407,134	3,908,842	510,463	438,814	695,169	5,960,422	111,123	434,062	512,739
1991	263,356	4,336,232	548,918	729,934	768,152	6,646,592	104,498	502,165	471,198
1992	322,334	3,808,804	813,788	366,637	818,400	6,129,963	118,221	511,613	416,311
1993	446,954	4,374,325	945,545	579,501	721,015	7,067,340	196,175	650,417	478,446
1994	642,879	4,122,584	863,281	444,543	517,019	6,590,306	222,603	749,914	639,964
1995	776,785	4,129,421	892,196	449,849	531,203	6,779,454	248,770	888,481	712,345
1996	831,995	4,071,725	894,080	417,480	562,021	6,777,301	266,445	953,115	763,037
1997	792,681	4,265,320	929,640	425,902	578,864	6,992,407	244,394	938,736	765,093
1998	794,524	4,270,483	929,223	425,985	579,083	6,999,298	244,815	939,206	765,127
1999	806,598	4,302,347	937,790	429,816	584,163	7,060,714	246,269	945,029	770,056
2000	809,025	4,309,546	940,525	430,689	585,265	7,075,050	246,297	946,470	771,405
2001	809,682	4,307,503	940,834	430,836	585,464	7,074,319	246,393	946,824	771,693
2002	810,011	4,308,483	941,191	430,949	585,608	7,076,242	246,398	947,013	771,868
2003	810,357	4,309,403	941,547	431,063	585,750	7,078,120	246,401	947,200	772,043
2004	810,879	4,310,272	941,971	431,198	585,920	7,080,240	246,406	947,424	772,253
2005	813,480	4,316,687	944,613	432,041	586,986	7,093,807	246,433	948,813	773,554
2006	813,574	4,316,621	944,622	432,044	586,990	7,093,851	246,432	948,818	773,559
2007	813,884	4,317,601	945,015	432,170	587,148	7,095,818	246,436	949,026	773,753
2008	814,127	4,318,292	945,227	432,237	587,233	7,097,116	246,438	949,136	773,856
2009	814,648	4,319,419	945,812	432,424	587,469	7,099,772	246,444	949,445	774,146
2010	815,338	4,320,804	946,284	432,574	587,659	7,102,659	246,449	949,692	774,378
2011	815,326	4,321,195	946,471	432,633	587,734	7,103,359	246,451	949,791	774,469
2012	818,563	4,328,557	949,594	433,631	588,993	7,119,338	246,483	951,434	776,009
2013	817,894	4,327,160	948,956	433,427	588,736	7,116,173	246,478	951,098	775,694
2014	818,404	4,328,364	949,517	433,605	588,962	7,118,852	246,483	951,393	775,969
2015	818,343	4,328,126	949,371	433,559	588,902	7,118,301	246,482	951,317	775,898
2016	818,447	4,328,263	949,484	433,596	588,949	7,118,739	246,483	951,377	775,953
2017	820,052	4,332,186	951,077	434,105	589,590	7,127,010	246,499	952,214	776,738
2018	819,924	4,331,922	950,976	434,072	589,549	7,126,443	246,498	952,162	776,690
2019	819,963	4,331,866	950,933	434,057	589,532	7,126,351	246,498	952,137	776,668
2020	819,298	4,330,403	950,432	433,898	589,331	7,123,362	246,493	951,876	776,421
2021	819,234	4,330,158	950,172	433,814	589,225	7,122,603	246,490	951,739	776,294
2022	819,302	4,330,331	950,320	433,862	589,285	7,123,100	246,492	951,816	776,366
2023	819,206	4,330,234	950,249	433,840	589,257	7,122,786	246,491	951,778	776,331
2024	819,246	4,330,237	950,267	433,845	589,263	7,122,858	246,491	951,788	776,340
2025	819,261	4,330,205	950,266	433,845	589,264	7,122,841	246,490	951,787	776,339
2026	819,092	4,329,997	950,146	433,807	589,216	7,122,258	246,489	951,725	776,280
2027	819,115	4,330,007	950,158	433,810	589,220	7,122,310	246,489	951,732	776,286
2028	819,006	4,329,649	950,037	433,772	589,170	7,121,634	246,489	951,666	776,227
2029	818,891	4,329,588	949,951	433,744	589,135	7,121,309	246,488	951,622	776,183
2030	819,053	4,329,678	950,092	433,790	589,193	7,121,806	246,489	951,696	776,254
2031	818,990	4,329,643	950,031	433,770	589,169	7,121,603	246,488	951,664	776,223
2032	819,041	4,329,651	950,063	433,780	589,182	7,121,717	246,489	951,681	776,239
2033	818,865	4,329,523	949,902	433,729	589,117	7,121,136	246,487	951,596	776,160
2034	819,008	4,329,673	950,074	433,784	589,185	7,121,724	246,489	951,687	776,245
2035	818,896	4,329,578	949,908	433,732	589,119	7,121,233	246,487	951,598	776,162
Total	39,784,239	228,448,379	48,058,899	23,053,681	41,149,329	380,494,527	12,093,631	47,505,189	38,874,405

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	438,405	266,196	259,524	361,905	348,601	3,775,844	321,053	360,209	3,568,890
1987	495,775	337,838	329,989	472,860	324,873	3,675,288	463,938	241,745	4,025,250
1988	540,482	295,228	224,836	378,523	318,463	3,452,742	411,089	313,788	3,754,057
1989	732,216	267,472	206,578	595,088	379,923	3,495,050	334,608	221,408	3,737,270
1990	648,735	361,236	221,553	478,313	673,308	3,974,182	442,420	214,723	4,329,265
1991	721,918	331,944	274,801	374,143	437,846	4,267,141	424,167	272,857	4,531,974
1992	582,063	328,904	276,024	401,553	424,181	4,775,398	728,297	570,506	4,323,624
1993	685,083	390,561	276,674	472,035	545,552	5,242,166	670,430	453,877	5,215,725
1994	632,103	489,359	421,248	691,081	698,019	4,738,004	576,527	399,061	4,650,335
1995	755,851	545,207	470,043	764,111	779,764	5,005,352	640,844	500,040	4,873,656
1996	810,099	584,661	504,249	815,654	837,945	5,223,358	687,974	537,877	5,056,762
1997	788,998	578,250	528,111	820,335	877,686	5,425,759	721,125	505,055	5,246,858
1998	789,199	578,556	527,918	820,888	878,172	5,430,594	720,982	504,945	5,252,960
1999	794,144	582,142	531,425	825,928	883,700	5,458,583	725,677	508,202	5,278,839
2000	795,589	582,940	532,718	826,760	884,879	5,464,342	727,187	509,307	5,282,246
2001	795,886	583,160	532,913	827,076	885,215	5,462,639	727,362	509,427	5,280,512
2002	796,074	583,264	533,081	827,185	885,369	5,463,412	727,551	509,564	5,280,978
2003	796,262	583,367	533,249	827,293	885,522	5,464,126	727,731	509,696	5,281,402
2004	796,487	583,491	533,449	827,422	885,705	5,464,757	727,897	509,819	5,281,765
2005	797,884	584,261	534,697	828,226	886,843	5,469,795	729,247	510,807	5,284,712
2006	797,889	584,263	534,700	828,229	886,848	5,469,697	729,211	510,779	5,284,655
2007	798,096	584,378	534,888	828,348	887,017	5,470,515	729,452	510,956	5,285,123
2008	798,207	584,440	534,986	828,412	887,106	5,471,011	729,528	511,014	5,285,444
2009	798,518	584,611	535,263	828,591	887,360	5,471,964	729,872	511,264	5,285,955
2010	798,767	584,748	535,485	828,735	887,563	5,472,882	729,985	511,346	5,286,551
2011	798,865	584,803	535,573	828,792	887,643	5,473,321	730,186	511,494	5,286,774
2012	800,518	585,713	537,048	829,742	888,988	5,479,013	731,698	512,599	5,290,097
2013	800,180	585,526	536,746	829,548	888,713	5,477,927	731,388	512,373	5,289,477
2014	800,476	585,690	537,010	829,719	888,956	5,478,917	731,702	512,604	5,290,030
2015	800,399	585,648	536,941	829,674	888,892	5,478,661	731,579	512,512	5,289,905
2016	800,460	585,682	536,995	829,708	888,941	5,478,791	731,648	512,564	5,289,962
2017	801,301	586,145	537,747	830,194	889,628	5,481,835	732,435	513,139	5,291,756
2018	801,248	586,115	537,699	830,164	889,584	5,481,653	732,402	513,114	5,291,643
2019	801,225	586,103	537,679	830,148	889,566	5,481,544	732,333	513,063	5,291,599
2020	800,961	585,957	537,443	829,998	889,349	5,480,540	732,181	512,953	5,290,956
2021	800,822	585,881	537,319	829,918	889,237	5,480,178	731,926	512,767	5,290,818
2022	800,901	585,924	537,390	829,963	889,301	5,480,387	732,053	512,860	5,290,906
2023	800,864	585,904	537,356	829,942	889,271	5,480,320	732,030	512,842	5,290,871
2024	800,874	585,910	537,366	829,947	889,279	5,480,313	732,028	512,842	5,290,867
2025	800,872	585,909	537,364	829,946	889,278	5,480,281	732,019	512,836	5,290,846
2026	800,809	585,874	537,307	829,910	889,226	5,480,140	731,983	512,807	5,290,768
2027	800,815	585,877	537,313	829,913	889,231	5,480,143	731,984	512,809	5,290,768
2028	800,751	585,841	537,256	829,878	889,179	5,479,864	731,920	512,762	5,290,598
2029	800,706	585,817	537,216	829,851	889,142	5,479,819	731,886	512,737	5,290,586
2030	800,780	585,858	537,283	829,892	889,202	5,479,902	731,955	512,788	5,290,605
2031	800,748	585,840	537,255	829,876	889,177	5,479,866	731,923	512,763	5,290,598
2032	800,765	585,850	537,269	829,885	889,190	5,479,864	731,930	512,769	5,290,591
2033	800,679	585,803	537,192	829,835	889,121	5,479,748	731,846	512,708	5,290,555
2034	800,770	585,853	537,274	829,889	889,195	5,479,911	731,959	512,791	5,290,613
2035	800,684	585,805	537,195	829,837	889,124	5,479,771	731,835	512,700	5,290,576
Total	41,597,267	28,910,331	25,851,416	40,685,550	43,280,148	285,644,301	36,939,112	26,192,862	277,118,395

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)		Tehachapi Division			Mojave Division			
	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	5,769,009	16,676,082	19,232,233	109,946	19,342,179	706,412	351,066	0	347,806
1987	5,516,648	16,882,405	16,699,386	98,310	16,797,696	1,260,974	558,244	0	817,859
1988	5,171,041	15,771,399	17,842,932	138,276	17,981,208	1,236,942	560,646	0	584,862
1989	5,439,787	16,281,552	17,586,947	88,598	17,675,545	1,051,949	285,524	0	368,764
1990	6,349,334	18,750,993	19,531,129	99,847	19,630,976	1,298,419	235,900	0	474,640
1991	5,733,885	18,448,537	19,510,173	131,502	19,641,675	1,427,786	663,613	0	1,024,673
1992	6,569,119	20,025,814	17,989,253	278,958	18,268,211	1,165,742	737,920	0	666,539
1993	7,492,218	22,769,359	18,203,069	203,271	18,406,340	1,711,274	659,643	0	1,114,313
1994	6,873,634	21,781,852	20,066,222	329,415	20,395,637	1,609,970	941,745	0	1,067,706
1995	7,183,327	23,367,791	21,246,323	346,947	21,593,270	1,856,897	1,311,757	0	1,146,234
1996	7,395,956	24,437,132	21,836,076	313,868	22,149,944	2,046,670	1,431,860	0	1,255,533
1997	7,662,565	25,102,965	21,630,334	270,526	21,900,860	1,908,945	1,103,606	0	1,118,042
1998	7,666,823	25,120,185	21,645,049	270,354	21,915,403	1,910,742	1,093,645	0	1,112,238
1999	7,702,944	25,252,938	21,709,583	272,114	21,981,697	1,922,814	1,105,786	0	1,122,393
2000	7,711,924	25,282,064	21,719,376	272,528	21,991,904	1,925,579	1,120,221	0	1,131,666
2001	7,706,250	25,275,350	21,699,145	272,573	21,971,718	1,925,556	1,118,594	0	1,130,787
2002	7,707,394	25,279,151	21,700,499	272,622	21,973,121	1,925,921	1,120,326	0	1,131,899
2003	7,708,444	25,282,736	21,701,739	272,666	21,974,405	1,926,257	1,121,891	0	1,132,906
2004	7,709,222	25,286,097	21,702,811	272,687	21,975,498	1,926,521	1,122,771	0	1,133,470
2005	7,716,834	25,312,106	21,711,287	273,024	21,984,311	1,928,887	1,134,767	0	1,141,176
2006	7,716,526	25,311,606	21,711,159	272,998	21,984,157	1,928,813	1,133,919	0	1,140,632
2007	7,717,933	25,315,921	21,712,466	273,073	21,985,539	1,929,220	1,136,519	0	1,142,301
2008	7,718,474	25,318,052	21,713,470	273,081	21,986,551	1,929,443	1,136,877	0	1,142,533
2009	7,720,231	25,323,664	21,714,809	273,180	21,987,989	1,929,902	1,140,342	0	1,144,759
2010	7,720,931	25,327,512	21,716,760	273,161	21,989,921	1,930,268	1,139,894	0	1,144,472
2011	7,722,104	25,330,266	21,717,245	273,250	21,990,495	1,930,530	1,142,858	0	1,146,375
2012	7,730,388	25,359,730	21,726,864	273,592	22,000,456	1,933,144	1,155,185	0	1,154,297
2013	7,728,761	25,353,909	21,725,096	273,523	21,998,619	1,932,648	1,152,656	0	1,152,670
2014	7,730,456	25,359,405	21,726,611	273,612	22,000,223	1,933,127	1,155,811	0	1,154,695
2015	7,729,787	25,357,695	21,726,349	273,561	21,999,910	1,932,977	1,154,079	0	1,153,583
2016	7,730,095	25,358,659	21,726,460	273,583	22,000,043	1,933,044	1,154,879	0	1,154,097
2017	7,734,533	25,374,164	21,731,675	273,766	22,005,441	1,934,455	1,161,440	0	1,158,311
2018	7,734,345	25,373,317	21,731,320	273,765	22,005,085	1,934,377	1,161,350	0	1,158,253
2019	7,733,951	25,372,514	21,731,267	273,730	22,004,997	1,934,302	1,160,204	0	1,157,519
2020	7,733,023	25,368,151	21,729,212	273,734	22,002,946	1,933,887	1,160,125	0	1,157,469
2021	7,731,759	25,365,148	21,729,080	273,623	22,002,703	1,933,654	1,156,406	0	1,155,079
2022	7,732,385	25,366,744	21,729,216	273,674	22,002,890	1,933,775	1,158,112	0	1,156,176
2023	7,732,306	25,366,306	21,729,123	273,671	22,002,794	1,933,753	1,158,016	0	1,156,114
2024	7,732,271	25,366,316	21,729,109	273,668	22,002,777	1,933,742	1,157,911	0	1,156,045
2025	7,732,197	25,366,164	21,729,051	273,664	22,002,715	1,933,724	1,157,749	0	1,155,941
2026	7,732,059	25,365,377	21,728,818	273,662	22,002,480	1,933,672	1,157,686	0	1,155,901
2027	7,732,051	25,365,411	21,728,822	273,661	22,002,483	1,933,671	1,157,641	0	1,155,872
2028	7,731,646	25,364,077	21,728,317	273,645	22,001,962	1,933,537	1,157,058	0	1,155,499
2029	7,731,562	25,363,615	21,728,309	273,640	22,001,949	1,933,524	1,156,871	0	1,155,378
2030	7,731,778	25,364,482	21,728,306	273,657	22,001,963	1,933,560	1,157,499	0	1,155,779
2031	7,731,669	25,364,090	21,728,312	273,649	22,001,961	1,933,544	1,157,195	0	1,155,587
2032	7,731,659	25,364,181	21,728,288	273,648	22,001,936	1,933,539	1,157,191	0	1,155,584
2033	7,731,368	25,363,098	21,728,250	273,625	22,001,875	1,933,489	1,156,434	0	1,155,097
2034	7,731,839	25,364,515	21,728,316	273,663	22,001,979	1,933,574	1,157,703	0	1,155,911
2035	7,731,320	25,363,094	21,728,342	273,616	22,001,958	1,933,490	1,156,118	0	1,154,894
Total	406,322,544	1,311,015,151	1,145,062,276	13,710,431	1,158,772,707	92,999,063	57,090,767	0	57,131,298

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	315,688	242,230	178,902	6,184,414	154,339	516,121	8,996,978	31,012	2,776,691
1987	357,365	297,811	235,976	5,665,261	150,089	731,858	10,075,437	19,362	2,847,323
1988	399,768	331,019	149,786	6,916,654	252,077	969,393	11,401,147	36,499	3,081,532
1989	343,089	195,467	137,340	5,941,890	346,362	1,241,154	9,911,539	30,784	3,190,705
1990	207,572	276,837	51,616	6,830,375	435,238	1,880,372	11,690,969	25,302	3,328,862
1991	515,297	477,751	230,560	7,408,885	259,871	1,550,368	13,558,804	31,890	3,844,638
1992	696,214	584,636	168,266	7,065,414	316,263	608,308	12,009,302	55,675	4,039,508
1993	776,873	529,896	204,623	7,568,894	356,065	1,652,089	14,573,670	57,899	4,009,888
1994	677,768	564,491	405,158	7,972,297	766,439	222,650	14,228,224	324,944	5,372,804
1995	864,893	624,664	491,735	8,118,588	611,442	(484,928)	14,541,282	671,700	5,148,212
1996	949,720	686,325	537,473	7,878,012	586,890	6,645,469	22,017,952	257,395	5,013,088
1997	797,870	587,448	431,479	7,667,354	475,448	(422,125)	13,668,067	60,653	5,126,782
1998	791,494	583,964	428,749	7,648,858	474,933	1,595,221	15,639,844	60,591	5,132,325
1999	799,930	589,539	432,950	7,694,953	477,332	3,556,015	17,701,712	60,947	5,155,494
2000	809,203	594,780	437,061	7,735,227	479,536	(30,653)	14,202,620	60,947	5,158,432
2001	808,194	594,266	436,643	7,726,271	478,852	1,777,054	15,996,217	60,971	5,151,279
2002	809,306	594,892	437,137	7,730,926	479,157	1,785,593	16,015,157	60,971	5,151,685
2003	810,313	595,461	437,584	7,735,098	479,436	1,678,488	15,917,434	60,971	5,152,057
2004	810,877	595,781	437,835	7,737,273	479,677	1,709,884	15,954,089	60,971	5,152,379
2005	818,583	600,138	441,251	7,769,458	481,585	2,232,988	16,548,833	60,971	5,154,922
2006	818,039	599,833	441,010	7,767,074	481,556	1,976,772	16,287,648	60,971	5,154,884
2007	819,708	600,775	441,751	7,774,128	481,850	1,823,275	16,149,527	60,971	5,155,276
2008	819,940	600,906	441,851	7,774,940	482,076	1,977,685	16,306,251	60,971	5,155,576
2009	822,166	602,163	442,842	7,784,526	482,377	1,387,249	15,736,326	60,971	5,155,978
2010	821,879	602,002	442,714	7,782,663	482,816	4,844,369	19,191,077	60,971	5,156,564
2011	823,782	603,075	443,558	7,791,229	482,926	166,096	14,530,429	60,971	5,156,709
2012	831,704	607,552	447,071	7,823,855	485,091	1,928,879	16,366,778	60,971	5,159,596
2013	830,077	606,636	446,349	7,817,179	484,692	1,872,535	16,295,442	60,971	5,159,065
2014	832,102	607,781	447,246	7,825,689	485,034	2,312,856	16,754,341	60,971	5,159,519
2015	830,990	607,150	446,753	7,821,049	484,975	548,843	14,980,399	60,971	5,159,442
2016	831,504	607,441	446,982	7,822,977	485,000	2,020,778	16,456,702	60,971	5,159,475
2017	835,718	609,823	448,853	7,840,564	486,174	1,918,621	16,393,959	60,971	5,161,040
2018	835,660	609,790	448,826	7,840,310	486,094	1,855,581	16,330,241	60,971	5,160,933
2019	834,926	609,373	448,499	7,837,042	486,082	2,289,858	16,757,805	60,971	5,160,917
2020	834,876	609,347	448,478	7,837,326	485,620	252,337	14,719,465	60,971	5,160,300
2021	832,486	607,996	447,415	7,826,915	485,590	1,916,487	16,362,028	60,971	5,160,261
2022	833,583	608,617	447,904	7,831,694	485,621	2,068,306	16,523,788	60,971	5,160,301
2023	833,521	608,580	447,875	7,831,498	485,599	1,875,406	16,330,362	60,971	5,160,273
2024	833,452	608,542	447,846	7,831,112	485,596	1,786,152	16,240,398	60,971	5,160,269
2025	833,348	608,484	447,799	7,830,747	485,583	2,372,797	16,826,172	60,971	5,160,252
2026	833,308	608,460	447,781	7,830,566	485,531	1,835,114	16,288,019	60,971	5,160,182
2027	833,279	608,445	447,767	7,830,523	485,532	1,773,403	16,226,133	60,971	5,160,183
2028	832,906	608,234	447,604	7,828,861	485,418	2,116,634	16,565,751	60,971	5,160,032
2029	832,785	608,165	447,551	7,828,420	485,416	1,508,763	15,956,873	60,971	5,160,029
2030	833,186	608,394	447,728	7,830,141	485,415	1,768,629	16,220,331	60,971	5,160,028
2031	832,994	608,283	447,643	7,829,356	485,417	1,864,665	16,314,684	60,971	5,160,030
2032	832,991	608,280	447,641	7,829,140	485,411	1,864,654	16,314,431	60,971	5,160,023
2033	832,504	608,007	447,425	7,827,155	485,403	2,250,873	16,696,387	60,971	5,160,011
2034	833,318	608,467	447,788	7,830,742	485,417	1,451,767	15,904,687	60,971	5,160,031
2035	832,301	607,893	447,335	7,826,213	485,424	4,528,986	18,972,654	60,971	5,160,040
Total	41,239,637	31,021,049	21,598,976	417,768,341	24,862,549	93,894,110	837,605,790	4,442,722	262,665,804

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	981,955	4,485,232	3,785,131	457,562	2,897,411	1,478,950	1,029,535
1987	278,094	218,717	1,118,142	4,481,638	3,371,569	212,755	2,898,112	947,702	417,565
1988	271,876	200,794	1,178,950	4,769,651	3,459,707	254,893	3,019,022	884,734	456,842
1989	231,309	281,347	1,131,971	4,866,116	4,013,038	405,691	2,745,613	1,400,047	865,023
1990	437,647	307,979	1,530,319	5,630,109	4,033,592	382,868	3,218,239	3,093,315	751,391
1991	843,089	632,695	1,218,697	6,571,009	3,816,369	304,513	3,572,348	646,993	740,002
1992	282,408	5,634,388	1,101,949	11,113,928	4,260,887	327,195	4,175,344	1,037,521	783,079
1993	363,601	740,395	915,286	6,087,069	3,942,230	375,031	4,387,424	1,617,161	669,545
1994	526,099	733,393	1,786,267	8,743,507	4,689,252	564,930	2,322,550	3,606,690	705,779
1995	459,477	743,726	1,831,651	8,854,766	5,014,375	641,319	3,067,251	3,827,326	713,120
1996	497,406	541,693	2,539,788	8,849,370	5,150,243	649,725	2,991,062	3,814,355	711,315
1997	520,992	567,400	2,007,327	8,283,154	5,188,065	668,906	2,575,513	3,238,971	713,313
1998	521,245	567,568	2,408,783	8,690,512	5,193,697	657,302	2,576,785	3,207,252	713,526
1999	524,319	570,920	2,278,278	8,589,958	5,218,077	667,642	2,590,086	3,243,876	715,916
2000	524,319	570,920	2,496,618	8,811,236	5,220,901	683,305	2,594,320	3,299,238	715,916
2001	524,527	571,146	2,465,950	8,773,873	5,220,115	681,295	2,592,481	3,292,619	716,077
2002	524,527	571,146	2,527,675	8,836,004	5,220,487	683,173	2,593,049	3,299,060	716,077
2003	524,527	571,146	2,642,167	8,950,868	5,220,829	684,866	2,593,566	3,304,858	716,077
2004	524,527	571,146	2,760,974	9,069,997	5,221,095	685,781	2,593,988	3,307,998	716,077
2005	524,527	571,146	2,662,573	8,974,139	5,223,506	698,751	2,597,605	3,352,484	716,077
2006	524,527	571,146	2,705,823	9,017,351	5,223,429	697,829	2,597,514	3,349,357	716,077
2007	524,527	571,146	2,618,089	8,930,009	5,223,848	700,664	2,598,110	3,358,996	716,077
2008	524,527	571,146	2,620,901	8,933,121	5,224,069	701,026	2,598,481	3,360,261	716,077
2009	524,527	571,146	2,413,489	8,726,111	5,224,548	704,840	2,599,141	3,373,344	716,077
2010	524,527	571,146	2,702,678	9,015,886	5,224,909	704,343	2,599,799	3,371,495	716,077
2011	524,527	571,146	2,453,470	8,766,823	5,225,183	707,556	2,600,130	3,382,682	716,077
2012	524,527	571,146	2,823,199	9,139,439	5,227,847	720,923	2,604,162	3,428,322	716,077
2013	524,527	571,146	2,705,640	9,021,349	5,227,340	718,156	2,603,403	3,418,934	716,077
2014	524,527	571,146	2,965,053	9,281,216	5,227,832	721,567	2,604,102	3,430,547	716,077
2015	524,527	571,146	2,662,947	8,979,033	5,227,674	719,656	2,603,923	3,424,240	716,077
2016	524,527	571,146	2,668,589	8,984,708	5,227,744	720,540	2,604,000	3,426,937	716,077
2017	524,527	571,146	2,755,589	9,073,273	5,229,183	727,654	2,606,183	3,451,425	716,077
2018	524,527	571,146	2,755,320	9,072,897	5,229,106	727,584	2,606,054	3,451,078	716,077
2019	524,527	571,146	3,034,923	9,352,484	5,229,024	726,313	2,605,969	3,446,731	716,077
2020	524,527	571,146	2,554,788	8,871,732	5,228,609	726,252	2,605,250	3,446,562	716,077
2021	524,527	571,146	2,744,168	9,061,073	5,228,361	722,227	2,605,006	3,432,869	716,077
2022	524,527	571,146	2,507,729	8,824,674	5,228,492	724,110	2,605,147	3,439,278	716,077
2023	524,527	571,146	2,734,664	9,051,581	5,228,469	724,021	2,605,109	3,438,985	716,077
2024	524,527	571,146	2,853,567	9,170,480	5,228,458	723,907	2,605,097	3,438,531	716,077
2025	524,527	571,146	2,814,638	9,131,534	5,228,438	723,716	2,605,070	3,437,968	716,077
2026	524,527	571,146	2,757,453	9,074,279	5,228,388	723,672	2,604,983	3,437,715	716,077
2027	524,527	571,146	2,733,323	9,050,150	5,228,386	723,612	2,604,983	3,437,616	716,077
2028	524,527	571,146	2,546,360	8,863,036	5,228,250	722,996	2,604,773	3,435,366	716,077
2029	524,527	571,146	2,996,041	9,312,714	5,228,236	722,781	2,604,759	3,434,717	716,077
2030	524,527	571,146	2,642,476	8,959,148	5,228,271	723,400	2,604,793	3,436,872	716,077
2031	524,527	571,146	2,733,434	9,050,108	5,228,253	723,057	2,604,777	3,435,748	716,077
2032	524,527	571,146	2,733,036	9,049,703	5,228,247	723,059	2,604,767	3,435,592	716,077
2033	524,527	571,146	2,681,115	8,997,770	5,228,194	722,221	2,604,713	3,432,831	716,077
2034	524,527	571,146	2,519,228	8,835,903	5,228,285	723,611	2,604,807	3,437,612	716,077
2035	524,527	571,146	1,866,159	8,182,843	5,228,196	721,942	2,604,727	3,431,685	716,077
Total	27,518,008	33,891,576	127,068,810	455,586,920	273,222,164	35,119,809	146,381,759	166,587,615	38,815,062

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
	West Branch (continued)		Coastal Branch					Total	
	Reach 30 (65)	Subtotal (66)	Reach 31A (a (67)	Reach 33A (68)	Reach 34 (69)	Reach 35 (70)	Subtotal (71)	(72)	(73)
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	1,338,132	10,986,721	1,718,459	0	0	0	1,718,459	73,731,678	77,000,360
1987	1,405,242	9,252,945	1,689,899	0	0	0	1,689,899	70,324,555	74,076,719
1988	1,450,284	9,525,482	1,965,892	0	0	0	1,965,892	72,455,303	76,171,723
1989	1,500,860	10,930,272	1,763,961	0	0	0	1,763,961	73,528,990	78,280,592
1990	878,481	12,357,886	2,246,792	0	0	0	2,246,792	85,014,382	90,206,219
1991	(149,734)	8,930,491	2,297,508	0	0	0	2,297,508	84,626,178	88,700,025
1992	2,206,514	12,790,540	2,463,523	0	0	0	2,463,523	94,444,936	100,297,569
1993	1,095,727	12,087,118	2,734,257	0	0	0	2,734,257	96,232,412	103,554,479
1994	1,285,603	13,174,804	4,695,824	0	0	0	4,695,824	102,367,964	111,790,191
1995	2,936,738	16,200,129	4,450,071	0	0	0	4,450,071	109,138,701	116,543,346
1996	1,565,550	14,882,250	3,958,817	0	0	0	3,958,817	116,705,285	124,088,938
1997	4,211,293	16,596,061	3,918,262	590,098	172,536	133,255	4,814,151	111,304,257	118,840,827
1998	3,132,207	15,480,769	3,923,439	582,606	165,966	131,876	4,803,887	112,611,065	120,153,686
1999	1,427,651	13,863,248	3,946,845	585,584	167,089	133,034	4,832,552	113,313,051	120,900,412
2000	2,030,202	14,543,882	3,949,609	586,990	167,292	133,571	4,837,462	110,782,942	118,375,560
2001	1,893,333	14,395,920	3,950,908	586,777	167,344	133,589	4,838,618	112,363,903	119,958,316
2002	1,923,161	14,435,007	3,951,288	586,969	167,370	133,664	4,839,291	112,493,027	120,088,169
2003	1,929,740	14,449,936	3,951,638	587,148	167,398	133,732	4,839,916	112,533,598	120,129,411
2004	1,933,264	14,458,203	3,951,962	587,305	167,420	133,793	4,840,480	112,706,043	120,302,478
2005	1,958,683	14,547,106	3,954,398	588,526	167,599	134,267	4,844,790	113,354,517	120,955,587
2006	1,980,201	14,564,407	3,954,369	588,506	167,597	134,260	4,844,732	113,153,224	120,754,244
2007	1,990,888	14,588,583	3,954,743	588,695	167,624	134,333	4,845,395	112,961,378	120,563,098
2008	1,992,235	14,592,149	3,955,016	588,838	167,643	134,386	4,845,883	113,130,574	120,732,834
2009	2,006,984	14,624,934	3,955,426	589,034	167,673	134,466	4,846,599	112,398,248	120,001,259
2010	2,058,546	14,675,169	3,955,966	589,314	167,714	134,572	4,847,566	116,204,600	123,808,691
2011	1,960,596	14,592,224	3,956,112	589,382	167,724	134,599	4,847,817	111,216,470	118,820,805
2012	2,069,763	14,767,094	3,958,897	590,773	167,927	135,139	4,852,736	113,670,056	121,279,697
2013	2,059,389	14,743,299	3,958,374	590,517	167,888	135,038	4,851,817	113,443,267	121,051,922
2014	2,140,807	14,840,932	3,958,825	590,735	167,921	135,125	4,852,606	114,271,718	121,881,209
2015	2,219,159	14,910,729	3,958,740	590,696	167,915	135,108	4,852,459	112,262,445	119,871,793
2016	1,949,850	14,645,148	3,958,783	590,713	167,919	135,117	4,852,532	113,480,645	121,090,067
2017	2,128,801	14,859,323	3,960,279	591,462	168,028	135,407	4,855,176	113,757,382	121,369,658
2018	2,032,731	14,762,630	3,960,178	591,411	168,021	135,388	4,854,998	113,594,286	121,206,365
2019	1,972,594	14,696,708	3,960,158	591,406	168,019	135,385	4,854,968	114,234,524	121,846,584
2020	2,133,654	14,856,404	3,959,589	591,110	167,977	135,273	4,853,949	111,862,722	119,473,652
2021	2,074,259	14,778,799	3,959,517	591,088	167,971	135,260	4,853,836	113,612,752	121,223,608
2022	2,113,472	14,826,576	3,959,572	591,108	167,976	135,270	4,853,926	113,588,424	121,199,359
2023	2,082,088	14,794,749	3,959,539	591,096	167,973	135,264	4,853,872	113,589,002	121,199,875
2024	2,050,280	14,762,350	3,959,539	591,096	167,973	135,264	4,853,872	113,585,642	121,196,512
2025	2,150,521	14,861,790	3,959,525	591,085	167,973	135,261	4,853,844	114,231,642	121,842,489
2026	2,017,482	14,728,317	3,959,451	591,051	167,967	135,246	4,853,715	113,500,683	121,111,387
2027	2,141,796	14,852,470	3,959,453	591,051	167,968	135,246	4,853,718	113,538,943	121,149,652
2028	1,987,932	14,695,394	3,959,312	590,979	167,957	135,220	4,853,468	113,531,171	121,141,611
2029	2,075,824	14,782,394	3,959,297	590,977	167,956	135,218	4,853,448	113,458,000	121,068,418
2030	2,100,823	14,810,236	3,959,319	590,979	167,958	135,222	4,853,478	113,397,350	121,007,795
2031	2,078,502	14,786,414	3,959,312	590,979	167,957	135,220	4,853,468	113,558,153	121,168,587
2032	2,077,934	14,785,676	3,959,311	590,975	167,957	135,218	4,853,461	113,556,986	121,167,417
2033	2,105,711	14,809,747	3,959,276	590,966	167,955	135,214	4,853,411	113,909,056	121,519,442
2034	2,111,195	14,821,587	3,959,318	590,980	167,958	135,221	4,853,477	112,969,725	120,580,166
2035	1,524,554	14,227,181	3,959,299	590,981	167,957	135,217	4,853,454	114,788,143	122,398,578
Total	111,903,287	772,029,696	199,944,176	22,999,986	6,547,060	5,252,938	234,744,160	5,855,307,767	6,240,427,988

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	6,284,403	2,531,225	2,240,488	2,223,201
1988	17,867	20,024	23,987	61,878	913,717	6,443,836	2,631,296	2,571,939	2,569,844
1989	26,413	45,485	6,589	78,487	1,084,717	9,645,601	4,017,939	3,980,189	3,990,355
1990	58,623	68,476	43,103	170,202	1,873,401	10,213,812	4,311,785	5,780,222	6,014,887
1991	22,100	33,340	3,301	58,741	438,716	2,203,271	893,420	975,717	1,031,210
1992	22,028	19,889	11,641	53,558	334,888	3,207,945	1,185,080	1,254,061	1,304,959
1993	(21,249)	(12,942)	(6,323)	(40,514)	(162,681)	586,735	366,778	(82,963)	(56,064)
1994	69,086	54,830	55,100	179,016	754,279	7,672,823	3,508,492	3,405,682	3,906,709
1995	160,370	109,215	94,004	363,589	2,619,970	24,794,446	9,712,582	10,925,600	12,628,469
1996	195,181	123,492	215,148	533,821	2,884,913	27,290,854	10,742,469	12,141,008	14,047,715
1997	186,364	125,370	123,318	435,052	3,506,403	27,538,138	12,142,630	13,909,540	16,127,791
1998	184,609	125,131	126,145	435,885	3,388,764	27,204,678	11,552,549	13,076,879	15,138,618
1999	194,351	125,643	136,702	456,696	3,484,245	28,743,946	12,180,734	14,111,788	16,118,175
2000	217,296	138,577	157,605	513,478	3,793,188	30,586,387	13,326,348	15,629,784	17,878,594
2001	218,820	137,783	164,165	520,768	3,771,447	30,855,787	13,242,252	15,518,377	17,749,071
2002	223,861	139,343	172,480	535,684	3,814,155	31,101,979	13,381,957	15,690,701	17,946,650
2003	229,178	140,773	181,923	551,874	3,853,286	31,343,509	13,500,377	15,831,909	18,107,401
2004	234,236	142,007	191,066	567,309	3,887,083	31,722,189	13,573,871	15,902,984	18,184,117
2005	263,586	161,550	212,433	637,569	4,154,506	34,055,911	14,676,077	17,421,089	19,956,978
2006	265,912	161,392	218,322	645,626	4,150,463	34,126,899	14,622,575	17,332,397	19,850,072
2007	271,579	162,995	228,003	662,577	4,191,695	34,353,857	14,810,907	17,593,690	20,156,712
2008	277,206	164,228	238,819	680,253	4,223,366	34,532,155	14,857,372	17,620,274	20,179,780
2009	283,112	165,871	248,856	697,839	4,265,636	34,856,716	15,072,820	17,928,145	20,542,778
2010	291,934	169,771	260,417	722,122	4,327,173	35,739,047	15,246,146	18,134,603	20,776,816
2011	296,749	170,372	271,282	738,403	4,342,479	35,595,297	15,388,996	18,353,752	21,039,289
2012	320,959	182,279	299,205	802,443	4,645,981	38,138,666	16,428,680	19,664,772	22,549,118
2013	321,045	180,090	306,695	807,830	4,590,172	37,645,039	16,235,017	19,418,880	22,265,549
2014	328,544	181,965	321,029	831,538	4,637,971	38,022,405	16,458,195	19,732,950	22,634,617
2015	333,780	183,371	332,040	849,191	4,629,725	37,915,259	16,323,495	19,506,619	22,360,952
2016	337,724	183,510	343,134	864,368	4,633,242	38,079,265	16,408,257	19,651,008	22,536,048
2017	353,835	190,025	366,842	910,702	4,797,746	39,285,059	16,941,999	20,308,075	23,288,926
2018	356,940	189,582	377,601	924,123	4,786,540	39,179,432	16,924,406	20,296,778	23,278,454
2019	360,983	189,515	389,321	939,819	4,784,874	39,204,984	16,849,074	20,167,313	23,121,158
2020	359,970	186,949	396,559	943,478	4,720,048	38,630,359	16,759,812	20,122,044	23,085,041
2021	360,415	186,784	398,204	945,403	4,715,880	38,730,751	16,599,225	19,843,564	22,746,404
2022	360,743	186,954	398,567	946,264	4,720,181	38,758,534	16,695,877	20,008,390	22,946,311
2023	360,518	186,837	398,318	945,673	4,717,232	38,709,897	16,699,919	20,020,245	22,961,622
2024	360,485	186,819	398,281	945,585	4,716,790	38,728,195	16,687,136	19,998,642	22,935,515
2025	360,347	186,748	398,129	945,224	4,714,995	38,764,215	16,684,525	19,998,324	22,935,685
2026	359,783	186,456	397,506	943,745	4,707,612	38,628,740	16,673,642	19,990,820	22,928,618
2027	359,792	186,461	397,517	943,770	4,707,740	38,647,298	16,671,974	19,987,751	22,924,842
2028	358,574	185,830	396,171	940,575	4,691,793	38,545,631	16,614,036	19,913,318	22,838,761
2029	358,556	185,821	396,151	940,528	4,691,565	38,461,560	16,604,795	19,897,487	22,819,487
2030	358,548	185,816	396,143	940,507	4,691,461	38,605,132	16,646,443	19,971,266	22,909,428
2031	358,563	185,824	396,159	940,546	4,691,653	38,573,958	16,636,789	19,953,434	22,887,645
2032	358,505	185,794	396,095	940,394	4,690,899	38,612,015	16,633,255	19,948,574	22,881,921
2033	358,413	185,745	395,993	940,151	4,689,688	38,476,887	16,587,316	19,869,879	22,786,269
2034	358,572	185,828	396,169	940,569	4,691,775	38,535,598	16,644,204	19,966,495	22,903,567
2035	358,637	185,862	396,240	940,739	4,692,615	38,370,655	16,513,584	19,738,294	22,625,202
Total	12,653,443	7,153,480	12,764,483	32,571,406	193,230,437	1,540,444,523	661,101,605	777,173,611	887,042,293

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 been combined 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)

	California Aqueduct (continued)								
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 24	Reach 26A	Reach 28J	Reach 29A
Calendar Year	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	126,040	(10,805,393)	51,295	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	28,216,022	(766,443)	4,125,465	0	688,899	(18,532,961)	90,760	2,020,134
1990	13,618,589	48,328,631	(834,580)	6,505,724	0	88,738	(20,909,320)	146,115	2,855,157
1991	2,398,890	8,423,772	(357,644)	1,009,941	0	0	(6,921,017)	0	586,724
1992	2,621,676	8,776,271	(930,710)	1,216,005	0	190,997	(9,488,799)	(56,097)	684,204
1993	(474,660)	(2,247,854)	(55,994)	(257,321)	0	(54,207)	(7,502,549)	0	115,120
1994	7,693,568	26,030,004	65,195	3,994,671	0	1,183,035	(15,770,027)	0	1,841,471
1995	26,179,212	91,289,145	(2,124,021)	14,117,228	0	2,123,996	(30,259,493)	264,239	5,655,603
1996	29,217,907	102,068,059	(2,024,783)	15,526,728	(6,081,859)	0	(29,465,362)	289,994	6,359,275
1997	33,670,458	117,892,730	(5,066,573)	17,145,056	(4,890,841)	2,242,321	(30,039,225)	464,120	7,545,605
1998	31,542,996	110,325,301	(4,918,496)	16,208,366	(5,242,261)	126,184	(29,206,559)	0	6,997,346
1999	33,600,410	117,783,196	(4,960,895)	16,476,542	(5,300,899)	0	(29,763,396)	171,650	7,707,790
2000	37,353,790	131,088,652	(5,221,411)	18,749,031	(5,729,940)	1,875,528	(29,725,654)	32,203	8,298,365
2001	37,076,606	130,103,653	(5,204,044)	18,537,115	(5,542,388)	4,058	(29,861,083)	52,950	8,266,321
2002	37,497,087	131,592,884	(5,206,179)	18,754,409	(5,523,959)	0	(29,881,680)	0	8,354,013
2003	37,838,741	132,802,120	(5,196,374)	18,905,815	(5,531,530)	114,395	(29,879,725)	0	8,434,196
2004	37,999,276	133,366,275	(5,142,752)	18,888,386	(5,500,958)	84,633	(29,817,200)	0	8,503,385
2005	41,792,591	146,835,090	(5,397,504)	21,078,738	(5,776,367)	0	(30,696,579)	0	9,085,942
2006	41,561,239	146,008,690	(5,361,045)	20,848,582	(5,644,617)	0	(30,785,329)	0	9,077,043
2007	42,217,423	148,339,136	(5,410,761)	21,309,724	(5,732,323)	0	(30,917,055)	0	9,169,899
2008	42,262,174	148,490,098	(5,346,383)	21,181,576	(5,648,148)	0	(30,801,714)	0	9,231,677
2009	43,040,672	151,258,012	(5,451,053)	21,799,015	(5,715,218)	452,810	(30,823,512)	232,082	9,316,078
2010	43,544,255	153,050,003	(5,442,353)	21,571,095	(5,488,988)	0	(31,361,604)	0	9,462,955
2011	44,102,533	155,027,029	(5,537,960)	22,128,353	(5,768,593)	1,735,629	(31,214,277)	205,503	9,459,727
2012	47,319,783	166,428,374	(5,569,583)	23,803,400	(5,853,915)	0	(31,263,124)	0	10,108,303
2013	46,715,014	164,284,050	(5,555,236)	23,499,327	(5,812,837)	0	(31,286,641)	0	9,981,578
2014	47,507,848	167,105,078	(5,602,409)	24,062,898	(5,806,094)	0	(31,278,760)	0	10,089,911
2015	46,915,230	164,988,430	(5,507,251)	23,533,467	(5,571,507)	1,363,061	(31,364,243)	54,626	10,042,789
2016	47,293,606	166,338,624	(5,558,281)	23,866,255	(5,707,780)	0	(31,495,804)	51,704	10,075,821
2017	48,895,530	172,010,736	(5,560,192)	24,657,604	(5,692,134)	0	(31,445,085)	0	10,411,371
2018	48,874,403	171,938,582	(5,586,941)	24,686,163	(5,692,547)	32,547	(31,454,353)	0	10,394,470
2019	48,535,720	170,732,114	(5,507,760)	24,339,028	(5,608,199)	0	(31,305,559)	0	10,384,976
2020	48,467,331	170,504,750	(5,630,308)	24,627,262	(5,714,616)	1,680,178	(31,629,216)	199,761	10,260,651
2021	47,734,612	167,887,860	(5,522,956)	23,872,764	(5,681,998)	0	(31,537,613)	0	10,240,062
2022	48,167,234	169,432,933	(5,612,968)	24,309,761	(5,951,390)	0	(31,441,045)	233,971	10,254,831
2023	48,200,292	169,551,454	(5,638,905)	24,371,337	(6,000,362)	128	(31,432,810)	0	10,245,858
2024	48,143,992	169,350,980	(5,622,554)	24,296,795	(5,947,806)	91,210	(31,378,303)	0	10,250,968
2025	48,146,132	169,360,675	(5,626,432)	24,331,415	(5,901,089)	0	(31,625,875)	0	10,238,559
2026	48,130,755	169,305,326	(5,644,308)	24,344,176	(5,887,240)	43,919	(31,535,807)	0	10,229,122
2027	48,122,684	169,276,678	(5,645,294)	24,349,700	(5,888,428)	108,056	(31,542,786)	0	10,223,131
2028	47,939,359	168,627,253	(5,637,094)	24,228,172	(5,878,695)	0	(31,542,346)	188,925	10,196,414
2029	47,897,818	168,479,433	(5,626,823)	24,183,436	(5,871,526)	374,171	(31,451,751)	0	10,196,120
2030	48,092,163	169,172,374	(5,628,638)	24,406,749	(5,765,387)	101,711	(31,608,793)	96,066	10,192,410
2031	48,044,728	169,002,770	(5,618,242)	24,374,272	(5,803,205)	0	(31,611,069)	0	10,184,501
2032	48,032,362	168,958,903	(5,596,844)	24,305,763	(5,736,549)	0	(31,661,654)	0	10,206,535
2033	47,826,505	168,225,456	(5,561,502)	24,123,595	(5,673,351)	0	(31,656,861)	49,314	10,189,060
2034	48,079,298	169,126,708	(5,619,788)	24,397,735	(5,804,824)	427,632	(31,612,659)	221,533	10,190,338
2035	47,481,751	167,002,268	(5,539,118)	23,845,351	(5,893,798)	0	(31,253,792)	884,168	10,149,731
Total	1,857,607,389	6,519,772,183	(222,896,174)	940,328,977	(228,264,166)	16,714,935	(1,429,582,295)	4,858,991	401,495,402

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, in acre-feet, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.

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)							Grand Total (26)
	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)	
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	118,676	0	0	774,253	1,117,913
1969	0	0	0	78,350	0	0	507,516	773,646
1970	0	0	0	136,429	0	0	693,842	1,103,798
1971	0	0	0	166,296	0	0	1,121,164	1,513,435
1972	3,578	(193,058)	72,639	237,638	0	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)	70,875	(11,562,268)	(38,453)	245,082	0	6,331,764	7,254,800
1988	(6,993,235)	55,110	(12,292,637)	(201,157)	215,561	0	5,614,783	6,590,378
1989	(8,235,085)	14,458	(14,514,471)	132,204	283,590	0	23,562,028	24,725,232
1990	(11,011,065)	0	(20,116,507)	241,640	386,599	0	45,620,427	47,664,030
1991	(4,947,445)	351,563	(9,132,760)	0	36,048	0	(3,448,310)	(2,950,853)
1992	(5,049,289)	32,967	(9,185,725)	(1,075,787)	107,178	0	(5,205,064)	(4,816,618)
1993	(4,964,396)	0	(9,747,620)	(461,990)	(53,423)	0	(24,890,408)	(25,093,603)
1994	(7,173,974)	0	(12,979,412)	161,963	133,410	0	23,673,610	24,606,905
1995	(14,584,588)	0	(25,766,035)	0	475,246	0	125,431,629	128,415,188
1996	(14,969,763)	0	(26,700,056)	516,175	526,386	809,802	140,294,549	143,713,283
1997	(17,411,397)	0	(28,389,272)	0	860,718	1,099,503	164,841,302	168,782,757
1998	(16,737,168)	0	(27,234,277)	0	830,997	1,024,064	150,689,217	154,513,866
1999	(17,940,484)	0	(29,282,135)	444,279	1,206,337	1,766,461	163,063,499	167,004,440
2000	(17,857,212)	0	(29,117,638)	0	1,265,666	2,053,035	190,485,528	194,792,194
2001	(17,882,474)	0	(29,161,124)	22,961	1,258,411	2,032,870	187,069,319	191,361,534
2002	(17,884,285)	0	(29,155,019)	0	1,272,662	2,072,486	190,013,706	194,363,545
2003	(17,884,245)	0	(29,154,796)	0	1,285,718	2,108,781	192,626,292	197,031,452
2004	(17,883,310)	0	(29,154,696)	0	1,296,995	2,140,133	194,163,328	198,617,720
2005	(17,940,845)	0	(29,266,438)	25,842	1,347,547	2,388,195	219,586,267	224,378,342
2006	(17,940,379)	0	(29,264,548)	0	1,346,236	2,384,444	218,162,259	222,958,348
2007	(17,952,488)	0	(29,286,042)	0	1,359,609	2,422,690	222,434,978	227,289,250
2008	(17,947,398)	0	(29,275,028)	0	1,369,882	2,452,071	223,158,388	228,062,007
2009	(17,942,452)	0	(29,266,643)	0	1,383,593	2,491,280	229,175,123	234,138,598
2010	(17,971,695)	0	(29,330,224)	0	1,403,553	2,548,360	231,881,969	236,931,264
2011	(17,921,241)	0	(29,221,443)	57,181	1,408,518	2,562,559	237,400,852	242,481,734
2012	(17,955,016)	0	(29,294,334)	0	1,506,961	2,844,087	258,856,172	264,304,596
2013	(17,938,403)	0	(29,259,558)	0	1,488,860	2,792,319	254,472,958	259,870,960
2014	(17,952,184)	0	(29,289,435)	0	1,504,363	2,836,657	260,026,040	265,495,549
2015	(17,905,458)	0	(29,201,398)	0	1,501,688	2,829,006	257,784,765	263,263,681
2016	(17,948,576)	0	(29,276,694)	122,533	1,502,830	2,832,269	258,771,085	264,268,695
2017	(17,941,963)	0	(29,267,737)	0	1,556,186	2,984,864	270,433,239	276,141,687
2018	(17,952,002)	0	(29,285,219)	65,661	1,552,553	2,974,471	270,226,858	275,937,521
2019	(17,942,699)	0	(29,267,999)	122,058	1,552,012	2,972,924	268,349,145	274,073,838
2020	(17,955,870)	0	(29,294,247)	0	1,530,985	2,912,790	268,556,707	274,220,233
2021	(17,940,054)	0	(29,259,601)	0	1,529,633	2,908,926	262,151,579	267,812,862
2022	(17,946,837)	0	(29,276,459)	0	1,531,029	2,912,916	265,023,088	270,689,533
2023	(17,943,591)	0	(29,268,141)	0	1,530,072	2,910,179	264,917,194	270,580,099
2024	(17,951,803)	0	(29,285,382)	31,967	1,529,928	2,909,769	264,769,249	270,431,624
2025	(17,938,505)	0	(29,260,784)	0	1,529,347	2,908,103	264,544,295	270,204,514
2026	(17,949,117)	0	(29,277,194)	64,087	1,526,951	2,901,257	264,473,747	270,125,104
2027	(17,938,104)	0	(29,259,233)	0	1,526,994	2,901,377	264,466,640	270,118,150
2028	(17,948,871)	0	(29,276,863)	92,746	1,521,821	2,886,583	263,309,150	268,941,518
2029	(17,948,983)	0	(29,277,067)	1,276	1,521,746	2,886,371	263,147,550	268,779,643
2030	(17,942,045)	0	(29,267,037)	0	1,521,713	2,886,275	264,389,830	270,021,798
2031	(17,932,334)	0	(29,242,965)	0	1,521,775	2,886,454	263,858,511	269,490,710
2032	(17,963,763)	0	(29,311,076)	0	1,521,530	2,885,752	263,716,724	269,348,017
2033	(17,943,324)	0	(29,268,275)	0	1,521,138	2,884,630	262,436,736	268,066,575
2034	(17,938,522)	0	(29,259,323)	0	1,521,815	2,886,565	264,666,372	270,298,716
2035	(17,878,087)	0	(29,137,836)	562,886	1,522,088	2,887,346	261,880,693	267,514,047
Total	(797,050,937)	2,028,462	(1,342,595,007)	(1,778,228)	59,828,607	101,778,624	9,748,008,795	9,973,810,638

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)
				Application of Oroville Power Revenues to:			
	Capital Costs (a (1)	Capital Cost Credits (b (2)	Operating Costs (c (3)	Capital Costs (d (4)	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)	5,378,401	(14,650,000)	(1,500,000)	287,374	(6,111,562)
1973	3,985,414	(136,997)	6,083,392	(14,650,000)	(1,500,000)	203,384	(6,014,807)
1974	6,660,000	(137,503)	6,873,552	(17,950,000)	(1,500,000)	201,907	(5,852,044)
1975	8,084,450	(234,567)	7,622,422	(14,650,000)	(1,500,000)	146,188	(531,507)
1976	5,870,531	(204,944)	6,956,842	(14,650,000)	(1,500,000)	205,234	(3,322,337)
1977	21,285,849	(150,214)	10,411,936	(14,650,000)	(1,500,000)	857,419	16,254,990
1978	7,713,251	(64,566)	12,750,917	(14,650,000)	(1,500,000)	2,131,286	6,380,888
1979	9,030,801	0	9,435,703	(14,650,000)	(1,500,000)	2,131,884	4,448,388
1980	10,372,763	0	13,066,808	(14,650,000)	(1,500,000)	3,734,312	11,023,883
1981	11,097,282	0	10,064,574	(14,650,000)	(1,500,000)	4,599,246	9,611,102
1982	16,570,541	0	14,876,928	(14,650,000)	(1,500,000)	4,594,682	19,892,151
1983	11,954,981	0	21,615,762	(34,705,000)	(8,735,000)	3,751,993	(6,117,264)
1984	8,021,887	0	22,006,698	(14,650,000)	(10,348,000)	3,743,484	8,774,069
1985	10,342,540	0	23,059,865	(14,650,000)	(8,079,000)	3,675,801	14,349,206
1986	18,519,795	0	25,628,015	(14,650,000)	(9,107,000)	2,478,330	22,869,140
1987	28,735,810	0	23,797,419	(14,650,000)	(9,451,000)	1,766,739	30,198,968
1988	26,444,950	0	25,740,924	(14,650,000)	(8,677,000)	1,813,458	30,672,332
1989	7,636,579	0	26,328,714	(14,650,000)	(8,104,000)	2,675,611	13,886,904
1990	25,179,395	0	36,034,507	(14,650,000)	(8,498,000)	1,441,262	39,507,164
1991	34,850,345	0	74,422,166	(14,650,000)	(9,486,000)	1,728,338	86,864,849
1992	24,141,871	0	33,706,413	(14,650,000)	(8,526,000)	1,716,262	36,388,546
1993	18,618,032	0	40,403,665	(14,650,000)	(8,768,000)	1,690,364	37,294,061
1994	15,519,552	0	44,968,807	(14,650,000)	(7,705,000)	7,025,000	45,158,359
1995	27,205,694	0	49,265,461	(14,650,000)	(7,041,000)	8,272,000	63,052,155
1996	35,994,303	0	49,872,413	(14,650,000)	(6,975,000)	12,402,000	76,643,716
1997	34,271,939	0	50,629,238	(14,650,000)	(7,122,000)	16,043,000	79,172,177
1998	22,389,568	0	52,771,655	(14,650,000)	(7,122,000)	16,043,000	69,432,223
1999	1,740,580	0	51,828,868	(14,650,000)	(7,122,000)	16,043,000	47,840,448
2000	1,633,940	0	52,198,458	(14,650,000)	(7,122,000)	16,043,000	48,103,398
2001	0	0	51,250,103	(14,650,000)	(7,122,000)	6,043,000	35,521,103
2002	0	0	51,535,743	(14,650,000)	(7,122,000)	6,043,000	35,806,743
2003	0	0	51,669,706	(14,650,000)	(7,122,000)	6,043,000	35,940,706
2004	0	0	51,718,708	(14,650,000)	(7,122,000)	6,043,000	35,989,708
2005	0	0	52,038,599	(14,650,000)	(7,122,000)	6,043,000	36,309,599
2006	0	0	52,238,641	(14,650,000)	(7,122,000)	6,043,000	36,509,641
2007	0	0	52,282,576	(14,650,000)	(7,122,000)	6,043,000	36,553,576
2008	0	0	52,498,281	(14,650,000)	(7,122,000)	6,043,000	36,769,281
2009	0	0	52,374,717	(14,650,000)	(7,122,000)	6,043,000	36,645,717
2010	0	0	52,347,062	(14,650,000)	(7,122,000)	6,043,000	36,618,062
2011	0	0	48,229,965	(14,650,000)	(7,122,000)	0	26,457,965
2012	0	0	48,520,308	(14,650,000)	(7,122,000)	0	26,748,308
2013	0	0	48,440,499	(14,650,000)	(7,122,000)	0	26,668,499
2014	0	0	48,336,613	(14,650,000)	(7,122,000)	0	26,564,613
2015	0	0	48,713,589	(14,650,000)	(7,122,000)	0	26,941,589
2016	0	0	48,550,896	(14,650,000)	(7,122,000)	0	26,778,896
2017	0	0	48,850,619	(14,650,000)	(7,122,000)	0	27,078,619
2018	0	0	48,767,903	(14,650,000)	(7,122,000)	0	26,995,903
2019	0	0	48,789,581	(14,650,000)	(7,122,000)	0	27,017,581
2020	0	0	48,688,308	(14,650,000)	(7,122,000)	0	26,916,308
2021	0	0	47,777,961	(14,650,000)	(7,122,000)	0	26,005,961
2022	0	0	47,630,087	(14,650,000)	(7,122,000)	0	25,858,087
2023	0	0	47,833,739	(14,650,000)	(7,122,000)	0	26,061,739
2024	0	0	47,835,471	(14,650,000)	(7,122,000)	0	26,063,471
2025	0	0	47,983,798	(14,650,000)	(7,122,000)	0	26,211,798
2026	0	0	48,598,907	(14,650,000)	(7,122,000)	0	26,826,907
2027	0	0	48,566,586	(14,650,000)	(7,122,000)	0	26,794,586
2028	0	0	49,746,400	(14,650,000)	(7,122,000)	0	27,974,400
2029	0	0	49,799,858	(14,650,000)	(7,122,000)	0	28,027,858
2030	0	0	49,712,171	(14,650,000)	(7,122,000)	0	27,940,171
2031	0	0	49,763,123	(14,650,000)	(7,122,000)	0	27,991,123
2032	0	0	49,798,708	(14,650,000)	(7,122,000)	0	28,026,708
2033	0	0	49,798,153	(14,650,000)	(7,122,000)	0	28,026,153
2034	0	0	49,775,382	(14,650,000)	(7,122,000)	0	28,003,382
2035	0	0	50,700,798	(14,650,000)	(7,122,000)	0	28,928,798
Total	1,009,098,288	(11,528,320)	2,563,934,343	(1,002,213,000)	(416,758,000)	203,126,102	2,345,659,413

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 (1993) 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)	(74,216)	(132,606)	(206,822)
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	27,461	52,907	80,368
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	17,275	36,859	54,134
1986	10,565,941	16,926,630	27,492,571	32,043	31,590	88,104	151,737	75,873	186,291	262,164
1987	7,980,018	12,599,438	20,579,456	50,342	48,880	139,836	239,058	373,496	989,836	1,363,332
1988	2,312,674	4,340,347	6,653,021	114,710	110,923	298,322	523,955	422,907	1,105,238	1,528,145
1989	1,226,854	1,605,341	2,832,195	109,693	104,269	263,853	477,815	359,518	915,516	1,275,034
1990	434,926	886,179	1,321,105	171,353	174,349	495,862	841,564	459,591	1,155,588	1,615,179
1991	98,511	153,789	252,300	153,771	144,529	362,584	660,884	670,321	1,641,802	2,312,123
1992	57,126	119,169	176,295	90,030	83,926	207,552	381,508	1,082,565	2,545,869	3,628,434
1993	112,593	118,448	231,041	69,287	67,416	175,882	312,585	4,061,537	9,326,836	13,388,373
1994	198,138	409,862	608,000	24,006	22,856	58,730	105,592	33,006,527	73,807,221	106,813,748
1995	423,528	581,472	1,005,000	32,124	30,597	78,183	140,904	43,650,376	143,022,445	186,672,821
1996	4,251	4,749	9,000	30,832	29,416	75,368	135,616	10,258,355	50,955,763	61,214,118
1997	4,251	4,749	9,000	2,974	3,950	14,635	21,559	341,569	777,080	1,118,649
1998	1,297	703	2,000	979	932	3,226	5,137	150,999	333,993	484,992
1999	0	0	0	0	0	0	0	150,404	332,897	483,301
2000	0	0	0	0	0	0	0	150,436	332,964	483,400
2001	0	0	0	0	0	0	0	62,241	137,759	200,000
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	39,479,354	51,212,555	90,691,909	7,691,641	9,554,723	32,103,169	49,349,533	98,444,394	293,560,933	392,005,327

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	936	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	(3,765)	(15,377)	444	(41,954)	(788)	(354,494)	(208)	1,751	(7,916)	(422,307)
1982	47,866	2,482	5,672	78,941	12,566	655,267	2,533	1,179	98,146	904,652
1983	51,612	(35,334)	11,516	108,406	13,627	1,085,672	2,728	1,269	105,722	1,345,218
1984	86,347	4,474	14,303	155,328	22,775	1,621,402	4,571	2,678	177,021	2,088,899
1985	25,451	1,313	5,381	46,704	6,753	496,207	1,343	1,151	52,067	636,370
1986	38,315	(41,067)	9,865	71,715	10,323	796,602	2,008	778	78,150	966,689
1987	28,996	1,486	7,109	56,050	8,036	623,020	1,520	1,502	59,137	786,856
1988	52,422	2,836	16,906	70,385	12,064	922,199	2,899	4,663	109,902	1,194,276
1989	156,936	8,059	28,088	353,897	43,187	3,877,206	8,243	12,176	320,266	4,808,058
1990	278,188	14,419	44,327	521,734	83,252	6,039,070	14,749	22,056	570,415	7,588,210
1991	335,568	17,390	54,467	550,569	87,947	6,459,982	17,787	22,819	688,023	8,234,552
1992	102,884	5,318	20,468	174,885	27,140	2,757,741	5,437	10,193	210,657	3,314,723
1993	64,098	3,264	17,878	119,992	17,428	2,033,045	3,338	3,922	130,269	2,393,234
1994	37,132	1,924	5,993	60,565	9,749	669,892	1,968	3,544	76,121	866,888
1995	52,700	2,732	8,315	85,636	13,822	945,719	2,793	5,057	108,070	1,224,844
1996	50,389	2,612	7,919	81,920	13,220	904,230	2,671	4,831	103,328	1,171,120
1997	1,403	68	613	3,244	434	38,116	69	39	2,790	46,776
1998	551	28	286	1,236	164	15,266	28	18	1,094	18,671
1999	0	0	0	0	0	0	0	0	0	0
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	5,176,341	116,851	1,592,229	12,082,573	1,528,035	134,746,809	262,625	254,057	10,379,390	166,138,910

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; and $43,033 in 1986 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	(154,499)	612,169	(46,275)	(8,495)	(76,318)	(2,504)	(100,996)	(19,059)	(137,345)	(41,762)
1982	1,557,171	854,174	297,603	79,185	490,799	26,209	610,714	196,492	1,423,333	388,958
1983	2,072,284	516,921	397,335	117,181	655,281	34,851	805,656	261,096	2,150,623	588,520
1984	1,525,235	296,308	300,340	86,382	495,322	27,388	611,351	189,426	1,569,309	429,629
1985	899,997	156,644	222,003	63,804	366,126	13,333	451,394	108,308	1,143,643	312,635
1986	899,448	104,927	244,050	63,970	402,489	10,677	501,911	103,895	1,169,247	319,280
1987	348,391	106,485	198,328	52,257	327,077	6,031	406,969	43,756	965,482	262,808
1988	262,541	172,519	95,882	30,629	158,128	4,119	190,144	30,075	645,936	172,497
1989	1,060,236	437,446	354,179	105,530	584,112	17,846	713,118	130,592	1,894,650	511,758
1990	534,731	319,964	338,364	100,264	558,030	5,809	683,538	55,144	1,812,304	491,360
1991	640,116	343,883	361,312	121,984	595,874	9,274	718,926	74,339	2,235,531	608,956
1992	354,657	264,146	226,543	126,604	373,614	5,486	404,010	48,277	2,146,770	587,024
1993	371,376	223,646	170,418	171,429	281,056	6,266	234,232	46,034	3,931,081	1,069,880
1994	204,590	48,609	83,027	79,270	136,931	3,437	118,682	25,769	1,822,247	496,983
1995	95,409	245,108	23,772	16,273	39,205	1,616	40,039	12,076	4,267,015	1,143,090
1996	91,386	360,625	17,261	4,403	28,468	1,549	35,888	11,571	360,499	96,908
1997	7,047	3,760	2,102	568	3,466	138	4,290	978	10,922	2,890
1998	2,807	1,706	699	197	1,153	50	1,410	362	3,883	1,029
1999	0	0	0	0	0	0	0	0	0	0
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	48,246,004	31,315,361	13,952,740	4,425,315	23,011,058	874,779	27,432,783	6,410,652	94,496,871	24,690,248

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				South Bay Area Future Contractor (39)	Grand Total (40)
	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)		
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	(25,255)	15,729,966	224,721	15,954,348	0	0	34	34	(6,763)	15,799,834
1982	239,199	30,679,200	313,699	37,156,736	0	0	11	11	13,817	39,381,608
1983	361,997	25,081,871	185,799	33,229,415	0	0	19	19	70,456	38,004,227
1984	264,151	16,453,002	103,354	22,351,197	0	0	26	26	83,234	30,561,347
1985	192,227	10,331,489	55,534	14,317,137	0	0	29	29	15,669	28,695,000
1986	196,396	9,011,209	34,800	13,062,299	0	0	31	31	16,296	41,951,787
1987	161,798	7,946,177	36,411	10,861,970	0	0	32	32	29,963	33,860,667
1988	106,754	7,741,206	56,608	9,667,038	0	0	56	56	49,364	19,615,855
1989	315,205	21,345,219	154,055	27,623,946	0	0	52	52	46,351	37,063,451
1990	302,450	17,706,699	107,951	23,016,608	0	0	38	38	87,283	34,469,987
1991	374,500	20,724,383	113,812	26,922,890	0	0	54	54	67,856	38,450,659
1992	360,492	19,163,484	85,712	24,146,819	0	0	43	43	41,490	31,689,312
1993	661,478	27,243,739	71,739	34,482,374	0	0	37	37	14,964	50,822,608
1994	307,193	10,943,066	16,665	14,286,469	0	0	0	0	14,353	122,695,050
1995	719,427	28,921,873	88,774	35,613,677	0	0	0	0	10,160	224,667,406
1996	60,729	11,483,873	131,489	12,684,649	0	0	0	0	10,171	75,224,674
1997	1,785	152,629	1,110	191,685	0	0	0	0	1,571	1,389,240
1998	638	60,335	497	74,766	0	0	0	0	432	585,998
1999	0	0	0	0	0	0	0	0	184	483,485
2000	0	0	0	0	0	0	0	0	0	483,400
2001	0	0	0	0	0	0	0	0	0	200,000
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	15,322,556	1,392,173,500	10,602,655	1,692,954,522	0	0	341,030	341,030	7,023,355	2,398,504,586

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	234,604	107,124	341,728	350,145	434,879	1,515,804	2,300,828	192,405	362,346	554,751
1983	262,622	151,541	414,163	350,547	435,304	1,517,185	2,303,036	190,115	358,198	548,313
1984	326,645	224,655	551,300	357,609	442,014	1,534,493	2,334,116	191,591	361,037	552,628
1985	456,635	364,959	821,594	365,414	449,206	1,552,448	2,367,068	193,245	364,188	557,433
1986	821,069	693,705	1,514,774	366,423	450,188	1,555,177	2,371,788	194,166	366,141	560,307
1987	1,363,054	1,561,964	2,925,018	368,067	451,808	1,559,696	2,379,571	198,058	375,697	573,755
1988	1,774,728	2,211,944	3,986,672	370,664	454,330	1,566,910	2,391,904	217,326	426,761	644,087
1989	1,894,754	2,437,198	4,331,952	376,727	460,189	1,582,688	2,419,604	239,347	484,255	723,602
1990	1,958,834	2,521,038	4,479,872	382,604	465,774	1,596,850	2,445,228	258,197	532,205	790,402
1991	1,982,131	2,568,072	4,550,203	394,052	477,245	1,628,909	2,500,206	283,079	594,286	877,365
1992	1,987,435	2,576,218	4,563,653	415,964	497,567	1,679,085	2,592,616	319,584	683,082	1,002,666
1993	1,990,547	2,582,573	4,573,120	425,816	506,768	1,703,044	2,635,628	378,771	821,539	1,200,310
1994	1,997,113	2,588,940	4,586,053	432,669	513,413	1,721,144	2,667,226	598,979	1,326,359	1,925,338
1995	2,007,850	2,611,151	4,619,001	433,970	514,652	1,724,327	2,672,949	2,387,627	5,326,027	7,713,654
1996	2,031,000	2,642,934	4,673,934	435,726	516,324	1,728,600	2,680,650	4,773,592	13,143,750	17,917,342
1997	2,031,235	2,643,196	4,674,431	437,427	517,947	1,732,758	2,688,132	5,339,457	15,954,542	21,293,999
1998	2,031,472	2,643,461	4,674,933	437,592	518,167	1,733,573	2,689,332	5,358,481	15,997,821	21,356,302
1999	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,366,977	16,016,613	21,383,590
2000	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,375,531	16,035,546	21,411,077
2001	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,384,184	16,054,699	21,438,883
2002	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2003	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2004	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2005	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2006	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2007	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2008	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2009	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2010	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2011	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2012	2,031,545	2,643,500	4,675,045	437,647	518,219	1,733,754	2,689,620	5,387,808	16,062,720	21,450,528
2013	2,031,545	2,643,500	4,675,045	326,499	412,347	1,367,137	2,105,983	5,387,808	16,062,720	21,450,528
2014	2,031,545	2,643,500	4,675,045	291,163	346,978	1,201,640	1,839,781	5,379,282	16,044,655	21,423,937
2015	2,031,545	2,643,500	4,675,045	253,155	257,808	831,661	1,342,624	5,373,555	16,033,758	21,407,313
2016	2,013,445	2,643,500	4,656,945	234,055	226,890	657,459	1,118,404	5,364,313	16,016,295	21,380,608
2017	1,989,894	2,643,500	4,633,394	202,894	196,656	542,911	942,461	5,346,017	15,982,204	21,328,221
2018	1,909,820	2,643,500	4,553,320	161,270	155,639	420,371	737,280	5,331,739	15,955,500	21,287,239
2019	1,865,964	2,643,500	4,509,464	123,049	120,126	318,439	561,614	5,328,011	15,948,365	21,276,376
2020	1,862,168	2,643,500	4,505,668	109,136	105,164	279,412	493,712	5,326,022	15,944,526	21,270,548
2021	1,859,956	2,643,500	4,503,456	106,126	102,041	272,495	480,662	5,324,713	15,941,946	21,266,659
2022	1,858,591	2,643,500	4,502,091	105,510	101,112	268,205	474,827	5,323,717	15,939,883	21,263,600
2023	1,857,588	2,612,061	4,469,649	104,882	100,460	264,959	470,301	5,323,212	15,938,854	21,262,066
2024	1,854,705	2,610,485	4,465,190	104,347	99,841	262,950	467,138	5,322,812	15,938,012	21,260,824
2025	1,846,245	2,607,127	4,453,372	103,545	98,596	259,220	461,361	5,322,320	15,937,020	21,259,340
2026	1,841,560	2,602,574	4,444,134	102,691	97,790	257,108	457,589	5,214,948	15,738,537	20,953,485
2027	1,838,613	2,598,307	4,436,920	100,957	96,021	251,516	448,494	5,212,319	15,732,795	20,945,114
2028	1,835,339	2,594,217	4,429,556	98,598	93,720	244,711	437,029	5,205,741	15,720,340	20,926,081
2029	1,831,803	2,590,048	4,421,851	94,964	90,352	235,788	421,104	5,203,576	15,716,116	20,919,692
2030	1,822,044	2,575,615	4,397,659	92,644	88,161	230,142	410,947	5,201,003	15,711,106	20,912,109
2031	1,808,553	2,555,921	4,364,474	85,781	81,817	214,601	382,199	5,191,617	15,693,610	20,885,227
2032	1,796,941	2,536,377	4,333,318	87,502	83,340	217,950	388,792	5,195,403	15,700,374	20,895,777
2033	1,768,923	2,491,959	4,260,882	87,100	82,915	216,569	386,584	5,197,694	15,704,522	20,902,216
2034	1,704,899	2,418,846	4,123,745	80,039	76,206	199,261	355,506	5,196,217	15,701,683	20,897,900
2035	1,574,910	2,278,542	3,853,452	72,233	69,013	181,306	322,552	5,194,563	15,698,531	20,893,094
Total	99,038,381	128,091,900	227,130,281	21,170,485	25,518,478	85,661,662	132,350,625	219,858,833	650,271,800	870,130,633

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	74,151	2,396	49,035	336,364	49,053	411,484	8,520	4,662	63,339	999,004
1969	74,280	7,187	57,518	392,696	52,628	845,042	9,028	5,068	239,654	1,683,101
1970	81,410	7,187	59,328	424,150	54,017	1,027,826	9,278	5,270	177,349	1,845,815
1971	92,818	7,187	60,434	445,305	54,809	1,365,137	9,420	5,676	188,724	2,229,510
1972	103,707	7,187	61,051	455,027	55,172	2,044,173	9,487	10,877	582,201	3,328,882
1973	114,078	7,187	61,477	459,256	55,346	2,357,642	9,518	6,284	225,187	3,295,975
1974	173,139	7,187	61,998	461,295	55,446	2,640,206	9,535	7,036	373,772	3,789,614
1975	210,292	7,187	62,561	463,612	55,588	3,162,243	9,560	7,249	445,999	4,424,291
1976	160,336	7,187	62,829	465,473	55,777	3,408,868	9,595	8,187	319,057	4,497,309
1977	157,635	7,187	63,472	468,181	56,064	3,735,141	9,639	7,500	305,061	4,809,880
1978	168,524	7,187	65,911	470,042	56,255	4,151,922	9,661	7,905	327,294	5,264,701
1979	199,864	7,187	66,226	472,808	56,591	4,558,991	9,723	8,108	368,353	5,747,851
1980	212,600	7,187	66,515	475,557	56,928	4,974,890	9,791	11,554	370,726	6,185,748
1981	212,600	7,187	68,105	491,979	58,873	5,444,652	10,183	8,716	392,960	6,695,255
1982	212,600	7,187	68,128	489,840	58,833	5,878,211	10,172	9,122	414,676	7,148,769
1983	222,452	7,187	68,464	494,089	59,474	6,371,815	10,307	9,324	49,368	7,292,480
1984	233,860	7,187	69,088	499,780	60,169	6,684,401	10,450	9,730	323,732	7,898,397
1985	244,749	7,187	69,818	507,704	61,331	7,117,960	10,683	9,933	235,512	8,264,877
1986	255,638	7,187	70,111	510,158	61,676	7,547,987	10,753	10,338	502,575	8,976,423
1987	266,527	7,187	70,617	513,837	62,205	7,985,961	10,856	10,541	524,291	9,452,022
1988	277,417	7,187	70,984	516,729	62,620	8,394,795	10,935	10,946	546,007	9,897,620
1989	288,306	7,187	71,878	520,450	63,246	8,689,721	11,087	11,351	568,240	10,231,466
1990	299,195	7,187	73,363	539,015	65,501	8,996,126	11,519	11,554	612,707	10,616,167
1991	299,195	7,187	75,977	567,849	69,878	8,996,126	12,327	11,554	612,707	10,652,800
1992	299,195	7,187	79,180	598,608	74,534	8,996,126	13,308	11,554	612,707	10,692,399
1993	299,195	7,187	80,704	611,654	75,982	8,996,126	13,663	11,554	612,707	10,708,772
1994	299,195	7,187	82,318	620,870	76,919	8,996,126	13,900	11,554	612,707	10,720,776
1995	299,195	7,187	82,643	624,152	77,447	8,996,126	14,006	11,554	612,707	10,725,017
1996	299,195	7,187	83,098	628,833	78,202	8,996,126	14,159	11,554	612,707	10,731,061
1997	299,195	7,187	83,534	633,352	78,932	8,996,126	14,306	11,554	612,707	10,736,893
1998	299,195	7,187	83,569	633,532	78,956	8,996,126	14,310	11,554	612,707	10,737,136
1999	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2000	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2001	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2002	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2003	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2004	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2005	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2006	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2007	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2008	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2009	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2010	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2011	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2012	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2013	299,195	7,187	83,585	633,602	78,965	8,996,126	14,312	11,554	612,707	10,737,233
2014	299,195	7,187	80,855	633,602	78,965	8,996,126	14,312	11,554	612,707	10,734,503
2015	299,195	7,187	77,545	569,198	69,663	8,996,126	14,312	11,554	612,707	10,657,487
2016	299,195	7,187	71,524	513,128	61,861	8,996,126	14,312	11,554	612,707	10,587,594
2017	299,195	7,187	57,281	399,926	44,554	8,996,126	14,312	11,554	612,707	10,442,842
2018	299,195	7,187	34,549	297,238	29,912	8,996,126	5,792	11,554	612,707	10,294,260
2019	299,195	7,187	26,067	240,906	26,337	8,996,126	5,284	11,554	612,707	10,225,363
2020	299,195	7,187	24,257	209,452	24,948	8,996,126	5,034	11,554	612,707	10,190,460
2021	299,195	7,187	23,151	188,297	24,156	8,996,126	4,892	11,554	612,707	10,167,265
2022	299,195	7,187	22,534	178,575	23,793	8,996,126	4,824	11,554	612,707	10,156,495
2023	299,195	7,187	22,108	174,346	23,619	8,996,126	4,794	11,554	612,707	10,151,636
2024	299,195	7,187	21,587	172,307	23,519	8,996,126	4,776	11,554	612,707	10,148,958
2025	299,195	7,187	21,024	169,990	23,377	8,996,126	4,752	11,554	612,707	10,145,912
2026	299,195	7,187	20,756	168,129	23,188	8,996,126	4,717	11,554	612,707	10,143,559
2027	299,195	7,187	20,112	165,421	22,901	8,996,126	4,673	11,554	612,707	10,139,876
2028	299,195	7,187	17,674	163,560	22,710	8,996,126	4,650	11,554	612,707	10,135,363
2029	299,195	7,187	17,359	160,794	22,374	8,996,126	4,589	11,554	612,707	10,131,885
2030	299,195	7,187	17,070	158,045	22,037	8,996,126	4,521	11,554	612,707	10,128,442
2031	299,195	7,187	15,480	141,623	20,092	8,996,126	4,129	11,554	612,707	10,108,093
2032	299,195	7,187	15,457	143,762	20,132	8,996,126	4,140	11,554	612,707	10,110,260
2033	299,195	7,187	15,121	139,513	19,491	8,996,126	4,005	11,554	612,707	10,104,899
2034	299,195	7,187	14,497	133,822	18,796	8,996,126	3,862	11,554	612,707	10,097,746
2035	299,195	7,187	13,767	125,898	17,634	8,996,126	3,629	11,554	612,707	10,087,697
Total	17,799,953	483,925	4,100,616	30,962,313	3,847,803	512,620,864	694,670	716,861	35,728,599	606,955,604

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	1,906,909	1,372,066	542,908	163,875	894,756	35,836	1,068,509	259,374	3,420,286	879,076
1983	1,986,971	1,416,040	558,271	167,965	920,092	37,185	1,100,030	269,481	3,493,941	899,196
1984	2,093,128	1,442,665	578,672	173,980	953,738	38,971	1,141,395	282,859	3,604,435	929,425
1985	2,170,944	1,457,782	593,996	178,388	979,009	40,368	1,172,585	292,524	3,684,499	951,344
1986	2,217,062	1,465,910	605,380	181,659	997,785	41,052	1,195,734	298,076	3,743,186	967,384
1987	2,263,200	1,471,292	617,899	184,940	1,018,431	41,600	1,221,479	303,405	3,803,164	983,762
1988	2,281,173	1,476,786	628,131	187,636	1,035,304	41,911	1,242,474	305,663	3,852,971	997,320
1989	2,295,455	1,485,862	633,176	189,243	1,043,625	42,130	1,252,485	307,264	3,886,851	1,006,370
1990	2,351,530	1,508,859	651,756	194,776	1,074,267	43,069	1,289,899	314,133	3,986,246	1,033,218
1991	2,385,569	1,528,110	671,009	200,431	1,106,020	43,460	1,328,840	317,659	4,089,309	1,061,155
1992	2,430,093	1,549,345	692,450	207,478	1,141,380	44,108	1,371,677	322,648	4,219,223	1,096,551
1993	2,464,541	1,568,493	708,033	215,119	1,167,079	44,630	1,400,462	326,832	4,350,421	1,132,431
1994	2,496,806	1,585,874	720,128	225,103	1,187,027	45,156	1,419,073	330,657	4,578,633	1,194,506
1995	2,507,893	1,588,508	724,627	229,399	1,194,447	45,342	1,425,505	332,053	4,677,382	1,221,437
1996	2,513,108	1,601,906	725,927	230,288	1,196,590	45,430	1,427,693	332,713	4,910,621	1,283,920
1997	2,518,149	1,621,798	726,879	230,531	1,198,160	45,516	1,429,673	333,351	4,930,506	1,289,265
1998	2,518,541	1,622,008	726,996	230,563	1,198,353	45,523	1,429,912	333,406	4,931,114	1,289,426
1999	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2000	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2001	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2002	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2003	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2004	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2005	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2006	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2007	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2008	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2009	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2010	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2011	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2012	2,518,699	1,622,104	727,035	230,574	1,198,418	45,526	1,429,991	333,426	4,931,333	1,289,484
2013	2,485,313	1,622,104	727,035	230,574	1,185,026	45,526	1,429,991	333,426	4,879,501	1,276,357
2014	2,455,715	1,594,604	712,581	226,196	1,175,199	44,381	1,401,499	325,205	4,848,366	1,268,162
2015	2,399,882	1,569,000	701,894	223,367	1,157,574	43,440	1,379,581	318,177	4,796,017	1,254,075
2016	2,302,534	1,520,659	682,225	218,073	1,125,135	41,765	1,339,430	305,698	4,698,413	1,227,910
2017	2,100,484	1,410,918	640,764	207,060	1,056,758	38,229	1,254,504	279,307	4,497,216	1,173,706
2018	1,846,587	1,201,714	585,795	191,955	966,103	33,723	1,143,169	245,979	4,200,200	1,094,615
2019	1,544,327	997,692	516,882	173,172	852,451	28,247	1,003,479	205,984	3,792,925	986,305
2020	1,247,258	840,583	430,647	145,630	710,229	22,058	837,336	161,829	3,236,912	845,000
2021	990,482	673,354	326,018	110,154	537,670	16,630	639,772	124,240	2,533,065	668,623
2022	858,981	563,819	271,350	92,880	447,511	14,164	533,284	106,533	2,117,922	567,242
2023	809,317	549,368	254,424	88,182	419,597	13,188	499,175	99,678	1,980,623	531,633
2024	791,236	502,721	246,333	83,987	406,252	12,866	487,028	97,326	1,890,801	511,043
2025	768,203	488,391	233,110	80,206	384,445	12,451	460,577	94,309	1,808,283	489,312
2026	755,273	475,816	223,231	77,511	368,153	12,198	440,572	92,574	1,730,037	468,501
2027	743,154	462,794	216,255	75,612	356,646	11,982	426,399	90,993	1,680,943	455,445
2028	732,973	443,842	211,592	74,292	348,957	11,790	417,031	89,624	1,650,768	447,510
2029	717,560	419,854	207,584	73,158	342,346	11,523	408,980	87,651	1,628,882	441,808
2030	699,267	371,948	203,402	72,044	335,449	11,218	400,446	85,380	1,608,255	436,267
2031	603,911	281,272	181,768	66,265	299,770	9,562	356,332	73,080	1,504,045	408,279
2032	611,790	250,038	184,127	66,699	303,663	9,690	361,482	74,052	1,511,047	410,408
2033	531,728	206,063	168,765	62,609	278,326	8,341	329,961	63,946	1,437,392	390,288
2034	425,571	179,438	148,363	56,593	244,680	6,555	288,597	50,567	1,326,898	360,059
2035	347,756	164,321	133,040	52,186	219,409	5,158	257,406	40,903	1,246,833	338,140
Total	124,434,989	80,092,590	35,732,699	11,238,403	58,900,557	2,253,392	70,344,582	16,494,630	238,418,945	62,268,261

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	20,870,436
1969	187,388	21,895,715	202,953	26,511,186	0	0	3,197	3,197	296,694	30,917,250
1970	275,492	29,043,291	258,310	35,426,203	0	0	15,147	15,147	317,009	40,103,180
1971	385,698	37,307,488	316,860	45,716,630	0	0	15,975	15,975	320,786	50,800,730
1972	448,838	44,139,086	354,554	53,695,385	0	0	17,363	17,363	321,421	59,937,728
1973	471,006	46,380,435	357,966	56,290,814	0	0	17,363	17,363	322,094	62,539,423
1974	484,103	48,407,058	372,762	58,560,922	0	0	17,364	17,364	322,507	65,312,447
1975	497,590	49,371,141	377,168	59,753,202	0	0	17,367	17,367	323,964	67,159,944
1976	510,541	50,224,837	381,453	60,799,556	0	0	17,368	17,368	324,384	68,598,602
1977	518,645	50,915,911	385,770	61,626,697	0	0	17,370	17,370	325,225	69,763,840
1978	523,569	51,516,371	391,424	62,329,576	0	0	17,372	17,372	326,306	70,960,482
1979	527,097	52,321,535	400,346	63,236,224	0	0	17,374	17,374	327,779	72,381,775
1980	530,514	53,731,251	417,864	64,782,544	0	0	17,375	17,375	329,139	74,409,284
1981	547,764	56,767,059	450,597	68,307,728	0	0	17,376	17,376	332,158	78,535,811
1982	546,477	57,569,665	462,063	69,121,800	0	0	17,378	17,378	331,814	79,817,068
1983	558,851	59,150,900	478,190	71,037,113	0	0	17,379	17,379	332,635	81,945,119
1984	577,446	60,440,645	487,746	72,745,105	0	0	17,380	17,380	336,320	84,435,246
1985	590,922	61,280,063	493,019	73,885,443	0	0	17,381	17,381	340,567	86,254,363
1986	600,786	61,812,382	495,892	74,622,288	0	0	17,382	17,382	341,401	88,404,363
1987	610,860	62,274,627	497,677	75,292,336	0	0	17,384	17,384	342,234	90,982,320
1988	619,207	62,684,554	499,556	75,852,686	0	0	17,386	17,386	343,743	93,134,098
1989	624,807	63,091,018	502,532	76,360,818	0	0	17,388	17,388	346,355	94,431,185
1990	641,344	64,211,692	510,625	77,811,414	0	0	17,391	17,391	348,712	96,509,186
1991	658,544	65,242,914	517,070	79,150,090	0	0	17,393	17,393	353,649	98,101,706
1992	680,315	66,475,660	524,069	80,754,997	0	0	17,396	17,396	361,611	99,985,338
1993	702,354	67,712,552	530,337	82,323,284	0	0	17,398	17,398	366,033	101,824,545
1994	740,732	69,397,910	535,847	84,457,452	0	0	17,400	17,400	369,141	104,743,386
1995	757,379	69,990,923	536,750	85,231,645	0	0	17,400	17,400	369,715	111,349,381
1996	796,703	71,571,816	541,603	87,178,318	0	0	17,400	17,400	370,421	123,569,126
1997	800,053	72,205,282	548,856	87,878,019	0	0	17,400	17,400	371,109	127,659,983
1998	800,153	72,213,783	548,918	87,888,696	0	0	17,400	17,400	371,214	127,735,013
1999	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,767,028
2000	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,794,515
2001	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,822,321
2002	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2003	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2004	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2005	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2006	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2007	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2008	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2009	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2010	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2011	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2012	800,188	72,217,178	548,946	87,892,902	0	0	17,400	17,400	371,238	127,833,966
2013	792,020	71,524,999	548,946	87,080,818	0	0	17,400	17,400	328,034	126,395,041
2014	786,956	70,954,306	539,550	86,332,720	0	0	17,400	17,400	301,070	125,324,456
2015	778,282	70,032,626	531,147	85,185,062	0	0	16,995	16,995	270,968	123,555,494
2016	762,156	68,310,046	515,460	83,049,504	0	0	16,835	16,835	253,995	121,063,885
2017	728,780	64,509,903	480,670	78,378,299	0	0	16,837	16,837	214,010	115,956,064
2018	679,883	57,846,866	415,413	70,452,002	0	0	16,835	16,835	138,531	107,479,467
2019	612,801	50,321,462	345,992	61,381,719	0	0	14,204	14,204	74,544	98,043,284
2020	524,697	43,173,887	290,635	52,466,701	0	0	2,253	2,253	54,229	88,983,571
2021	414,490	34,909,690	232,086	42,176,274	0	0	1,426	1,426	50,452	78,646,194
2022	351,350	28,078,091	194,392	34,197,519	0	0	38	38	49,817	70,644,387
2023	329,182	25,836,743	190,980	31,602,090	0	0	37	37	49,144	68,004,923
2024	316,085	23,810,120	176,183	29,331,981	0	0	36	36	48,731	65,722,858
2025	302,598	22,846,037	171,777	28,139,699	0	0	34	34	47,273	64,506,991
2026	289,648	21,992,341	167,493	27,093,348	0	0	33	33	46,854	63,139,002
2027	281,543	21,301,267	163,175	26,266,208	0	0	30	30	46,013	62,282,655
2028	276,619	20,700,807	157,521	25,563,326	0	0	29	29	44,932	61,536,316
2029	273,091	19,895,643	148,599	24,656,679	0	0	27	27	43,459	60,594,697
2030	269,674	18,485,926	131,081	23,110,357	0	0	25	25	42,098	59,001,637
2031	252,424	15,450,119	98,348	19,585,175	0	0	24	24	39,080	55,364,272
2032	253,712	14,647,512	86,883	18,771,103	0	0	22	22	39,424	54,538,696
2033	241,337	13,066,278	70,755	16,855,789	0	0	22	22	38,603	52,548,995
2034	222,743	11,776,533	61,200	15,147,797	0	0	21	21	34,918	50,657,633
2035	209,266	10,937,115	55,927	14,007,460	0	0	19	19	30,671	49,194,945
Total	38,640,579	3,540,920,693	27,100,721	4,306,841,041	0	0	869,927	869,927	18,391,140	6,162,669,251

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	614,486	584,186	1,786,698	2,985,370	233,336	430,478	663,814
1987	293,960	0	293,960	681,720	647,067	1,987,926	3,316,713	229,117	461,278	690,395
1988	312,424	0	312,424	675,713	654,243	1,907,686	3,237,642	256,797	557,279	814,076
1989	399,470	680,418	1,079,888	713,695	709,507	1,890,350	3,313,552	241,521	662,439	903,960
1990	652,828	666,315	1,319,143	776,908	775,104	2,117,350	3,669,362	306,228	669,657	975,885
1991	722,079	855,845	1,577,924	538,991	520,883	1,511,231	2,571,105	312,083	691,781	1,003,864
1992	479,189	706,135	1,185,324	948,064	1,012,338	2,632,608	4,593,010	347,352	738,442	1,085,794
1993	486,149	661,778	1,147,927	1,291,316	1,292,607	3,390,975	5,974,898	379,108	721,302	1,100,410
1994	600,625	1,035,019	1,635,644	1,693,299	1,607,311	4,188,641	7,489,251	566,662	1,045,425	1,612,087
1995	689,711	1,170,658	1,860,369	1,162,319	1,125,184	3,144,508	5,432,011	548,203	1,011,369	1,559,572
1996	717,019	1,219,896	1,936,915	1,130,333	1,100,046	3,112,419	5,342,798	502,629	1,018,293	1,520,922
1997	714,265	1,231,739	1,946,004	1,179,699	1,148,256	3,130,131	5,458,086	808,459	1,795,199	2,603,658
1998	714,661	1,232,449	1,947,110	1,181,022	1,149,379	3,132,753	5,463,154	804,625	1,785,495	2,590,120
1999	718,540	1,239,602	1,958,142	1,187,802	1,155,976	3,150,724	5,494,502	809,384	1,795,175	2,604,559
2000	719,241	1,241,190	1,960,431	1,188,395	1,156,526	3,152,078	5,496,999	810,452	1,797,465	2,607,917
2001	719,361	1,241,424	1,960,785	1,188,616	1,156,757	3,152,783	5,498,156	810,524	1,797,623	2,608,147
2002	719,457	1,241,645	1,961,102	1,188,699	1,156,834	3,152,970	5,498,503	810,670	1,797,935	2,608,605
2003	719,547	1,241,845	1,961,392	1,188,775	1,156,904	3,153,145	5,498,824	810,808	1,798,229	2,609,037
2004	719,624	1,242,021	1,961,645	1,188,846	1,156,970	3,153,312	5,499,128	810,931	1,798,500	2,609,431
2005	720,232	1,243,395	1,963,627	1,189,375	1,157,460	3,154,510	5,501,345	811,875	1,800,523	2,612,398
2006	720,222	1,243,374	1,963,596	1,189,369	1,157,456	3,154,501	5,501,326	811,864	1,800,498	2,612,362
2007	720,317	1,243,587	1,963,904	1,189,448	1,157,529	3,154,680	5,501,657	812,007	1,800,808	2,612,815
2008	720,390	1,243,750	1,964,140	1,189,509	1,157,586	3,154,818	5,501,913	812,114	1,801,033	2,613,147
2009	720,485	1,243,967	1,964,452	1,189,595	1,157,665	3,155,015	5,502,275	812,271	1,801,375	2,613,646
2010	720,625	1,244,284	1,964,909	1,189,719	1,157,779	3,155,297	5,502,795	812,484	1,801,829	2,614,313
2011	720,662	1,244,364	1,965,026	1,189,745	1,157,803	3,155,358	5,502,906	812,536	1,801,944	2,614,480
2012	721,351	1,245,923	1,967,274	1,190,352	1,158,366	3,156,739	5,505,457	813,616	1,804,261	2,617,877
2013	721,226	1,245,637	1,966,863	1,190,238	1,158,261	3,156,479	5,504,978	813,415	1,803,825	2,617,240
2014	721,334	1,245,883	1,967,217	1,190,333	1,158,351	3,156,697	5,505,381	813,588	1,804,195	2,617,783
2015	721,314	1,245,840	1,967,154	1,190,319	1,158,335	3,156,659	5,505,313	813,555	1,804,128	2,617,683
2016	721,324	1,245,858	1,967,182	1,190,326	1,158,342	3,156,682	5,505,350	813,573	1,804,165	2,617,738
2017	721,698	1,246,703	1,968,401	1,190,651	1,158,643	3,157,423	5,506,717	814,152	1,805,402	2,619,554
2018	721,674	1,246,646	1,968,320	1,190,629	1,158,623	3,157,369	5,506,621	814,112	1,805,320	2,619,432
2019	721,670	1,246,638	1,968,308	1,190,627	1,158,621	3,157,366	5,506,614	814,109	1,805,307	2,619,416
2020	721,524	1,246,304	1,967,828	1,190,498	1,158,501	3,157,071	5,506,070	813,885	1,804,829	2,618,714
2021	721,515	1,246,284	1,967,799	1,190,489	1,158,493	3,157,050	5,506,032	813,857	1,804,774	2,618,631
2022	721,525	1,246,306	1,967,831	1,190,499	1,158,502	3,157,070	5,506,071	813,878	1,804,819	2,618,697
2023	721,518	1,246,289	1,967,807	1,190,491	1,158,495	3,157,056	5,506,042	813,866	1,804,790	2,618,656
2024	721,517	1,246,288	1,967,805	1,190,491	1,158,494	3,157,055	5,506,040	813,866	1,804,790	2,618,656
2025	721,513	1,246,279	1,967,792	1,190,489	1,158,492	3,157,050	5,506,031	813,861	1,804,781	2,618,642
2026	721,497	1,246,241	1,967,738	1,190,471	1,158,476	3,157,012	5,505,959	813,830	1,804,716	2,618,546
2027	721,497	1,246,241	1,967,738	1,190,472	1,158,477	3,157,013	5,505,962	813,830	1,804,719	2,618,549
2028	721,460	1,246,160	1,967,620	1,190,442	1,158,448	3,156,945	5,505,835	813,777	1,804,602	2,618,379
2029	721,460	1,246,159	1,967,619	1,190,439	1,158,446	3,156,935	5,505,820	813,773	1,804,591	2,618,364
2030	721,460	1,246,159	1,967,619	1,190,442	1,158,451	3,156,946	5,505,839	813,780	1,804,608	2,618,388
2031	721,460	1,246,159	1,967,619	1,190,441	1,158,448	3,156,942	5,505,831	813,777	1,804,602	2,618,379
2032	721,458	1,246,155	1,967,613	1,190,441	1,158,449	3,156,943	5,505,833	813,776	1,804,599	2,618,375
2033	721,456	1,246,149	1,967,605	1,190,434	1,158,443	3,156,928	5,505,805	813,763	1,804,573	2,618,336
2034	721,460	1,246,160	1,967,620	1,190,442	1,158,449	3,156,945	5,505,836	813,779	1,804,608	2,618,387
2035	721,462	1,246,164	1,967,626	1,190,440	1,158,448	3,156,940	5,505,828	813,774	1,804,593	2,618,367
Total	35,082,568	55,523,325	90,605,893	61,757,935	60,106,584	164,748,612	286,613,131	37,586,225	81,929,224	119,515,449

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	212,388	10,559	111,499	541,919	6,489,422	10,799	10,714	426,334	7,813,634
1987	204,822	10,233	109,484	531,121	6,366,528	10,467	10,356	412,187	7,655,198
1988	201,922	10,121	122,711	515,006	6,366,326	10,352	10,051	407,025	7,643,514
1989	220,279	11,075	115,411	557,553	6,671,316	11,326	10,766	444,690	8,042,416
1990	267,195	13,469	146,331	655,107	8,008,145	13,773	13,205	540,111	9,657,336
1991	276,691	13,898	149,127	664,206	8,203,201	14,214	13,335	558,306	9,892,978
1992	321,311	16,204	163,007	770,447	9,187,707	16,575	18,416	649,701	11,143,368
1993	356,821	17,920	181,156	820,536	10,233,537	18,328	19,561	719,937	12,367,796
1994	354,915	17,726	270,779	832,191	11,415,975	18,133	20,458	714,129	13,644,306
1995	371,614	18,464	261,958	881,626	11,757,842	18,888	21,369	745,767	14,077,528
1996	377,892	18,731	240,179	906,182	11,698,682	19,158	21,767	757,416	14,040,007
1997	386,482	19,191	255,373	924,594	11,751,559	19,628	22,244	775,325	14,154,396
1998	386,875	19,209	255,692	925,384	11,763,030	19,649	22,268	776,115	14,168,222
1999	389,292	19,329	257,235	930,875	11,834,287	19,771	22,378	780,968	14,254,135
2000	389,722	19,352	257,438	931,932	11,846,914	19,793	22,392	781,823	14,269,366
2001	389,705	19,349	257,500	931,851	11,847,189	19,791	22,390	781,778	14,269,553
2002	389,764	19,353	257,528	931,994	11,848,883	19,795	22,391	781,895	14,271,603
2003	389,819	19,354	257,554	932,129	11,850,519	19,797	22,394	782,008	14,273,574
2004	389,882	19,357	257,580	932,281	11,852,285	19,800	22,396	782,134	14,275,715
2005	390,288	19,378	257,766	933,276	11,864,033	19,821	22,408	782,943	14,289,913
2006	390,289	19,378	257,763	933,274	11,864,017	19,821	22,408	782,945	14,289,895
2007	390,349	19,380	257,790	933,420	11,865,765	19,824	22,409	783,062	14,291,999
2008	390,390	19,381	257,810	933,516	11,866,894	19,825	22,411	783,141	14,293,368
2009	390,466	19,389	257,841	933,712	11,869,180	19,829	22,413	783,296	14,296,126
2010	390,558	19,391	257,884	933,914	11,871,612	19,834	22,416	783,475	14,299,084
2011	390,576	19,392	257,894	933,972	11,872,298	19,835	22,416	783,513	14,299,896
2012	391,054	19,415	258,105	935,136	11,886,023	19,859	22,430	784,463	14,316,485
2013	390,959	19,412	258,067	934,904	11,883,326	19,853	22,428	784,277	14,313,226
2014	391,040	19,415	258,100	935,103	11,885,646	19,858	22,430	784,434	14,316,026
2015	391,024	19,415	258,092	935,058	11,885,143	19,858	22,430	784,405	14,315,425
2016	391,035	19,415	258,097	935,091	11,885,506	19,858	22,430	784,428	14,315,860
2017	391,286	19,427	258,210	935,696	11,892,659	19,870	22,438	784,924	14,324,510
2018	391,268	19,426	258,202	935,653	11,892,184	19,869	22,437	784,888	14,323,927
2019	391,267	19,426	258,202	935,644	11,892,068	19,869	22,436	784,886	14,323,798
2020	391,173	19,421	258,157	935,435	11,889,526	19,865	22,434	784,700	14,320,711
2021	391,155	19,421	258,153	935,368	11,888,834	19,865	22,433	784,663	14,319,892
2022	391,168	19,421	258,155	935,408	11,889,275	19,865	22,434	784,690	14,320,416
2023	391,158	19,421	258,154	935,389	11,889,026	19,865	22,433	784,672	14,320,118
2024	391,160	19,421	258,154	935,392	11,889,076	19,865	22,433	784,675	14,320,176
2025	391,160	19,421	258,152	935,391	11,889,044	19,865	22,433	784,675	14,320,141
2026	391,143	19,421	258,148	935,348	11,888,576	19,864	22,433	784,641	14,319,574
2027	391,145	19,421	258,148	935,353	11,888,616	19,865	22,433	784,642	14,319,623
2028	391,123	19,420	258,138	935,301	11,888,011	19,863	22,433	784,602	14,318,891
2029	391,117	19,419	258,133	935,279	11,887,770	19,862	22,433	784,583	14,318,596
2030	391,128	19,420	258,138	935,316	11,888,151	19,863	22,433	784,610	14,319,059
2031	391,122	19,420	258,137	935,299	11,887,994	19,863	22,433	784,599	14,318,867
2032	391,126	19,420	258,137	935,307	11,888,074	19,863	22,433	784,605	14,318,965
2033	391,109	19,419	258,134	935,265	11,887,613	19,862	22,433	784,574	14,318,409
2034	391,125	19,420	258,137	935,312	11,888,100	19,863	22,433	784,606	14,318,996
2035	391,113	19,419	258,134	935,274	11,887,694	19,862	22,433	784,583	14,318,512
Total	20,018,441	995,028	12,869,511	47,916,113	608,792,714	1,017,732	1,120,341	40,180,285	732,910,165

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	2,319,944	1,106,132	620,031	163,059	1,022,548	40,190	1,271,489	297,011	3,325,352	894,907
1987	2,319,041	1,015,316	617,766	164,599	1,018,814	40,982	1,262,239	301,909	3,353,710	901,012
1988	2,309,526	1,044,557	650,556	175,998	1,072,892	40,708	1,324,219	299,214	3,592,294	962,196
1989	2,268,901	1,083,207	610,599	169,285	1,007,004	39,315	1,235,395	291,359	3,487,444	929,088
1990	2,596,749	1,256,594	699,809	198,844	1,154,132	44,840	1,406,011	331,255	4,041,452	1,066,844
1991	2,719,894	1,169,831	758,383	209,088	1,250,725	48,640	1,535,257	355,950	4,320,938	1,143,156
1992	2,785,409	1,586,026	750,458	198,142	1,237,655	49,893	1,539,489	363,332	4,129,502	1,115,259
1993	3,029,793	1,648,407	827,798	228,365	1,365,213	54,597	1,676,511	399,672	4,665,091	1,242,617
1994	3,095,409	1,818,558	840,365	220,379	1,385,923	55,414	1,729,980	405,159	4,765,878	1,293,059
1995	3,344,677	1,959,713	890,600	224,919	1,468,764	60,173	1,850,014	439,703	4,849,415	1,331,334
1996	3,481,525	1,922,090	987,480	320,004	1,628,591	62,893	1,899,514	458,949	6,471,526	1,648,310
1997	3,438,887	2,005,572	890,599	224,537	1,468,763	61,495	1,849,767	450,335	4,770,492	1,304,845
1998	3,439,324	1,974,212	910,447	249,575	1,501,517	61,473	1,848,081	450,251	5,216,317	1,391,586
1999	3,457,048	1,934,303	935,602	275,418	1,543,013	61,809	1,858,548	452,670	5,679,073	1,483,913
2000	3,462,926	1,955,541	901,616	231,241	1,486,935	61,947	1,864,250	453,610	4,894,374	1,331,860
2001	3,461,150	1,950,712	919,505	253,702	1,516,449	61,913	1,862,944	453,370	5,292,486	1,409,217
2002	3,461,892	1,952,030	919,924	253,893	1,517,145	61,933	1,863,630	453,486	5,295,978	1,410,025
2003	3,462,578	1,952,631	919,133	252,632	1,515,835	61,947	1,864,259	453,594	5,273,601	1,405,776
2004	3,463,102	1,953,032	919,643	253,077	1,516,680	61,959	1,864,651	453,675	5,281,518	1,407,389
2005	3,468,161	1,956,805	927,297	260,215	1,529,300	62,078	1,869,379	454,476	5,408,753	1,433,074
2006	3,467,946	1,957,295	924,533	256,975	1,524,740	62,070	1,869,089	454,437	5,351,130	1,421,783
2007	3,468,897	1,958,191	923,432	255,175	1,522,927	62,093	1,870,065	454,594	5,319,198	1,415,727
2008	3,469,212	1,958,409	925,110	257,132	1,525,695	62,100	1,870,259	454,640	5,354,040	1,422,567
2009	3,470,442	1,959,592	919,687	249,906	1,516,746	62,132	1,871,553	454,843	5,225,614	1,397,740
2010	3,470,809	1,961,280	955,105	293,177	1,575,184	62,136	1,871,546	454,883	5,994,721	1,547,800
2011	3,471,642	1,958,948	907,680	234,751	1,496,935	62,158	1,872,595	455,028	4,956,434	1,345,421
2012	3,477,131	1,965,405	928,136	257,437	1,530,684	62,284	1,877,536	455,895	5,359,959	1,425,049
2013	3,476,036	1,964,447	927,074	256,604	1,528,935	62,259	1,876,536	455,722	5,345,124	1,421,972
2014	3,477,207	1,967,541	932,159	262,265	1,537,324	62,288	1,877,722	455,911	5,445,749	1,441,812
2015	3,476,712	1,969,526	913,798	240,111	1,507,031	62,275	1,877,126	455,822	5,052,076	1,364,910
2016	3,476,954	1,961,782	929,009	258,566	1,532,127	62,280	1,877,392	455,865	5,380,062	1,428,944
2017	3,479,867	1,968,761	929,242	257,624	1,532,511	62,344	1,880,035	456,325	5,363,451	1,426,183
2018	3,479,752	1,965,886	928,564	256,826	1,531,393	62,343	1,879,968	456,308	5,349,259	1,423,404
2019	3,479,461	1,963,934	932,825	262,212	1,538,424	62,335	1,879,580	456,257	5,445,006	1,442,016
2020	3,478,940	1,968,379	911,860	236,686	1,503,830	62,328	1,879,395	456,190	4,991,245	1,353,448
2021	3,477,966	1,966,013	928,291	257,358	1,530,950	62,304	1,878,124	456,017	5,358,647	1,424,909
2022	3,478,438	1,967,467	930,139	259,329	1,533,987	62,314	1,878,717	456,099	5,393,705	1,431,849
2023	3,478,375	1,966,517	928,142	256,912	1,530,693	62,312	1,878,676	456,089	5,350,700	1,423,451
2024	3,478,358	1,965,568	927,210	255,788	1,529,154	62,312	1,878,637	456,084	5,330,761	1,419,553
2025	3,478,308	1,968,473	933,192	263,126	1,539,029	62,312	1,878,584	456,078	5,461,132	1,444,978
2026	3,478,213	1,964,528	927,657	256,388	1,529,897	62,312	1,878,534	456,066	5,341,410	1,421,611
2027	3,478,209	1,968,164	927,020	255,615	1,528,847	62,311	1,878,524	456,063	5,327,666	1,418,928
2028	3,477,951	1,963,501	930,424	259,881	1,534,460	62,302	1,878,289	456,024	5,403,453	1,433,667
2029	3,477,876	1,966,033	924,163	252,266	1,524,129	62,301	1,878,215	456,011	5,268,091	1,407,252
2030	3,478,068	1,966,880	926,934	255,544	1,528,699	62,306	1,878,437	456,047	5,326,380	1,418,660
2031	3,477,980	1,966,166	927,865	256,735	1,530,243	62,303	1,878,336	456,028	5,347,512	1,422,762
2032	3,477,984	1,966,152	927,859	256,732	1,530,231	62,303	1,878,326	456,029	5,347,487	1,422,758
2033	3,477,746	1,966,817	931,686	261,534	1,536,549	62,298	1,878,060	455,987	5,432,817	1,439,362
2034	3,478,111	1,967,211	923,718	251,587	1,523,396	62,308	1,878,507	456,054	5,256,044	1,404,950
2035	3,477,689	1,949,772	954,978	290,033	1,574,980	62,294	1,877,958	455,976	5,939,327	1,538,162
Total	179,346,921	99,053,267	48,100,383	13,279,269	79,327,322	3,205,606	97,432,029	23,468,318	276,140,251	73,513,752

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	552,193	52,969,648	443,381	65,025,885	0	0	2,595	2,595	279,638	76,974,556
1987	556,412	49,843,902	402,732	61,798,434	0	0	2,595	2,595	342,829	74,100,124
1988	594,539	51,388,685	407,570	63,862,954	0	0	2,600	2,600	364,590	76,237,800
1989	574,749	52,437,947	429,192	64,563,485	0	0	2,672	2,672	420,609	78,326,582
1990	660,576	60,253,684	487,227	74,198,017	0	0	2,687	2,687	470,470	90,292,900
1991	707,188	58,879,268	456,633	73,554,951	0	0	2,730	2,730	212,496	88,816,048
1992	688,301	67,628,568	504,692	82,576,726	0	0	2,774	2,774	552,245	101,139,241
1993	768,432	65,920,450	525,323	82,352,269	0	0	2,912	2,912	630,160	103,576,372
1994	796,989	69,729,101	536,637	86,672,851	0	0	3,058	3,058	732,994	111,790,191
1995	818,067	75,222,162	590,450	93,049,991	0	0	3,211	3,211	560,664	116,543,346
1996	1,026,574	80,275,266	591,661	100,774,383	0	0	3,372	3,372	561,541	124,179,938
1997	803,657	76,382,417	609,708	94,261,074	0	0	3,372	3,372	601,637	119,028,227
1998	860,530	77,063,317	600,397	95,567,027	0	0	3,372	3,372	602,081	120,341,086
1999	920,744	76,975,578	588,672	96,166,391	0	0	3,372	3,372	606,711	121,087,812
2000	820,961	75,557,177	595,021	93,617,459	0	0	3,372	3,372	607,416	118,562,960
2001	871,694	76,551,434	593,515	95,198,091	0	0	3,372	3,372	607,612	120,145,716
2002	872,207	76,668,615	593,916	95,324,674	0	0	3,372	3,372	607,710	120,275,569
2003	869,408	76,737,311	594,107	95,362,812	0	0	3,372	3,372	607,800	120,316,811
2004	870,455	76,893,286	594,229	95,532,696	0	0	3,372	3,372	607,891	120,489,878
2005	887,162	77,311,674	595,428	96,163,802	0	0	3,372	3,372	608,530	121,142,987
2006	879,771	77,197,230	595,567	95,962,566	0	0	3,372	3,372	608,527	120,941,644
2007	875,781	77,046,203	595,848	95,768,131	0	0	3,372	3,372	608,620	120,750,498
2008	880,256	77,160,265	595,917	95,935,602	0	0	3,372	3,372	608,692	120,920,234
2009	863,956	76,611,486	596,292	95,199,989	0	0	3,372	3,372	608,799	120,188,659
2010	962,279	79,256,965	596,783	99,002,668	0	0	3,372	3,372	608,950	123,996,091
2011	829,644	75,826,189	596,122	94,013,547	0	0	3,372	3,372	608,978	119,008,205
2012	881,696	77,627,588	598,115	96,446,915	0	0	3,372	3,372	609,717	121,467,097
2013	879,706	77,431,838	597,813	96,224,066	0	0	3,372	3,372	609,577	121,239,322
2014	892,678	78,097,735	598,746	97,049,137	0	0	3,372	3,372	609,693	122,068,609
2015	842,295	76,679,574	599,315	95,040,571	0	0	3,372	3,372	609,675	120,059,193
2016	884,251	77,413,997	597,050	96,258,279	0	0	3,372	3,372	609,686	121,277,467
2017	882,377	77,686,559	599,145	96,524,424	0	0	3,372	3,372	610,080	121,557,058
2018	880,559	77,549,479	598,301	96,362,042	0	0	3,372	3,372	610,051	121,393,765
2019	892,760	78,049,894	597,722	97,002,426	0	0	3,372	3,372	610,050	122,033,984
2020	834,731	76,358,409	599,022	94,634,463	0	0	3,372	3,372	609,894	119,661,052
2021	881,590	77,564,926	598,303	96,385,398	0	0	3,372	3,372	609,884	121,411,008
2022	886,121	77,483,569	598,743	96,360,477	0	0	3,372	3,372	609,895	121,386,759
2023	880,621	77,550,444	598,463	96,361,395	0	0	3,372	3,372	609,885	121,387,275
2024	878,069	77,578,303	598,181	96,357,978	0	0	3,372	3,372	609,885	121,383,912
2025	894,730	78,025,052	599,034	97,004,028	0	0	3,372	3,372	609,883	122,029,889
2026	879,417	77,479,830	597,876	96,273,739	0	0	3,372	3,372	609,859	121,298,787
2027	877,664	77,533,993	598,943	96,311,947	0	0	3,372	3,372	609,861	121,337,052
2028	887,322	77,420,246	597,569	96,305,089	0	0	3,372	3,372	609,825	121,329,011
2029	870,013	77,547,569	598,309	96,232,228	0	0	3,372	3,372	609,819	121,255,818
2030	877,485	77,397,084	598,567	96,171,091	0	0	3,372	3,372	609,827	121,195,195
2031	880,178	77,527,635	598,352	96,332,095	0	0	3,372	3,372	609,824	121,355,987
2032	880,171	77,526,453	598,349	96,330,834	0	0	3,372	3,372	609,825	121,354,817
2033	891,060	77,751,049	598,535	96,683,500	0	0	3,372	3,372	609,815	121,706,842
2034	868,499	77,074,481	598,664	95,743,530	0	0	3,372	3,372	609,825	120,767,566
2035	955,803	77,891,955	593,525	97,562,452	0	0	3,372	3,372	609,821	122,585,978
Total	45,467,874	4,018,226,330	31,220,067	4,987,781,389	0	0	186,365	186,365	31,289,974	6,248,902,366

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	112,810	183,781	296,591	758,813	689,794	1,642,509	3,091,116	0	0	0
1994	120,549	221,263	341,812	573,222	621,059	1,531,925	2,726,206	0	0	0
1995	82,680	152,605	235,285	526,313	526,288	1,253,037	2,305,638	0	0	0
1996	89,969	166,456	256,425	562,840	537,244	1,279,153	2,379,237	90,461	656,301	746,762
1997	95,188	168,922	264,110	586,530	535,515	1,275,066	2,397,111	165,837	1,460,563	1,626,400
1998	98,204	167,669	265,873	571,799	522,053	1,243,013	2,336,865	161,669	1,423,848	1,585,517
1999	96,368	156,198	252,566	532,883	486,545	1,158,440	2,177,868	780,829	1,420,671	2,201,500
2000	93,315	144,564	237,879	487,531	445,136	1,059,849	1,992,516	714,375	1,299,761	2,014,136
2001	95,696	141,580	237,276	477,469	435,949	1,037,974	1,951,392	699,630	1,272,935	1,972,565
2002	94,288	134,384	228,672	453,199	413,790	985,214	1,852,203	664,068	1,208,232	1,872,300
2003	93,104	127,182	220,286	428,911	391,614	932,415	1,752,940	628,480	1,143,481	1,771,961
2004	92,452	121,372	213,824	409,315	373,722	889,815	1,672,852	599,766	1,091,238	1,691,004
2005	84,846	112,289	197,135	361,551	330,113	785,981	1,477,645	529,779	963,901	1,493,680
2006	83,870	107,961	191,831	347,618	317,390	755,690	1,420,698	509,361	926,752	1,436,113
2007	81,773	101,857	183,630	327,963	299,443	712,962	1,340,368	480,560	874,351	1,354,911
2008	77,571	93,065	170,636	299,652	273,596	651,418	1,224,666	439,078	798,877	1,237,955
2009	74,827	87,059	161,886	280,315	255,941	609,381	1,145,637	410,744	747,324	1,158,068
2010	67,943	77,196	145,139	247,062	225,577	537,090	1,009,729	362,018	658,668	1,020,686
2011	65,260	71,662	136,922	229,353	209,409	498,592	937,354	336,068	611,457	947,525
2012	61,977	66,181	128,158	211,811	193,392	460,458	865,661	310,364	564,689	875,053
2013	14,972	15,483	30,455	49,552	45,243	107,722	202,517	72,608	132,107	204,715
2014	32,498	32,579	65,077	104,268	95,202	226,670	426,140	152,784	277,981	430,765
2015	14,205	13,902	28,107	44,225	40,379	96,141	180,745	64,803	117,904	182,707
2016	7,241	6,896	14,137	21,941	20,033	47,697	89,671	32,150	58,494	90,644
2017	3,370	3,126	6,496	9,946	9,081	21,622	40,649	14,573	26,516	41,089
2018	3,456	3,125	6,581	9,942	9,078	21,613	40,633	14,569	26,506	41,075
2019	3,555	3,135	6,690	9,975	9,107	21,683	40,765	14,615	26,592	41,207
2020	3,650	3,141	6,791	9,993	9,124	21,724	40,841	14,643	26,641	41,284
2021	3,657	3,136	6,793	9,974	9,107	21,683	40,764	14,615	26,592	41,207
2022	3,666	3,143	6,809	9,999	9,129	21,735	40,863	14,651	26,656	41,307
2023	3,677	3,152	6,829	10,028	9,155	21,799	40,982	14,694	26,733	41,427
2024	7,601	6,516	14,117	20,728	18,927	45,062	84,717	30,374	55,263	85,637
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	2,462,687	3,341,921	5,804,608	12,903,480	12,820,372	37,723,267	63,447,119	8,338,166	18,117,210	26,455,376

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	571,789	146,493	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	374,750	21,907	9,990,316	0	29,209	28,523	914,695	11,359,400
1994	315,801	26,768	8,653,587	0	20,978	20,882	903,201	9,941,217
1995	269,342	14,004	679,720	5,791,619	18,672	18,147	553,154	7,344,658
1996	274,956	14,296	693,887	5,912,327	19,061	18,525	564,683	7,497,735
1997	274,076	14,250	691,671	5,893,437	19,001	18,466	562,879	7,473,780
1998	267,187	13,892	674,283	5,745,290	18,522	18,002	548,729	7,285,905
1999	249,008	12,947	627,515	5,534,946	17,262	16,777	511,394	6,969,849
2000	227,816	11,845	574,109	5,063,881	15,793	15,349	467,871	6,376,664
2001	223,114	11,600	562,259	4,959,365	15,467	15,033	458,214	6,245,052
2002	211,772	11,011	533,680	4,707,282	14,681	14,268	434,923	5,927,617
2003	200,424	10,421	505,079	4,455,011	13,894	13,504	411,615	5,609,948
2004	191,267	9,944	482,003	4,251,473	13,260	12,887	392,809	5,353,643
2005	168,947	8,784	425,758	3,755,365	11,712	11,383	346,972	4,728,921
2006	162,437	8,445	409,350	3,610,633	11,261	10,945	333,599	4,546,670
2007	153,252	7,968	386,203	3,406,478	10,624	10,325	314,738	4,289,588
2008	140,023	7,280	352,866	3,112,429	9,707	9,434	287,569	3,919,308
2009	130,987	6,810	330,096	2,911,580	9,081	8,826	269,012	3,666,392
2010	115,448	6,003	290,936	2,566,178	8,003	7,778	237,099	3,231,445
2011	107,173	5,573	270,082	2,382,238	7,429	7,221	220,104	2,999,820
2012	98,976	5,146	249,425	2,200,033	6,861	6,669	203,269	2,770,379
2013	23,155	1,204	58,352	514,688	1,605	1,560	47,554	648,118
2014	48,723	2,533	122,785	1,083,015	3,378	3,283	100,064	1,363,781
2015	20,666	1,075	52,078	459,356	1,432	1,392	42,442	578,441
2016	10,253	533	25,837	227,894	711	691	21,056	286,975
2017	4,647	242	11,712	103,306	323	314	9,544	130,088
2018	4,645	242	11,708	103,267	322	313	9,541	130,038
2019	4,661	242	11,746	103,601	323	314	9,572	130,459
2020	4,669	243	11,768	103,796	324	314	9,590	130,704
2021	4,661	242	11,746	103,601	323	314	9,572	130,459
2022	4,672	243	11,774	103,853	324	314	9,596	130,776
2023	4,686	244	11,808	104,155	325	315	9,623	131,156
2024	9,686	503	24,410	215,306	672	653	19,893	271,123
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	7,615,708	406,703	35,176,283	154,219,410	548,567	534,274	14,785,657	213,286,602

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	3,595,128	1,871,659	1,768,081	149,254	2,916,185	89,302	1,377,725	465,213	1,255,414	1,486,183
1994	5,334,595	1,892,275	1,497,497	214,383	2,469,698	106,893	2,195,790	817,775	1,022,444	1,583,140
1995	2,432,466	1,299,763	1,130,228	100,302	1,864,142	95,143	2,485,522	643,661	1,614,611	684,986
1996	2,614,283	1,417,367	1,153,784	107,387	1,902,994	97,125	2,537,325	729,709	1,798,104	699,263
1997	2,749,048	1,503,245	1,150,098	112,022	1,896,914	96,815	2,529,219	728,219	1,941,722	697,029
1998	2,821,105	1,553,503	1,121,186	116,487	1,849,230	94,381	2,465,640	709,913	2,038,521	679,507
1999	3,210,691	1,747,348	1,044,903	117,608	1,723,411	87,960	2,297,880	661,612	2,487,863	814,210
2000	3,358,911	1,866,558	955,974	124,152	1,576,736	80,474	2,102,314	605,304	2,483,048	827,683
2001	3,289,585	1,828,033	936,243	121,589	1,544,193	78,813	2,058,924	592,810	2,431,799	810,600
2002	3,122,376	1,735,114	888,654	115,410	1,465,701	74,807	1,954,269	562,678	2,308,192	769,397
2003	2,955,043	1,642,128	841,029	109,225	1,387,152	70,798	1,849,537	532,523	2,184,492	728,165
2004	2,820,034	1,567,103	802,605	104,234	1,323,777	67,563	1,765,036	508,193	2,084,688	694,896
2005	3,009,912	1,508,742	708,948	117,391	1,169,304	59,679	1,559,072	448,892	2,762,136	653,705
2006	2,893,912	1,450,595	681,626	112,866	1,124,240	57,379	1,498,986	431,592	2,655,684	628,511
2007	2,730,280	1,368,575	643,084	106,485	1,060,672	54,135	1,414,228	407,189	2,505,523	592,974
2008	2,494,601	1,250,439	587,573	97,293	969,114	49,462	1,292,152	372,039	2,289,246	541,788
2009	2,333,622	1,169,747	549,656	91,014	906,576	46,270	1,208,768	348,032	2,141,518	506,826
2010	2,411,400	1,030,979	484,450	99,617	799,028	40,781	1,065,371	306,744	2,151,714	471,867
2011	2,278,060	957,080	449,725	92,476	741,756	37,858	989,007	284,757	1,997,483	438,044
2012	2,103,822	883,878	415,329	85,403	685,022	34,962	913,363	262,978	1,844,705	404,541
2013	492,180	206,779	97,165	19,979	160,258	8,180	213,677	61,522	431,561	94,641
2014	1,035,653	435,108	204,455	42,041	337,218	17,211	449,623	129,457	908,097	199,144
2015	439,267	184,549	86,718	19,897	143,029	7,300	190,705	54,908	385,165	89,347
2016	217,928	91,558	43,022	9,871	70,960	3,621	94,612	27,241	191,087	44,327
2017	98,789	41,504	19,503	4,474	32,167	1,641	42,889	12,348	86,622	20,093
2018	98,752	41,488	19,495	4,473	32,154	1,641	42,873	12,344	86,588	20,086
2019	99,070	41,623	19,558	4,487	32,259	1,646	43,011	12,384	86,868	20,151
2020	99,257	41,701	19,595	4,835	32,318	1,650	43,092	12,407	87,031	21,207
2021	99,070	41,622	19,558	4,826	32,258	1,647	43,011	12,383	86,869	21,166
2022	99,310	41,724	19,605	4,838	32,336	1,651	43,115	12,414	87,079	21,218
2023	99,600	41,845	19,663	4,852	32,430	1,655	43,241	12,450	87,333	21,279
2024	205,890	86,500	40,646	10,030	67,039	3,422	89,386	25,736	180,532	43,989
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	86,713,695	43,875,412	33,413,348	3,689,819	54,708,323	1,865,166	38,519,446	13,518,960	54,369,335	23,170,671

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	81,849,226	0	96,823,370	0	0	0	0	111,570,477
1994	0	94,922,620	997,173	113,054,283	0	0	0	0	126,063,518
1995	0	93,718,539	221,890	106,291,253	0	0	0	0	116,176,834
1996	359,621	95,555,694	226,514	109,199,170	0	0	0	0	120,079,329
1997	477,963	95,134,649	225,791	109,242,734	0	0	0	0	121,004,135
1998	270,346	92,630,344	220,115	106,570,278	0	0	0	0	118,044,438
1999	251,952	86,327,906	820,554	101,593,898	0	0	0	0	113,195,681
2000	262,789	78,980,770	750,719	93,975,432	0	0	0	0	104,596,627
2001	257,366	77,350,641	735,224	92,035,820	0	0	0	0	102,442,105
2002	244,283	73,418,924	697,853	87,357,658	0	0	0	0	97,238,450
2003	231,192	69,484,298	660,454	82,676,036	0	0	0	0	92,031,171
2004	220,630	66,309,725	630,279	78,898,763	0	0	0	0	87,830,086
2005	259,334	58,571,980	556,731	71,385,826	0	0	0	0	79,283,207
2006	249,340	56,314,634	535,275	68,634,640	0	0	0	0	76,229,952
2007	235,241	53,130,437	505,009	64,753,832	0	0	0	0	71,922,329
2008	214,934	48,544,191	461,416	59,164,248	0	0	0	0	65,716,813
2009	201,065	45,411,585	431,641	55,346,320	0	0	0	0	61,478,303
2010	221,253	40,024,375	380,435	49,488,014	0	0	0	0	54,895,013
2011	205,394	37,155,498	353,166	45,980,304	0	0	0	0	51,001,925
2012	189,684	34,313,661	326,154	42,463,502	0	0	0	0	47,102,753
2013	44,375	8,027,532	76,302	9,934,151	0	0	0	0	11,019,956
2014	93,376	16,891,662	160,557	20,903,602	0	0	0	0	23,189,365
2015	50,867	7,164,514	68,099	8,884,365	0	0	0	0	9,854,365
2016	25,236	3,554,440	33,785	4,407,688	0	0	0	0	4,889,115
2017	11,440	1,611,258	15,315	1,998,043	0	0	0	0	2,216,365
2018	11,436	1,610,649	15,309	1,997,288	0	0	0	0	2,215,615
2019	11,472	1,615,856	15,359	2,003,744	0	0	0	0	2,222,865
2020	14,124	1,618,890	15,388	2,011,495	0	0	0	0	2,231,115
2021	14,648	1,615,850	15,359	2,008,267	0	0	0	0	2,227,490
2022	14,683	1,619,772	15,396	2,013,141	0	0	0	0	2,232,896
2023	14,726	1,624,488	15,441	2,019,003	0	0	0	0	2,239,397
2024	30,441	3,358,098	31,919	4,173,628	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	4,689,211	2,063,994,954	10,624,912	2,433,153,252	0	0	0	0	2,742,146,957

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	4.1511341	0	0
1963	0	0	0	0	0	0	4.5639383	4.5639383	0	0
1964	0	0	0	0	0	0	3.5452154	3.5452154	0	0
1965	0	0	0	0	0	0	4.1911773	4.1911773	0	0
1966	0	0	0	0	0	0	3.5074573	3.5074573	0	0
1967	0	0	0	0	0	0	3.9306767	5.1337448	1.2030681	1.2030681
1968	0	0	0	0	5.7570016	5.7570016	3.3315620	4.8750942	1.5435322	1.5435322
1969	0	0	0	0	3.1823595	3.1823595	3.6949019	4.8016170	1.1067151	1.1067151
1970	0	0	0	0	3.7584301	3.7584301	4.4256141	5.3721490	0.9465349	0.9465349
1971	0	0	0	0	4.2082507	4.2082507	3.8714396	4.7522833	0.8808437	0.8808437
1972	0	0	0	0	3.9577735	3.9577735	4.3250690	5.2281686	0.9030996	0.9030996
1973	0	0	0	0	3.8103903	3.8103903	5.2455409	6.1841800	0.9386391	0.9386391
1974	0	0	0	0	3.5878850	3.5878850	6.3321503	7.2293909	0.8972406	0.8972406
1975	0	0	0	0	2.1606725	2.1606725	3.7365711	4.8327731	1.0962020	1.0962020
1976	0	0	0	0	2.9283909	2.9283909	4.5191527	5.7132795	1.1941268	1.1941268
1977	0	0	0	0	2.7516411	2.7516411	4.7630172	6.5309908	1.7679736	1.7679736
1978	0	0	0	0	3.5949619	3.5949619	5.2086183	6.8200209	1.6114026	1.6114026
1979	0	0	0	0	2.4747752	2.4747752	4.9524184	7.0889234	2.1365050	2.1365050
1980	0	0	0	0	2.9737588	2.9737588	4.5186576	5.8865852	1.3679276	1.3679276
1981	0	0	0	0	2.6487057	2.6487057	4.3834851	6.4772202	2.0937351	2.0937351
1982	0	0	0	0	10.0239077	10.0239077	4.9779475	6.7284782	1.7505307	1.7505307
1983	0	0	0	0	1.0209882	1.0209882	1.3122465	2.1157080	0.8034615	0.8034615
1984	0	0	0	0	1.6647280	1.6647280	2.7638756	3.9589160	1.1950404	1.1950404
1985	0	0	0	0	2.5219114	2.5219114	3.6775932	5.2979619	1.6203687	1.6203687
1986	0	0	0	0	4.3967036	4.3967036	7.4448499	10.7240533	3.2792034	3.2792034
1987	0	0	0	0	3.5385415	3.5385415	6.5424647	9.5537096	3.0112449	3.0112449
1988	1.1818362	1.1818362	4.6212786	5.8031148	4.2650223	5.4468585	6.1966928	8.9636831	2.7669903	2.7669903
1989	1.2532859	1.2532859	2.6374232	3.8907091	0.4317884	1.6850743	7.6237339	11.1088901	3.4851562	3.4851562
1990	2.2461356	2.2461356	4.3186176	6.5647532	6.2108069	8.4569425	11.9649412	15.9965090	4.0315678	4.0315678
1991	2.6460728	2.6460728	8.6485084	11.2945812	2.3920290	5.0381018	8.7291032	12.9593705	4.2302673	4.2302673
1992	1.1707148	1.1707148	2.0216507	3.1923655	1.8179259	2.9886407	4.3684272	6.7276911	2.3592639	2.3592639
1993	-0.6165206	-0.6165206	-0.8100394	-1.4265600	-0.7957463	-1.4122669	-1.5596761	-1.2851004	0.2745757	0.2745757
1994	2.0460832	2.0460832	4.0675074	6.1135906	9.6921724	11.7382556	7.8367434	11.5917446	3.7550012	3.7550012
1995	3.6431168	3.6431168	6.2984429	9.9415597	9.6118609	13.2549777	15.0522815	21.5555557	6.5032742	6.5032742
1996	4.0472991	4.0472991	6.9572958	11.0045949	20.6376978	24.6849969	16.3871753	23.4427860	7.0556107	7.0556107
1997	3.7790530	3.7790530	6.9074380	10.6864910	11.1448712	14.9239242	18.6511790	25.7678541	7.1166751	7.1166751
1998	3.6614240	3.6614240	6.7419720	10.4033960	10.7724167	14.4338407	18.0253404	24.9958800	6.9705396	6.9705396
1999	3.7741722	3.7741722	6.8310227	10.6051949	11.0869424	14.8611146	18.5332181	25.7715851	7.2383670	7.2383670
2000	4.1256123	4.1256123	7.4471733	11.5727856	12.0770115	16.2026238	20.1765319	27.8523621	7.6758302	7.6758302
2001	4.1065966	4.1065966	7.4045034	11.5111000	12.0135382	16.1201348	20.0608883	27.7704076	7.7095193	7.7095193
2002	4.1605985	4.1605985	7.4883383	11.6489368	12.1593232	16.3199217	20.2880585	28.0568798	7.7688213	7.7688213
2003	4.2112826	4.2112826	7.5651870	11.7764696	12.2920946	16.5033772	20.4962021	28.3275118	7.8313097	7.8313097
2004	4.2572883	4.2572883	7.6315026	11.8887909	12.4068831	16.6641714	20.6759734	28.6013215	7.9253481	7.9253481
2005	4.5841043	4.5841043	8.2897167	12.8738210	13.2770625	17.8611668	22.0984362	30.4921758	8.3937396	8.3937396
2006	4.5886454	4.5886454	8.2816092	12.8702546	13.2718541	17.8604995	22.0769309	30.4874164	8.4104855	8.4104855
2007	4.6423761	4.6423761	8.3638649	13.0062410	13.4119412	18.0543173	22.2962500	30.7626687	8.4664187	8.4664187
2008	4.6864920	4.6864920	8.4271346	13.1136266	13.5308215	18.2173135	22.4647128	30.9750726	8.5103598	8.5103598
2009	4.7422446	4.7422446	8.5114429	13.2536875	13.6734066	18.4156512	22.6895532	31.2937427	8.6041895	8.6041895
2010	4.8453776	4.8453776	8.7709754	13.6163530	13.8889067	18.7342843	23.0168777	31.7454573	8.7285796	8.7285796
2011	4.8727258	4.8727258	8.8020252	13.6747510	13.9836082	18.8563340	23.0982926	31.8244651	8.7261725	8.7261725
2012	5.2230919	5.2230919	9.4171833	14.6402752	14.9977444	20.2208363	24.7126649	34.0218490	9.3091841	9.3091841
2013	5.1698068	5.1698068	9.3040918	14.4738986	14.8881068	20.0579136	24.4158085	33.6045043	9.1886958	9.1886958
2014	5.2357610	5.2357610	9.4009609	14.6367219	15.1072471	20.3430081	24.6700585	33.9508647	9.2808062	9.2808062
2015	5.2234742	5.2234742	9.2968465	14.5203207	15.1616438	20.3851180	24.6261968	33.8956651	9.2694683	9.2694683
2016	5.2360310	5.2360310	9.3038937	14.5399247	15.2504000	20.4864310	24.6449043	33.9331098	9.2882055	9.2882055
2017	5.4352535	5.4352535	9.6342020	15.0694555	15.8806061	21.3158596	25.5199255	35.0975919	9.5776664	9.5776664
2018	5.4328767	5.4328767	9.6117420	15.0446187	15.9325316	21.3654083	25.4603191	35.0145561	9.5542370	9.5542370
2019	5.4446908	5.4446908	9.6083452	15.0530360	16.0214403	21.4661311	25.4514574	35.0128697	9.5614123	9.5614123
2020	5.3807175	5.3807175	9.4782498	14.8589673	15.9260643	21.3067818	25.1066383	34.5481336	9.4414953	9.4414953
2021	5.3793284	5.3793284	9.4698844	14.8492128	15.9281600	21.3074884	25.0844681	34.5146945	9.4302264	9.4302264
2022	5.3842239	5.3842239	9.4785033	14.8627272	15.9426800	21.3269039	25.1073457	34.5497233	9.4423776	9.4423776
2023	5.3808657	5.3808657	9.4725715	14.8534372	15.9327200	21.3135857	25.0916596	34.5168107	9.4251511	9.4251511
2024	5.3803731	5.3803731	9.4716589	14.8520320	15.9312400	21.3116131	25.0893085	34.5214044	9.4320959	9.4320959
2025	5.3783134	5.3783134	9.4680592	14.8463726	15.9251600	21.3034734	25.0797606	34.5149187	9.4351581	9.4351581
2026	5.3698955	5.3698955	9.4532549	14.8231504	15.9002400	21.2701355	25.0404894	34.4451728	9.4046834	9.4046834
2027	5.3700299	5.3700299	9.4535084	14.8235383	15.9006800	21.2707099	25.0411702	34.4498037	9.4086335	9.4086335
2028	5.3518507	5.3518507	9.4215169	14.7733676	15.8468400	21.1986907	24.9563457	34.3451427	9.3887970	9.3887970
2029	5.3515821	5.3515821	9.4210606	14.7726427	15.8460400	21.1976221	24.9551330	34.3233521	9.3682191	9.3682191
2030	5.3514627	5.3514627	9.4208071	14.7722698	15.8457200	21.1971827	24.9545798	34.3522936	9.3977138	9.3977138
2031	5.3516866	5.3516866	9.4212127	14.7728993	15.8463600	21.1980466	24.9556011	34.3417094	9.3861083	9.3861083
2032	5.3508209	5.3508209	9.4196917	14.7705126	15.8438000	21.1946209	24.9515904	34.3469590	9.3953686	9.3953686
2033	5.3494478	5.3494478	9.4172075	14.7666553	15.8397200	21.1891678	24.9451489	34.3087740	9.3636251	9.3636251
2034	5.3518209	5.3518209	9.4214155	14.7732364	15.8467600	21.1985809	24.9562500	34.3457182	9.3894682	9.3894682
2035	5.3527910	5.3527910	9.4231393	14.7759303	15.8496000	21.2023910	24.9607181	34.3300361	9.3693180	9.3693180

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)

Calendar Year	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	
	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	0.6028739	1.7979143	1.0364230	2.8343373	1.2225175	4.0568548	2.5595676	6.6164224	8.3521698	14.9685922
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	2.3741588	7.0484302	2.7626510	9.8110812	5.9668234	15.7779046	20.6435041	36.4214087
1987	1.2918346	4.3030795	2.2564137	6.5594932	2.5738801	9.1333733	5.3754819	14.5088552	17.9512279	32.4600831
1988	1.1857121	3.9527024	2.1312092	6.0839116	2.4287598	8.5126714	5.0672280	13.5798994	16.7760708	30.3559702
1989	1.5156579	5.0008141	2.7015545	7.7023686	3.0191335	10.7215021	6.5760148	17.2975169	22.2736391	39.5711560
1990	1.8051577	5.8367255	3.3052168	9.1419423	3.7451498	12.8870921	8.6757569	21.5628490	31.0136723	52.5765213
1991	1.8991358	6.1294031	2.2796972	8.4091003	2.4136828	10.8227831	5.6149196	16.4377027	19.9471760	36.3848787
1992	0.9251473	3.2844112	1.5122431	4.7966543	1.7336626	6.5303169	3.5986818	10.1289987	12.2349429	22.3639416
1993	0.1824062	0.4569819	-0.1053061	0.3516758	-0.0865334	0.2651424	-0.6676679	-0.4025255	-3.0917901	-3.4943156
1994	1.8120151	5.5670163	2.7056822	8.2726985	3.2592571	11.5319556	6.5285489	18.0605045	22.3022117	40.3627162
1995	2.6980257	9.2012999	4.4882173	13.6895172	5.4543909	19.1439081	11.5145078	30.6584159	40.5624068	71.2208227
1996	2.9406084	9.9962191	4.9235763	14.9197954	5.9856678	20.9054632	12.6748258	33.5802890	44.7236952	78.3039842
1997	3.3033763	10.4200514	5.6475946	16.0676460	6.8807093	22.9483553	14.6252514	37.5736067	51.7251691	89.2987758
1998	3.1146435	10.0851831	5.2387187	15.3239018	6.3682613	21.6921631	13.5058971	35.1980602	47.7082796	82.9063398
1999	3.2246736	10.4630406	5.4642464	15.9272870	6.6529993	22.5802863	14.1319631	36.7122494	49.9596179	86.6718673
2000	3.5151982	11.1910284	6.0031984	17.1942268	7.3161957	24.5104225	15.5729948	40.0834173	55.1122400	95.1956573
2001	3.4769370	11.1864563	5.9205429	17.1069992	7.2114576	24.3184568	15.3452800	39.6637368	54.2979310	93.9616678
2002	3.5125681	11.2813894	5.9836876	17.2650770	7.2883615	24.5534385	15.5119965	40.0654350	54.8933585	94.9587935
2003	3.5446779	11.3759876	6.0400782	17.4160658	7.3569401	24.7730059	15.6604797	40.4334856	55.4232866	95.8567722
2004	3.5637023	11.4890504	6.0665208	17.5555712	7.3872357	24.9428069	15.7250271	40.6678340	55.6519706	96.3198046
2005	3.7985508	12.1922904	6.4967387	18.6890291	7.9142914	26.6033205	16.8752385	43.4785590	59.7737891	103.2523481
2006	3.7843485	12.1948340	6.4627908	18.6576248	7.8707661	26.5283909	16.7793692	43.3077601	59.4286197	102.7363798
2007	3.8330892	12.2995079	6.5602200	18.8597279	7.9923521	26.8520800	17.0442880	43.8963680	60.3771604	104.2735284
2008	3.8451144	12.3554742	6.5701325	18.9256067	8.0014988	26.9271055	17.0623551	43.9894606	60.4386051	104.4280657
2009	3.9074742	12.5116637	6.7012411	19.2129048	8.1665702	27.3794750	17.4225727	44.8020477	61.7292211	106.5312688
2010	3.9084805	12.6370601	6.6703215	19.3073816	8.1196706	27.4270522	17.3224286	44.7494808	61.3746654	106.1241462
2011	3.9606811	12.6868536	6.7892470	19.4761006	8.2718480	27.7479486	17.6522683	45.4002169	62.5523649	107.9525818
2012	4.2090436	13.5182277	7.2267730	20.7450007	8.8040363	29.5490370	18.8064237	48.3554607	66.6753632	115.0308239
2013	4.1594269	13.3481227	7.1364081	20.4845308	8.6933202	29.1778510	18.5660688	47.7439198	65.8162934	113.5602132
2014	4.2166054	13.4974116	7.2518283	20.7492399	8.8374184	29.5866583	18.8811669	48.4678252	66.9464677	115.4142929
2015	4.1891229	13.4585912	7.1859440	20.6445352	8.7529468	29.3974820	18.6942908	48.0917728	66.2723373	114.3641101
2016	4.2007354	13.4889409	7.2141375	20.7030784	8.7891254	29.4922038	18.7746946	48.2668984	66.5631932	114.8300916
2017	4.3351696	13.9128360	7.4499074	21.3627434	9.0756997	30.4384431	19.3952916	49.8337347	68.7781587	118.6118934
2018	4.3317730	13.8860100	7.4484873	21.3344973	9.0751447	30.4096420	19.3945811	49.8042231	68.7767256	118.5809487
2019	4.3129390	13.8743513	7.4020767	21.2764280	9.0152459	30.2916739	19.2632793	49.5549532	68.3051952	117.8601484
2020	4.2997570	13.7412523	7.4093469	21.1505992	9.0320950	30.1826942	19.3034256	49.4861198	68.4547718	117.9408916
2021	4.2416529	13.6718793	7.2652451	20.9371244	8.8458361	29.7829605	18.8946947	48.6776552	66.9863384	115.6639936
2022	4.2689065	13.7112841	7.3318819	21.0431660	8.9317161	29.9748821	19.0836373	49.0585194	67.6660715	116.7245909
2023	4.2673846	13.6925357	7.3299352	21.0224709	8.9295356	29.9520065	19.0790314	49.0310379	67.6501305	116.6811684
2024	4.2652997	13.6973956	7.3249328	21.0223284	8.9231442	29.9454726	19.0649265	49.0103991	67.5993800	116.6097791
2025	4.2619252	13.6970833	7.3181557	21.0152390	8.9145919	29.9298309	19.0470308	48.9768617	67.5362583	116.5131200
2026	4.2603335	13.6650169	7.3183339	20.9833508	8.9156293	29.8989801	19.0491769	48.9481570	67.5435989	116.4917559
2027	4.2596374	13.6682709	7.3165463	20.9848172	8.9133015	29.8981187	19.0441131	48.9422318	67.5254895	116.4677213
2028	4.2471675	13.6359645	7.2950412	20.9310057	8.8872617	29.8182674	18.9877199	48.8059873	67.3241704	116.1301577
2029	4.2447574	13.6129765	7.2891243	20.9021008	8.8796098	29.7817106	18.9709358	48.7526464	67.2639718	116.0166182
2030	4.2528038	13.6505176	7.3097469	20.9602645	8.9063183	29.8665828	19.0298812	48.8964640	67.4761836	116.3726476
2031	4.2484291	13.6345374	7.2985237	20.9330611	8.8917726	29.8248337	18.9978956	48.8227293	67.3613018	116.1840311
2032	4.2475267	13.6428953	7.2967460	20.9396413	8.8895489	29.8291902	18.9930058	48.8221960	67.3438172	116.1660132
2033	4.2363354	13.5999605	7.2692878	20.8692483	8.8541048	29.7233531	18.9153380	48.6386911	67.0648176	115.7035087
2034	4.2563615	13.6458297	7.3181737	20.9640034	8.9172059	29.8812093	19.0534249	48.9346342	67.5603145	116.4949487
2035	4.2324594	13.6017774	7.2578839	20.8596613	8.8390362	29.6986975	18.8823069	48.5810044	66.9464218	115.5274262

TABLE B-17

Unit Variable OMP&R Component of Transportation Charge

(Dollars per Acre-Foot)

Calendar Year	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	
	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	14.9685922	2.5301405	17.4987327	0	17.4987327	-29.6920921	-12.1933594	1.7879684	16.7565606
1985	0	20.7760012	3.4967556	24.2727568	0	24.2727568	-30.7672356	-6.4944788	2.1683888	22.9443900
1986	-2.3583180	34.0630907	6.0001395	40.0632302	0	40.0632302	-29.2499580	10.8132722	3.2342581	39.6556668
1987	-2.6107019	29.8493812	5.1909608	35.0403420	0	35.0403420	-30.5133657	4.5269763	3.1272921	35.5873752
1988	-1.4076158	28.9483544	4.8456180	33.7939724	0	33.7939724	-29.5512806	4.2426918	2.9971055	33.3530757
1989	-1.1019487	38.4692073	6.4423849	44.9115922	0	44.9115922	-28.3706997	16.5408925	3.5381171	43.1092731
1990	-1.0672075	51.5093138	8.9799647	60.4892785	0	60.4892785	-28.8762479	31.6130306	3.6781647	56.2546860
1991	-2.0170435	34.3678352	6.1613326	40.5291678	0	40.5291678	-42.9791408	-2.4499730	2.3948596	38.7797383
1992	-2.6095224	19.7544192	3.7905614	23.5449806	0	23.5449806	-29.7202958	-6.1753152	1.8971241	24.2610657
1993	-0.1889087	-3.6832243	-1.0872985	-4.7705228	0	-4.7705228	-36.6160187	-41.3865415	0.2624124	-3.2319032
1994	0.0978842	40.4606004	6.6722074	47.1328078	0	47.1328078	-26.2032401	20.9295677	3.6748141	44.0375303
1995	-1.7915389	69.4292838	12.7305866	82.1598704	0	82.1598704	-27.9682241	54.1916463	5.3104254	76.5312481
1996	-1.6853680	76.6186162	13.8643753	90.4829915	-5.4307116	85.0522799	-27.6164151	57.4358648	5.8838432	84.1878274
1997	-4.3669291	84.9318467	15.9443512	100.8761979	-4.5483251	96.3278728	-28.7309882	67.5968846	6.7431680	96.0419438
1998	-4.2164630	78.6898768	15.0334985	93.7233753	-4.8622739	88.8611014	-28.4561698	60.4049316	6.1058866	89.0122264
1999	-4.1421983	82.5296690	15.0595303	97.5891993	-4.8450122	92.7441871	-28.5995649	64.1446222	6.6451052	93.3169725
2000	-4.3443702	90.8512871	17.2598507	108.1111378	-5.2748278	102.8363100	-28.2908015	74.5455085	7.0522590	102.2479163
2001	-4.2663619	89.6953059	16.7880519	106.4833578	-5.0194380	101.4639198	-28.4276202	73.0362996	7.0272602	100.9889280
2002	-4.2654369	90.6933566	16.9730838	107.6664404	-4.9992841	102.6671563	-28.4276079	74.2395484	7.0995508	102.0583443
2003	-4.2612544	91.5955178	17.1272058	108.7227236	-5.0111381	103.7115855	-28.4257480	75.2858375	7.1676933	103.0244655
2004	-4.2162763	92.1035283	17.1069071	109.2104354	-4.9821286	104.2283068	-28.3662655	75.8620413	7.2264927	103.5462973
2005	-4.2340837	99.0182644	18.5035118	117.5217762	-5.0706582	112.4511180	-28.3035167	84.1476013	7.6886262	110.9409743
2006	-4.2054833	98.5308965	18.3014743	116.8323708	-4.9550043	111.8773665	-28.3853478	83.4920187	7.6787438	110.4151236
2007	-4.2444831	100.0290453	18.7062778	118.7353231	-5.0319951	113.7033280	-28.5068047	85.1965233	7.7572955	112.0308239
2008	-4.1939817	100.2340840	18.5937859	118.8278699	-4.9581039	113.8697660	-28.4004555	85.4693105	7.8095567	112.2376224
2009	-4.2981004	102.2331684	19.2460798	121.4792482	-5.0458946	116.4333536	-28.4898778	87.9434758	7.8809559	114.4122247
2010	-4.1494000	101.9747462	18.6601168	120.6348630	-4.7482595	115.8866035	-28.4988905	87.3877130	8.0052068	114.1293530
2011	-4.2698097	103.6827721	19.4278097	123.1105818	-5.0645943	118.0459875	-28.4242392	89.6217483	8.0075434	115.9601252
2012	-4.2386476	110.7921763	20.5911765	131.3833528	-5.0639403	126.3194125	-28.4093998	97.9100127	8.5511403	123.5819642
2013	-4.2277291	109.3324841	20.3281375	129.6606216	-5.0284057	124.6322159	-28.4307701	96.2014458	8.4439371	122.0041503
2014	-4.2636294	111.1506635	20.8156557	131.9663192	-5.0225727	126.9437465	-28.4236085	98.5201380	8.5355816	123.9498745
2015	-4.2122015	110.1519086	20.4736409	130.6255495	-4.8470982	125.7784513	-28.4047776	97.3736737	8.4957186	122.8598287
2016	-4.2161815	110.6139101	20.5686661	131.1825762	-4.9191386	126.2634376	-28.5230984	97.7403392	8.5342247	123.3643163
2017	-4.2159396	114.3959538	21.2409907	135.6369445	-4.9034190	130.7335255	-28.4635302	102.2699953	8.8075214	127.4194148
2018	-4.2370216	114.3439271	21.2701546	135.6140817	-4.9048266	130.7092551	-28.4719194	102.2373357	8.7987911	127.3797398
2019	-4.1761838	113.6839646	20.9665573	134.6505219	-4.8311143	129.8194076	-28.3372338	101.4821738	8.7956239	126.6557723
2020	-4.3023293	113.6385623	21.4026339	135.0411962	-4.9663592	130.0748370	-28.5698950	101.5049420	8.6800195	126.6209111
2021	-4.1707869	111.4932067	20.4705574	131.9637641	-4.8722329	127.0915312	-28.4199450	98.6715862	8.6626021	124.3265957
2022	-4.2462747	112.4783162	20.8872406	133.3655568	-5.1135063	128.2520505	-28.3928710	99.8591795	8.6750960	125.3996869
2023	-4.2583515	112.4228169	20.8980947	133.3209116	-5.1452298	128.1756818	-28.3255024	99.8501794	8.6675053	125.3486737
2024	-4.2482850	112.3614941	20.8468856	133.2083797	-5.1032756	128.1051041	-28.2763837	99.8287204	8.6745656	125.2843447
2025	-4.2444418	112.2686782	20.8388275	133.1075057	-5.0540331	128.0534726	-28.4661341	99.5873385	8.6613307	125.1744507
2026	-4.2590291	112.2327268	20.8558839	133.0886107	-5.0436536	128.0449571	-28.3850648	99.6598923	8.6588334	125.1505893
2027	-4.2613843	112.2063370	20.8695735	133.0759105	-5.0468380	128.0290725	-28.3913465	99.6377260	8.6482793	125.1160006
2028	-4.2586052	111.8715525	20.7843148	132.6558673	-5.0430815	127.6127858	-28.4397156	99.1730702	8.6336317	124.7637894
2029	-4.2541559	111.7624623	20.7642849	132.5267472	-5.0413857	127.4853615	-28.3094068	99.1759547	8.6255384	124.6421566
2030	-4.2478942	112.1247534	20.9133419	133.0380953	-4.9401703	128.0979250	-28.4447168	99.6532082	8.6222908	124.9949384
2031	-4.2344302	111.9496009	20.8540999	132.8037008	-4.9650967	127.8386041	-28.4221084	99.4164957	8.6156002	124.7996313
2032	-4.2183027	111.9477105	20.7954851	132.7431956	-4.9080672	127.8351284	-28.4675904	99.3675380	8.6342399	124.8002531
2033	-4.1932424	111.5102663	20.6484420	132.1587083	-4.8560695	127.3026388	-28.4760574	98.8265814	8.6194569	124.3229656
2034	-4.2534067	112.2415420	20.9738758	133.2154178	-4.9902028	128.2252150	-28.4804118	99.7448032	8.6205380	125.1154867
2035	-4.1990912	111.3283350	20.5364559	131.8647909	-5.0759465	126.7888444	-28.2961895	98.4926549	8.6348135	124.1622397

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	1.7489056	3.2063521	0	0
1973	0	14.3146414	-6.8099448	7.5046966	1.4609575	2.9992858	0	0
1974	0	13.2552168	-7.4013274	5.8538894	1.4255635	2.8964935	0	0
1975	0	13.2265356	-6.5604921	6.6660435	1.0379624	2.5944238	0	0
1976	0	14.7226680	-6.7213324	8.0013356	1.5465478	3.2570573	0	0
1977	0	18.6871644	-30.4985994	-11.8114350	1.7573375	4.1392042	0	0
1978	0	13.8264421	-9.0130187	4.8134234	1.9032115	3.9353966	0	0
1979	0	18.4494656	-19.0478097	-0.5983441	1.5331899	4.3284883	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	0.1742772	1.3467390	0	0
1984	-15.0246012	1.7319594	-13.7320333	-12.0000739	0.7223811	2.5202954	0	0
1985	-14.7115359	8.2328541	-40.4779966	-32.2451425	1.1915106	3.6753724	0	0
1986	-14.1893653	25.4663015	-28.1596224	-2.6933209	2.2665598	6.9408312	0	0
1987	-14.8696165	20.7177587	-27.0536484	-6.3358897	1.8902405	6.1933200	0	0
1988	-14.7032843	18.6497914	-25.6857024	-7.0359110	1.7424051	5.6951075	0	0
1989	-14.4231503	28.6861228	-25.3986130	3.2875098	2.3854505	7.3862646	0	0
1990	-14.1850383	42.0696477	-26.0776141	15.9920336	3.5208739	9.3575994	0	0
1991	-20.1942298	18.5855085	-34.7357609	-16.1502524	24.0962567	30.2256598	0	0
1992	-14.0004063	10.2606594	-25.2448073	-14.9841479	1.3458655	4.6302767	0	0
1993	-11.3163585	-14.5482617	-22.2197329	-36.7679946	-0.6255800	-0.1685981	0	0
1994	-14.3162811	29.7212492	-26.3423250	3.3789242	2.7513457	8.3183620	0	0
1995	-13.6944488	62.8367993	-24.3075802	38.5292191	4.9920798	14.1933797	0	0
1996	-13.8505931	70.3372343	-24.8126565	45.5245778	4.5046854	14.5009045	37.3990671	51.8999716
1997	-15.5597828	80.4821610	-25.4840862	54.9980748	6.0397025	16.4597539	23.2403932	39.7001471
1998	-14.6048586	74.4073678	-23.8687791	50.5385887	5.8311487	15.9163318	21.6458254	37.5621572
1999	-15.4670012	77.8499713	-25.3505481	52.4994232	5.9961280	16.4591686	25.0611611	41.5203297
2000	-15.1757225	87.0721938	-24.8508470	62.2213468	6.5277528	17.7187812	29.1268479	46.8456291
2001	-15.2020233	85.7869047	-24.8957451	60.8911596	6.4903347	17.6767910	28.8407627	46.5175537
2002	-15.1987302	86.8596141	-24.8827503	61.9768638	6.5638352	17.8452246	29.4028034	47.2480280
2003	-15.1986962	87.8257693	-24.8825600	62.9432093	6.6311723	18.0071599	29.9177283	47.9248882
2004	-15.1979016	88.3483957	-24.8824746	63.4659211	6.6893342	18.1783846	30.3625259	48.5409105
2005	-15.1817452	95.7592291	-24.8706660	70.8885631	7.1493214	19.3416118	33.8818347	53.2234465
2006	-15.1767016	95.2384220	-24.8615649	70.3768571	7.1423660	19.3372000	33.8286184	53.1658184
2007	-15.1869453	96.8438786	-24.8798250	71.9640536	7.2133156	19.5128235	34.3712227	53.8840462
2008	-15.1826394	97.0549830	-24.8704681	72.1845149	7.2678183	19.6232925	34.7880572	54.4113497
2009	-15.1784553	99.2337694	-24.8633447	74.3704247	7.3405611	19.8522248	35.3443237	55.1965485
2010	-15.2031935	98.9261595	-24.9173596	74.0087999	7.4464576	20.0835177	36.1541299	56.2376476
2011	-15.1701108	100.7900144	-24.8404154	75.9495990	7.4727990	20.1596526	36.3555742	56.5152268
2012	-15.1890838	108.3928804	-24.8868694	83.5060110	7.9950819	21.5133096	40.3496723	61.8629819
2013	-15.1750300	106.8291203	-24.8573256	81.9717947	7.8990482	21.2471709	39.6152286	60.8623995
2014	-15.1866881	108.7631864	-24.8827075	83.8804789	7.9812983	21.4787099	40.2442613	61.7229712
2015	-15.1471601	107.7126686	-24.8079161	82.9047525	7.9671063	21.4256975	40.1357149	61.5614124
2016	-15.2024507	108.1618656	-24.9022190	83.2596466	7.9731651	21.4621060	40.1820078	61.6441138
2017	-15.1780416	112.2413732	-24.8642741	87.3770991	8.2562418	22.1690778	42.3469058	64.5159836
2018	-15.1961501	112.1835897	-24.8946309	87.2889588	8.2369672	22.1229772	42.1994580	64.3224352
2019	-15.1966881	111.4590842	-24.8935570	86.5655272	8.2340970	22.1084483	42.1775104	64.2859587
2020	-15.1898063	111.4311048	-24.8867955	86.5443093	8.1225396	21.8637919	41.3243765	63.1881684
2021	-15.1764267	109.1501690	-24.8573622	84.2928068	8.1153667	21.7872460	41.2695571	63.0568031
2022	-15.1821648	110.2175221	-24.8716838	85.3458383	8.1227730	21.8340571	41.3261641	63.1602212
2023	-15.1794188	110.1692549	-24.8646173	85.3046376	8.1176957	21.8102314	41.2873337	63.0975651
2024	-15.1911590	110.0931857	-24.8869935	85.2061922	8.1169318	21.8143274	41.2815169	63.0958443
2025	-15.1751163	109.9993344	-24.8583672	85.1409672	8.1138493	21.8109326	41.2578810	63.0688136
2026	-15.1937205	109.9568688	-24.8878294	85.0690394	8.1011375	21.7661544	41.1607553	62.9269097
2027	-15.1747771	109.9412235	-24.8570495	85.0841740	8.1013656	21.7696365	41.1624578	62.9320943
2028	-15.1978860	109.5659034	-24.8946003	84.6713031	8.0739206	21.7098851	40.9525721	62.6624572
2029	-15.1841731	109.4579835	-24.8725113	84.5854722	8.0735227	21.6864992	40.9495645	62.6360637
2030	-15.1781110	109.8168274	-24.8636794	84.9531480	8.0733476	21.7238652	40.9482025	62.6720677
2031	-15.1698959	109.6297354	-24.8432291	84.7865063	8.0736766	21.7082140	40.9507420	62.6589560
2032	-15.1964834	109.6037697	-24.9010925	84.7026772	8.0723767	21.7152720	40.9407826	62.6560546
2033	-15.1791930	109.1437726	-24.8647311	84.2790415	8.0702970	21.6702575	40.9248645	62.5951220
2034	-15.1751307	109.9403560	-24.8571260	85.0832300	8.0738888	21.7197185	40.9523168	62.6720353
2035	-15.2096591	108.9525806	-24.8918928	84.0606878	8.0753372	21.6771146	40.9633970	62.6405116

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	26,857	13,215	351,259	391,331	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	223,844	242,569	841,328	1,307,741	0	0	0
1988	5,342	56,536	61,878	232,194	300,522	788,454	1,321,170	0	0	0
1989	9,912	68,575	78,487	291,449	289,297	999,800	1,580,546	0	0	0
1990	58,755	111,447	170,202	528,874	507,138	1,469,285	2,505,297	0	0	0
1991	6,953	51,788	58,741	121,961	163,910	365,454	651,325	0	(20,025)	(20,025)
1992	17,623	35,935	53,558	98,688	128,855	288,209	515,752	0	0	0
1993	(10,859)	(29,655)	(40,514)	(39,658)	(13,199)	(79,760)	(132,617)	0	0	0
1994	52,699	126,317	179,016	259,180	255,691	630,695	1,145,566	0	0	0
1995	129,634	233,955	363,589	905,398	905,355	2,155,555	3,966,308	0	0	0
1996	257,341	276,480	533,821	1,031,506	984,597	2,344,279	4,360,382	136,134	987,656	1,123,790
1997	165,133	269,919	435,052	1,185,321	1,082,224	2,576,786	4,844,331	191,514	1,686,700	1,878,214
1998	169,020	266,865	435,885	1,149,836	1,049,802	2,499,588	4,699,226	181,199	1,595,866	1,777,065
1999	183,238	273,458	456,696	1,185,493	1,082,406	2,577,159	4,845,058	1,038,008	1,888,594	2,926,602
2000	211,444	302,034	513,478	1,281,208	1,169,799	2,785,237	5,236,244	1,171,141	2,130,820	3,301,961
2001	220,282	300,486	520,768	1,277,439	1,166,357	2,777,041	5,220,837	1,162,938	2,115,897	3,278,835
2002	231,498	304,186	535,684	1,290,617	1,178,388	2,805,688	5,274,693	1,181,201	2,149,125	3,330,326
2003	244,250	307,624	551,874	1,303,065	1,189,755	2,832,752	5,325,572	1,198,122	2,179,912	3,378,034
2004	256,628	310,681	567,309	1,315,661	1,201,256	2,860,132	5,377,049	1,213,523	2,207,932	3,421,455
2005	285,779	351,790	637,569	1,402,640	1,280,671	3,049,218	5,732,529	1,330,586	2,420,922	3,751,508
2006	293,805	351,821	645,626	1,402,421	1,280,471	3,048,742	5,731,634	1,329,145	2,418,301	3,747,446
2007	306,923	355,654	662,577	1,415,083	1,292,033	3,076,266	5,783,382	1,347,101	2,450,970	3,798,071
2008	321,536	358,717	680,253	1,424,854	1,300,953	3,097,507	5,823,314	1,360,283	2,474,955	3,835,238
2009	335,165	362,674	697,839	1,439,512	1,314,337	3,129,375	5,883,224	1,379,914	2,510,670	3,890,584
2010	351,268	370,854	722,122	1,460,291	1,333,309	3,174,546	5,968,146	1,405,940	2,558,026	3,963,966
2011	365,813	372,590	738,403	1,463,925	1,336,627	3,182,447	5,982,999	1,412,880	2,570,653	3,983,533
2012	403,406	399,037	802,443	1,565,005	1,428,918	3,402,184	6,396,107	1,546,575	2,813,900	4,360,475
2013	413,193	394,637	807,830	1,545,807	1,411,389	3,360,451	6,317,647	1,521,560	2,768,387	4,289,947
2014	432,289	399,249	831,538	1,561,740	1,425,936	3,395,087	6,382,763	1,543,074	2,807,531	4,350,605
2015	446,434	402,757	849,191	1,559,201	1,423,618	3,389,567	6,372,386	1,539,036	2,800,182	4,339,218
2016	460,945	403,423	864,368	1,560,923	1,425,191	3,393,311	6,379,425	1,541,102	2,803,944	4,345,046
2017	492,396	418,306	910,702	1,614,490	1,474,099	3,509,759	6,598,348	1,612,900	2,934,574	4,547,474
2018	506,360	417,763	924,123	1,610,670	1,470,611	3,501,456	6,582,737	1,608,060	2,925,771	4,533,831
2019	521,627	418,192	939,819	1,610,592	1,470,540	3,501,287	6,582,419	1,607,148	2,924,110	4,531,258
2020	530,539	412,939	943,478	1,589,214	1,451,022	3,454,814	6,495,050	1,579,703	2,874,178	4,453,881
2021	532,687	412,716	945,403	1,587,676	1,449,618	3,451,469	6,488,763	1,576,420	2,868,202	4,444,622
2022	533,173	413,091	946,264	1,589,287	1,451,089	3,454,972	6,495,348	1,579,005	2,872,905	4,451,910
2023	532,840	412,833	945,673	1,587,773	1,449,706	3,451,681	6,489,160	1,577,439	2,870,056	4,447,495
2024	532,790	412,795	945,585	1,587,984	1,449,899	3,452,141	6,490,024	1,577,395	2,869,977	4,447,372
2025	532,587	412,637	945,224	1,587,686	1,449,627	3,451,492	6,488,805	1,576,720	2,868,749	4,445,469
2026	531,753	411,992	943,745	1,584,478	1,446,698	3,444,516	6,475,692	1,573,172	2,862,293	4,435,465
2027	531,768	412,002	943,770	1,584,691	1,446,892	3,444,980	6,476,563	1,573,302	2,862,530	4,435,832
2028	529,967	410,608	940,575	1,579,877	1,442,496	3,434,514	6,456,887	1,566,561	2,850,265	4,416,826
2029	529,941	410,587	940,528	1,578,874	1,441,581	3,432,335	6,452,790	1,565,901	2,849,064	4,414,965
2030	529,930	410,577	940,507	1,580,206	1,442,796	3,435,229	6,458,231	1,566,802	2,850,701	4,417,503
2031	529,951	410,595	940,546	1,579,719	1,442,352	3,434,171	6,456,242	1,566,475	2,850,105	4,416,580
2032	529,866	410,528	940,394	1,579,960	1,442,572	3,434,696	6,457,228	1,566,401	2,849,973	4,416,374
2033	529,729	410,422	940,151	1,578,204	1,440,968	3,430,878	6,450,050	1,564,878	2,847,202	4,412,080
2034	529,965	410,604	940,569	1,579,904	1,442,521	3,434,571	6,456,996	1,566,801	2,850,700	4,417,501
2035	530,060	410,679	940,739	1,579,182	1,441,861	3,433,004	6,454,047	1,566,012	2,849,267	4,415,279
Total	16,941,706	15,629,700	32,571,406	62,856,754	58,200,818	145,696,491	266,754,063	54,702,071	102,851,540	157,553,611

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	1,124,054	2,040	7,375	376,604	1,580,376
1973	33,931	4,615	0	0	764,825	2,308	3,017	77,630	886,326
1974	49,114	4,413	0	46,752	671,406	2,207	3,114	106,332	883,338
1975	63,122	4,670	0	34,574	842,482	2,490	3,920	134,257	1,085,515
1976	70,851	5,131	0	94,653	965,096	2,737	4,910	100,597	1,243,975
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	1,593,785	4,249	6,294	24,494	1,925,014
1979	107,742	4,861	0	193,697	2,364,584	5,591	13,137	433,610	3,123,222
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	904,115	5,517	3,071	1,179	987,294
1984	81,086	0	0	213,746	1,954,329	5,855	7,621	10,325	2,272,962
1985	114,881	12,973	0	243,229	2,570,860	8,445	8,901	272,706	3,231,995
1986	234,878	5,469	0	375,012	4,849,592	17,295	16,760	373,146	5,872,152
1987	199,494	10,949	0	535,679	4,460,248	17,212	17,033	400,548	5,641,163
1988	191,559	16,325	0	528,187	4,320,243	15,811	12,280	381,297	5,465,702
1989	284,393	15,405	0	679,495	6,142,303	20,004	21,467	647,680	7,810,747
1990	211,850	7,465	0	819,913	4,637,275	11,673	11,780	333,102	6,033,058
1991	5,681	1,355	0	231,447	77,281	0	596	13,362	329,722
1992	78,071	4,447	0	228,288	1,731,095	6,468	5,282	153,474	2,207,125
1993	23,131	1,253	0	74,576	370,826	4,282	1,699	56,880	532,647
1994	167,612	19,774	0	540,439	3,560,587	11,134	10,961	479,376	4,789,883
1995	530,915	27,604	0	1,325,769	11,141,077	36,805	37,069	1,090,354	14,189,593
1996	576,782	29,989	0	1,441,408	12,043,123	39,984	40,217	1,184,552	15,356,055
1997	601,237	31,260	0	1,512,955	12,822,832	41,681	40,565	1,234,776	16,285,306
1998	581,915	30,256	0	1,459,597	12,338,739	40,341	39,732	1,195,094	15,685,674
1999	603,718	31,389	0	1,516,483	13,205,210	41,852	41,259	1,239,870	16,679,781
2000	645,722	33,573	0	1,623,920	14,193,514	44,764	43,752	1,326,137	17,911,382
2001	645,458	33,560	0	1,622,304	14,155,455	44,746	43,944	1,325,595	17,871,062
2002	650,936	33,844	0	1,636,224	14,282,262	45,125	44,282	1,336,844	18,029,517
2003	656,395	34,128	0	1,650,020	14,405,652	45,504	44,638	1,348,054	18,184,391
2004	662,919	34,467	0	1,666,025	14,536,136	45,956	45,174	1,361,453	18,352,130
2005	703,495	36,577	0	1,768,756	15,452,985	48,769	47,844	1,444,786	19,503,212
2006	703,642	36,584	0	1,768,700	15,442,758	48,779	47,940	1,445,088	19,493,491
2007	709,681	36,898	0	1,784,392	15,591,321	49,198	48,259	1,457,492	19,677,241
2008	712,911	37,066	0	1,792,261	15,657,622	49,421	48,509	1,464,124	19,761,914
2009	721,923	37,535	0	1,815,521	15,870,568	50,047	49,044	1,482,632	20,027,270
2010	729,158	37,911	0	1,832,535	15,998,662	50,548	49,753	1,497,492	20,196,059
2011	732,031	38,061	0	1,840,874	16,094,146	50,748	49,739	1,503,392	20,308,991
2012	780,002	40,555	0	1,961,457	17,150,343	54,073	53,062	1,601,910	21,641,402
2013	770,187	40,044	0	1,936,768	16,935,138	53,393	52,376	1,581,752	21,369,658
2014	778,801	40,492	0	1,958,876	17,136,599	53,989	52,901	1,599,444	21,621,102
2015	776,560	40,375	0	1,952,685	17,072,265	53,834	52,836	1,594,843	21,543,398
2016	778,311	40,467	0	1,957,245	17,113,739	53,956	52,943	1,598,439	21,595,100
2017	802,770	41,739	0	2,018,872	17,658,591	55,652	54,593	1,648,671	22,280,888
2018	801,222	41,658	0	2,015,133	17,628,741	55,544	54,459	1,645,492	22,242,249
2019	800,550	41,623	0	2,012,954	17,600,161	55,498	54,500	1,644,110	22,209,396
2020	792,870	41,223	0	1,994,601	17,455,373	54,965	53,817	1,628,338	22,021,187
2021	788,867	41,016	0	1,983,216	17,333,146	54,688	53,752	1,620,118	21,874,803
2022	791,141	41,134	0	1,989,498	17,397,564	54,846	53,822	1,624,787	21,952,792
2023	790,059	41,077	0	1,986,871	17,377,294	54,771	53,723	1,622,565	21,926,360
2024	790,340	41,092	0	1,987,487	17,380,369	54,789	53,763	1,623,141	21,930,981
2025	790,322	41,091	0	1,987,364	17,377,326	54,789	53,780	1,623,104	21,927,776
2026	788,471	40,995	0	1,982,914	17,343,442	54,660	53,607	1,619,305	21,883,394
2027	788,659	41,005	0	1,983,346	17,346,134	54,674	53,629	1,619,690	21,887,137
2028	786,796	40,908	0	1,978,609	17,302,707	54,544	53,516	1,615,861	21,832,941
2029	785,469	40,839	0	1,975,341	17,277,245	54,452	53,399	1,613,138	21,799,883
2030	787,635	40,951	0	1,980,811	17,322,617	54,602	53,567	1,617,586	21,857,769
2031	786,712	40,903	0	1,978,454	17,302,467	54,538	53,501	1,615,693	21,832,268
2032	787,195	40,929	0	1,979,594	17,310,172	54,571	53,554	1,616,683	21,842,698
2033	784,718	40,800	0	1,973,296	17,256,661	54,400	53,373	1,611,596	21,774,844
2034	787,364	40,937	0	1,980,261	17,320,903	54,583	53,520	1,617,031	21,854,599
2035	784,823	40,805	0	1,973,408	17,255,028	54,407	53,405	1,611,810	21,773,686
Total	32,815,288	1,734,900	0	81,242,306	711,761,388	2,257,281	2,252,503	66,893,649	898,957,315

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	44,585	0	12,780	0	4,491	1,515	0	32,092	0
1973	286	28,247	102,811	6,895	159,535	3,854	0	0	301,444	0
1974	15,558	28,096	100,954	9,891	157,742	4,932	221	0	177,172	6,529
1975	99,182	27,760	108,250	12,758	170,106	6,391	0	0	136,060	53,482
1976	385,090	38,108	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	44,714	173,774	20,834	263,661	2,724	0	0	36,905	70,726
1979	1,058,567	83,320	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	(303,945)	173,383	10,834	273,548	386	0	0	(71,309)	(8,732)
1984	488,905	(102,708)	275,919	19,738	437,469	15	0	0	(67,746)	(93,352)
1985	818,808	(355,149)	412,369	34,515	655,364	0	0	32,369	(47,995)	(32,654)
1986	1,109,926	54,808	729,551	60,334	1,161,835	5,553	0	105,458	69,432	102,228
1987	1,037,002	(27,837)	680,868	64,790	1,103,771	33,050	595	160,560	39,616	48,122
1988	1,031,054	(66,694)	697,913	67,791	1,148,995	12,129	305	51,240	53,614	37,965
1989	1,742,458	180,616	982,351	97,459	1,639,274	38,389	8,982	352,059	343,754	212,369
1990	2,431,638	414,311	1,397,303	110,514	2,304,642	90,065	0	444,364	595,304	526,326
1991	292,971	(40,472)	280,867	34,529	463,248	17,939	130,161	134,515	(8,969)	(13,228)
1992	597,868	(194,687)	245,504	6,216	404,903	4,958	246,637	79,710	(20,737)	(48,834)
1993	(158,714)	(501,870)	(92,512)	0	(152,626)	(2,703)	(53,282)	(25,259)	(180,487)	(595,843)
1994	2,322,115	130,329	641,994	91,909	1,058,790	46,531	943,504	355,973	1,073,686	301,386
1995	4,082,651	1,224,397	1,251,827	168,429	2,064,702	159,687	4,173,721	1,080,320	1,788,324	758,682
1996	4,743,306	1,508,834	1,326,769	182,862	2,188,307	176,222	4,320,656	1,323,969	2,067,692	804,103
1997	5,546,729	1,919,479	1,561,487	216,739	2,575,441	195,343	4,893,457	1,469,319	2,636,279	946,355
1998	5,409,772	1,874,965	1,395,352	213,266	2,301,428	180,987	4,514,145	1,361,334	2,537,008	845,671
1999	6,928,696	2,330,062	1,481,739	241,135	2,443,910	189,819	4,711,404	1,427,763	3,527,954	1,154,603
2000	8,721,724	3,131,905	1,722,001	308,511	2,840,182	208,957	5,224,084	1,571,727	4,472,731	1,490,911
2001	8,610,749	3,066,771	1,687,139	304,393	2,782,684	206,298	5,154,368	1,551,728	4,382,178	1,460,727
2002	8,706,563	3,120,657	1,714,933	308,001	2,828,526	208,594	5,215,491	1,568,996	4,454,374	1,484,790
2003	8,793,171	3,168,689	1,739,102	311,135	2,868,390	210,670	5,268,549	1,584,602	4,517,151	1,505,718
2004	8,841,938	3,195,121	1,752,415	312,686	2,890,344	211,840	5,294,798	1,593,391	4,551,721	1,517,240
2005	11,486,120	3,842,160	1,943,811	430,126	3,206,024	227,743	5,712,516	1,713,017	7,573,283	1,792,345
2006	11,429,584	3,814,426	1,928,663	427,930	3,181,044	226,621	5,683,371	1,704,583	7,514,283	1,778,379
2007	11,603,370	3,900,450	1,968,038	434,917	3,245,988	230,067	5,776,129	1,730,502	7,667,688	1,814,688
2008	11,627,153	3,912,401	1,974,340	435,553	3,256,381	230,538	5,784,584	1,734,049	7,692,238	1,820,496
2009	11,859,047	4,030,877	2,031,495	445,356	3,350,646	235,136	5,914,815	1,768,634	7,914,913	1,873,194
2010	13,868,565	4,011,277	2,018,656	550,462	3,329,471	234,543	5,887,038	1,764,163	8,965,980	1,966,224
2011	14,349,695	4,116,468	2,070,263	560,717	3,414,587	238,469	5,996,738	1,793,712	9,195,193	2,016,490
2012	15,333,637	4,526,027	2,261,720	600,017	3,730,373	254,822	6,417,026	1,916,704	10,045,568	2,202,975
2013	15,131,616	4,442,870	2,222,253	592,002	3,665,275	251,465	6,331,317	1,891,451	9,870,269	2,164,534
2014	15,383,252	4,546,323	2,275,816	602,984	3,753,618	255,647	6,448,743	1,922,906	10,108,168	2,216,703
2015	15,245,024	4,493,438	2,249,332	666,625	3,709,937	253,350	6,389,545	1,905,628	9,990,539	2,317,493
2016	15,308,966	4,512,673	2,257,802	669,196	3,723,908	254,413	6,414,182	1,913,621	10,028,159	2,326,220
2017	15,832,399	4,735,839	2,362,436	692,888	3,896,487	263,111	6,641,262	1,979,050	10,492,902	2,434,027
2018	15,825,199	4,731,062	2,361,684	692,758	3,895,242	262,992	6,640,030	1,978,150	10,489,552	2,433,248
2019	15,733,860	4,691,853	2,344,238	688,043	3,866,471	261,474	6,594,825	1,966,733	10,412,072	2,415,276
2020	15,727,577	4,690,703	2,344,763	741,428	3,867,339	261,368	6,607,802	1,965,948	10,414,407	2,537,624
2021	15,430,660	4,568,670	2,279,312	724,421	3,759,387	256,435	6,456,249	1,928,833	10,123,705	2,466,788
2022	15,566,999	4,625,745	2,306,747	731,038	3,804,635	258,699	6,515,204	1,945,875	10,245,551	2,496,479
2023	15,559,318	4,623,512	2,306,540	730,600	3,804,291	258,573	6,511,325	1,944,915	10,244,628	2,496,253
2024	15,550,830	4,618,174	2,306,044	730,198	3,803,474	258,431	6,507,740	1,943,853	10,242,426	2,495,717
2025	15,537,985	4,614,640	2,300,466	742,710	3,794,277	258,218	6,505,115	1,942,247	10,217,661	2,619,148
2026	15,533,008	4,610,742	2,302,144	742,661	3,797,042	258,135	6,504,683	1,941,626	10,225,106	2,621,056
2027	15,529,357	4,611,563	2,301,631	742,569	3,796,197	258,075	6,503,879	1,941,169	10,222,831	2,620,472
2028	15,483,023	4,589,185	2,290,898	740,154	3,778,494	257,305	6,482,729	1,935,378	10,175,157	2,608,252
2029	15,467,926	4,584,533	2,290,966	739,416	3,778,604	257,053	6,476,259	1,933,490	10,175,454	2,608,329
2030	15,518,066	4,604,460	2,301,989	742,968	3,796,787	257,887	6,507,374	1,939,758	10,224,419	2,740,463
2031	15,493,825	4,595,430	2,296,521	741,463	3,787,770	257,484	6,494,200	1,936,729	10,200,134	2,733,954
2032	15,493,564	4,590,887	2,295,391	741,443	3,785,905	257,480	6,494,025	1,936,695	10,195,109	2,732,609
2033	15,433,021	4,567,923	2,282,894	738,356	3,765,292	256,473	6,466,975	1,929,128	10,139,607	2,717,730
2034	15,534,229	4,611,512	2,304,104	743,706	3,800,276	258,157	6,513,841	1,941,778	10,233,816	2,742,982
2035	15,407,842	4,556,088	2,275,180	735,374	3,752,570	256,055	6,440,873	1,925,980	10,105,346	2,836,588
Total	546,845,713	162,443,711	92,785,516	23,686,922	152,775,510	10,063,318	247,176,249	74,940,443	339,502,609	86,603,767

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	943,397	0	0	0	0	0	3,261,922
1973	0	1,083,333	0	1,686,405	0	0	0	0	0	3,168,975
1974	0	1,872,299	0	2,373,394	0	0	0	0	0	3,919,920
1975	0	3,886,921	0	4,500,910	0	0	0	0	0	6,053,571
1976	0	5,485,263	0	6,491,619	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	4,872,844	0	0	0	0	0	7,587,308
1979	0	4,019,308	0	5,855,746	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	(8,033,123)	0	0	0	0	0	(6,843,181)
1984	0	(6,698,557)	0	(5,740,317)	0	0	0	0	0	(3,071,158)
1985	0	(15,853,883)	0	(14,336,256)	0	0	0	0	0	(10,445,229)
1986	0	1,161,277	0	4,560,402	0	0	0	0	0	11,638,267
1987	0	(2,861,863)	0	278,674	0	0	0	0	0	7,254,800
1988	0	(3,292,684)	0	(258,372)	0	0	0	0	0	6,590,378
1989	0	9,657,741	0	15,255,452	0	0	0	0	0	24,725,232
1990	0	30,437,556	203,450	38,955,473	0	0	0	0	0	47,664,030
1991	0	(5,280,540)	18,363	(3,970,616)	0	0	0	0	0	(2,950,853)
1992	0	(8,914,591)	0	(7,593,053)	0	0	0	0	0	(4,816,618)
1993	0	(23,689,823)	0	(25,453,119)	0	0	0	0	0	(25,093,603)
1994	0	11,229,011	297,212	18,492,440	0	0	0	0	0	24,606,905
1995	0	92,828,774	314,184	109,895,698	0	0	0	0	0	128,415,188
1996	413,539	102,931,291	351,685	122,339,235	0	0	0	0	0	143,713,283
1997	648,930	122,327,885	402,411	145,339,854	0	0	0	0	0	168,782,757
1998	336,456	110,573,596	372,036	131,916,016	0	0	0	0	0	154,513,866
1999	357,285	116,125,193	1,176,740	142,096,303	0	0	0	0	0	167,004,440
2000	473,365	136,294,349	1,368,682	167,829,129	0	0	0	0	0	194,792,194
2001	463,782	133,456,912	1,342,303	164,470,032	0	0	0	0	0	191,361,534
2002	471,421	135,747,029	1,363,950	167,193,325	0	0	0	0	0	194,363,545
2003	478,066	137,763,059	1,383,279	169,591,581	0	0	0	0	0	197,031,452
2004	481,724	138,862,828	1,393,731	170,899,777	0	0	0	0	0	198,617,720
2005	711,048	154,573,205	1,542,126	194,753,524	0	0	0	0	0	224,378,342
2006	705,509	153,413,913	1,531,845	193,340,151	0	0	0	0	0	222,958,348
2007	719,911	156,712,551	1,563,680	197,367,979	0	0	0	0	0	227,289,250
2008	722,216	157,203,297	1,568,042	197,961,288	0	0	0	0	0	228,062,007
2009	743,122	161,860,722	1,611,724	203,639,681	0	0	0	0	0	234,138,598
2010	921,942	160,957,887	1,604,763	206,080,971	0	0	0	0	0	236,931,264
2011	945,509	165,126,773	1,643,194	211,467,808	0	0	0	0	0	242,481,734
2012	1,032,950	180,987,796	1,794,554	231,104,169	0	0	0	0	0	264,304,596
2013	1,014,925	177,744,179	1,763,722	227,085,878	0	0	0	0	0	259,870,960
2014	1,039,388	181,953,971	1,802,022	232,309,541	0	0	0	0	0	265,495,549
2015	1,319,414	179,837,029	1,782,134	230,159,488	0	0	0	0	0	263,263,681
2016	1,324,382	180,561,529	1,789,705	231,084,756	0	0	0	0	0	264,268,695
2017	1,385,758	189,216,254	1,871,862	241,804,275	0	0	0	0	0	276,141,687
2018	1,385,317	189,089,093	1,870,254	241,654,581	0	0	0	0	0	275,937,521
2019	1,375,082	187,605,240	1,855,779	239,810,946	0	0	0	0	0	274,073,838
2020	1,690,057	187,602,301	1,855,320	240,306,637	0	0	0	0	0	274,220,233
2021	1,707,019	182,547,648	1,810,144	234,059,271	0	0	0	0	0	267,812,862
2022	1,727,563	184,787,408	1,831,276	236,843,219	0	0	0	0	0	270,689,533
2023	1,727,409	184,733,629	1,830,418	236,771,411	0	0	0	0	0	270,580,099
2024	1,727,036	184,605,179	1,828,560	236,617,662	0	0	0	0	0	270,431,624
2025	1,722,860	184,314,801	1,827,112	236,397,240	0	0	0	0	0	270,204,514
2026	1,724,116	184,300,666	1,825,823	236,386,808	0	0	0	0	0	270,125,104
2027	1,723,733	184,297,403	1,825,969	236,374,848	0	0	0	0	0	270,118,150
2028	1,715,695	183,420,121	1,817,898	235,294,289	0	0	0	0	0	268,941,518
2029	1,715,743	183,327,633	1,816,071	235,171,477	0	0	0	0	0	268,779,643
2030	1,724,000	184,166,235	1,823,382	236,347,788	0	0	0	0	0	270,021,798
2031	1,719,907	183,767,711	1,819,946	235,845,074	0	0	0	0	0	269,490,710
2032	1,719,058	183,630,598	1,818,559	235,691,323	0	0	0	0	0	269,348,017
2033	1,709,700	182,672,446	1,809,905	234,489,450	0	0	0	0	0	268,066,575
2034	1,725,584	184,393,118	1,825,948	236,629,051	0	0	0	0	0	270,298,716
2035	1,703,923	182,128,804	1,805,673	233,930,296	0	0	0	0	0	267,514,047
Total	46,954,444	6,769,440,605	64,755,436	8,617,974,243	0	0	0	0	0	9,973,810,638

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	438,748	107,124	545,872	828,143	849,663	3,208,687	4,886,493	333,262	622,209	955,471
1983	355,245	151,541	506,786	846,611	902,381	3,833,983	5,582,975	359,899	671,432	1,031,331
1984	467,914	224,655	692,569	1,132,880	1,098,238	5,743,334	7,974,452	392,142	731,031	1,123,173
1985	736,919	364,959	1,101,878	1,582,798	1,793,926	6,564,325	9,941,049	439,447	818,399	1,257,846
1986	1,086,047	693,705	1,779,752	1,407,617	1,532,274	6,881,358	9,821,249	427,502	796,619	1,224,121
1987	1,774,621	1,561,964	3,336,585	1,895,660	2,015,555	6,695,029	10,606,244	427,175	836,975	1,264,150
1988	2,208,464	2,382,676	4,591,140	1,895,436	2,213,701	6,379,286	10,488,423	474,123	984,040	1,458,163
1989	2,368,720	3,324,431	5,693,151	1,789,224	1,855,062	5,862,185	9,506,471	480,868	1,146,694	1,627,562
1990	2,747,543	3,437,605	6,185,148	2,223,655	2,262,388	6,673,735	11,159,778	564,425	1,201,862	1,766,287
1991	2,746,394	3,573,303	6,319,697	1,411,110	1,640,630	4,572,663	7,624,403	595,162	1,432,218	2,027,380
1992	2,558,778	3,470,790	6,029,568	1,867,736	2,167,587	5,782,715	9,818,038	666,936	1,421,524	2,088,460
1993	2,578,647	3,398,477	5,977,124	2,436,287	2,475,970	6,656,768	11,569,025	757,879	1,542,841	2,300,720
1994	2,770,986	3,971,539	6,742,525	2,958,370	2,997,474	8,072,405	14,028,249	1,165,641	2,371,784	3,537,425
1995	2,909,875	4,168,369	7,078,244	3,028,000	3,071,479	8,277,427	14,376,906	2,935,830	6,337,396	9,273,226
1996	3,095,329	4,305,766	7,401,095	3,160,405	3,138,211	8,464,451	14,763,067	5,502,816	15,806,000	21,308,816
1997	3,005,821	4,313,776	7,319,597	3,388,977	3,283,942	8,714,741	15,387,660	6,505,267	20,897,004	27,402,271
1998	3,013,357	4,310,444	7,323,801	3,340,249	3,239,401	8,608,927	15,188,577	6,505,974	20,803,030	27,309,004
1999	3,029,691	4,312,758	7,342,449	3,343,825	3,243,146	8,620,077	15,207,048	7,995,198	21,121,053	29,116,251
2000	3,055,545	4,331,288	7,386,833	3,394,781	3,289,680	8,730,918	15,415,379	8,071,499	21,263,592	29,335,091
2001	3,066,884	4,326,990	7,393,874	3,381,171	3,277,282	8,701,552	15,360,005	8,057,276	21,241,154	29,298,430
2002	3,076,788	4,323,715	7,400,503	3,370,162	3,267,231	8,677,626	15,315,019	8,043,747	21,218,012	29,261,759
2003	3,088,446	4,320,151	7,408,597	3,358,398	3,256,492	8,652,066	15,266,956	8,025,218	21,184,342	29,209,560
2004	3,100,249	4,317,574	7,417,823	3,351,469	3,250,167	8,637,013	15,238,649	8,012,028	21,160,390	29,172,418
2005	3,122,402	4,350,974	7,473,376	3,391,213	3,286,463	8,723,463	15,401,139	8,060,048	21,248,066	29,308,114
2006	3,129,442	4,346,656	7,476,098	3,377,055	3,273,536	8,692,687	15,343,278	8,038,178	21,208,271	29,246,449
2007	3,140,558	4,344,598	7,485,156	3,370,141	3,267,224	8,677,662	15,315,027	8,027,476	21,188,849	29,216,325
2008	3,151,042	4,339,032	7,490,074	3,351,662	3,250,354	8,637,497	15,239,513	7,999,283	21,137,585	29,136,868
2009	3,162,022	4,337,200	7,499,222	3,347,069	3,246,162	8,627,525	15,220,756	7,990,737	21,122,089	29,112,826
2010	3,171,381	4,335,834	7,507,215	3,334,719	3,234,884	8,600,687	15,170,290	7,968,250	21,081,243	29,049,493
2011	3,183,280	4,332,116	7,515,396	3,320,670	3,222,058	8,570,151	15,112,879	7,949,292	21,046,774	28,996,066
2012	3,218,279	4,354,641	7,572,920	3,404,815	3,298,895	8,753,135	15,456,845	8,058,363	21,245,570	29,303,933
2013	3,180,936	4,299,257	7,480,193	3,112,096	3,027,240	7,991,789	14,131,125	7,795,391	20,767,039	28,562,430
2014	3,217,666	4,321,211	7,538,877	3,147,504	3,026,467	7,980,094	14,154,065	7,888,728	20,934,362	28,823,090
2015	3,213,498	4,305,999	7,519,497	3,046,900	2,880,140	7,474,028	13,401,068	7,790,949	20,755,972	28,546,921
2016	3,202,955	4,299,677	7,502,632	3,007,245	2,830,456	7,255,149	13,092,850	7,751,138	20,682,898	28,434,036
2017	3,207,358	4,311,635	7,518,993	3,017,981	2,838,479	7,231,715	13,088,175	7,787,642	20,748,696	28,536,338
2018	3,141,310	4,311,034	7,452,344	2,972,511	2,793,951	7,100,809	12,867,271	7,768,480	20,713,097	28,481,577
2019	3,112,816	4,311,465	7,424,281	2,934,243	2,758,394	6,998,775	12,691,412	7,763,883	20,704,374	28,468,257
2020	3,117,881	4,305,884	7,423,765	2,898,841	2,723,811	6,913,021	12,535,673	7,734,253	20,650,174	28,384,427
2021	3,117,815	4,305,636	7,423,451	2,894,265	2,719,259	6,902,697	12,516,221	7,729,605	20,641,514	28,371,119
2022	3,116,955	4,306,040	7,422,995	2,895,295	2,719,832	6,901,982	12,517,109	7,731,251	20,644,263	28,375,514
2023	3,115,623	4,274,335	7,389,958	2,893,174	2,717,816	6,895,495	12,506,485	7,729,211	20,640,433	28,369,644
2024	3,116,613	4,276,084	7,392,697	2,903,550	2,727,161	6,917,208	12,547,919	7,744,447	20,668,042	28,412,489
2025	3,100,345	4,266,043	7,366,388	2,881,720	2,706,715	6,867,762	12,456,197	7,712,901	20,610,550	28,323,451
2026	3,094,810	4,260,807	7,355,617	2,877,640	2,702,964	6,858,636	12,439,240	7,601,950	20,405,546	28,007,496
2027	3,091,878	4,256,550	7,348,428	2,876,120	2,701,390	6,853,509	12,431,019	7,599,451	20,400,044	27,999,495
2028	3,086,766	4,250,985	7,337,751	2,868,917	2,694,664	6,836,170	12,399,751	7,586,079	20,375,207	27,961,286
2029	3,083,204	4,246,794	7,329,998	2,864,277	2,690,379	6,825,058	12,379,714	7,583,250	20,369,771	27,953,021
2030	3,073,434	4,232,351	7,305,785	2,863,292	2,689,408	6,822,317	12,375,017	7,581,585	20,366,415	27,948,000
2031	3,059,964	4,212,675	7,272,639	2,855,941	2,682,617	6,805,714	12,344,272	7,571,869	20,348,317	27,920,186
2032	3,048,265	4,193,060	7,241,325	2,857,903	2,684,361	6,809,589	12,351,853	7,575,580	20,354,946	27,930,526
2033	3,020,108	4,148,530	7,168,638	2,855,738	2,682,326	6,804,375	12,342,439	7,576,335	20,356,297	27,932,632
2034	2,956,324	4,075,610	7,031,934	2,850,385	2,677,176	6,790,777	12,318,338	7,576,797	20,356,991	27,933,788
2035	2,826,432	3,935,385	6,761,817	2,841,855	2,669,322	6,771,250	12,282,427	7,574,349	20,352,391	27,926,740
Total	153,525,342	202,586,846	356,112,188	158,688,654	156,646,252	433,830,032	749,164,938	320,485,295	853,169,774	1,173,655,069

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	180,935	9,535	54,674	446,119	1,530,491	12,882	11,495	206,611	2,452,742
1969	176,533	9,525	87,677	525,877	2,363,555	11,495	10,492	348,382	3,533,536
1970	198,198	16,290	94,778	574,839	2,880,185	11,623	13,023	287,306	4,076,242
1971	193,912	17,249	95,799	606,768	3,777,353	16,571	14,317	442,017	5,163,986
1972	215,432	18,046	98,896	632,511	4,897,397	13,997	20,506	1,057,581	6,954,366
1973	198,014	14,188	97,657	640,155	4,842,338	14,265	11,611	401,146	6,219,374
1974	275,069	14,157	98,569	699,154	5,134,675	14,357	12,679	584,714	6,833,374
1975	340,376	15,099	106,811	716,513	6,239,967	15,367	14,360	712,919	8,161,412
1976	297,691	15,645	108,194	775,207	6,589,960	15,736	16,016	553,594	8,372,043
1977	259,796	12,755	112,664	798,781	6,756,053	17,183	13,810	500,964	8,472,006
1978	346,406	11,614	115,636	889,271	8,172,867	17,493	17,843	493,461	10,064,591
1979	376,484	15,485	114,369	896,774	9,301,878	18,828	24,737	940,456	11,689,011
1980	397,622	13,854	126,316	890,254	9,861,341	19,403	24,129	712,828	12,045,747
1981	461,410	31,774	134,338	1,081,276	11,290,952	23,594	22,910	897,580	13,943,834
1982	452,444	14,808	135,437	1,003,561	12,055,400	21,456	22,222	731,594	14,436,922
1983	626,311	16,430	149,594	1,028,108	15,273,398	38,450	30,564	426,505	17,589,360
1984	898,667	16,841	164,921	2,061,639	23,372,751	52,951	59,651	773,484	27,400,905
1985	1,101,369	90,071	187,465	2,381,969	28,011,267	68,765	71,129	2,189,791	34,101,826
1986	1,255,075	36,073	181,610	2,374,753	30,675,716	79,506	76,087	2,174,064	36,852,884
1987	1,121,784	53,305	180,101	2,835,230	29,260,800	77,669	75,468	2,248,964	35,853,321
1988	1,096,159	64,779	193,695	2,753,530	28,991,414	72,949	60,056	2,184,554	35,417,136
1989	1,124,830	50,893	187,289	2,428,652	28,904,323	65,376	67,890	2,414,617	35,243,870
1990	997,621	35,852	219,694	2,508,018	26,858,108	49,054	48,585	1,830,863	32,547,795
1991	594,634	25,555	225,104	2,105,169	17,423,101	26,541	26,841	1,215,105	21,642,050
1992	943,071	41,765	242,187	2,377,642	25,700,329	54,928	50,959	1,896,520	31,307,401
1993	1,053,897	48,267	261,860	11,573,064	19,600,489	65,482	61,337	2,304,219	34,968,615
1994	1,137,523	71,455	353,097	10,724,006	23,972,688	64,145	63,855	2,709,413	39,096,182
1995	1,471,066	67,259	344,601	3,588,714	37,686,664	88,371	88,139	3,001,982	46,336,796
1996	1,528,825	70,203	323,277	3,748,512	38,650,258	92,362	92,063	3,119,358	47,624,858
1997	1,560,990	71,888	338,907	3,841,504	39,463,954	94,616	92,829	3,185,687	48,650,375
1998	1,535,172	70,544	339,261	3,771,752	38,843,185	92,822	91,556	3,132,645	47,876,937
1999	1,541,213	70,852	340,820	3,787,440	39,570,569	93,197	91,968	3,144,939	48,640,998
2000	1,562,455	71,957	341,023	3,842,528	40,100,435	94,662	93,047	3,188,538	49,294,645
2001	1,557,472	71,696	341,085	3,828,981	39,958,135	94,316	92,921	3,178,294	49,122,900
2002	1,551,667	71,395	341,113	3,814,465	39,834,553	93,913	92,495	3,166,369	48,965,970
2003	1,545,833	71,090	341,139	3,799,795	39,707,308	93,507	92,090	3,154,384	48,805,146
2004	1,543,263	70,955	341,165	3,792,876	39,636,020	93,328	92,011	3,149,103	48,718,721
2005	1,561,925	71,926	341,351	3,840,357	40,068,509	94,614	93,189	3,187,408	49,259,279
2006	1,555,563	71,594	341,348	3,823,891	39,913,534	94,173	92,847	3,174,339	49,067,289
2007	1,552,477	71,433	341,375	3,816,582	39,859,690	93,958	92,547	3,167,999	48,996,061
2008	1,542,519	70,914	341,395	3,791,210	39,633,071	93,265	91,908	3,147,541	48,711,823
2009	1,542,571	70,921	341,426	3,791,896	39,647,454	93,269	91,837	3,147,647	48,727,021
2010	1,534,359	70,492	341,469	3,769,952	39,432,578	92,697	91,501	3,130,773	48,463,821
2011	1,528,975	70,213	341,479	3,757,495	39,344,808	92,324	90,930	3,119,716	48,345,940
2012	1,569,227	72,303	341,690	3,858,585	40,232,525	95,105	93,715	3,202,349	49,465,499
2013	1,483,496	67,847	341,652	3,642,591	38,329,278	89,163	87,918	3,026,290	47,068,235
2014	1,517,759	69,627	338,955	3,729,331	39,101,386	91,537	90,168	3,096,649	48,035,412
2015	1,487,445	68,052	335,637	3,578,682	38,412,890	89,436	88,212	3,034,397	47,094,751
2016	1,478,794	67,602	329,621	3,493,162	38,223,265	88,837	87,618	3,016,630	46,785,529
2017	1,497,898	68,595	315,491	3,410,760	38,650,682	90,157	88,899	3,055,846	47,178,328
2018	1,496,330	68,513	292,751	3,289,644	38,620,318	81,527	88,763	3,052,628	46,990,474
2019	1,495,673	68,478	284,269	3,227,587	38,591,956	80,974	88,804	3,051,275	46,889,016
2020	1,487,907	68,074	282,414	3,176,204	38,444,821	80,188	88,119	3,035,335	46,663,062
2021	1,483,878	67,866	281,304	3,142,783	38,321,707	79,768	88,053	3,027,060	46,492,419
2022	1,486,176	67,985	280,689	3,139,048	38,386,818	79,859	88,124	3,031,780	46,560,479
2023	1,485,098	67,929	280,262	3,132,033	38,366,601	79,755	88,025	3,029,567	46,529,270
2024	1,490,381	68,203	279,741	3,143,115	38,480,877	80,102	88,403	3,040,416	46,671,238
2025	1,480,677	67,699	279,176	3,116,122	38,262,496	79,406	87,767	3,020,486	46,393,829
2026	1,478,809	67,603	278,904	3,109,579	38,228,144	79,241	87,594	3,016,653	46,346,527
2027	1,478,999	67,613	278,260	3,107,021	38,230,876	79,212	87,616	3,017,039	46,346,636
2028	1,477,114	67,515	275,812	3,100,180	38,186,844	79,057	87,503	3,013,170	46,287,195
2029	1,475,781	67,445	275,492	3,093,788	38,161,141	78,903	87,386	3,010,428	46,250,364
2030	1,477,958	67,558	275,208	3,096,209	38,206,894	78,986	87,554	3,014,903	46,305,270
2031	1,477,029	67,510	273,617	3,075,468	38,186,587	78,530	87,488	3,012,999	46,259,228
2032	1,477,516	67,536	273,594	3,078,795	38,194,372	78,574	87,541	3,013,995	46,271,923
2033	1,475,022	67,406	273,255	3,067,565	38,140,400	78,267	87,360	3,008,877	46,198,152
2034	1,477,684	67,544	272,634	3,068,191	38,205,129	78,308	87,507	3,014,344	46,271,341
2035	1,475,131	67,411	271,901	3,052,214	38,138,848	77,898	87,392	3,009,100	46,179,895
Total	78,249,390	3,620,556	16,970,127	199,144,818	1,987,394,376	4,518,250	4,623,979	157,588,190	2,452,109,686

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	1,305,498	562,427	181,440	926,946	42,456	1,111,252	274,997	3,393,625	866,355
1973	2,114,330	1,323,750	696,764	183,960	1,138,475	43,539	1,174,136	287,724	3,976,686	948,006
1974	2,177,886	1,383,005	712,285	193,538	1,165,339	45,270	1,205,921	292,482	4,003,812	991,990
1975	2,354,468	1,450,976	753,208	206,305	1,233,164	48,548	1,272,523	304,697	4,164,534	1,092,496
1976	2,707,527	1,446,814	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	1,599,926	876,244	231,269	1,421,571	47,171	1,386,151	322,107	4,465,749	1,213,451
1979	3,520,829	1,634,643	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	3,953,505	2,060,867	1,154,725	280,475	1,882,439	56,032	1,947,024	407,400	5,416,621	1,565,222
1983	5,150,521	2,341,366	1,747,484	333,469	2,830,399	69,466	2,022,121	495,281	6,028,556	1,558,633
1984	7,186,139	3,405,340	2,830,550	445,975	4,559,019	75,848	2,253,016	553,865	7,057,233	2,332,300
1985	8,956,727	3,744,865	3,629,817	542,418	5,839,136	79,898	2,376,559	737,534	7,778,354	2,388,551
1986	8,806,790	4,321,337	4,052,369	578,512	6,522,356	102,667	2,467,223	1,002,031	7,877,533	3,053,421
1987	8,787,002	4,153,469	3,908,374	604,478	6,371,440	211,626	2,486,099	1,024,593	9,148,289	3,024,587
1988	8,309,866	4,231,120	3,916,756	618,581	6,451,328	125,143	2,567,844	782,756	9,499,543	2,837,255
1989	8,664,483	4,098,491	3,552,989	588,063	5,908,419	170,782	2,510,068	1,444,106	8,975,381	2,939,914
1990	9,908,542	4,515,105	4,212,320	619,880	6,946,786	288,652	2,695,910	1,635,094	9,815,999	3,681,150
1991	6,448,403	3,189,418	2,734,180	569,933	4,508,798	175,246	3,468,252	1,297,055	8,942,198	2,988,796
1992	8,572,045	4,488,300	2,812,566	440,299	4,637,979	121,839	4,288,054	1,133,482	8,690,020	3,015,551
1993	8,930,748	4,586,689	3,211,400	592,738	5,295,851	185,826	4,401,416	1,166,458	10,090,439	3,265,388
1994	13,248,925	5,427,036	3,699,984	751,774	6,101,438	253,994	6,288,347	1,909,564	11,440,641	4,372,091
1995	12,367,687	6,072,381	3,997,282	723,049	6,592,055	360,345	9,934,762	2,495,737	12,929,732	3,996,439
1996	13,352,222	6,450,197	4,193,960	840,541	6,916,482	381,670	10,185,188	2,845,340	15,247,943	4,435,596
1997	14,252,813	7,050,094	4,329,063	783,829	7,139,278	399,169	10,702,116	2,981,224	14,278,999	4,237,494
1998	14,188,742	7,024,688	4,153,981	809,891	6,850,528	382,364	10,257,778	2,854,904	14,722,960	4,206,190
1999	16,115,134	7,633,817	4,189,279	864,735	6,908,752	385,114	10,297,823	2,875,471	16,626,223	4,742,210
2000	18,062,260	8,576,108	4,306,626	894,478	7,102,271	396,904	10,620,639	2,964,067	16,781,486	4,939,938
2001	17,880,183	8,467,620	4,269,922	910,258	7,041,744	392,550	10,506,227	2,931,334	17,037,796	4,970,028
2002	17,809,530	8,429,905	4,250,546	907,878	7,009,790	390,860	10,463,381	2,918,586	16,989,877	4,953,696
2003	17,729,491	8,385,552	4,226,299	903,566	6,969,795	388,941	10,412,336	2,904,145	16,906,577	4,929,143
2004	17,643,773	8,337,360	4,201,698	900,571	6,929,219	386,888	10,354,476	2,888,685	16,849,260	4,909,009
2005	20,482,892	8,929,811	4,307,091	1,038,306	7,103,046	395,026	10,570,958	2,949,811	20,675,505	5,168,608
2006	20,310,141	8,844,420	4,261,857	1,028,345	7,028,442	391,596	10,481,437	2,924,038	20,452,430	5,118,157
2007	20,321,246	8,849,320	4,261,589	1,027,151	7,028,005	391,821	10,490,413	2,925,711	20,423,742	5,112,873
2008	20,109,665	8,743,353	4,214,058	1,020,552	6,949,608	387,626	10,376,986	2,894,154	20,266,857	5,074,335
2009	20,181,810	8,782,320	4,227,873	1,016,850	6,972,386	389,064	10,425,127	2,904,935	20,213,378	5,067,244
2010	22,269,473	8,625,640	4,185,246	1,173,830	6,902,101	382,986	10,253,946	2,859,216	22,043,748	5,275,375
2011	22,618,096	8,654,600	4,154,703	1,118,518	6,851,696	384,011	10,288,331	2,866,923	21,080,443	5,089,439
2012	23,433,289	8,997,414	4,332,220	1,173,431	7,144,497	397,594	10,637,916	2,969,003	22,181,565	5,322,049
2013	21,585,145	8,236,200	3,973,527	1,099,159	6,539,494	367,430	9,851,521	2,742,121	20,526,455	4,957,504
2014	22,351,827	8,543,576	4,125,011	1,133,486	6,803,359	379,527	10,177,587	2,833,479	21,310,380	5,125,821
2015	21,560,885	8,216,513	3,951,742	1,150,000	6,517,571	366,365	9,836,957	2,734,535	20,223,797	5,025,825
2016	21,306,382	8,086,672	3,912,058	1,155,706	6,452,130	362,079	9,725,616	2,702,425	20,297,721	5,027,401
2017	21,511,539	8,157,022	3,951,945	1,162,046	6,517,923	365,325	9,818,690	2,727,030	20,440,191	5,054,009
2018	21,250,290	7,940,150	3,895,538	1,146,012	6,424,892	360,699	9,706,040	2,692,781	20,125,599	4,971,353
2019	20,856,718	7,695,102	3,813,503	1,127,914	6,289,605	353,702	9,520,895	2,641,358	19,736,871	4,863,748
2020	20,553,032	7,541,366	3,706,865	1,128,579	6,113,716	347,404	9,367,625	2,596,374	18,729,595	4,757,279
2021	19,998,178	7,249,659	3,553,179	1,096,759	5,860,265	337,016	9,017,156	2,521,473	18,102,286	4,581,486
2022	20,003,728	7,198,755	3,527,841	1,088,085	5,818,469	336,828	8,970,320	2,520,921	17,844,257	4,516,788
2023	19,946,610	7,161,242	3,508,769	1,080,546	5,787,011	335,728	8,932,417	2,513,132	17,663,284	4,472,616
2024	20,026,314	7,172,963	3,520,233	1,080,003	5,805,919	337,031	8,962,791	2,522,999	17,644,520	4,470,302
2025	19,784,496	7,071,504	3,466,768	1,086,042	5,717,751	332,981	8,844,276	2,492,634	17,487,076	4,553,438
2026	19,766,494	7,051,086	3,453,032	1,076,560	5,695,092	332,645	8,823,789	2,490,266	17,296,553	4,511,168
2027	19,750,720	7,042,521	3,444,906	1,073,796	5,681,690	332,368	8,808,802	2,488,225	17,231,440	4,494,845
2028	19,693,947	6,996,528	3,432,914	1,074,327	5,661,911	331,397	8,778,049	2,481,026	17,229,378	4,489,429
2029	19,663,362	6,970,420	3,422,713	1,064,840	5,645,079	330,877	8,763,454	2,477,152	17,072,427	4,457,389
2030	19,695,401	6,943,288	3,432,325	1,070,556	5,660,935	331,411	8,786,257	2,481,185	17,159,054	4,595,390
2031	19,575,716	6,842,868	3,406,154	1,064,463	5,617,783	329,349	8,728,868	2,465,837	17,051,691	4,564,995
2032	19,583,338	6,807,077	3,407,377	1,064,874	5,619,799	329,473	8,733,833	2,466,776	17,053,643	4,565,775
2033	19,442,495	6,740,803	3,383,345	1,062,499	5,580,167	327,112	8,674,996	2,449,061	17,009,816	4,547,380
2034	19,437,911	6,758,161	3,376,185	1,051,886	5,568,352	327,020	8,680,945	2,448,399	16,816,758	4,507,991
2035	19,233,287	6,670,181	3,363,198	1,077,593	5,546,959	323,507	8,576,237	2,422,859	17,291,506	4,712,890
Total	937,341,318	385,464,980	210,031,946	51,894,413	345,711,712	17,387,482	453,472,306	128,422,351	908,431,140	245,556,451

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	24,733,509
1969	199,094	23,191,328	215,563	28,196,625	0	0	3,197	3,197	349,657	35,765,835
1970	290,113	30,667,864	274,055	37,535,555	0	0	15,147	15,147	386,754	45,883,260
1971	410,000	40,024,070	342,980	49,173,057	0	0	16,029	16,029	376,318	58,499,879
1972	537,970	53,024,698	422,922	64,674,638	0	0	17,403	17,403	401,833	76,198,519
1973	588,787	57,354,082	436,278	70,266,517	0	0	17,364	17,364	376,313	80,902,631
1974	612,269	61,860,856	456,213	75,100,866	0	0	17,507	17,507	399,290	86,604,928
1975	645,490	66,842,602	479,060	80,848,071	0	0	18,436	18,436	408,510	93,730,938
1976	669,204	68,572,597	476,252	83,328,599	0	0	17,507	17,507	431,101	97,104,601
1977	697,419	66,322,926	507,736	81,296,623	0	0	18,262	18,262	423,842	95,141,756
1978	709,955	73,007,400	523,862	88,771,161	0	0	17,411	17,411	427,091	104,560,576
1979	713,782	72,755,138	527,103	89,330,736	0	0	20,609	20,609	447,131	106,918,773
1980	778,921	80,025,825	571,965	98,296,368	0	0	17,791	17,791	507,956	116,874,513
1981	806,438	90,957,855	636,898	110,736,615	0	0	21,223	21,223	517,366	131,212,257
1982	854,507	93,188,475	671,333	113,438,625	0	0	28,334	28,334	513,728	134,805,445
1983	953,334	101,902,852	799,538	126,233,020	0	0	16,957	16,957	553,418	151,513,847
1984	1,074,111	138,522,776	869,368	171,165,540	0	0	18,023	18,023	562,242	208,936,904
1985	1,127,281	173,471,115	914,820	211,587,075	0	0	19,980	19,980	682,394	258,692,048
1986	1,152,979	193,524,594	939,273	234,401,085	0	0	19,977	19,977	621,039	284,720,107
1987	1,167,272	178,195,861	900,409	219,983,499	0	0	19,979	19,979	685,063	271,748,841
1988	1,213,746	190,716,864	907,	232,177,928	0	0	19,986	19,986	708,333	284,861,109
1989	1,199,556	193,498,252	931,724	234,482,228	0	0	20,060	20,060	766,964	287,340,306
1990	1,301,920	238,867,341	1,479,187	285,967,886	0	0	20,078	20,078	819,182	338,466,154
1991	1,365,732	173,136,301	1,124,471	209,948,783	0	0	20,123	20,123	566,145	248,148,581
1992	1,368,616	197,227,033	1,028,761	237,824,545	0	0	20,170	20,170	913,856	288,002,038
1993	1,470,786	191,792,405	1,055,660	236,045,804	0	0	20,310	20,310	996,193	291,877,791
1994	1,537,721	245,278,642	2,366,869	302,677,026	0	0	20,458	20,458	1,102,135	367,204,000
1995	1,575,446	331,760,398	1,663,274	394,468,587	0	0	20,611	20,611	930,379	472,484,749
1996	2,596,437	350,334,067	1,711,463	419,491,106	0	0	20,772	20,772	931,962	511,541,676
1997	2,730,603	366,050,233	1,786,766	436,721,681	0	0	20,772	20,772	972,746	536,475,102
1998	2,267,485	352,481,040	1,741,466	421,942,017	0	0	20,772	20,772	973,295	520,634,403
1999	2,330,169	351,645,855	3,134,912	427,749,494	0	0	20,772	20,772	977,949	529,054,961
2000	2,357,303	363,049,474	3,263,368	443,314,922	0	0	20,772	20,772	978,654	545,746,296
2001	2,393,030	359,576,165	3,219,988	439,596,845	0	0	20,772	20,772	978,850	541,771,676
2002	2,388,099	358,051,746	3,204,665	437,768,559	0	0	20,772	20,772	978,948	539,711,530
2003	2,378,854	356,201,846	3,186,786	435,523,331	0	0	20,772	20,772	979,038	537,213,400
2004	2,372,997	354,283,017	3,167,185	433,224,138	0	0	20,772	20,772	979,129	534,771,650
2005	2,657,732	362,674,037	3,243,231	450,196,054	0	0	20,772	20,772	979,768	552,638,502
2006	2,634,808	359,142,955	3,211,633	445,830,259	0	0	20,772	20,772	979,765	547,963,910
2007	2,631,121	359,106,369	3,213,483	445,782,844	0	0	20,772	20,772	979,858	547,796,043
2008	2,617,594	355,124,931	3,174,321	440,954,040	0	0	20,772	20,772	979,930	542,533,020
2009	2,608,331	356,100,971	3,188,603	442,078,892	0	0	20,772	20,772	980,037	543,639,526
2010	2,905,662	352,456,405	3,130,927	442,464,555	0	0	20,772	20,772	980,188	543,656,334
2011	2,780,735	350,325,638	3,141,428	439,354,561	0	0	20,772	20,772	980,216	540,325,830
2012	2,904,518	365,146,223	3,267,769	457,907,488	0	0	20,772	20,772	980,955	560,708,412
2013	2,731,026	334,728,548	2,986,783	420,324,913	0	0	20,772	20,772	937,611	518,525,279
2014	2,812,398	347,897,674	3,100,875	436,595,000	0	0	20,772	20,772	910,763	536,077,979
2015	2,990,858	333,713,743	2,980,695	419,269,486	0	0	20,367	20,367	880,643	516,732,733
2016	2,996,025	329,840,012	2,936,000	414,800,227	0	0	20,207	20,207	863,681	511,499,162
2017	3,008,355	333,023,974	2,966,992	418,705,041	0	0	20,209	20,209	824,090	515,871,174
2018	2,957,195	326,096,087	2,899,277	410,465,913	0	0	20,207	20,207	748,582	507,026,368
2019	2,892,115	317,592,452	2,814,852	400,198,835	0	0	17,576	17,576	684,594	496,373,971
2020	3,063,609	308,753,487	2,760,365	389,419,296	0	0	5,625	5,625	664,123	485,095,971
2021	3,017,747	296,638,114	2,655,892	374,629,210	0	0	4,798	4,798	660,336	470,097,554
2022	2,979,717	291,968,840	2,639,807	369,414,356	0	0	3,410	3,410	659,712	464,953,575
2023	2,951,938	289,745,304	2,635,302	366,753,899	0	0	3,409	3,409	659,029	462,211,694
2024	2,951,631	289,351,700	2,634,843	366,481,249	0	0	3,408	3,408	658,616	462,167,616
2025	2,920,188	285,185,890	2,597,923	361,540,967	0	0	3,406	3,406	657,156	456,741,394
2026	2,893,181	283,772,837	2,591,192	359,753,895	0	0	3,405	3,405	656,713	454,562,893
2027	2,882,940	283,132,663	2,588,087	358,953,003	0	0	3,402	3,402	655,874	453,737,857
2028	2,879,636	281,541,174	2,572,988	357,162,704	0	0	3,401	3,401	654,757	451,806,845
2029	2,858,847	280,770,845	2,562,979	356,060,384	0	0	3,399	3,399	653,278	450,630,158
2030	2,871,159	280,049,245	2,553,030	355,629,236	0	0	3,397	3,397	651,925	450,218,630
2031	2,852,509	276,745,465	2,516,646	351,762,344	0	0	3,396	3,396	648,904	446,210,969
2032	2,852,941	275,804,563	2,503,791	350,793,260	0	0	3,394	3,394	649,249	445,241,530
2033	2,842,097	273,489,773	2,479,195	348,028,739	0	0	3,394	3,394	648,418	442,322,412
2034	2,816,826	273,244,132	2,485,812	347,520,378	0	0	3,393	3,393	644,743	441,723,915
2035	2,868,992	270,957,874	2,455,125	345,500,208	0	0	3,391	3,391	640,492	439,294,970
Total	135,752,108	16,392,582,582	133,701,136	20,345,749,925	0	0	1,056,292	1,056,292	49,681,114	25,127,529,212

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 1995			
Total costs of "Initial" Project Conservation Facilities to be reimbursed and project water entitlements during the Project Repayment Period	$2,734.75 (b 174.05 AF	$1,673.90 (c 174.05 AF	$4,408.65 174.05 AF
Less project power revenues to be realized during the Project Repayment Period	(1,009.28)	(311.91)	(1,321.19)
Less Delta Water Charges paid and project water entitlements prior to 1995	(875.40) (d (97.42) AF	(514.55) (97.42) AF	(1,389.95) (97.42) AF
Total	**$850.07 76.63 AF**	**$847.44 76.63 AF**	**$1,697.51 76.63 AF**
Rate Applicable in 1995	$11.09 per acre-foot	$11.06 per acre-foot	$22.15 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	21.81	10.92	32.73
Less Oroville power revenues	-13.17	-4.07	-17.24
Subtotal	8.64	6.85	15.49
Delta facilities (b	6.17	5.26	11.43
California Aqueduct, portion			
Reach 1	1.38	2.10	3.48
Reach 2A	0.83	0.40	1.23
Reach 2B	0.42	0.17	0.59
Reach 3	0.29	0.12	0.41
Subtotal	2.92	2.79	5.71
San Luis facilities	4.19	2.87	7.06
Planning and preoperating costs through 1993	1.18	0.00	1.18
Less capital cost credits	-0.59	0.00	-0.59
Less Delta Water Charges paid prior to 1995	-11.42	-6.71	-18.13
Rate applicable in 1995	**11.09**	**11.06**	**22.15**

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	216,627	758,637	975,264	930,300	930,300	2,215,000	4,075,600	553,750	1,007,515	1,561,265
1996	230,914	837,270	1,068,184	974,600	930,300	2,215,000	4,119,900	553,750	1,007,515	1,561,265
1997	245,090	847,237	1,092,327	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
1998	259,376	857,426	1,116,802	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
1999	273,109	867,615	1,140,724	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2000	289,057	877,583	1,166,640	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2001	302,680	887,772	1,190,452	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2002	314,198	897,961	1,212,159	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2003	327,820	908,150	1,235,970	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2004	341,110	918,117	1,259,227	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2005	354,400	919,225	1,273,625	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2006	364,367	920,332	1,284,699	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2007	376,550	921,440	1,297,990	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2008	390,947	922,547	1,313,494	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2009	403,130	923,655	1,326,785	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2010	415,312	924,762	1,340,074	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2011	429,710	925,870	1,355,580	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2012	441,892	926,977	1,368,869	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2013	456,290	928,085	1,384,375	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2014	470,687	929,192	1,399,879	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2015	485,085	930,300	1,415,385	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2016	498,375	930,300	1,428,675	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2017	511,665	930,300	1,441,965	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2018	524,955	930,300	1,455,255	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2019	538,245	930,300	1,468,545	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2020	551,535	930,300	1,481,835	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2021	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2022	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2023	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2024	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2025	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2026	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2027	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2028	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2029	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2030	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2031	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2032	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2033	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2034	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
2035	553,750	930,300	1,484,050	1,018,900	930,300	2,215,000	4,164,200	553,750	1,007,515	1,561,265
Total	19,301,633	40,402,482	59,704,115	50,580,703	48,472,605	121,831,073	220,884,381	26,255,948	47,758,925	74,014,873

TABLE B-21

Total Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Kern County Water Agency		County of Kings (16)	Oak Flat Water District (17)	Tulare Lake Basin Water Storage District (18)	Total (19)
				Municipal and Industrial (14)	Agricultural (15)				
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	2,213,919	12,425,873	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	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
1996	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
1997	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
1998	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
1999	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2000	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2001	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2002	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2003	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2004	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2005	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2006	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2007	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2008	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2009	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2010	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2011	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2012	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2013	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2014	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2015	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2016	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2017	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2018	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2019	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2020	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2021	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2022	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2023	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2024	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2025	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2026	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2027	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2028	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2029	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2030	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2031	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2032	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2033	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2034	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
2035	1,278,055	66,450	0	2,649,140	22,898,668	88,600	126,255	2,624,775	29,731,943
Total	67,716,397	3,723,408	0	140,464,711	1,186,139,743	4,648,947	6,823,470	136,797,862	1,546,314,538

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	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
1996	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
1997	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
1998	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
1999	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2000	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2001	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2002	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2003	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2004	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2005	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2006	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2007	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2008	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2009	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2010	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2011	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2012	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2013	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2014	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2015	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2016	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2017	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2018	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2019	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2020	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2021	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2022	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2023	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2024	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2025	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2026	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2027	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2028	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2029	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2030	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2031	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2032	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2033	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2034	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
2035	3,065,560	1,200,530	511,665	128,470	843,915	50,945	1,125,220	383,195	2,272,590	637,920
Total	151,900,926	62,084,439	26,235,349	6,581,227	43,100,894	2,607,190	57,701,469	19,944,688	118,837,982	33,163,879

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	383,195	44,554,721	443,000	55,600,926	212,640	26,580	27,687	266,907	0	92,211,905
1996	383,195	44,554,721	443,000	55,600,926	212,640	26,580	28,795	268,015	0	92,350,233
1997	383,195	44,554,721	443,000	55,600,926	212,640	26,580	29,902	269,122	0	92,419,783
1998	383,195	44,554,721	443,000	55,600,926	212,640	26,580	31,010	270,230	0	92,445,366
1999	383,195	44,554,721	443,000	55,600,926	212,640	26,580	32,117	271,337	0	92,470,395
2000	383,195	44,554,721	443,000	55,600,926	212,640	26,580	33,446	272,666	0	92,497,640
2001	383,195	44,554,721	443,000	55,600,926	212,640	609,125	34,775	856,540	0	93,105,326
2002	383,195	44,554,721	443,000	55,600,926	212,640	609,125	36,104	857,869	0	93,128,362
2003	383,195	44,554,721	443,000	55,600,926	212,640	609,125	37,433	859,198	0	93,153,502
2004	383,195	44,554,721	443,000	55,600,926	212,640	609,125	38,762	860,527	0	93,178,088
2005	383,195	44,554,721	443,000	55,600,926	212,640	609,125	40,091	861,856	0	93,193,815
2006	383,195	44,554,721	443,000	55,600,926	212,640	609,125	41,642	863,407	0	93,206,440
2007	383,195	44,554,721	443,000	55,600,926	212,640	609,125	43,192	864,957	0	93,221,281
2008	383,195	44,554,721	443,000	55,600,926	212,640	609,125	44,743	866,508	0	93,238,336
2009	383,195	44,554,721	443,000	55,600,926	212,640	609,125	46,293	868,058	0	93,253,177
2010	383,195	44,554,721	443,000	55,600,926	212,640	609,125	47,844	869,609	0	93,268,017
2011	383,195	44,554,721	443,000	55,600,926	212,640	609,125	49,616	871,381	0	93,285,295
2012	383,195	44,554,721	443,000	55,600,926	212,640	609,125	51,388	873,153	0	93,300,356
2013	383,195	44,554,721	443,000	55,600,926	212,640	609,125	53,381	875,146	0	93,317,855
2014	383,195	44,554,721	443,000	55,600,926	212,640	609,125	55,375	877,140	0	93,335,353
2015	383,195	44,554,721	443,000	55,600,926	212,640	609,125	57,590	879,355	0	93,353,074
2016	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,368,579
2017	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,381,869
2018	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,395,159
2019	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,408,449
2020	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,421,739
2021	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2022	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2023	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2024	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2025	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2026	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2027	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2028	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2029	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2030	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2031	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2032	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2033	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2034	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
2035	383,195	44,554,721	443,000	55,600,926	212,640	609,125	59,805	881,570	0	93,423,954
Total	19,081,590	2,293,377,854	21,103,204	2,855,720,691	9,754,174	21,865,981	2,343,840	33,963,995	0	4,790,602,593

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	146,878	223,975	370,853	160,367	203,936	566,085	930,388	110,339	206,360	316,699
1994	144,871	222,900	367,771	161,027	199,216	556,244	916,487	128,512	251,207	379,719
1995	177,381	297,713	475,094	206,349	244,637	682,848	1,133,834	215,643	443,370	659,013
1996	181,782	305,099	486,881	211,468	250,706	699,789	1,161,963	220,993	454,369	675,362
1997	175,723	294,931	470,654	204,420	242,351	676,466	1,123,237	213,628	439,226	652,854
1998	174,361	292,644	467,005	202,835	240,471	671,221	1,114,527	211,971	435,821	647,792
1999	173,818	291,733	465,551	202,204	239,723	669,132	1,111,059	211,312	434,464	645,776
2000	169,380	284,284	453,664	197,041	233,602	652,046	1,082,689	205,916	423,371	629,287
2001	177,048	301,348	478,396	206,662	225,919	629,472	1,062,053	321,004	841,474	1,162,478
2002	175,388	298,523	473,911	204,724	223,801	623,570	1,052,095	317,994	833,584	1,151,578
2003	174,988	297,842	472,830	204,257	223,290	622,147	1,049,694	317,269	831,683	1,148,952
2004	181,461	308,859	490,320	211,813	231,550	645,160	1,088,523	329,004	862,446	1,191,450
2005	181,795	309,428	491,223	212,203	231,976	646,349	1,090,528	329,610	864,035	1,193,645
2006	182,376	310,417	492,793	212,881	232,718	648,415	1,094,014	330,664	866,797	1,197,461
2007	182,945	311,384	494,329	213,545	233,443	650,437	1,097,425	331,695	869,499	1,201,194
2008	183,351	312,076	495,427	214,019	233,962	651,881	1,099,862	332,432	871,430	1,203,862
2009	183,923	313,050	496,973	214,687	234,692	653,916	1,103,295	333,470	874,151	1,207,621
2010	184,474	313,988	498,462	215,331	235,395	655,875	1,106,601	334,469	876,770	1,211,239
2011	184,779	314,506	499,285	215,686	235,784	656,957	1,108,427	335,020	878,216	1,213,236
2012	185,194	315,213	500,407	216,170	236,313	658,433	1,110,916	335,773	880,189	1,215,962
2013	185,540	315,801	501,341	216,574	236,754	659,662	1,112,990	336,400	881,832	1,218,232
2014	186,028	316,633	502,661	217,144	237,378	661,399	1,115,921	337,285	884,154	1,221,439
2015	186,471	317,387	503,858	217,661	237,943	662,974	1,118,578	338,089	886,259	1,224,348
2016	186,985	318,262	505,247	218,261	238,599	664,802	1,121,662	339,021	888,703	1,227,724
2017	187,536	319,200	506,736	218,905	239,303	666,762	1,124,970	340,020	891,323	1,231,343
2018	187,941	319,889	507,830	219,377	239,819	668,201	1,127,397	340,754	893,246	1,234,000
2019	188,599	321,008	509,607	220,145	240,658	670,539	1,131,342	341,946	896,372	1,238,318
2020	189,105	321,870	510,975	220,736	241,304	672,339	1,134,379	342,864	898,779	1,241,643
2021	190,043	323,466	513,509	221,830	242,500	675,672	1,140,002	344,564	903,234	1,247,798
2022	191,047	325,176	516,223	223,003	243,783	679,245	1,146,031	346,386	908,010	1,254,396
2023	225,604	383,994	609,598	263,340	287,878	802,107	1,353,325	409,040	1,072,251	1,481,291
2024	148,761	253,201	401,962	173,643	189,824	528,901	892,368	269,717	707,031	976,748
2025	24,039	40,916	64,955	28,060	30,674	85,467	144,201	43,585	114,252	157,837
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	6,066,425	10,185,952	16,252,377	7,005,271	7,870,143	21,995,632	36,871,046	9,770,323	24,587,363	34,357,686

TABLE B-22

Water System Revenue Bond Surcharge for Each Contractor

(Dollars)

	San Joaquin Valley Area								
				Kern County Water Agency					
Calendar Year	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	194,969	8,893	0	443,880	4,059,486	12,026	16,121	398,854	5,134,229
1994	186,666	8,490	0	386,183	3,923,555	11,523	15,414	381,861	4,913,692
1995	228,012	10,382	0	520,600	4,739,806	14,081	18,818	466,414	5,998,113
1996	233,669	10,640	0	533,515	4,857,394	14,430	19,285	477,985	6,146,918
1997	225,881	10,285	0	515,735	4,695,508	13,949	18,642	462,055	5,942,055
1998	224,129	10,205	0	511,736	4,659,099	13,841	18,497	458,472	5,895,979
1999	223,432	10,173	0	510,143	4,644,600	13,798	18,440	457,045	5,877,631
2000	217,727	9,914	0	497,117	4,526,004	13,446	17,969	445,375	5,727,552
2001	211,364	9,623	0	426,013	4,469,994	13,078	17,475	432,430	5,579,977
2002	209,382	9,533	0	422,019	4,428,082	12,955	17,311	428,375	5,527,657
2003	208,905	9,511	0	421,056	4,417,981	12,926	17,272	427,398	5,515,049
2004	216,632	9,863	0	436,630	4,581,399	13,404	17,910	443,207	5,719,045
2005	217,031	9,881	0	437,435	4,589,840	13,429	17,943	444,024	5,729,583
2006	217,725	9,912	0	438,833	4,604,514	13,472	18,001	445,443	5,747,900
2007	218,403	9,943	0	440,201	4,618,868	13,514	18,057	446,832	5,765,818
2008	218,888	9,965	0	441,179	4,629,125	13,544	18,097	447,824	5,778,622
2009	219,572	9,997	0	442,557	4,643,580	13,586	18,154	449,223	5,796,669
2010	220,230	10,027	0	443,882	4,657,490	13,627	18,208	450,568	5,814,032
2011	220,593	10,043	0	444,615	4,665,174	13,649	18,238	451,312	5,823,624
2012	221,088	10,066	0	445,613	4,675,651	13,680	18,279	452,325	5,836,702
2013	221,501	10,084	0	446,445	4,684,382	13,705	18,313	453,170	5,847,600
2014	222,084	10,111	0	447,621	4,696,714	13,741	18,361	454,363	5,862,995
2015	222,613	10,135	0	448,686	4,707,898	13,774	18,405	455,445	5,876,956
2016	223,227	10,163	0	449,924	4,720,879	13,812	18,456	456,701	5,893,162
2017	223,885	10,193	0	451,250	4,734,798	13,853	18,510	458,047	5,910,536
2018	224,368	10,215	0	452,224	4,745,013	13,883	18,550	459,035	5,923,288
2019	225,153	10,251	0	453,806	4,761,616	13,931	18,615	460,642	5,944,014
2020	225,758	10,278	0	455,025	4,774,402	13,969	18,665	461,879	5,959,976
2021	226,877	10,329	0	457,280	4,798,072	14,038	18,757	464,168	5,989,521
2022	228,077	10,384	0	459,698	4,823,441	14,112	18,857	466,623	6,021,192
2023	269,331	12,262	0	542,848	5,695,905	16,665	22,267	551,025	7,110,303
2024	177,594	8,085	0	357,949	3,755,820	10,989	14,683	363,340	4,688,460
2025	28,698	1,307	0	57,842	606,917	1,776	2,373	58,714	757,627
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	7,394,890	336,862	0	15,923,399	155,236,717	457,377	611,144	15,121,210	195,081,599

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	692,210	402,542	153,117	43,280	252,397	12,116	315,027	89,680	842,926	223,689
1994	669,267	390,210	149,159	42,403	245,873	11,729	306,506	86,760	829,268	220,060
1995	818,986	476,570	182,978	52,116	301,614	14,361	375,902	106,208	1,021,678	271,193
1996	839,304	488,393	187,517	53,409	309,097	14,717	385,228	108,843	1,047,025	277,921
1997	811,332	472,116	181,268	51,629	298,795	14,227	372,389	105,215	1,012,130	268,659
1998	805,041	468,455	179,862	51,229	296,478	14,116	369,501	104,399	1,004,281	266,575
1999	802,535	466,998	179,303	51,069	295,556	14,073	368,352	104,075	1,001,156	265,746
2000	782,043	455,073	174,724	49,765	288,009	13,713	358,946	101,417	975,593	258,960
2001	757,783	441,662	169,148	48,189	278,818	13,282	347,555	98,245	953,725	253,235
2002	750,678	437,521	167,562	47,737	276,204	13,157	344,296	97,324	944,783	250,861
2003	748,965	436,523	167,180	47,628	275,574	13,127	343,511	97,102	942,627	250,288
2004	776,669	452,670	173,364	49,390	285,767	13,613	356,217	100,693	977,495	259,546
2005	778,100	453,504	173,683	49,481	286,294	13,638	356,873	100,879	979,295	260,025
2006	780,588	454,953	174,238	49,639	287,209	13,682	358,014	101,201	982,426	260,856
2007	783,021	456,372	174,782	49,794	288,104	13,724	359,130	101,517	985,489	261,669
2008	784,760	457,385	175,170	49,905	288,744	13,755	359,928	101,742	987,677	262,250
2009	787,210	458,813	175,717	50,060	289,646	13,798	361,052	102,060	990,762	263,069
2010	789,569	460,188	176,243	50,210	290,513	13,839	362,133	102,366	993,729	263,857
2011	790,871	460,947	176,534	50,293	290,993	13,862	362,731	102,535	995,369	264,293
2012	792,647	461,982	176,930	50,406	291,646	13,893	363,546	102,765	997,604	264,886
2013	794,127	462,845	177,261	50,500	292,191	13,919	364,224	102,957	999,467	265,381
2014	796,218	464,063	177,727	50,633	292,960	13,956	365,183	103,228	1,002,098	266,079
2015	798,114	465,168	178,151	50,754	293,657	13,989	366,053	103,474	1,004,485	266,713
2016	800,315	466,451	178,642	50,894	294,467	14,027	367,062	103,759	1,007,254	267,448
2017	802,674	467,826	179,168	51,044	295,335	14,069	368,144	104,065	1,010,224	268,237
2018	804,406	468,836	179,555	51,154	295,973	14,099	368,939	104,289	1,012,404	268,816
2019	807,221	470,476	180,183	51,333	297,008	14,148	370,230	104,654	1,015,946	269,756
2020	809,388	471,739	180,667	51,471	297,806	14,186	371,224	104,935	1,018,674	270,481
2021	813,401	474,078	181,563	51,726	299,282	14,257	373,064	105,456	1,023,724	271,821
2022	817,702	476,585	182,523	51,999	300,864	14,332	375,037	106,013	1,029,137	273,259
2023	965,607	562,789	215,537	61,405	355,285	16,925	442,873	125,189	1,215,287	322,686
2024	636,711	371,097	142,123	40,490	234,271	11,160	292,026	82,548	801,348	212,776
2025	102,889	59,967	22,966	6,543	37,857	1,803	47,190	13,339	129,493	34,383
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	26,444,165	15,353,228	5,916,324	1,684,142	9,752,854	464,883	12,157,983	3,438,910	33,232,118	8,822,880

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	137,459	14,476,079	125,219	17,765,741	23,801	2,976	4,930	31,707	0	24,549,617
1994	135,264	14,089,765	121,210	17,297,474	22,743	2,843	4,846	30,432	0	23,905,575
1995	166,704	17,260,440	148,106	21,196,856	27,772	3,471	6,065	37,308	0	29,500,218
1996	170,840	17,688,647	151,780	21,722,721	28,461	3,557	6,215	38,233	0	30,232,078
1997	165,146	17,099,125	146,722	20,998,753	27,513	3,439	6,008	36,960	0	29,224,513
1998	163,865	16,966,538	145,584	20,835,924	27,299	3,412	5,962	36,673	0	28,997,900
1999	163,355	16,913,739	145,131	20,771,088	27,214	3,401	5,943	36,558	0	28,907,663
2000	159,184	16,481,861	141,425	20,240,713	26,519	3,314	5,791	35,624	0	28,169,529
2001	155,692	16,029,097	137,300	19,683,731	25,827	73,985	6,564	106,376	0	28,073,011
2002	154,232	15,878,802	136,013	19,499,170	25,585	73,291	6,502	105,378	0	27,809,789
2003	153,880	15,842,582	135,702	19,454,689	25,526	73,124	6,488	105,138	0	27,746,352
2004	159,572	16,428,589	140,722	20,174,307	26,471	75,829	6,728	109,028	0	28,772,673
2005	159,866	16,458,857	140,981	20,211,476	26,519	75,969	6,740	109,228	0	28,825,683
2006	160,377	16,511,475	141,432	20,276,090	26,604	76,212	6,762	109,578	0	28,917,836
2007	160,877	16,562,949	141,873	20,339,301	26,687	76,449	6,783	109,919	0	29,007,986
2008	161,235	16,599,729	142,188	20,384,468	26,746	76,619	6,798	110,163	0	29,072,404
2009	161,738	16,651,564	142,632	20,448,121	26,830	76,858	6,819	110,507	0	29,163,186
2010	162,223	16,701,445	143,059	20,509,374	26,910	77,088	6,839	110,837	0	29,250,545
2011	162,490	16,728,999	143,295	20,543,212	26,955	77,216	6,851	111,022	0	29,298,806
2012	162,855	16,766,567	143,617	20,589,344	27,015	77,389	6,866	111,270	0	29,364,601
2013	163,159	16,797,877	143,885	20,627,793	27,066	77,533	6,879	111,478	0	29,419,434
2014	163,589	16,842,100	144,264	20,682,098	27,137	77,738	6,897	111,772	0	29,496,886
2015	163,978	16,882,204	144,607	20,731,347	27,201	77,923	6,913	112,037	0	29,567,124
2016	164,431	16,928,755	145,006	20,788,511	27,276	78,138	6,932	112,346	0	29,648,652
2017	164,915	16,978,668	145,434	20,849,803	27,357	78,368	6,953	112,678	0	29,736,066
2018	165,271	17,015,297	145,748	20,894,787	27,416	78,537	6,968	112,921	0	29,800,223
2019	165,849	17,074,834	146,257	20,967,895	27,512	78,812	6,992	113,316	0	29,904,492
2020	166,295	17,120,685	146,650	21,024,201	27,586	79,023	7,011	113,620	0	29,984,794
2021	167,119	17,205,561	147,377	21,128,429	27,722	79,415	7,046	114,183	0	30,133,442
2022	168,003	17,296,534	148,156	21,240,144	27,869	79,835	7,083	114,787	0	30,292,773
2023	198,391	20,425,130	174,955	25,082,059	32,910	94,276	8,364	135,550	0	35,772,126
2024	130,817	13,468,118	115,364	16,538,849	21,701	62,164	5,515	89,380	0	23,587,767
2025	21,139	2,176,365	18,642	2,672,576	3,507	10,045	891	14,443	0	3,811,639
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	5,423,145	560,312,157	4,795,020	687,797,809	888,744	1,893,472	219,367	3,001,583	0	973,362,100

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	438,748	142,041	580,789	1,286,131	1,368,716	4,887,976	7,542,823	371,428	721,997	1,093,425
1983	355,245	163,576	518,821	1,163,314	1,262,156	4,948,778	7,374,248	397,903	740,334	1,138,237
1984	467,914	247,108	715,022	1,467,467	1,479,152	6,875,782	9,822,401	450,051	836,529	1,286,580
1985	736,919	386,960	1,123,879	1,964,768	2,229,654	7,809,264	12,003,686	545,550	1,011,336	1,556,886
1986	1,121,405	715,472	1,836,877	1,830,995	2,017,646	8,211,973	12,060,614	578,708	1,071,966	1,650,674
1987	1,774,621	1,584,948	3,359,569	2,325,684	2,509,341	7,999,929	12,834,954	612,530	1,173,639	1,786,169
1988	2,326,473	2,573,647	4,900,120	2,384,986	2,777,608	7,840,721	13,003,315	727,041	1,445,039	2,172,080
1989	2,520,212	3,699,380	6,219,592	2,346,420	2,498,503	7,524,321	12,369,244	839,214	1,798,730	2,637,944
1990	2,901,432	3,853,219	6,754,651	2,796,849	2,930,249	8,360,687	14,087,785	1,010,183	2,013,823	3,024,006
1991	2,939,079	4,061,219	7,000,298	2,076,608	2,403,688	6,475,569	10,955,865	1,083,452	2,322,672	3,406,124
1992	2,801,977	4,086,825	6,888,802	2,686,528	3,091,374	8,053,797	13,831,699	1,234,701	2,457,229	3,691,930
1993	2,897,982	4,153,230	7,051,212	3,368,548	3,520,864	9,213,526	16,102,938	1,376,043	2,673,158	4,049,201
1994	3,097,835	4,753,819	7,851,654	3,916,235	4,033,370	10,620,743	18,570,348	1,792,176	3,529,115	5,321,291
1995	3,303,883	5,224,719	8,528,602	4,164,649	4,246,416	11,175,275	19,586,340	3,705,223	7,788,281	11,493,504
1996	3,508,025	5,448,135	8,956,160	4,346,473	4,319,217	11,379,240	20,044,930	6,277,559	17,267,884	23,545,443
1997	3,426,634	5,455,944	8,882,578	4,612,297	4,456,593	11,606,207	20,675,097	7,272,645	22,343,745	29,616,390
1998	3,447,094	5,460,514	8,907,608	4,561,984	4,410,172	11,495,148	20,467,304	7,271,695	22,246,366	29,518,061
1999	3,476,618	5,472,106	8,948,724	4,564,929	4,413,169	11,504,209	20,482,307	8,760,260	22,563,032	31,323,292
2000	3,513,982	5,493,155	9,007,137	4,610,722	4,453,582	11,597,964	20,662,268	8,831,165	22,694,478	31,525,643
2001	3,546,612	5,516,110	9,062,722	4,606,733	4,433,501	11,546,024	20,586,258	8,932,030	23,090,143	32,022,173
2002	3,566,374	5,520,199	9,086,573	4,593,786	4,421,332	11,516,196	20,531,314	8,915,491	23,059,111	31,974,602
2003	3,591,254	5,526,143	9,117,397	4,581,555	4,410,082	11,489,213	20,480,850	8,896,237	23,023,540	31,919,777
2004	3,622,820	5,544,550	9,167,370	4,582,182	4,412,017	11,497,173	20,491,372	8,894,782	23,030,351	31,925,133
2005	3,658,597	5,579,627	9,238,224	4,622,316	4,448,739	11,584,812	20,655,867	8,943,408	23,119,616	32,063,024
2006	3,676,185	5,577,405	9,253,590	4,608,836	4,436,554	11,556,102	20,601,492	8,922,592	23,082,583	32,005,175
2007	3,700,053	5,577,422	9,277,475	4,602,586	4,430,967	11,543,099	20,576,652	8,912,921	23,065,863	31,978,784
2008	3,725,340	5,573,655	9,298,995	4,584,581	4,414,616	11,504,378	20,503,575	8,885,465	23,016,530	31,901,995
2009	3,749,075	5,573,905	9,322,980	4,580,656	4,411,154	11,496,441	20,488,251	8,877,957	23,003,755	31,881,712
2010	3,771,167	5,574,584	9,345,751	4,568,950	4,400,579	11,471,562	20,441,091	8,856,469	22,965,528	31,821,997
2011	3,797,769	5,572,492	9,370,261	4,555,256	4,388,142	11,442,108	20,385,506	8,838,062	22,932,505	31,770,567
2012	3,845,365	5,596,831	9,442,196	4,639,885	4,465,508	11,626,568	20,731,961	8,947,886	23,133,274	32,081,160
2013	3,822,766	5,543,143	9,365,909	4,347,570	4,194,294	10,866,451	19,408,315	8,685,541	22,656,386	31,341,927
2014	3,874,381	5,567,036	9,441,417	4,383,548	4,194,145	10,856,493	19,434,186	8,779,763	22,826,031	31,605,794
2015	3,885,054	5,553,686	9,438,740	4,283,461	4,048,383	10,352,002	18,683,846	8,682,788	22,649,746	31,332,534
2016	3,888,315	5,548,239	9,436,554	4,244,406	3,999,355	10,134,951	18,378,712	8,643,909	22,579,116	31,223,025
2017	3,906,559	5,561,135	9,467,694	4,255,786	4,008,082	10,113,477	18,377,345	8,681,412	22,647,534	31,328,946
2018	3,854,206	5,561,223	9,415,429	4,210,788	3,964,070	9,984,010	18,158,868	8,662,984	22,613,858	31,276,842
2019	3,839,660	5,562,773	9,402,433	4,173,288	3,929,352	9,884,314	17,986,954	8,659,579	22,608,261	31,267,840
2020	3,858,521	5,558,054	9,416,575	4,138,477	3,895,415	9,800,360	17,834,252	8,630,867	22,556,468	31,187,335
2021	3,861,608	5,559,402	9,421,010	4,134,995	3,892,059	9,793,369	17,820,423	8,627,919	22,552,263	31,180,182
2022	3,861,752	5,561,516	9,423,268	4,137,198	3,893,915	9,796,227	17,827,340	8,631,387	22,559,788	31,191,175
2023	3,894,977	5,588,629	9,483,606	4,175,414	3,935,994	9,912,602	18,024,010	8,692,001	22,720,199	31,412,200
2024	3,819,124	5,459,585	9,278,709	4,096,093	3,847,285	9,661,109	17,604,487	8,567,914	22,382,588	30,950,502
2025	3,678,134	5,237,259	8,915,393	3,928,680	3,667,689	9,168,229	16,764,598	8,310,236	21,732,317	30,042,553
2026	3,648,560	5,191,107	8,839,667	3,896,540	3,633,264	9,073,636	16,603,440	8,155,700	21,413,061	29,568,761
2027	3,645,628	5,186,850	8,832,478	3,895,020	3,631,690	9,068,509	16,595,219	8,153,201	21,407,559	29,560,760
2028	3,640,516	5,181,285	8,821,801	3,887,817	3,624,964	9,051,170	16,563,951	8,139,829	21,382,722	29,522,551
2029	3,636,954	5,177,094	8,814,048	3,883,177	3,620,679	9,040,058	16,543,914	8,137,000	21,377,286	29,514,286
2030	3,627,184	5,162,651	8,789,835	3,882,192	3,619,708	9,037,317	16,539,217	8,135,335	21,373,930	29,509,265
2031	3,613,714	5,142,975	8,756,689	3,874,841	3,612,917	9,020,714	16,508,472	8,125,619	21,355,832	29,481,451
2032	3,602,015	5,123,360	8,725,375	3,876,803	3,614,661	9,024,589	16,516,053	8,129,330	21,362,461	29,491,791
2033	3,573,858	5,078,830	8,652,688	3,874,638	3,612,626	9,019,375	16,506,639	8,130,085	21,363,812	29,493,897
2034	3,510,074	5,005,910	8,515,984	3,869,285	3,607,476	9,005,777	16,482,538	8,130,547	21,364,506	29,495,053
2035	3,380,182	4,865,685	8,245,867	3,860,755	3,599,622	8,986,250	16,446,627	8,128,099	21,359,906	29,488,005
Total	178,893,400	253,175,280	432,068,680	216,274,628	212,989,000	577,656,737	1,006,920,365	356,511,566	925,516,062	1,282,027,628

TABLE B-23

Total Transportation and Delta Water Charge for Each Contractor

(Dollars)

Calendar Year	San Joaquin Valley Area								
	Dudley Ridge Water District (11)	Empire West Side Irrigation District (12)	Future Contractor San Joaquin Valley (13)	Kern County Water Agency: Municipal and Industrial (14)	Kern County Water Agency: 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	221,630	20,004	54,674	446,119	1,696,013	16,059	19,568	305,219	2,779,286
1969	237,800	12,806	87,677	525,877	2,701,241	15,695	19,297	450,860	4,051,253
1970	302,603	36,240	94,778	574,839	3,845,100	20,268	30,313	515,401	5,419,542
1971	323,508	38,969	95,799	606,768	5,155,125	25,983	34,589	706,277	6,987,018
1972	376,188	42,159	98,896	632,511	7,073,232	25,250	63,637	1,962,638	10,274,511
1973	393,555	40,852	97,657	1,026,793	7,215,505	27,598	39,164	774,453	9,615,577
1974	499,271	42,066	98,569	1,145,699	7,916,270	28,311	42,449	1,029,852	10,802,487
1975	670,064	42,512	106,811	1,198,073	9,281,015	29,987	48,062	1,540,510	12,917,034
1976	711,936	45,033	108,194	1,324,756	10,521,745	31,409	51,982	1,430,745	14,225,800
1977	572,328	40,950	112,664	1,368,326	10,827,271	33,160	54,099	1,127,174	14,135,972
1978	688,614	43,202	115,636	1,564,210	13,123,826	37,499	58,908	1,159,977	16,791,872
1979	772,007	49,779	114,369	1,669,531	15,203,864	41,691	70,462	1,712,069	19,633,772
1980	952,963	51,533	126,316	1,771,625	16,845,367	46,675	94,787	1,646,309	21,535,575
1981	1,202,199	85,978	134,338	2,432,763	22,431,682	65,150	100,602	2,270,748	28,723,460
1982	1,234,840	72,056	135,437	2,522,554	24,758,836	69,163	108,095	2,262,037	31,163,018
1983	1,169,773	54,434	149,594	2,085,897	24,414,713	73,921	88,837	505,011	28,542,180
1984	1,479,046	30,413	164,921	3,394,839	33,114,374	92,844	121,421	1,529,616	39,927,474
1985	1,769,109	132,512	187,465	3,922,580	39,415,187	116,865	140,449	2,834,174	48,518,341
1986	2,000,522	81,435	181,610	4,588,672	43,101,589	135,452	153,202	3,643,789	53,886,271
1987	1,883,964	97,790	180,101	4,601,295	42,671,617	136,983	152,576	3,752,565	53,476,891
1988	1,957,814	112,847	193,695	4,737,608	44,425,678	137,059	146,447	3,884,982	55,596,130
1989	2,105,724	103,406	187,289	4,670,374	46,468,136	135,413	165,642	4,353,046	58,189,030
1990	2,015,258	88,407	219,694	4,794,595	45,082,418	119,150	148,211	3,920,364	56,388,097
1991	1,700,260	82,494	225,104	4,585,788	37,323,674	102,520	134,708	3,485,051	47,639,599
1992	2,224,936	107,687	242,187	5,558,021	48,499,877	142,916	175,755	4,528,156	61,479,535
1993	2,420,926	118,099	261,860	14,751,073	44,354,849	158,760	193,242	5,110,162	67,368,971
1994	2,473,628	139,707	353,097	13,791,547	48,191,698	155,352	192,819	5,451,905	70,749,753
1995	2,977,133	144,091	344,601	6,758,454	65,325,138	191,052	233,212	6,093,171	82,066,852
1996	3,040,549	147,293	323,277	6,931,167	66,406,320	195,392	237,603	6,222,118	83,503,719
1997	3,064,926	148,623	338,907	7,006,379	67,058,130	197,165	237,726	6,272,517	84,324,373
1998	3,037,356	147,199	339,261	6,932,628	66,400,952	195,263	236,308	6,215,892	83,504,859
1999	3,042,700	147,475	340,820	6,946,723	67,113,837	195,595	236,663	6,226,759	84,250,572
2000	3,058,237	148,321	341,023	6,988,785	67,525,107	196,708	237,271	6,258,688	84,754,140
2001	3,046,891	147,769	341,085	6,904,134	67,326,797	195,994	236,651	6,235,499	84,434,820
2002	3,039,104	147,378	341,113	6,885,624	67,161,303	195,468	236,061	6,219,519	84,225,570
2003	3,032,793	147,051	341,139	6,869,991	67,023,957	195,033	235,617	6,206,557	84,052,138
2004	3,037,950	147,268	341,165	6,878,646	67,116,087	195,332	236,176	6,217,085	84,169,709
2005	3,057,011	148,257	341,351	6,926,932	67,557,017	196,643	237,387	6,256,207	84,720,805
2006	3,051,343	147,956	341,348	6,911,864	67,416,716	196,245	237,103	6,244,557	84,547,132
2007	3,048,935	147,826	341,375	6,905,923	67,377,226	196,072	236,859	6,239,606	84,493,822
2008	3,039,462	147,329	341,395	6,881,529	67,160,864	195,409	236,260	6,220,140	84,222,388
2009	3,040,198	147,368	341,426	6,883,593	67,189,702	195,455	236,246	6,221,645	84,255,633
2010	3,032,644	146,969	341,469	6,862,974	66,988,736	194,924	235,964	6,206,116	84,009,796
2011	3,027,623	146,706	341,479	6,851,250	66,908,650	194,573	235,423	6,195,803	83,901,507
2012	3,068,370	148,819	341,690	6,953,338	67,806,844	197,385	238,249	6,279,449	85,034,144
2013	2,983,052	144,381	341,652	6,738,176	65,912,328	191,468	232,486	6,104,235	82,647,778
2014	3,017,898	146,188	338,955	6,826,092	66,696,768	193,878	234,784	6,175,787	83,630,350
2015	2,988,113	144,637	335,637	6,676,508	66,019,456	191,810	232,872	6,114,617	82,703,650
2016	2,980,076	144,215	329,621	6,592,226	65,842,812	191,249	232,329	6,098,106	82,410,634
2017	2,999,838	145,238	315,491	6,511,150	66,284,148	192,610	233,664	6,138,668	82,820,807
2018	2,998,753	145,178	292,751	6,391,008	66,263,999	184,010	233,568	6,136,438	82,645,705
2019	2,998,881	145,179	284,269	6,330,533	66,252,240	183,505	233,674	6,136,692	82,564,973
2020	2,991,720	144,802	282,414	6,280,369	66,117,891	182,757	233,039	6,121,989	82,354,981
2021	2,988,810	144,645	281,304	6,249,203	66,018,447	182,406	233,065	6,116,003	82,213,883
2022	2,992,308	144,819	280,689	6,247,886	66,108,927	182,571	233,236	6,123,178	82,313,614
2023	3,032,484	146,641	280,262	6,324,021	66,961,174	185,020	236,547	6,205,367	83,371,516
2024	2,946,030	142,738	279,741	6,150,204	65,135,365	179,691	229,341	6,028,531	81,091,641
2025	2,787,430	135,456	279,176	5,823,104	61,768,081	169,782	216,395	5,703,975	76,883,399
2026	2,756,864	134,053	278,904	5,758,719	61,126,812	167,841	213,849	5,641,428	76,078,470
2027	2,757,054	134,063	278,260	5,756,161	61,129,544	167,812	213,871	5,641,814	76,078,579
2028	2,755,169	133,965	275,812	5,749,320	61,085,512	167,657	213,758	5,637,945	76,019,138
2029	2,753,836	133,895	275,492	5,742,928	61,059,809	167,503	213,641	5,635,203	75,982,307
2030	2,756,013	134,008	275,208	5,745,349	61,105,562	167,586	213,809	5,639,678	76,037,213
2031	2,755,084	133,960	273,617	5,724,608	61,085,255	167,130	213,743	5,637,774	75,991,171
2032	2,755,571	133,986	273,594	5,727,935	61,093,040	167,174	213,796	5,638,770	76,003,866
2033	2,753,077	133,856	273,255	5,716,705	61,039,068	166,867	213,615	5,633,652	75,930,095
2034	2,755,739	133,994	272,634	5,717,331	61,103,797	166,908	213,762	5,639,119	76,003,284
2035	2,753,186	133,861	271,901	5,701,354	61,037,516	166,498	213,647	5,633,875	75,911,838
Total	153,360,677	7,680,826	16,970,127	355,532,928	3,328,770,836	9,624,574	12,058,593	309,507,262	4,193,505,823

TABLE B-23

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	1,380,249	604,224	186,102	991,249	43,823	1,178,770	288,018	3,763,364	951,557
1973	2,336,537	1,430,913	748,316	191,239	1,218,469	46,116	1,269,240	313,855	4,031,594	962,344
1974	2,456,976	1,526,271	771,824	204,329	1,258,369	48,991	1,327,790	332,113	4,468,962	1,106,417
1975	2,674,290	1,617,283	817,172	219,555	1,333,679	53,300	1,413,245	355,686	4,644,267	1,212,201
1976	3,138,545	1,654,487	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	1,874,745	973,557	255,697	1,568,984	56,858	1,623,064	420,452	5,097,517	1,378,764
1979	4,241,002	1,954,720	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	5,504,939	2,724,949	1,409,023	346,883	2,283,178	82,367	2,260,081	642,500	6,758,544	1,929,704
1983	6,261,515	2,813,887	1,931,767	381,228	3,121,766	88,468	2,456,638	659,206	6,972,331	1,810,729
1984	7,636,544	3,914,942	3,033,464	498,222	4,880,737	96,567	2,725,298	728,365	8,060,993	2,598,683
1985	9,522,608	4,336,211	3,870,161	603,958	6,221,106	104,372	2,928,293	938,139	8,931,337	2,696,956
1986	9,441,856	4,980,596	4,327,716	648,672	6,960,854	130,489	3,093,217	1,225,816	9,162,786	3,404,220
1987	9,439,452	4,829,645	4,196,505	677,582	6,838,535	240,690	3,134,101	1,253,247	10,468,018	3,389,366
1988	9,085,773	5,030,813	4,263,284	706,993	7,021,816	159,321	3,335,481	1,047,142	11,089,477	3,279,394
1989	10,953,744	5,027,664	3,962,547	692,659	6,591,544	210,846	3,411,138	1,748,242	10,843,105	3,463,198
1990	12,301,219	5,471,942	4,640,818	728,715	7,653,487	330,475	3,632,211	1,949,169	11,743,926	4,224,309
1991	9,199,935	4,291,087	3,209,831	691,350	5,293,248	221,275	4,504,869	1,642,531	11,125,233	3,595,768
1992	11,778,755	5,821,092	3,370,049	583,029	5,557,378	175,502	5,501,336	1,536,229	11,260,760	3,729,559
1993	12,434,276	6,090,195	3,833,747	753,833	6,322,173	244,662	5,748,343	1,607,553	13,017,478	4,074,091
1994	16,675,250	6,896,961	4,309,317	909,719	7,106,299	311,541	7,606,836	2,340,957	14,313,797	5,165,874
1995	16,252,233	7,749,481	4,691,925	903,635	7,737,584	425,651	11,435,884	2,985,140	16,224,000	4,905,552
1996	17,257,086	8,139,120	4,893,142	1,022,420	8,069,494	447,332	11,695,636	3,337,378	18,567,558	5,351,437
1997	18,129,705	8,722,740	5,021,996	963,928	8,281,988	464,341	12,199,725	3,469,634	17,563,719	5,144,073
1998	18,059,343	8,693,673	4,845,508	989,590	7,990,921	447,425	11,752,499	3,342,498	17,999,831	5,110,685
1999	19,983,229	9,301,345	4,880,247	1,044,274	8,048,223	450,132	11,791,395	3,362,741	19,899,969	5,645,876
2000	21,909,863	10,231,711	4,993,015	1,072,713	8,234,195	461,562	12,104,805	3,448,679	20,029,669	5,836,818
2001	21,703,526	10,109,812	4,950,735	1,086,917	8,164,477	456,777	11,979,002	3,412,774	20,264,111	5,861,183
2002	21,625,768	10,067,956	4,929,773	1,084,085	8,129,909	454,962	11,932,897	3,399,105	20,207,250	5,842,477
2003	21,544,016	10,022,605	4,905,144	1,079,664	8,089,284	453,013	11,881,067	3,384,442	20,121,794	5,817,351
2004	21,486,002	9,990,560	4,886,727	1,078,431	8,058,901	451,446	11,835,913	3,372,573	20,099,345	5,806,475
2005	24,326,552	10,583,845	4,992,439	1,216,257	8,233,255	459,609	12,053,051	3,433,885	23,927,390	6,066,553
2006	24,156,289	10,499,903	4,947,760	1,206,454	8,159,566	456,223	11,964,671	3,408,434	23,707,446	6,016,933
2007	24,169,827	10,506,222	4,948,036	1,205,415	8,160,024	456,490	11,974,763	3,410,423	23,681,821	6,012,462
2008	23,959,985	10,401,268	4,900,893	1,198,927	8,082,267	452,326	11,862,134	3,379,091	23,527,124	5,974,505
2009	24,034,580	10,441,663	4,915,255	1,195,380	8,105,947	453,807	11,911,399	3,390,190	23,476,730	5,968,233
2010	26,124,602	10,286,358	4,873,154	1,352,510	8,036,529	447,770	11,741,299	3,344,777	25,310,067	6,177,152
2011	26,474,527	10,316,077	4,842,902	1,297,281	7,986,604	448,818	11,776,282	3,352,653	24,348,402	5,991,652
2012	27,291,496	10,659,926	5,020,815	1,352,307	8,280,058	462,432	12,126,682	3,454,963	25,451,759	6,224,855
2013	25,444,832	9,899,575	4,662,453	1,278,129	7,675,600	432,294	11,340,965	3,228,273	23,798,512	5,860,805
2014	26,213,605	10,208,169	4,814,403	1,312,589	7,940,234	444,428	11,667,990	3,319,902	24,585,068	6,029,820
2015	25,424,559	9,882,211	4,641,558	1,329,224	7,655,143	431,299	11,328,230	3,221,204	23,500,872	5,930,458
2016	25,172,257	9,753,653	4,602,365	1,335,070	7,590,512	427,051	11,217,898	3,189,379	23,577,565	5,932,769
2017	25,379,773	9,825,378	4,642,778	1,341,560	7,657,173	430,339	11,312,054	3,214,290	23,723,005	5,960,166
2018	25,120,256	9,609,516	4,586,758	1,325,636	7,564,780	425,743	11,200,199	3,180,265	23,410,593	5,878,089
2019	24,729,499	9,366,108	4,505,351	1,307,717	7,430,528	418,795	11,016,345	3,129,207	23,025,407	5,771,424
2020	24,427,980	9,213,635	4,399,197	1,308,520	7,255,437	412,535	10,864,069	3,084,504	22,020,859	5,665,680
2021	23,877,139	8,924,267	4,246,407	1,276,955	7,003,462	402,218	10,515,440	3,010,124	21,398,600	5,491,227
2022	23,886,990	8,875,870	4,222,029	1,268,554	6,963,248	402,105	10,470,577	3,010,129	21,145,984	5,427,967
2023	23,977,777	8,944,561	4,235,971	1,270,421	6,986,211	403,598	10,500,510	3,021,516	21,151,161	5,433,222
2024	23,728,585	8,744,590	4,174,021	1,248,963	6,884,105	399,136	10,380,037	2,988,742	20,718,458	5,320,998
2025	22,952,945	8,332,001	4,001,399	1,221,055	6,599,523	385,729	10,016,686	2,889,168	19,889,159	5,225,741
2026	22,832,054	8,251,616	3,964,697	1,205,030	6,539,007	383,590	9,949,009	2,873,461	19,569,143	5,149,088
2027	22,816,280	8,243,051	3,956,571	1,202,266	6,525,605	383,313	9,934,022	2,871,420	19,504,030	5,132,765
2028	22,759,507	8,197,058	3,944,579	1,202,797	6,505,826	382,342	9,903,269	2,864,221	19,501,968	5,127,349
2029	22,728,922	8,170,950	3,934,378	1,193,310	6,488,994	381,822	9,888,674	2,860,347	19,345,017	5,095,309
2030	22,760,961	8,143,818	3,943,990	1,199,026	6,504,850	382,356	9,911,477	2,864,380	19,431,644	5,233,310
2031	22,641,276	8,043,398	3,917,819	1,192,933	6,461,698	380,294	9,854,088	2,849,032	19,324,281	5,202,915
2032	22,648,898	8,007,607	3,919,042	1,193,344	6,463,714	380,418	9,859,053	2,849,971	19,326,233	5,203,695
2033	22,508,055	7,941,333	3,895,010	1,190,969	6,424,082	378,057	9,800,216	2,832,256	19,282,406	5,185,300
2034	22,503,471	7,958,691	3,887,850	1,180,356	6,412,267	377,965	9,806,165	2,831,594	19,089,348	5,145,911
2035	22,298,847	7,870,711	3,874,863	1,206,063	6,390,874	374,452	9,701,457	2,806,054	19,564,096	5,350,810
Total	1,115,686,409	462,902,647	242,183,619	60,159,782	398,565,460	20,459,555	523,331,758	151,805,949	1,060,501,240	287,543,210

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	25,317,140
1969	199,094	23,191,328	215,563	28,214,429	0	1,225	4,126	5,351	349,657	36,593,413
1970	290,113	30,667,864	274,055	37,573,460	0	3,848	17,142	20,990	386,754	48,044,146
1971	410,000	40,024,070	342,980	49,221,565	0	4,546	19,215	23,761	376,318	61,196,671
1972	537,970	55,067,909	422,922	67,600,965	0	4,929	21,181	26,110	401,833	83,404,571
1973	588,787	59,671,975	436,278	73,245,663	0	7,059	21,808	28,867	376,313	88,359,629
1974	612,269	66,092,789	456,213	80,663,313	0	8,336	22,438	30,774	399,290	97,288,442
1975	645,490	71,915,888	479,060	87,381,116	0	9,416	23,553	32,969	408,510	106,171,789
1976	669,204	74,994,764	476,252	91,522,641	0	7,004	23,287	30,291	431,101	112,404,361
1977	697,419	73,427,204	507,736	90,271,199	0	16,917	24,089	41,006	423,842	111,011,680
1978	709,955	82,023,789	523,862	100,073,729	0	12,635	24,255	36,890	427,091	123,986,107
1979	713,782	83,690,330	527,103	102,940,548	0	16,575	28,382	44,957	447,131	130,014,628
1980	863,215	93,128,621	584,361	114,629,791	0	19,834	26,592	46,426	507,956	144,431,609
1981	947,368	111,867,954	673,034	136,728,610	0	21,682	34,593	56,275	517,366	174,548,168
1982	1,022,436	117,187,035	728,581	142,880,220	0	16,117	43,028	59,145	513,728	183,833,148
1983	1,077,482	119,106,159	850,210	147,531,386	0	15,202	27,091	42,293	553,418	185,700,583
1984	1,213,093	157,289,234	933,712	193,609,854	20,590	15,442	28,704	64,736	562,242	245,988,309
1985	1,294,216	195,522,089	999,702	237,969,148	24,050	16,976	32,146	73,172	682,394	301,927,506
1986	1,348,035	218,614,252	1,060,238	264,398,747	31,753	18,145	33,434	83,332	621,039	334,537,554
1987	1,374,870	204,290,904	1,048,693	251,181,608	37,071	17,794	33,621	88,486	685,063	323,412,740
1988	1,471,369	222,140,456	1,126,360	269,757,679	48,058	19,117	35,691	102,866	708,333	346,240,523
1989	1,510,126	230,591,269	1,231,504	280,237,586	61,184	20,809	38,090	120,083	766,964	360,540,443
1990	1,629,062	276,521,690	1,848,423	332,675,446	66,041	20,855	38,742	125,638	819,182	413,874,805
1991	1,731,689	215,072,379	1,533,308	262,112,503	180,212	22,526	41,305	244,043	566,145	331,924,577
1992	1,799,334	246,425,674	1,506,956	299,045,653	208,216	26,028	45,673	279,917	913,856	386,131,392
1993	1,959,660	247,128,063	1,587,139	304,801,213	218,806	27,352	48,803	294,961	996,193	400,664,689
1994	2,017,618	299,439,380	2,886,498	369,980,047	213,984	26,749	49,210	289,943	1,102,135	473,865,171
1995	2,125,345	393,575,559	2,254,380	471,266,369	240,412	30,051	54,363	324,826	930,379	594,196,872
1996	3,150,472	412,577,435	2,306,243	496,814,753	241,101	30,137	55,782	327,020	931,962	634,123,987
1997	3,278,944	427,704,079	2,376,488	513,321,360	240,153	30,019	56,682	326,854	972,746	658,119,398
1998	2,814,545	414,002,299	2,330,050	498,378,867	239,939	29,992	57,744	327,675	973,295	642,077,669
1999	2,876,719	413,114,315	3,723,043	504,121,508	239,854	29,981	58,832	328,667	977,949	650,433,019
2000	2,899,682	424,086,056	3,847,793	519,156,561	239,159	29,894	60,009	329,062	978,654	666,413,465
2001	2,931,917	420,159,983	3,800,288	514,881,502	238,467	683,110	62,111	983,688	978,850	662,950,013
2002	2,925,526	418,485,269	3,783,678	512,868,655	238,225	682,416	63,378	984,019	978,948	660,649,681
2003	2,915,929	416,599,149	3,765,488	510,578,946	238,166	682,249	64,693	985,108	979,038	658,113,254
2004	2,915,764	415,266,327	3,750,907	508,999,371	239,111	684,954	66,262	990,327	979,129	656,722,411
2005	3,200,793	423,687,615	3,827,212	526,008,456	239,159	685,094	67,603	991,856	979,768	674,658,000
2006	3,178,380	420,209,151	3,796,065	521,707,275	239,244	685,337	69,176	993,757	979,765	670,088,186
2007	3,175,193	420,224,039	3,798,356	521,723,071	239,327	685,574	70,747	995,648	979,858	670,025,310
2008	3,162,024	416,279,381	3,759,509	516,939,434	239,386	685,744	72,313	997,443	979,930	664,843,760
2009	3,153,264	417,307,256	3,774,235	518,127,939	239,470	685,983	73,884	999,337	980,037	666,055,889
2010	3,451,080	413,712,571	3,716,986	518,574,855	239,550	686,213	75,455	1,001,218	980,188	666,174,896
2011	3,326,420	411,609,358	3,727,723	515,498,699	239,595	686,341	77,239	1,003,175	980,216	662,909,931
2012	3,450,568	426,467,511	3,854,386	534,097,758	239,655	686,514	79,026	1,005,195	980,955	683,373,369
2013	3,277,380	396,081,146	3,573,668	496,553,632	239,706	686,658	81,032	1,007,396	937,611	641,262,568
2014	3,359,182	409,294,495	3,688,139	512,878,024	239,777	686,863	83,044	1,009,684	910,763	658,910,218
2015	3,538,031	395,150,668	3,568,302	495,601,759	239,841	687,048	84,870	1,011,759	880,643	639,652,931
2016	3,543,651	391,323,488	3,524,006	491,189,664	239,916	687,263	86,944	1,014,123	863,681	634,516,393
2017	3,556,465	394,557,363	3,555,426	495,155,770	239,997	687,493	86,967	1,014,457	824,090	638,989,109
2018	3,505,661	387,666,105	3,488,025	486,961,626	240,056	687,662	86,980	1,014,698	748,582	630,221,750
2019	3,441,159	379,222,007	3,404,109	476,767,656	240,152	687,937	84,373	1,012,462	684,594	619,686,912
2020	3,613,099	370,428,893	3,350,015	466,044,423	240,226	688,148	72,441	1,000,815	664,123	608,502,504
2021	3,568,061	358,398,396	3,246,269	451,358,565	240,362	688,540	71,649	1,000,551	660,336	593,654,950
2022	3,530,915	353,820,095	3,230,963	446,255,426	240,509	688,960	70,298	999,767	659,712	588,670,302
2023	3,533,524	354,725,155	3,253,257	447,436,884	245,550	703,401	71,578	1,020,529	659,029	591,407,774
2024	3,465,643	347,374,539	3,193,207	438,621,024	234,341	671,289	68,728	974,358	658,616	579,179,337
2025	3,324,522	331,916,976	3,059,565	419,814,469	216,147	619,170	64,102	899,419	657,156	553,976,987
2026	3,276,376	328,327,558	3,034,192	415,354,821	212,640	609,125	63,210	884,975	656,713	547,986,847
2027	3,266,135	327,687,384	3,031,087	414,553,929	212,640	609,125	63,207	884,972	655,874	547,161,811
2028	3,262,831	326,095,895	3,015,988	412,763,630	212,640	609,125	63,206	884,971	654,757	545,230,799
2029	3,242,042	325,325,566	3,005,979	411,661,310	212,640	609,125	63,204	884,969	653,278	544,054,112
2030	3,254,354	324,603,966	2,996,030	411,230,162	212,640	609,125	63,202	884,967	651,925	543,642,584
2031	3,235,704	321,300,186	2,959,646	407,363,270	212,640	609,125	63,201	884,966	648,904	539,634,923
2032	3,236,136	320,359,284	2,946,791	406,394,186	212,640	609,125	63,199	884,964	649,249	538,665,484
2033	3,225,292	318,044,494	2,922,195	403,629,665	212,640	609,125	63,199	884,964	648,418	535,746,366
2034	3,200,021	317,798,853	2,928,812	403,121,304	212,640	609,125	63,198	884,963	644,743	535,147,869
2035	3,252,187	315,512,595	2,898,125	401,101,134	212,640	609,125	63,196	884,961	640,492	532,718,924
Total	160,256,843	19,246,272,593,	159,599,360	23,889,268,425	10,642,918	23,759,453	3,619,499	38,021,870	49,681,114	30,891,493,905

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	31.93	3.24	35.17
County of Butte	0.00	0.00	0.00	0.00	0.00	13.72	1.37	15.09
Plumas County Flood Control and Water Conservation District	17.63	2.25	0.00	0.00	19.88	20.93	2.11	42.92
Feather River Area	1.23	0.16	0.00	0.00	1.39	17.60	1.76	20.75
North Bay Area								
Napa County Flood Control and Water Conservation District	113.71	37.56	3.79	12.4	167.46	14.77	6.35	188.58
Solano County Water Agency	83.78	31.64	3.17	7.72	126.31	22.59	6.68	155.58
North Bay Area	95.39	33.94	3.41	9.54	142.28	19.56	6.55	168.39
South Bay Area								
Alameda County Flood Control and Water Conservation District, Zone 7	17.26	27.39	7.79	19.60	72.04	20.92	2.65	95.61
Alameda County Water District	19.42	23.42	6.99	16.82	66.65	18.98	2.67	88.30
Santa Clara Valley Water District	18.19	17.53	6.18	13.04	54.94	14.41	2.03	71.38
South Bay Area	18.26	20.14	6.58	14.76	59.74	16.26	2.24	78.24
San Joaquin Valley Area								
County of Kings	4.21	3.81	3.26	6.55	17.83	17.79	1.53	37.15
Dudley Ridge Water District	4.95	4.43	2.63	5.84	17.85	15.64	1.46	34.95
Empire West Side Irrigation District	2.64	3.55	2.24	5.21	13.64	15.59	1.07	30.30
Kern County Water Agency	8.95	9.06	4.08	8.40	30.49	18.23	2.11	50.83
Oak Flat Water District	1.93	2.13	1.68	3.68	9.42	14.75	1.08	25.25
Tulare Lake Basin Water Storage District	5.14	4.63	2.55	6.07	18.39	16.21	1.56	36.16
San Joaquin Valley Area	8.29	8.30	3.83	7.99	28.41	17.86	2.01	48.28
Central Coastal Area								
San Luis Obispo County Flood Control and Water Conservation District	271.63	57.38	13.96	55.43	398.40	37.98	13.75	450.13
Santa Barbara County Flood Control and Water Conservation District	389.04	60.39	16.06	53.96	519.45	34.34	16.68	570.47
Central Coastal Area	350.04	59.39	15.36	54.45	479.24	35.55	15.71	530.50
Southern California Area								
Antelope Valley-East Kern Water Agency	40.90	35.97	23.99	70.58	171.44	28.56	4.78	204.78
Castaic Lake Water Agency	48.50	35.45	22.34	36.34	142.63	22.88	5.07	170.58
Coachella Valley Water District	43.00	36.74	40.00	54.12	173.86	19.55	4.05	197.46
Crestline-Lake Arrowhead Water Agency	98.06	75.23	29.86	82.90	286.05	36.34	8.60	330.99
Desert Water Agency	43.72	37.35	40.23	54.68	175.98	19.64	4.12	199.74
Littlerock Creek Irrigation District	41.23	35.18	26.85	76.39	179.65	27.93	4.62	212.20
Mojave Water Agency	71.63	62.94	28.39	103.43	266.39	36.28	7.04	309.71
Palmdale Water District	47.05	40.33	30.06	86.53	203.97	34.55	5.36	243.88
San Bernardino Valley Municipal Water District	124.52	95.06	22.52	68.39	310.49	41.83	10.31	362.63
San Gabriel Valley Municipal Water District	99.27	77.83	35.31	55.45	267.86	35.44	8.41	311.71
San Gorgonio Pass Water Agency	211.53	165.15	17.20	88.96	482.84	63.40	17.74	563.98
The Metropolitan Water District of Southern California	63.26	45.41	32.65	48.41	189.73	25.30	5.67	220.70
Ventura County Flood Control District	87.85	62.95	22.67	77.84	251.31	35.43	8.58	295.32
Southern California Area	63.75	46.74	31.80	51.26	193.55	26.11	5.78	225.44
All Areas	40.28	28.93	18.05	30.40	117.66	22.03	4.06	143.75

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	43.28	8.11	14.07	1.88	3.60	70.94	43.28	8.11	14.07	1.88	3.60	70.94
2	48.14	9.02	6.10	0.00	0.00	63.26	91.42	17.13	20.17	1.88	3.60	134.20
3A	9.95	1.86	14.75	4.12	4.92	35.60	101.37	18.99	34.92	6.00	8.52	169.80
3B	47.16	8.83	23.7	4.65	9.53	93.87	138.58	25.96	43.87	6.53	13.13	228.07
South Bay Aqueduct												
1	6.22	1.17	12.89	10.24	10.81	41.33	7.95	1.49	15.48	13.47	16.18	54.57
2	0.59	0.11	1.55	0.00	0.00	2.25	8.54	1.60	17.03	13.47	16.18	56.82
4	1.96	0.37	2.44	0.00	0.00	4.77	10.50	1.97	19.47	13.47	16.18	61.59
5	4.22	0.79	1.93	0.00	0.00	6.94	14.72	2.76	21.40	13.47	16.18	68.53
6	0.24	0.04	0.23	0.00	0.00	0.51	14.96	2.80	21.63	13.47	16.18	69.04
7	1.91	0.36	0.38	0.00	0.00	2.65	16.87	3.16	22.01	13.47	16.18	71.69
8	2.60	0.49	0.44	0.00	0.00	3.53	19.47	3.65	22.45	13.47	16.18	75.22
9	5.35	1.00	2.24	0.00	0.00	8.59	24.82	4.65	24.69	13.47	16.18	83.81
California Aqueduct												
1	1.73	0.32	2.59	3.23	5.37	13.24	1.73	0.32	2.59	3.23	5.37	13.24
2A	1.11	0.21	0.51	0.00	0.00	1.83	2.84	0.53	3.10	3.23	5.37	15.07
2B	0.56	0.10	0.22	0.00	0.00	0.88	3.40	0.63	3.32	3.23	5.37	15.95
3	0.48	0.09	0.19	0.00	0.00	0.76	3.88	0.72	3.51	3.23	5.37	16.71
4	0.77	0.14	1.21	1.50	2.46	6.08	4.65	0.86	4.72	4.73	7.83	22.79
5	0.60	0.11	0.25	0.00	0.00	0.96	5.25	0.97	4.97	4.73	7.83	23.75
6	0.16	0.03	0.12	0.00	0.00	0.31	5.41	1.00	5.09	4.73	7.83	24.06
7	0.67	0.13	0.30	0.00	0.00	1.10	6.08	1.13	5.39	4.73	7.83	25.16
8C	0.02	0.00	0.06	0.00	0.00	0.08	6.10	1.13	5.45	4.73	7.83	25.24
8D	0.35	0.07	0.25	0.00	0.00	0.67	6.45	1.20	5.70	4.73	7.83	25.91
9	0.28	0.05	0.23	0.00	0.00	0.56	6.73	1.25	5.93	4.73	7.83	26.47
10A	0.30	0.06	0.26	0.00	0.00	0.62	7.03	1.31	6.19	4.73	7.83	27.09
11B	0.44	0.08	0.19	0.00	0.00	0.71	7.47	1.39	6.38	4.73	7.83	27.80
12D	0.41	0.08	0.18	0.00	0.00	0.67	7.88	1.47	6.56	4.73	7.83	28.47
12E	0.28	0.05	0.28	0.00	0.00	0.61	8.16	1.52	6.84	4.73	7.83	29.08
13B	0.62	0.12	0.33	0.00	0.00	1.07	8.78	1.64	7.17	4.73	7.83	30.15
14A	2.35	0.44	2.41	2.56	4.53	12.29	11.13	2.08	9.58	7.29	12.36	42.44
14B	0.36	0.07	0.31	0.00	0.00	0.74	11.49	2.15	9.89	7.29	12.36	43.18
14C	0.32	0.06	0.23	0.00	0.00	0.61	11.81	2.21	10.12	7.29	12.36	43.79
15A	1.72	0.32	2.56	3.09	5.60	13.29	13.53	2.53	12.68	10.38	17.96	57.08
16A	2.85	0.53	3.88	6.68	12.02	25.96	16.38	3.06	16.56	17.06	29.98	83.04
17E	9.69	1.81	10.86	23.32	42.55	88.23	26.07	4.87	27.42	40.38	72.53	171.27
17F	2.54	0.48	0.12	0.00	0.00	3.14	28.61	5.35	27.54	40.38	72.53	174.41
18A	2.46	0.46	1.47	0.00	(2.76)	1.63	31.07	5.81	29.01	40.38	69.77	176.04
19	1.80	0.34	0.99	0.00	0.00	3.13	32.87	6.15	30.00	40.38	69.77	179.17
19C	0.00	0.00	0.00	0.00	0.00	0.00	32.87	6.15	30.00	40.38	69.77	179.17
20A	1.44	0.27	1.02	0.00	0.00	2.73	34.31	6.42	31.02	40.38	69.77	181.90
20B	1.71	0.32	0.77	0.00	0.00	2.80	36.02	6.74	31.79	40.38	69.77	184.70
21	0.85	0.16	0.61	0.00	0.00	1.62	36.87	6.90	32.40	40.38	69.77	186.32
22A	0.88	0.16	0.40	0.00	0.00	1.44	37.75	7.06	32.80	40.38	69.77	187.76
22B	8.73	1.64	8.74	7.28	13.31	39.70	46.48	8.70	41.54	47.66	83.08	227.46
23	2.09	0.39	0.49	0.00	(3.03)	(0.06)	48.57	9.09	42.03	47.66	80.05	227.40
24	4.61	0.86	1.78	0.00	0.00	7.25	53.18	9.95	43.81	47.66	80.05	234.65
25	3.52	0.66	0.12	0.00	0.00	4.30	56.70	10.61	43.93	47.66	80.05	238.95
26A	3.61	0.68	5.36	0.00	(24.92)	(15.27)	60.31	11.29	49.29	47.66	55.13	223.68
28G	5.96	1.12	1.61	0.00	0.00	8.69	66.27	12.41	50.90	47.66	55.13	232.37
28H	5.75	1.08	2.02	0.00	0.00	8.85	72.02	13.49	52.92	47.66	55.13	241.22
28J	73.65	13.79	38.35	0.00	0.00	125.79	145.67	27.28	91.27	47.66	55.13	367.01
West Branch												
29A	2.92	0.55	5.48	2.98	5.58	17.51	31.53	5.90	33.02	43.36	78.11	191.92
29F	2.14	0.40	0.68	0.00	0.00	3.22	33.67	6.30	33.70	43.36	78.11	195.14
29G	7.37	1.38	3.00	0.00	(12.54)	(0.79)	41.04	7.68	36.70	43.36	65.57	194.35
29H	4.50	0.84	3.08	0.00	0.00	8.42	45.54	8.52	39.78	43.36	65.57	202.77
29J	7.62	1.43	0.79	0.00	(22.99)	(13.15)	53.16	9.95	40.57	43.36	42.58	189.62
30	12.17	2.28	2.44	0.00	0.00	16.89	65.33	12.23	43.01	43.36	42.58	206.51
Coastal Branch												
31A	6.31	1.18	16.16	3.06	3.79	30.50	12.76	2.38	21.86	7.79	11.62	56.41
33A	173.67	32.53	8.50	15.62	34.91	265.23	186.43	34.91	30.36	23.41	46.53	321.64
34	57.88	10.84	2.80	0.00	0.00	71.52	244.31	45.75	33.16	23.41	46.53	393.16
35	63.07	11.81	2.43	0.00	0.00	77.31	307.38	57.56	35.59	23.41	46.53	470.47

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 canalside. 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 1994 (from 132-94, Table B-22) by the total Transportation Capital (132-94, B-15) and the Capital component of the Delta Water Charge (132-94, B-4 * 11.09221862). 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	1,798,000	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	13,307,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,230,000	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	34,000	37,000	34,000	33,000	10,000	2,403,500	19,654,000
1994	0	0	0	0	0	0	1,729,587	9,094,000
1995	0	0	0	0	0	0	192,000	839,000
1996	0	0	0	0	0	0	0	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	7,125,000	9,459,000	8,489,000	8,779,000	2,364,000	99,257,087	42,320,000

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	15,268,000	0	1,926,000	154,000	2,080,000	17,348,000
1987	178,000	0	19,773,000	0	3,699,000	437,000	4,136,000	23,909,000
1988	632,000	0	19,610,000	0	5,419,000	3,329,000	8,748,000	28,358,000
1989	1,130,000	0	19,629,000	0	40,683,000	1,650,000	42,333,000	61,962,000
1990	2,066,000	0	26,423,000	0	29,795,000	1,650,000	31,445,000	57,868,000
1991	4,980,000	0	28,439,000	0	26,622,000	999,000	27,621,000	56,060,000
1992	11,920,000	0	25,406,000	0	16,677,000	299,000	16,976,000	42,382,000
1993	16,303,000	0	38,508,500	0	9,663,600	0	9,663,600	48,172,100
1994	10,308,000	0	21,131,587	0	7,365,348	0	7,365,348	28,496,935
1995	2,193,880	0	3,224,880	0	320,000	0	320,000	3,544,880
1996	308,275	0	308,275	0	0	0	0	308,275
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	50,044,155	0	233,678,242	0	142,697,948	8,607,000	151,304,948	384,983,190

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	620,248	0
1995	0	0	0	0	0	0	1,282,169	0
1996	0	0	0	0	0	0	1,325,193	0
1997	0	0	0	0	0	0	1,357,918	0
1998	0	0	0	0	0	0	1,357,918	0
1999	0	0	0	0	0	0	1,357,918	0
2000	0	0	0	0	0	0	1,357,918	0
2001	0	0	0	0	0	0	1,357,918	0
2002	0	0	0	0	0	0	1,357,918	0
2003	0	0	0	0	0	0	1,357,918	0
2004	0	0	0	0	0	0	1,357,918	0
2005	0	0	0	0	0	0	1,357,918	0
2006	0	0	0	0	0	0	1,357,918	0
2007	0	0	0	0	0	0	1,357,918	0
2008	0	0	0	0	0	0	1,357,918	0
2009	0	0	0	0	0	0	1,357,918	0
2010	0	0	0	0	0	0	1,357,918	0
2011	0	0	0	0	0	0	1,357,918	0
2012	0	0	0	0	0	0	1,357,918	0
2013	0	0	0	0	0	0	1,357,918	0
2014	0	0	0	0	0	0	1,357,918	0
2015	0	0	0	0	0	0	1,357,918	0
2016	0	0	0	0	0	0	1,357,918	0
2017	0	0	0	0	0	0	1,357,918	0
2018	0	0	0	0	0	0	1,357,918	0
2019	0	0	0	0	0	0	1,357,918	0
2020	0	0	0	0	0	0	1,357,918	0
2021	0	0	0	0	0	0	1,357,918	0
2022	0	0	0	0	0	0	1,357,918	0
2023	0	0	0	0	0	0	1,357,918	0
2024	0	0	0	0	0	0	1,357,918	0
2025	0	0	0	0	0	0	1,357,918	0
2026	0	0	0	0	0	0	1,357,918	0
2027	0	0	0	0	0	0	1,357,918	0
2028	0	0	0	0	0	0	1,357,918	0
2029	0	0	0	0	0	0	1,357,918	0
2030	0	0	0	0	0	0	1,357,918	0
2031	0	0	0	0	0	0	1,357,918	0
2032	0	0	0	0	0	0	1,357,918	0
2033	0	0	0	0	0	0	1,357,918	0
2034	0	0	0	0	0	0	1,357,918	0
2035	0	0	0	0	0	0	1,357,918	0
Total	0	0	0	0	0	0	56,186,412	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	620,248	0	602,213	0	602,213	1,222,461
1995	0	0	1,282,169	0	1,282,383	0	1,282,383	2,564,552
1996	741,092	0	2,066,285	0	1,311,094	0	1,311,094	3,377,379
1997	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
1998	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
1999	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2000	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2001	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2002	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2003	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2004	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2005	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2006	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2007	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2008	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2009	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2010	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2011	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2012	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2013	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2014	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2015	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2016	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2017	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2018	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2019	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2020	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2021	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2022	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2023	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2024	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2025	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2026	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2027	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2028	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2029	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2030	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2031	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2032	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2033	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2034	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
2035	1,518,786	0	2,876,704	0	1,343,471	0	1,343,471	4,220,175
Total	59,973,746	0	116,160,158	0	55,591,059	0	55,591,059	171,751,217

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	212,760	274,001
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	1,756,627	236,237	1,362,679	41,900	78,842	13,686,361	17,347,999
1987	49,735	2,453,366	378,370	1,772,725	10,615	151,421	19,092,768	23,909,000
1988	124,534	2,656,946	486,926	1,710,708	13,783	221,830	23,143,272	28,357,999
1989	155,446	7,092,307	2,412,326	1,670,000	17,419	1,665,386	48,949,117	61,962,001
1990	62,786	6,452,056	1,940,799	2,234,542	8,680	1,219,678	45,949,459	57,868,000
1991	28,686	6,340,439	1,907,155	2,168,712	4,024	1,089,789	44,521,195	56,060,000
1992	2,911	4,997,316	1,684,267	1,359,335	471	682,684	33,655,016	42,382,000
1993	2,593	5,710,378	2,087,880	2,736,565	412	395,586	37,238,687	48,172,101
1994	0	3,411,111	1,254,568	1,316,123	0	301,505	22,213,627	28,496,934
1995	0	430,492	154,027	124,364	0	13,099	2,822,898	3,544,880
1996	0	39,092	14,235	0	0	0	254,948	308,275
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	661,719	43,070,451	12,929,600	18,136,435	121,539	5,841,434	304,222,012	384,983,190

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	18,581	1,209,431	363,067	509,276	3,413	0	8,542,642	10,646,410
1989	19,526	1,270,939	381,532	535,177	3,586	0	8,977,099	11,187,859
1990	19,522	1,270,644	381,443	535,053	3,586	0	8,975,016	11,185,264
1991	19,518	1,270,406	381,371	534,952	3,585	0	8,973,332	11,183,164
1992	41,098	2,675,027	803,034	1,126,421	7,548	0	18,894,672	23,547,800
1993	53,378	3,474,278	1,042,966	1,462,976	9,804	0	24,540,073	30,583,475
1994	53,110	3,456,831	1,037,729	1,455,629	9,755	0	24,416,834	30,429,888
1995	55,582	3,617,776	1,086,044	1,523,401	10,209	0	25,553,643	31,846,655
1996	53,994	3,514,406	1,055,012	1,479,873	9,917	0	24,823,508	30,936,710
1997	55,498	3,612,296	1,084,399	1,521,093	10,193	0	25,514,944	31,798,423
1998	55,377	3,604,381	1,082,023	1,517,761	10,171	0	25,459,035	31,728,748
1999	55,337	3,601,814	1,081,252	1,516,679	10,164	0	25,440,903	31,706,149
2000	56,989	3,709,356	1,113,536	1,561,964	10,467	0	26,200,506	32,652,818
2001	57,038	3,712,551	1,114,495	1,563,310	10,476	0	26,223,081	32,680,951
2002	56,623	3,685,482	1,106,369	1,551,911	10,400	0	26,031,881	32,442,666
2003	56,638	3,686,522	1,106,681	1,552,349	10,403	0	26,039,226	32,451,819
2004	54,204	3,528,049	1,059,108	1,485,618	9,956	0	24,919,870	31,056,805
2005	54,249	3,531,006	1,059,996	1,486,863	9,964	0	24,940,757	31,082,835
2006	54,332	3,536,427	1,061,623	1,489,146	9,979	0	24,979,053	31,130,560
2007	54,439	3,543,371	1,063,708	1,492,070	9,999	0	25,028,096	31,191,683
2008	54,550	3,550,574	1,065,870	1,495,103	10,019	0	25,078,973	31,255,089
2009	54,638	3,556,299	1,067,589	1,497,514	10,035	0	25,119,414	31,305,489
2010	54,757	3,564,062	1,069,919	1,500,783	10,057	0	25,174,247	31,373,825
2011	54,848	3,570,002	1,071,702	1,503,284	10,074	0	25,216,205	31,426,115
2012	54,946	3,576,355	1,073,609	1,505,959	10,092	0	25,261,080	31,482,041
2013	55,035	3,582,133	1,075,344	1,508,392	10,108	0	25,301,888	31,532,900
2014	55,127	3,588,121	1,077,141	1,510,914	10,125	0	25,344,187	31,585,615
2015	55,218	3,594,050	1,078,921	1,513,410	10,142	0	25,386,063	31,637,804
2016	55,323	3,600,918	1,080,983	1,516,302	10,161	0	25,434,571	31,698,258
2017	55,447	3,608,951	1,083,394	1,519,685	10,184	0	25,491,310	31,768,971
2018	55,583	3,617,814	1,086,055	1,523,417	10,209	0	25,553,912	31,846,990
2019	55,716	3,626,504	1,088,664	1,527,076	10,233	0	25,615,297	31,923,490
2020	55,871	3,636,570	1,091,686	1,531,315	10,262	0	25,686,394	32,012,098
2021	56,074	3,649,787	1,095,653	1,536,880	10,299	0	25,779,756	32,128,449
2022	56,306	3,664,857	1,100,177	1,543,226	10,342	0	25,886,195	32,261,103
2023	43,399	2,824,800	847,995	1,189,488	7,971	0	19,952,573	24,866,226
2024	44,801	2,916,013	875,377	1,227,897	8,229	0	20,596,847	25,669,164
2025	32,822	2,136,340	641,322	899,586	6,028	0	15,089,733	18,805,831
2026	8,301	540,316	162,201	227,520	1,525	0	3,816,445	4,756,308
2027	2,725	177,369	53,245	74,688	501	0	1,252,817	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	1,906,520	124,092,828	37,252,235	52,253,961	350,171	0	876,512,078	1,092,367,793

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	137,959	37,854	56,236	0	24,652	965,760	1,222,461
1995	0	289,890	80,272	116,250	0	52,495	2,025,645	2,564,552
1996	0	391,799	116,414	120,151	0	53,671	2,695,344	3,377,379
1997	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
1998	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
1999	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2000	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2001	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2002	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2003	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2004	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2005	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2006	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2007	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2008	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2009	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2010	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2011	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2012	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2013	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2014	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2015	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2016	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2017	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2018	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2019	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2020	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2021	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2022	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2023	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2024	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2025	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2026	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2027	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2028	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2029	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2030	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2031	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2032	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2033	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2034	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2035	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
Total	0	20,232,756	6,254,346	5,094,239	0	2,275,662	137,894,214	171,751,217

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	18,581	1,209,431	363,067	509,276	3,413	0	8,542,642	10,646,410
1989	19,526	1,270,939	381,532	535,177	3,586	0	8,977,099	11,187,859
1990	19,522	1,270,644	381,443	535,053	3,586	0	8,975,016	11,185,264
1991	19,518	1,270,406	381,371	534,952	3,585	0	8,973,332	11,183,164
1992	41,098	2,675,027	803,034	1,126,421	7,548	0	18,894,672	23,547,800
1993	53,378	3,474,278	1,042,966	1,462,976	9,804	0	24,540,073	30,583,475
1994	53,110	3,594,790	1,075,583	1,511,865	9,755	24,652	25,382,594	31,652,349
1995	55,582	3,907,666	1,166,316	1,639,651	10,209	52,495	27,579,288	34,411,207
1996	53,994	3,906,205	1,171,426	1,600,024	9,917	53,671	27,518,852	34,314,089
1997	55,498	4,110,068	1,238,753	1,644,211	10,193	54,996	28,904,879	36,018,598
1998	55,377	4,102,153	1,236,377	1,640,879	10,171	54,996	28,848,970	35,948,923
1999	55,337	4,099,586	1,235,606	1,639,797	10,164	54,996	28,830,838	35,926,324
2000	56,989	4,207,128	1,267,890	1,685,082	10,467	54,996	29,590,441	36,872,993
2001	57,038	4,210,323	1,268,849	1,686,428	10,476	54,996	29,613,016	36,901,126
2002	56,623	4,183,254	1,260,723	1,675,029	10,400	54,996	29,421,816	36,662,841
2003	56,638	4,184,294	1,261,035	1,675,467	10,403	54,996	29,429,161	36,671,994
2004	54,204	4,025,821	1,213,462	1,608,736	9,956	54,996	28,309,805	35,276,980
2005	54,249	4,028,778	1,214,350	1,609,981	9,964	54,996	28,330,692	35,303,010
2006	54,332	4,034,199	1,215,977	1,612,264	9,979	54,996	28,368,988	35,350,735
2007	54,439	4,041,143	1,218,062	1,615,188	9,999	54,996	28,418,031	35,411,858
2008	54,550	4,048,346	1,220,224	1,618,221	10,019	54,996	28,468,908	35,475,264
2009	54,638	4,054,071	1,221,943	1,620,632	10,035	54,996	28,509,349	35,525,664
2010	54,757	4,061,834	1,224,273	1,623,901	10,057	54,996	28,564,182	35,594,000
2011	54,848	4,067,774	1,226,056	1,626,402	10,074	54,996	28,606,140	35,646,290
2012	54,946	4,074,127	1,227,963	1,629,077	10,092	54,996	28,651,015	35,702,216
2013	55,035	4,079,905	1,229,698	1,631,510	10,108	54,996	28,691,823	35,753,075
2014	55,127	4,085,893	1,231,495	1,634,032	10,125	54,996	28,734,122	35,805,790
2015	55,218	4,091,822	1,233,275	1,636,528	10,142	54,996	28,775,998	35,857,979
2016	55,323	4,098,690	1,235,337	1,639,420	10,161	54,996	28,824,506	35,918,433
2017	55,447	4,106,723	1,237,748	1,642,803	10,184	54,996	28,881,245	35,989,146
2018	55,583	4,115,586	1,240,409	1,646,535	10,209	54,996	28,943,847	36,067,165
2019	55,716	4,124,276	1,243,018	1,650,194	10,233	54,996	29,005,232	36,143,665
2020	55,871	4,134,342	1,246,040	1,654,433	10,262	54,996	29,076,329	36,232,273
2021	56,074	4,147,559	1,250,007	1,659,998	10,299	54,996	29,169,691	36,348,624
2022	56,306	4,162,629	1,254,531	1,666,344	10,342	54,996	29,276,130	36,481,278
2023	43,399	3,322,572	1,002,349	1,312,606	7,971	54,996	23,342,508	29,086,401
2024	44,801	3,413,785	1,029,731	1,351,015	8,229	54,996	23,986,782	29,889,339
2025	32,822	2,634,112	795,676	1,022,704	6,028	54,996	18,479,668	23,026,006
2026	8,301	1,038,088	316,555	350,638	1,525	54,996	7,206,380	8,976,483
2027	2,725	675,141	207,599	197,806	501	54,996	4,642,752	5,781,520
2028	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2029	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2030	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2031	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2032	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2033	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2034	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
2035	0	497,772	154,354	123,118	0	54,996	3,389,935	4,220,175
Total	1,906,520	144,325,584	43,506,581	57,348,200	350,171	2,275,662	1,014,406,292	1,264,119,010

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.

TABLE B-33

Power Costs for Pumping Surplus Water

(Dollars)

Calendar Year	North Bay Aqueduct			South Bay Aqueduct	California Aqueduct							Combined Total (12)
	Reach 1 Barker Slough Pumping Plant (1)	Reach 3A Cordelia Solano Pumping Plant (2)	Reach 3B Cordelia Napa Pumping Plant (3)	Reach 1 South Bay and Del Valle Pumping Plants (4)	Reach 1 Banks Pumping Plant (5)	Reach 4 Dos Amigos Pumping Plant (6)	Reach 14A Buena Vista Pumping Plant (7)	Reach 15A Teerink Pumping Plant (8)	Reach 16A Chrisman Pumping Plant (9)	Reach 17E Edmonston Pumping Plant (10)	Reach 31A Las Perillas and Badger Hill Pumping Plants (11)	
1973(a												
Capacity	0	0	0	5,290	0	37,033	25,622	29,816	0	0	15,588	113,349
Energy	0	0	0	6,302	231,691	102,725	53,375	12,819	1,697	526	24,245	433,380
Total	0	0	0	11,592	231,691	139,758	78,997	42,635	1,697	526	39,833	546,729
1974												
Capacity	0	0	0	21,773	0	81,328	69,381	62,301	0	0	31,511	266,294
Energy	0	0	0	7,561	374,506	181,827	95,596	22,550	5,599	450	33,406	721,495
Total	0	0	0	29,334	374,506	263,155	164,977	84,851	5,599	450	64,917	987,789
1975												
Capacity	0	0	0	32,288	298,709	126,806	99,676	30,049	0	0	32,231	619,759
Energy	0	0	0	47,597	617,396	264,000	99,745	313	661	2,391	49,501	1,081,604
Total	0	0	0	79,885	916,105	390,806	199,421	30,362	661	2,391	81,732	1,701,363
1976												
Capacity	0	0	0	41,897	60,502	63,788	85,415	8,579	0	0	30,449	290,630
Energy	0	0	0	83,722	597,636	225,126	103,213	4,885	5,385	0	45,101	1,065,068
Total	0	0	0	125,619	658,138	288,914	188,628	13,464	5,385	0	75,550	1,355,698
1977												
Capacity	0	0	0	0	0	0	0	0	0	0	0	0
Energy	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
1978												
Capacity	0	0	0	0	144,188	51,403	0	0	0	0	0	195,591
Energy	0	0	0	0	15,039	6,591	0	0	0	0	0	21,630
Total	0	0	0	0	159,227	57,994	0	0	0	0	0	217,221
1979												
Capacity	0	0	0	27,116	382,070	232,001	35,743	6,771	3,165	0	8,769	695,635
Energy	0	0	0	39,517	599,886	256,188	51,045	8,205	4,194	0	11,808	970,843
Total	0	0	0	66,633	981,956	488,189	86,788	14,976	7,359	0	20,577	1,666,478
1980												
Capacity	0	0	0	30,319	530,982	227,837	28,682	3,559	5,146	0	3,228	829,753
Energy	0	0	0	35,268	373,023	162,404	73,422	11,451	9,753	0	22,755	688,076
Total	0	0	0	65,587	904,005	390,241	102,104	15,010	14,899	0	25,983	1,517,829
1981												
Capacity	0	0	0	36,749	625,106	281,362	69,202	22,262	24,138	1,054	26,168	1,086,041
Energy	0	0	0	44,229	806,574	366,945	85,341	27,489	29,847	1,629	34,020	1,396,074
Total	0	0	0	80,978	1,431,680	648,307	154,543	49,751	53,985	2,683	60,188	2,482,115
1982												
Capacity	0	0	0	40,355	1,704,800	578,744	176,362	16,932	2,612	0	6,148	2,525,953
Energy	0	0	0	3,225	192,415	88,494	19,390	2,109	296	0	5,278	311,207
Total	0	0	0	43,580	1,897,215	667,238	195,752	19,041	2,908	0	11,426	2,837,160
1983												
Capacity	0	0	0	0	40,303	16,941	0	0	0	0	0	57,244
Energy	0	0	0	0	43,045	20,026	0	0	0	0	0	63,071
Total	0	0	0	0	83,348	36,967	0	0	0	0	0	120,315
1984 (b												
Energy	0	0	0	51,632	1,865,605	769,718	0	0	0	0	37,407	2,724,362
1985												
Energy	0	0	0	301,663	2,835,778	1,180,255	0	0	0	0	46,140	4,363,836
1986												
Energy	0	0	0	43,007	227,832	99,593	0	0	0	0	20,176	390,608
1987												
Energy	0	0	0	98,970	610,046	273,559	59,496	15,365	6,776	0	12,700	1,076,912
1988												
Energy	0	0	0	0	0	0	0	0	0	0	0	0
1989												
Energy	0	0	0	0	0	0	0	0	0	0	0	0
1990												
Energy	0	0	0	0	485	0	0	0	0	0	0	485
1991												
Energy	32,329	14,490	17,802	0	0	0	0	0	0	0	0	64,621
1992												
Energy	7,499	0	18,933	0	0	0	0	0	0	0	0	26,432
Grand Total	39,828	14,490	36,735	998,480	13,177,617	5,694,694	1,230,706	285,455	99,269	6,050	496,629	22,079,953

a) May through December only.
b) No capacity costs are charged to surplus water pumping after 1983.

TABLE B-34

Power, Replacement, and Administrative Charge for Surplus Water Delivery

(Dollars)

Calendar Year	North Bay Area		South Bay Area		San Joaquin Valley Area						Southern California Area				Total
	NCFC&WCD (1)	SCWA (2)	ACWD (3)	SCVWD (4)	CLWA (5)	DRWD (6)	EWSID (7)	KCWA (a (8)	OFWD (9)	TLBWSD (10)	AVEK (11)	LCID (12)	CVWD (13)	DWA (14)	(15)
1978															
Capacity	0	0	0	3,275	0	14,642	0	154,051	4	23,619	0	0	0	0	195,591
Energy	0	0	0	0	0	10,119	0	11,505	6	0	0	0	0	0	21,630
Replacement	0	0	0	0	0	248	0	281	0	0	0	0	0	0	529
Administrative	0	0	0	0	0	3,793	0	4,312	3	0	0	0	0	0	8,108
Total	0	0	0	3,275	0	28,802	0	170,149	13	23,619	0	0	0	0	225,858
1979															
Capacity	0	0	0	37,413	0	37,615	0	547,875	417	72,315	0	0	0	0	695,635
Energy	0	0	0	54,354	0	51,418	0	774,587	651	89,833	0	0	0	0	970,843
Replacement	0	0	0	413	0	886	0	7,633	5	2,042	0	0	0	0	10,979
Administrative	0	0	0	4,005	0	20,051	0	116,977	176	46,075	0	0	0	0	187,284
Total	0	0	0	96,185	0	109,970	0	1,447,072	1,249	210,265	0	0	0	0	1,864,741
1980															
Capacity	0	0	0	41,641	8,485	40,160	0	636,135	432	102,900	0	0	0	0	829,753
Energy	0	0	0	48,510	13,101	52,131	0	553,902	666	19,766	0	0	0	0	688,076
Replacement	0	0	0	533	3,332	1,255	0	149,588	134	5,705	0	0	0	0	160,547
Administrative	0	0	0	5,638	3,815	21,859	0	281,776	666	22,258	0	0	0	0	336,012
Total	0	0	0	96,322	28,733	115,405	0	1,621,401	1,898	150,629	0	0	0	0	2,014,388
1981															
Capacity	0	0	0	50,706	14,608	40,674	2,520	784,875	1,601	189,238	0	1,819	0	0	1,086,041
Energy	0	0	0	61,028	22,575	42,078	3,897	980,142	2,475	281,071	0	2,808	0	0	1,396,074
Replacement	0	0	0	3,538	4,099	12,446	1,152	275,232	521	83,132	0	431	0	0	380,551
Administrative	0	0	725	11,192	6,160	19,221	1,869	348,397	1,950	146,357	0	123	0	0	535,994
Total	0	0	725	126,464	47,442	114,419	9,438	2,388,646	6,547	699,798	0	5,181	0	0	3,398,660
1982															
Capacity	0	0	0	55,431	20,739	74,514	6,103	1,658,571	434	339,639	370,522	0	0	0	2,525,953
Energy	0	0	0	4,386	13,578	18,876	1,208	184,594	643	87,922	0	0	0	0	311,207
Replacement	0	0	0	105	2,462	5,596	361	54,018	135	26,070	0	0	0	0	88,747
Administrative	0	0	0	7,328	3,710	5,487	698	185,494	676	50,524	0	0	0	0	253,917
Total	0	0	0	67,250	40,489	104,473	8,370	2,082,677	1,888	504,155	370,522	0	0	0	3,179,824
1983															
Capacity	0	0	0	1,698	187	3,850	60	48,348	0	3,101	0	0	0	0	57,244
Energy	0	0	0	0	0	62,996	0	0	75	0	0	0	0	0	63,071
Replacement	0	0	0	0	0	5,851	0	0	6	0	0	0	0	0	5,857
Administrative	0	0	0	0	0	6,510	0	0	14	0	0	0	0	0	6,524
Total	0	0	0	1,698	187	79,207	60	48,348	95	3,101	0	0	0	0	132,696
1984 (b															
Energy	0	0	0	70,885	98,169	222,456	0	2,322,714	10,138	0	0	0	0	0	2,724,362
Replacement	0	0	0	782	3,334	8,763	0	103,670	351	0	0	0	0	0	116,900
Administrative	0	0	2,450	7,160	6,800	9,380	0	36,460	6,340	0	0	0	0	0	68,590
Total	0	0	2,450	78,827	108,303	240,599	0	2,462,844	16,829	0	0	0	0	0	2,909,852
1985															
Energy	0	0	0	414,281	124,603	107,436	0	2,444,591	6,373	1,266,552	0	0	0	0	4,363,836
Replacement	0	0	0	2,053	2,737	3,429	0	83,732	163	43,502	0	0	0	0	135,616
Administrative	0	0	0	4,811	4,596	5,227	0	18,251	4,245	11,883	0	0	0	0	49,013
Total	0	0	0	421,145	131,936	116,092	0	2,546,574	10,781	1,321,937	0	0	0	0	4,548,465
1986															
Energy	0	0	0	58,939	52,904	7,658	12,104	113,630	1,267	144,106	0	0	0	0	390,608
Replacement	0	0	0	553	1,783	405	507	6,729	53	5,742	0	0	0	0	15,772
Administrative	0	0	2,263	3,468	6,051	3,995	1,550	7,533	3,545	5,470	0	0	0	0	33,875
Total	0	0	2,263	62,960	60,738	12,058	14,161	127,892	4,865	155,318	0	0	0	0	440,255
1987															
Energy	0	0	0	135,461	32,558	0	14,941	500,919	1,367	391,666	0	0	0	0	1,076,912
Replacement	0	0	0	1,974	1,508	0	1,099	37,897	72	30,007	0	0	0	0	72,557
Administrative	0	0	0	1,392	1,240	711	1,298	4,135	1,252	2,769	0	0	0	0	12,797
Total	0	0	0	138,827	35,306	711	17,338	542,951	2,691	424,442	0	0	0	0	1,162,266
1988															
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Replacement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative	0	0	0	839	838	839	838	839	838	839	0	0	839	839	7,548
Total	0	0	0	839	838	839	838	839	838	839	0	0	839	839	7,548
1989															
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Replacement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative	0	0	0	490	490	490	490	490	490	490	0	0	490	490	4,410
Total	0	0	0	490	490	490	490	490	490	490	0	0	490	490	4,410
1990															
Energy	0	0	0	0	0	0	0	0	485	0	0	0	0	0	485
Replacement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	485	0	0	0	0	0	485
1991															
Energy	24,855	39,766	0	0	0	0	0	0	0	0	0	0	0	0	64,621
Replacement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	24,855	39,766	0	0	0	0	0	0	0	0	0	0	0	0	64,621
1992															
Energy	26,432	0	0	0	0	0	0	0	0	0	0	0	0	0	26,432
Replacement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Administrative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26,432	0	0	0	0	0	0	0	0	0	0	0	0	0	26,432
Grand Total	51,287	39,766	5,438	1,094,282	454,462	923,065	50,695	13,439,883	48,669	3,494,593	370,522	5,181	1,329	1,329	19,980,501

a) 1982 costs are preliminary and may change when 1982 exchange is taken into consideration.
b) No capacity costs are charged to surplus water pumping after 1983.

NOTES

NOTES

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 meter (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