



MANAGEMENT OF THE
**CALIFORNIA
STATE WATER
PROJECT**

BULLETIN 132-08 | JUNE 2012

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Governor, State of California

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Natural Resources Agency*

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Bulletin 132-08

Management of the California State Water Project

Covers Activities during Calendar Year 2007



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Edmund G. Brown Jr. *Governor
State of California*

John Laird *Secretary for Natural Resources
Natural Resources Agency*

Mark W. Cowin *Director
Department of Water Resources*

Foreword

Bulletin 132-08, Management of the California State Water Project, continues the Bulletin 132 annual series begun in 1963. Bulletin 132-08 updates water supply planning, construction, financing, management, and operation activities of the State Water Project. Appendix B contains data and computations used to determine the State Water Project water contractors' Statement of Charges for 2009. Appendix B was previously printed and distributed to State Water Project water contractors to document and support calculation of contractors' annual charges.

The Bulletin discusses significant events and issues that affect State Water Project management and operations. The Bulletin covers the period from January 1, 2007, through December 31, 2007.

Bulletin 132-08 also discusses water supply and delivery as well as Delta resources and environmental issues, including the CALFED Bay-Delta Authority; Oroville facilities relicensing; and financial analysis of the State Water Project.

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than were available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.



Mark W. Cowin
Director

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Appendix C	The California State Water Project Summary (discontinued)
Appendix D	Costs of Recreation and Fish and Wildlife Enhancement (discontinued)
Appendix E	Water Operations in the Sacramento-San Joaquin Delta (discontinued)
Appendix F	San Joaquin Valley Post-Project Economic Impact (discontinued)

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Bulletin 132 also relies on these DWR divisions and offices for information, financial and cost accounting data, and content review.

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California Water Commission

The California Water Commission consists of nine members appointed by the Governor and confirmed by the Senate. Seven members are chosen for their expertise related to the control, storage, and beneficial use of water and two are chosen for their knowledge of the environment. The commission advises the Director of the Department of Water Resources (DWR) on matters within DWR's jurisdiction, approves rules and regulations, and monitors and reports on the construction and operation of the State Water Project (SWP).

The roles and responsibilities of the California Water Commission are defined in the Water Code, Government Code, and Code of Civil Procedure.

Its SWP-specific responsibilities are:

- conducting an annual review of the construction and operation of the SWP and reporting to DWR and to the Legislature with any recommendations (Water Code Section 165);
- holding public hearings on all additional facilities proposed to be added to the SWP and naming any new facilities (Water Code Sections 161.5 and 166); and
- adopting a resolution of necessity, and giving each affected person a venue to be heard, before DWR may commence an eminent domain proceeding (Code of Civil Procedure Section 1245.210).

Commission members at the time of publication:

Anthony Saracino (Chair)

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Joseph Byrne

Daniel Curtin

Joe Del Bosque

Kimberley Delfino

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Acronyms and Abbreviations

Symbols

2,4-D 2,4-dichlorophenoxyacetic acid
µg/L micrograms per liter
µm micrometer
µS/cm microsiemens per centimeter

A

AB Assembly Bill
ACWA Association of California Water Agencies
ADA Americans with Disabilities Act
af acre-feet/acre-foot
Ag Council Agricultural Water Management Council
ALP Alternative Licensing Process

B

Bay-Delta Accord Principles for Agreement on Bay-Delta Standards between the State of California and the Federal Government
Bay-Delta Estuary San Francisco Bay/Sacramento-San Joaquin Delta Estuary
Bay-Delta Plan Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
BCDC Bay Conservation and Development Commission
BDCP Bay Delta Conservation Plan
BMPs Best Management Practices
BO biological opinion

C

CAISO California Independent System Operator
CALFED CALFED Bay-Delta Program
Caltrans California Department of Transportation
CAMAL Net California Association of Mutual Aid Laboratories Network
C.A.S.T. Catch A Special Thrill
CBDA California Bay-Delta Authority
CDEC California Data Exchange Center
CDFA California Department of Food and Agriculture
CDO Cease and Desist Order
CEC California Energy Commission
CEEIN California Environmental Education Interagency Network
CEQA California Environmental Quality Act

CESA California Endangered Species Act
CFR Comprehensive Facility Review
cfs cubic feet per second
CIMIS California Irrigation Management Information System
CO₂ carbon dioxide
Corps U.S. Army Corps of Engineers
CPUC California Public Utilities Commission
CRA Colorado River Aqueduct
CREEC California Regional Environmental Education Community
CST Combined Solar Technologies
CUSE Catholic University of Santiago del Estero
CVC Cross Valley Canal
CVFPB Central Valley Flood Protection Board
CVFPP Central Valley Flood Protection Plan
CVP Central Valley Project
CVPIA Central Valley Project Improvement Act
CVRWQCB Central Valley Regional Water Quality Control Board
CV-SALTS Central Valley Salinity Alternatives for Long-Term Sustainability
CWC California Water Code
CWIN California Water Impact Network

D

D-1485 State Water Resources Control Board, Water Right Decision 1485
D-1641 State Water Resources Control Board, Water Right Decision 1641
DBEEP Delta-Bay Enhanced Enforcement Program
DBW Department of Boating and Waterways
DCC Delta Cross Channel
DCPA dimethyl tetrachloroterephthalate or dacthal
DDA Davis-Dolwig Act
Delta Fish Agreement Delta Pumping Plant Fish Protection Agreement
DFG Department of Fish and Game
DIRWM Division of Integrated Regional Water Management
DMMs demand management measures
DO dissolved oxygen
DOE Division of Engineering
DPH Department of Public Health
DPR Department of Parks and Recreation
DPS distinct population segment
DRMS Delta Risk Management Strategy
DSIWM Division of Statewide Integrated Water Management
DSM2 Delta Simulation Model 2
DSOD Division of Safety of Dams
DSWG Delta Smelt Working Group
DW drainage water
DWR Department of Water Resources

E

EC electrical conductivity
EIR environmental impact report
EIS environmental impact statement
ELAP DPH Environmental Laboratory Accreditation Program
EPA U.S. Environmental Protection Agency
ERO Electric Reliability Organization
ERP CALFED Ecosystem Restoration Program
ESA Endangered Species Act
ET_o reference evapotranspiration
EWA Environmental Water Account
EWMPs Efficient Water Management Practices

F

FAAST Financial Assistance Application Submittal Tool
Farm Bureau California Farm Bureau Federation
FERC Federal Energy Regulatory Commission
FGC California Fish and Game Commission
Fishery Plan Revised Fishery Protection Plan
FRFH Feather River Fish Hatchery
FWS Future Water Supply

G

GBP Grassland Bypass Project
GHG greenhouse gas
GIS geographic information system
GOES Geostationary Operational Environmental Satellite
gpm gallons per minute
GPS global positioning system

H

HEA Habitat Expansion Agreement
HECA Habitat Expansion Coordination Agreement
HFC high-flow channel
hp horsepower

I

ICS Incident Command System
IDM Integrated Drainage Management
IEP Interagency Ecological Program
IFDM Integrated On-Farm and Regional Drainage Management system
IR Interim Renewal
IRRP Interim Reliability Requirement Program

IRWM Integrated Regional Water Management
ISDP Interim South Delta Program

J

JPOD Joint Point of Diversion

K

kV kilovolt(s)
KWB Kern Water Bank
kWh kilowatt hour

L

LADWP Los Angeles Department of Water and Power
LEAPS Lake Elsinore Advance Pump Storage
LFC low-flow channel
LiDAR light detection and ranging
LSIP Levee System Integrity Program
LSJR Lower San Joaquin River
LTMS Long-Term Management Strategy
LTPP Long-Term Procurement Plan

M

maf million acre-feet
mg/L milligrams per liter
MIDS Morrow Island Distribution System
mmhos/cm millimhos per centimeter
MOU memorandum of understanding
MRTU Market Redesign and Technology Upgrade
mS/cm millisiemens per centimeter
MW megawatt
MWh megawatt hour
MWQI Municipal Water Quality Investigations

N

NAESB North American Energy Standards Board
NDFCERP North Delta Flood Control and Ecosystem Restoration Project
NDOI Net Delta Outflow Index
NEMDC Natomas East Main Drainage Canal
NEPA National Environmental Policy Act
NERC North American Electric Reliability Corporation
NOAA National Oceanic and Atmospheric Administration
NOAA Fisheries National Marine Fisheries Service
NODOS North-of-the-Delta Offstream Storage

NPC Nevada Power Company
NWS National Weather Service

O

OCAP Operations Criteria and Plan
O&M Division of Operations and Maintenance
OMP&R operations, maintenance, power, and replacement
OM&R operations, maintenance, and replacement
OTM otolith thermal marking
OWUET Office of Water Use Efficiency and Transfers

P

PAO Public Affairs Office
PCL Planning and Conservation League
PFMA Potential Failure Mode Analysis
PFR Periodic Facility Review
PG&E Pacific Gas & Electric Company
PL Public Law
PLC programmable logic controller
POD pelagic organism decline or point of delivery
Proposition 1E Disaster Preparedness and Flood Protection Bond Act of 2006
Proposition 13 Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Act of 2000
Proposition 25 Clean Water Bond Law of 1984
Proposition 44 Water Conservation and Water Quality Bond Law of 1986
Proposition 50 Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002
Proposition 82 Water Conservation Bond Law of 1988
Proposition 84 Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006
Proposition 204 Safe, Clean, Reliable Water Supply Act of 1996
PSP project solicitation package

Q

QA/QC quality assurance/quality control
QSA Quantification Settlement Agreement

R

RA Resource Adequacy
RCRC Regional Council of Rural Counties
Reclamation Bureau of Reclamation
R&FWE SWP Recreation and Fish and Wildlife Enhancement
RM river mile

RO reverse osmosis
ROD record of decision
RRR Red Rock Ranch
RST rotary screw trap
RTDF-CP Real Time Data and Forecasting Comprehensive Program
RTWQMP Real-time Water Quality Monitoring Program
RWQCB Regional Water Quality Control Board

S

SA Settlement Agreement
Sacramento Valley 40-30-30 Index Sacramento Valley Water Year Hydrologic Classification
SAIC Science Applications International Corporation
San Joaquin Valley 60-20-20 Index San Joaquin Valley Water Year Hydrologic Classification
SARMP Settlement Agreement Recreation Management Plan
SB Senate Bill
SB 34 Delta Flood Protection Act of 1988
SBA South Bay Aqueduct
SCE Southern California Edison
SDG&E San Diego Gas & Electric Company
SDIP South Delta Improvements Program
SDWA South Delta Water Agency
SJRGA San Joaquin River Group Authority
SJRIODAY San Joaquin River Input-Output Day
SJRMP San Joaquin River Management Program
SJRRP San Joaquin River Restoration Program
SJRWQMG San Joaquin River Water Quality Management Group
SJVDIP San Joaquin Valley Drainage Implementation Program
SLDFR San Luis Drainage Feature ReEvaluation
SMP Suisun Marsh Plan
SMPA Suisun Marsh Preservation Agreement
SMUD Sacramento Municipal Utility District
SRCD Suisun Resource Conservation District
STID Supporting Technical Information Document
SVWMA Sacramento Valley Water Management Agreement
SVWMP Sacramento Valley Water Management Program
SWC State Water Contractors
SWP State Water Project
SWPAO State Water Project Analysis Office
SWRCB State Water Resources Control Board

T

TAO Thermalito Afterbay Outlet
TDF through-Delta facility
TDS total dissolved solids

THM trihalomethane
TOC total organic carbon
TRC technical review committee

U

UC University of California
UCD University of California, Davis
UCLA University of California, Los Angeles
Urban Council California Urban Water Conservation Council
USDA U.S. Department of Agriculture
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey
USJRBSI Upper San Joaquin River Basin Storage Investigation
UWMP Urban Water Management Plan

V

VAMP Vernalis Adaptive Management Plan
VFD variable frequency drive

W

WECC Western Electricity Coordinating Council
WET Water Education for Teachers
WQCP Water Quality Control Plan
WRAC Water Recycling Advisory Committee
WRCD Westside Resource Conservation District
WSREC West Side Research and Extension Center

Y

Yuba Accord Lower Yuba River Accord

Z

ZLD zero liquid discharge

State Water Project Long-term Water Supply Contractors

The State Water Project long-term water supply contractors are listed below, followed by shortened forms of their names that are used in Bulletin 132.

Alameda County Flood Control and Water Conservation District, Zone 7	Alameda-Zone 7
Alameda County Water District	Alameda County
Antelope Valley-East Kern Water Agency	AVEK
Castaic Lake Water Agency	Castaic Lake
City of Yuba City	Yuba City
Coachella Valley Water District	Coachella
County of Butte	Butte
County of Kings	Kings
Crestline-Lake Arrowhead Water Agency	Crestline
Desert Water Agency	Desert
Dudley Ridge Water District	Dudley Ridge
Empire-West Side Irrigation District	Empire
Kern County Water Agency	Kern
Littlerock Creek Irrigation District	Littlerock
Metropolitan Water District of Southern California	Metropolitan
Mojave Water Agency	Mojave
Napa County Flood Control and Water Conservation District	Napa
Oak Flat Water District	Oak Flat
Palmdale Water District	Palmdale
Plumas County Flood Control and Water Conservation District	Plumas
San Bernardino Valley Municipal Water District	San Bernardino
San Gabriel Valley Municipal Water District	San Gabriel
San Geronio Pass Water Agency	San Geronio
San Luis Obispo County Flood Control and Water Conservation District	San Luis Obispo
Santa Barbara County Flood Control and Water Conservation District	Santa Barbara
Santa Clara Valley Water District	Santa Clara
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura

Non-SWP Water Contractors

The non-SWP water contractors are listed below, followed by shortened forms of their names that are used in Bulletin 132.

Arvin-Edison Water Storage District	Arvin-Edison
Belridge Water Storage District	Belridge
Berrenda Mesa Water District	Berrenda Mesa
Buena Vista Water Storage District	Buena Vista
Byron-Bethany Irrigation District	Byron-Bethany
Cawelo Water District	Cawelo
City of Tracy	Tracy
Contra Costa Water District	Contra Costa
County of Tulare	Tulare
Del Puerto Water District	Del Puerto
East Contra Costa Irrigation District	East Contra Costa
Fresno County Public Works	Fresno
Hills Valley Irrigation District	Hills Valley
Kern Delta Water District	Kern Delta
Kern-Tulare Water District	Kern-Tulare
Lost Hills Water District	Lost Hills
Lower Tule River Irrigation District	Lower Tule
Merced Irrigation District	Merced
Pixley Irrigation District	Pixley
Placer County Water Agency	Placer
Rag Gulch Water District	Rag Gulch
Rosedale-Rio Bravo Water Storage District	Rosedale-Rio
San Luis & Delta-Mendota Water Authority	San Luis & Delta-Mendota
Semitropic Water Storage District	Semitropic
South Feather Water and Power Agency	South Feather
Tejon-Castac Water District	Tejon-Castac
Tranquility Irrigation District	Tranquility
Tri-Valley Water District	Tri-Valley
United Water Conservation District	United
West Kern Water District	West Kern
Western Hills Water District	Western Hills
Westlands Water District	Westlands
Westside Mutual Water Company	Westside
Wheeler Ridge-Maricopa Water Storage District	Wheeler Ridge-Maricopa
Yuba County Water Agency	Yuba



Executive Summary

David N. Kennedy, DWR's sixth director, served in that capacity longer than any other director.



The annual Bulletin 132 series began in 1963 and reported the first deliveries of water by the new State Water Project (SWP). Bulletin 132-08, *Management of the California State Water Project*, continues this series as the forty-sixth edition. It reports on SWP planning, construction, finance, management, and operations during calendar year 2007. The SWP is operated and maintained by the California Department of Water Resources (DWR).

Please note that all figures, such as water delivery data, are accurate at the time of this publication; however, occasional changes do occur. For example, small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact the DWR staff in the State Water Project Analysis Office.

2007 SWP Highlights

The State Water Project (SWP) is one of the world's largest water, power, and conveyance systems. In the past decade it has conveyed an annual average of 2.9 million acre-feet (maf). SWP facilities—pumping and power plants; reservoirs, lakes, and storage tanks; canals, tunnels, and pipelines—capture, store, and convey water to 29 public water agencies.

California experienced lower-than-average rainfall and mountain snowpack during water year 2006–2007 (October 2006 through September 2007). Statewide precipitation was 65 percent of average, in stark contrast to the prior year's 136 percent. The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were dry and critical, respectively, based on observed data for water year 2006–2007. The Northern Sierra Eight Station Index finished with 37.3 inches of precipitation, or 75 percent of average.

Water storage in all SWP reservoirs at the end of water year 2006–2007 was 2.72 maf, or 50 percent of maximum storage. Total water storage in major SWP reservoirs at

the end of calendar year 2007 was about 2.45 maf, as compared with 4.49 maf in 2006. For more information see Chapter 8, Water Supply.

In 2007, SWP deliveries totaled 4,061,696 acre-feet (af). Water was delivered to 27 of the 29 long-term water contractors and 26 other agencies. Table A deliveries totaled 2,081,217 af, of which 94,762 af was 2006 carryover. For more information see Chapter 9, Water Contracts and Deliveries.

DWR continued to be its own energy scheduling coordinator with the California Independent System Operator (CAISO), and to schedule the purchase and sale of energy to operate the SWP. In 2007, energy used at the 28 SWP pumping and generating plants totaled 9.77 million megawatt hours (MWh). DWR sold 2.26 million MWh to 20 utilities and 22 power marketers, for total revenues of \$138.89 million in 2007. For further information see Chapter 10, Power Resources.

SWP facilities supported an estimated 4.7 million recreation days during the year. Large increases over 2006 occurred at Lake del Valle, Silverwood Lake and Castaic Lake, while Lake Perris visits were down, in part because of lowered lake levels

due to seismic concerns with Perris Dam. For further recreation information, see Chapter 13, Recreation.

The project continued to pay bondholders as scheduled and remained financially viable. The long-term water contractors continued to repay project construction bonds and operating expenses. In 2007, the SWP handled approximately \$1,022 million each in revenues and expenses. For more information, see Chapter 14, Financial Analysis.

David N. Kennedy: 1936–2007

On December 23, 2007, former DWR Director David N. Kennedy passed away at age 71. He was DWR's sixth director, serving from 1983 to 1998. Earlier in his career, he worked for DWR as an engineer from 1962 to 1968.

Under Director Kennedy, DWR expanded the SWP's Delta pumping capacity, enhanced the system's environmental safeguards, intensified Delta ecosystem and fish research, and completed construction of the 100-mile Coastal Branch to provide a supplemental water supply to users in Santa Barbara and San Luis Obispo counties. In 1994, he helped negotiate the historic Monterey Agreement.

Director Kennedy led DWR during the longest major statewide drought in modern California history, between 1987 and 1992. Drought responses included operating an innovative State Emergency Water Bank and many adaptive water supply adjustments and transfers.

Mr. Kennedy also led DWR during major flood events in 1986, 1995 and 1997—events he considered among the most challenging of his career. After widespread flooding in 1986, he helped upgrade DWR's flood-fighting abilities through creation of a Joint Operations Center.

Other achievements of the Kennedy era included the 1986 start of enlarging the SWP East Branch, adding four pumps to the Banks Pumping Plant in the 1990s, and completion of the North Bay Aqueduct Phase Two. Few individuals have had as much impact on the management of California's water supply and infrastructure as David Kennedy.

40th Anniversary of Sisk and Oroville Dams

During 2007, SWP recorded the 40th anniversary of two key elements—completion of Sisk Dam at San Luis Reservoir and Oroville Dam. Both dams were completed in 1967. Oroville Dam construction began in 1961. Lake Oroville is the second largest reservoir in California. Construction of Sisk Dam began in 1963. San Luis Reservoir is the largest off-stream storage reservoir in the United States.

Monterey Agreement Draft EIR and Public Meetings

The Monterey Amendment, based on Principles of Agreement released in 1994, was designed to increase the reliability of existing water supplies, provide stronger SWP financial management, and increase water management flexibility by providing more tools for local water agencies. In accordance with terms of the 2003 Monterey Settlement Agreement, the SWP operated pursuant to the Monterey Amendment while the new EIR was being prepared.

In October 2007, DWR released the *Draft Environmental Impact Report* (EIR) for the Monterey Amendment to SWP Contracts, including the Kern Water Bank Transfer and associated actions as part of a Settlement Agreement (Monterey Plus).

The draft EIR addressed the environmental impacts of changes to the SWP operations that are a consequence of the Monterey

Amendment and the Settlement Agreement. It also discussed the project alternatives, growth inducement, water supply reliability, as well as potential areas of controversy and concern. Four public meetings were held across the State to solicit public comments on the draft EIR.

Levee Evaluation and Repairs

Levee Emergency Repair

In January 2007, DWR completed work on 19 of the 71 emergency levee repair sites identified the year before—12 on the Sacramento River and seven on the lower San Joaquin River.

Aerial Levee Surveys

In spring, DWR aerially surveyed 350 miles of urban levees as part of the Levee Evaluation Program. The helicopter-borne equipment collected GPS, laser scanner and digital imagery data for use in geotechnical and erosion studies of the targeted levees.

Underwater Topographic Surveys

In December 2007, DWR conducted underwater topographic levee surveys of 111 miles of levee-protected waterways, gathering data along the Sacramento, American, San Joaquin and Calaveras rivers. The sonar imagery will aid in more concisely identifying areas of levee erosion as part of the overall geotechnical levee evaluation. Funding was provided by Propositions 84 and 1E, approved by voters the year before.

Climate Change

California water planners are concerned about climate change and its potential effects on water resources. Californians rely on two water projects: the SWP and federal Central Valley Project (CVP). These complex water storage and conveyance systems are operated by DWR and Reclamation for water supply, flood management, environmental protection, and recreational uses.

Legislative mandates, Executive Order S-3-05, and the latest update to the *California Water Plan* call for more quantitative assessments of climate change effects. To address these concerns, DWR and Reclamation formed a joint Climate Change Work Team to provide qualitative and quantitative information to managers on potential effects and risks of climate change to California's water resources.

In 2007, DWR participated in a climate change summit, co-sponsored a climate change workshop, and co-hosted a climate change water adaptation summit. DWR also signed a memorandum of agreement with the National Oceanic and Atmospheric Administration (NOAA) to establish a process for coordinating climate research applicable to water management.

DWR launched a climate change web portal to provide information about DWR's climate change activities, as well as basic information, resources, and research related to climate change.

Yearly Activities Summary

2007 Precipitation and Water Storage

Water stored and delivered by the SWP conservation and transportation facilities originates from rainfall and snowmelt in northern and central California watersheds, where most of the State's precipitation occurs. DWR monitors and records annual precipitation and runoff during each water year, which begins on October 1 and ends on September 30.

Precipitation and Snowpack in Water Year 2006–2007

California experienced a dry year with lower than average precipitation during water year 2006–2007 (covering October 2006 through September 2007). The State, as a

whole, received precipitation at 65 percent of average, as compared to 136 percent of average in 2005–2006. During the fourth week of February, statewide average snow water content peaked at 17 inches of water content. Not only was the peak storage observed a month earlier than the historical average April 1 peak date, the February 28 peak was only 58 percent of the April 1 average. These snow conditions compared poorly with those experienced during the 2005–2006 water year, which peaked at 161 percent. The Northern Sierra Eight Station Index finished with 37.3 inches of precipitation, or 74 percent of average.

Runoff

Statewide river runoff totaled 53 percent of average in water year 2006–2007. Sacramento River and San Joaquin River region runoff were 55 percent and 42 percent of average, respectively.

The Sacramento Valley Water Year Hydrologic Classification (40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (60-20-20 Index) were dry and critical, respectively, based on observed data for water year 2006–2007.

Water Year 2006–2007 Storage Totals

At the end of water year 2006–2007, storage in all SWP reservoirs was 2.72 maf or 50 percent of maximum storage, compared to 4.44 maf or 82 percent of minimum storage at the end of water year 2005–2006. The average end-of-month total storage for water year 2006–2007 in major SWP reservoirs was 3.98 maf. End-of-water-year storage on September 30, 2007 at Lake Oroville was 1.57 maf, about 1.26 maf less than the previous water year.

Calendar Year 2007 Storage Total

The total storage in major SWP reservoirs was about 2.45 maf at the end of calendar year 2007, compared with 4.49 maf in 2006.

Water Year 2007–2008 October–December Water Conditions

The last three months of calendar year 2007 were also the first three months of water year 2007–2008. At the end of October, water year runoff totals were 90, 47 and 46 percent of average for the Sacramento River, San Joaquin River and Tulare Lake regions, respectively. December runoff totals dropped to 47, 22 and 35 percent of average, respectively, for the three regions. For more information see Chapter 8, Water Supply.

2007 Water Supplies, Contracts, and Deliveries

2007 Water Deliveries

DWR approved an initial Table A allocation of 2.47 maf, or roughly 60 percent of most SWP contractor requests for Table A water deliveries, on November 30, 2006. The final allocation on May 23, 2007 remained at 60 percent, significantly below the historic 100 percent final allocation of the previous year.

In 2007, 4,061,696 af was delivered to 27 long-term contractors and 26 other agencies, as follows:

- 2,081,217 af of Table A water, which includes 94,762 af of 2006 carryover water;
- 309,973 af of Article 21 water;
- 115,204 af of Flexible storage withdrawal water;
- 2,581 af of SWP water for recreation and fish and wildlife;
- 1,258,278 af of nonproject water delivered to satisfy settlement agreements and agreements with SWP contractors for local water supplies; and
- 114,492 af of water delivered to satisfy agreements between the SWP and CVP.

Table ES-1 shows SWP water deliveries by category for 1962 through 2007. For more

Table ES-1 SWP Water Delivered by Category, 1962–2007 (Acre-feet) ^a

Year	Table A Water			Other SWP Water Deliveries					Total Deliveries
	Municipal and Industrial	Agricultural	Total	Article 21/Unscheduled		Other Water ^b	Feather River Diversions ^c	Fish & Wildlife/ Recreation Water	
				Municipal and Industrial	Agricultural				
1962	—	—	—	—	—	9,704	7,499	—	17,203
1963	—	—	—	—	—	13,212	16,049	—	29,261
1964	—	—	—	—	—	21,743	17,891	—	39,634
1965	—	—	—	—	—	35,985	27,425	—	63,410
1966	—	—	—	—	—	59,599	33,361	—	92,960
1967	5,563	5,791	11,354	0	0	45,225	24,639	—	81,218
1968	86,541	85,168	171,709	10,000	111,534	1,214	903,367	—	1,197,824
1969	63,956	129,064	193,020	0	72,397	8,692	832,454	—	1,106,563
1970	83,415	150,578	233,993	0	131,848	25,401	804,320	—	1,195,562
1971	93,776	263,564	357,340	0	294,581	35,438	825,886	8	1,513,253
1972	186,796	425,005	611,801	0	422,322	53,848	875,529	6,489	1,969,989
1973	297,497	395,391	692,888	0	294,916	29,540	851,285	1,155	1,869,784
1974	423,982	450,093	874,075	0	412,453	31,493	963,956	2,118	2,284,095
1975	670,492	553,498	1,223,990	356	620,329	46,995	924,696	3,377	2,819,743
1976	631,876	741,126	1,373,002	4,147	547,538	103,546	1,018,653	1,745	3,048,631
1977	354,930	218,966	573,896	0	0	410,991	624,497	1,111	1,610,495
1978	782,625	529,740	1,312,365	0	16,215	177,245	836,864	1,691	2,344,380
1979	692,888	711,404	1,404,292	0	646,830	431,693	933,067	1,766	3,417,648
1980	726,545	784,946	1,511,491	52,200	350,017	40,269	925,750	2,131	2,881,858
1981	1,053,273	835,852	1,889,125	18,920	889,508	283,310	993,785	4,688	4,079,336
1982	916,014	822,042	1,738,056	140	214,994	144,267	819,586	4,646	2,921,689
1983	482,749	701,370	1,184,119	0	13,019	172,030	633,778	7,849	2,010,795
1984	725,799	861,794	1,587,593	3,663	259,254	366,273	891,128	7,040	3,114,951
1985	983,341	929,424	1,912,765	9,638	292,206	474,417	924,049	4,033	3,617,108
1986	998,611	1,009,295	2,007,906	2,595	21,755	177,176	843,040	3,865	3,056,337
1987	1,079,983	1,033,932	2,113,915	6,949	107,958	375,810	882,301	7,672	3,494,605
1988	1,308,071	1,068,302	2,376,373	0	0	520,375	884,877	4,889	3,786,514
1989	1,602,543	1,251,204	2,853,747	0	0	474,559	830,500	8,135	4,166,941
1990	1,876,072	706,079	2,582,151	0	90	424,697	875,099	9,262	3,891,299
1991	536,669	12,444	549,113	3,521	0	543,582	565,395	4,879	1,666,490
1992	955,687	455,112	1,410,799	1,156	0	166,992	613,978	2,605	2,195,530
1993	1,069,258	1,243,978	2,313,236	0	0	256,853	822,589	2,609	3,395,287
1994	1,134,992	614,359	1,749,351	48,150	64,475	236,739	874,018	8,200	2,980,933
1995	801,570	1,165,523	1,967,093	17,984	46,346	85,560	860,077	2,575	2,979,635
1996	1,143,638	1,371,186	2,514,824	12,091	16,556	252,346	1,005,148	3,907	3,804,872
1997	1,220,200	1,040,183	2,260,383	2,814	18,618	322,000	993,211	4,146	3,601,172
1998	865,795	860,724	1,726,519	9,982	10,306	127,405	872,738	2,108	2,749,058
1999	1,405,311	1,333,592	2,738,903	61,191	96,879	85,312	1,108,672	4,324	4,095,281
2000	1,968,161	1,231,745	3,199,906	170,302	138,483	333,384	1,085,886	4,030	4,931,991
2001	1,168,333	365,930	1,534,263	10,261	33,174	535,147	1,077,997	2,929	3,193,771
2002	1,849,052	715,805	2,564,857	9,502	27,663	272,277	1,131,880	3,694	4,009,873
2003	2,102,557	787,658	2,890,215	5,397	29,629	233,069	1,006,995	2,846	4,168,151
2004	1,951,657	643,342	2,594,999	103,890	112,949	341,922	1,171,835	2,865	4,328,460
2005	1,877,647	948,563	2,826,210	186,787	544,296	92,858	1,074,706	1,506	4,726,363
2006	1,973,268	998,583	2,971,851	293,358	327,981	119,405	1,112,551	1,936	4,827,082
2007	1,572,198	509,019	2,081,217	185,825	124,148	449,935	1,217,990	2,581	4,061,696
Total	39,723,331	28,961,374	68,684,705	1,230,819	7,311,267	9,449,533	36,620,997	141,410	123,438,731

^a Note: values presented in this table reflect changes to historical delivery data as a result of an audit performed by DWR. These data supersede values presented in previous B132 editions.

^b Includes water conveyed for SWP and non-SWP water contractors.

^c Includes amounts of water diverted according to various water rights agreements.

information see Chapter 9, Water Contracts and Deliveries.

Power Resources

In 2007, DWR sold 2.26 million MWh to 20 utilities and 22 power marketers for total revenues of \$138.89 million. DWR also received \$40.43 million in revenues for capacity, exchanges, and other energy-related services, including \$24.35 million for transactions made through CAISO. See Table 10-4 in Chapter 10, Power Resources, for information about energy and other services sold and revenue received, including those sold to CAISO.

Also in 2007, DWR amended one of four power contracts with Calpine Energy Services, reducing both the amount to be purchased and the rate to be paid. The contract amendment was part of a larger effort by the State to transition out of the power supply business following the 2000–2001 energy crisis.

The sidebar, State Water Project Power Generation and Consumption in 2007, summarizes amounts of power generated and consumed by SWP. For more information, see Chapter 10, Power Resources.

Oroville Relicensing Settlement Agreement

The original 50-year term Federal Energy Regulatory Commission (FERC) Project Number 2100 hydropower license for operation of the Oroville Facilities, expired January 31, 2007. The project continued to operate under an annual license issued by FERC February 1, 2007.

U.S. Fish and Wildlife Service (USFWS) issued the terrestrial biological opinion (BO) for the project in April 2007, and in July, DWR submitted the biological assessment and essential fish habitat assessment evaluating the effects of the Settlement Agreement and

issuance of a new FERC license on federally listed anadromous fish.

In November, the Habitat Expansion Agreement (HEA) for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead was signed by DWR and Pacific Gas and Electric Company (PG&E). Concurrently, the two agencies entered into the Habitat Expansion Coordination Agreement (HECA) to ensure coordinated decision making and implementation of actions to achieve the goals of the HEA.

For additional Oroville Facilities relicensing information, see Chapter 3, Environmental Programs, Chapter 10, Power Resources, and Chapter 13, Recreation.

Financial Analysis

In 2007, DWR continued to pay bondholders as scheduled. The SWP was financially liable and was indirectly paid for by the approximately 25 million water users served by the project. Direct payment was through the 29 long-term water contractors. In 2007, the SWP handled approximately \$1,022 million in revenues and \$1,022 million in expenses. The 2007 Income Statement for the State Water Project sidebar presents a summary of the year's revenues and expenses. For more information about SWP revenues and expenditures for the year, see Chapter 14, Financial Analysis.

Litigation

In 2007, DWR was involved in or closely monitoring court cases and other actions related to SWP management—two are highlighted as follows. (See Chapter 6, Legislation and Litigation, for further information.)

Delta Smelt

Natural Resources Defense Council, et al. v. Kempthorne, et al.—The plaintiffs claim the USFWS BO fails to adequately consider

State Water Project Power Generation and Consumption in 2007

Power Generation and Consumption	Millions of Megawatt Hours
Energy generation by SWP facilities	5.577
Energy sources and firm purchases under long-term agreements and exchanges	6.642
Total Energy Available to the SWP	12.220
Energy sales	(2.446)
Net SWP Power Consumption	9.773

2007 Income Statement for the State Water Project

Revenues	Thousands of Dollars
Water Contract Payments	1,045,918
Revenue Bond Cover Adjustments	(41,947)
Rate Management Adjustments	(2,998)
Other Revenues	20,914
Total Operating Revenues	1,021,887
Expenses	
Project Operations, Maintenance, Power, and Replacement	698,315
Deposits to Reserves	54,369
Water Bond Principal	125,298
Water Bond Interest	143,905
Total Operating Expense and Debt Service	1,021,887
Net System Revenues	0

or address the effects on delta smelt. The plaintiffs claim the opinion improperly relies on uncertain measures and the adaptive management process without adequate evidence that the measures will be undertaken and be effective. The case seeks to have the U.S. Department of the Interior and USFWS withdraw the opinion and not take any action in reliance upon it. Deadlines were set for filing motions for summary judgment for the end of December 2007.

On May 31, 2006, Plaintiffs served a 60-day notice to the Federal Defendants, NOAA, of alleged Endangered Species Act (ESA) violations. The Plaintiffs' amended complaint alleges the five salmon-run species and steelhead survival and population stability are threatened by the current and planned joint operations of the CVP and SWP. Plaintiffs request the court declare the 2004 Salmon/Steelhead BO unlawful and issue an injunction from implementation of project operations, as described in the 2004 opinion.

Chapter 6, Legislation and Litigation, presents a complete summary of legal and legislative activities and milestones in 2007.

Flood Protection

"A California Challenge—Flooding in the Central Valley"

This paper was prepared at the request of DWR by an independent panel of experts from across the nation to provide insights and recommendations on how California should deal with the special circumstances of deep floodplains in the Central Valley.

Flood Protection Legislation

On October 10, the Governor signed a package of six bills relating to improved flood protection in California. One major bill renamed the Reclamation Board as the Central Valley Flood Protection Board, effective in 2008. It also mandated development of a comprehensive Central

Valley Flood Protection Plan, under board supervision.

Delta Flood Emergency Preparedness and Response Plan

DWR began developing a Delta Flood Emergency Preparedness and Response Plan to improve its ability to prepare for, respond to, and recover from multiple-island levee failure within the Sacramento-San Joaquin Delta caused by a flood or seismic event. The plan objective is to minimize recovery time from such an event through preparedness, response, and actions taken.

FloodSAFE

In 2006, DWR launched a comprehensive initiative called "FloodSAFE California" to address the State's flood management challenges. The FloodSAFE program is a collaborative statewide effort designed to accomplish five broad goals:

- reduce the chance of flooding;
- reduce the consequences of flooding
- sustain economic growth;
- protect and enhance ecosystems; and
- promote sustainability.

FloodSAFE programs will be funded by approximately \$700 million appropriated for fiscal year 2007–2008 from Propositions 1E and 84 bond funds.

In 2007, the FloodSAFE project team conducted public and government workshops statewide. In the workshops, DWR provided an overview of the FloodSAFE California Initiative and information on fiscal year 2007–2008 bond funding availability. Workshop participants were encouraged to initiate early stakeholder and partner dialog.

Delta Resources and Environmental Issues

Environmental Water Account

The Environmental Water Account (EWA) is a cooperatively managed program intended to provide beneficial environmental changes to protect the fish of the Bay-Delta Estuary and increased SWP and CVP operational flexibility for enhancement of the water supply reliability to its customers. The three management agencies—National Marine Fisheries Service (NOAA Fisheries), USFWS, and Department of Fish and Game (DFG) and the two project agencies—Reclamation and DWR, are responsible for EWA implementation.

In 2007, DWR and four governmental agencies made the Draft Supplemental Environmental Impact Statement (EIS)/EIR for EWA available for public review and comment. The document addressed changes to the regulatory and physical environment that occurred since completion of the Final EIS/EIR and the Record of Decision (ROD) in 2004.

In 2007, exports were periodically curtailed at the SWP and CVP export facilities between January and June. These actions resulted in EWA export reductions of 408,050 af to the SWP and 93,466 af to the CVP.

During water year 2007–2008, DWR and Reclamation obtained 451,472 af in acquisition assets for EWA. EWA had no carryover debt at the beginning of calendar year 2007 but by year's end, the EWA debt was 50,042 af. For more EWA information, see Chapter 3, Environmental Programs, Chapter 7, Water Supply Development and Reliability, and Chapter 9, Water Contracts and Deliveries.

DWR Stops Pumping to Protect Delta Smelt

In May 2007, the State saw the first voluntary shutdown of the SWP pumps in the Delta to

protect fish. Limited pumping resumed 10 days later, and 5 days after that, pumping was increased to resume water deliveries.

Delta Vision

Executive Order S-17-06 directed development of a Delta Vision to provide a sustainable management program for the Sacramento-San Joaquin Bay-Delta. The Governor appointed the Delta Vision Blue Ribbon Task Force in February 2007, which then held meetings soliciting public and scientific input on addressing Delta issues. Recommendations were published in a vision document, released in December.

Delta Risk Management Strategy

A major State priority is determining how to make the Delta sustainable in the future. The 2000 CALFED ROD presented its Preferred Program Alternative, describing actions, studies, and conditional decisions to help improve the Delta. Included in the Preferred Program Alternative for Stage 1 implementation was the completion of a Delta Risk Management Strategy (DRMS) looking at Delta sustainability and assessing major risks to the Delta resources from floods, seepage, subsidence, and earthquakes. DRMS would also evaluate the consequences, and develop recommendations to manage the risk.

In 2007, the DRMS preliminary findings were reviewed by a CALFED scientific panel, leading to reevaluation of some of the initial DRMS analyses. Reevaluation results will be incorporated into the final DRMS report, scheduled for 2008.

North Delta Program

The North Delta Program is part of the CALFED Conveyance Program. Several improvements to North Delta conveyance facilities proposed in the CALFED ROD are being considered, and DWR has been evaluating them in cooperation with other agencies.

During 2007, DWR continued overseeing preparation of the public draft EIR, incorporating responses to comments received on the administrative draft EIR.

Proposed project actions and alternatives have been subdivided into two groups for analysis in the EIR.

Group I includes levee modifications on McCormack-Williamson Tract, raising downstream levees to offset potential hydraulic impacts caused by these modifications, restoration of McCormack-Williamson Tract and the Grizzly Slough property, and dredging along the Mokelumne River.

Group II includes several project actions on Staten Island and Mokelumne River levee modifications and dredging.

See Chapter 2, Delta Resources, for more North Delta Program information.

Watershed Grant Awards

DWR awarded more than \$10 million in CALFED grants to 27 watershed projects throughout the State, selecting among 95 applications. The grants are to “study, restore and value” watersheds using money from Proposition 50 bond sales, approved by voters in 2002.

Quagga Mussel Monitoring

The quagga mussel, *Dreissena rostriformis bugensis*, and the closely related zebra mussel, *D polymorpha*, are invasive aquatic species. The mussels colonize hard or soft substrates, but tend to attach to structures, clogging power generation facility cooling and pumping plant systems and trash racks, screens, internal piping, strainers, and filters used in municipal, industrial, and agricultural water delivery systems. The resulting damage to infrastructure can cost billions of dollars in maintenance or repair.

Quagga mussels were discovered in January 2007 in Lake Mead, and subsequent surveys found them in Lakes Mohave and Havasu and part of the Colorado River Aqueduct (CRA) that serves Southern California. It was the first discovery of these mussels west of the Continental Divide. They are believed to have entered the Colorado River system in boats trailered there from infested waters in the Midwest. In August 2007 they were discovered in San Diego and Riverside county reservoirs served by the CRA.

DWR began monitoring the SWP for quagga mussels shortly after the mussels were first detected in California. No mussels were found in the SWP or its associated watersheds.

Status of Threatened or Endangered Species Listings

North American Green Sturgeon

In 2006, NOAA Fisheries published a final rule listing the Southern Distinct Population Segment (DPS) of North American green sturgeon as threatened under the federal ESA. In 2007, the Center for Biological Diversity filed a notice of intent to sue NOAA Fisheries for failing to designate critical habitat for the green sturgeon Southern DPS, as required by ESA. A settlement agreement was reached later in the year, with a critical habitat designation proposal expected in 2008.

Delta Smelt

In 1993, delta smelt was designated as threatened under the ESA. At the time of the ruling, delta smelt populations had declined nearly 90 percent since the 1970s, and abundance has continued since. In 2006, the Center for Biological Diversity, the Bay Institute, and the Natural Resources Defense Council petitioned USFWS to change the delta smelt status from threatened to endangered under the ESA. In 2007, the Center for Biological Diversity filed a notice of intent to sue USFWS for failure to respond

to the 2006 petition. On June 7, 2007, the California Fish and Game Commission accepted a petition to consider uplisting the delta smelt to endangered species status under CESA, initiating a species status review by DFG.

Longfin Smelt

In 2007, the Bay Institute, the Center for Biological Diversity and the Natural Resource Defense Council petitioned USFWS to list the Bay-Delta longfin smelt population as threatened or endangered under the federal ESA, and petitioned the California Fish and Game Commission to list the fish statewide under CESA. The petitions were in response to four consecutive years of population declines and related issues.

For more information on listed species, see Chapter 3, Environmental Programs.

Pelagic Organism Decline in the Upper San Francisco Estuary

Long-term monitoring by the Interagency Ecological Program (IEP) showed continued marked declines in pelagic fishes in the upper San Francisco Estuary in 2007. Affected populations include delta smelt, longfin smelt, striped bass, and threadfin shad. IEP formed a pelagic organism decline (POD) work team to evaluate the potential causes. The POD work team developed a pelagic fish work plan for 2006–2007. Major findings through 2007 were synthesized using two conceptual modeling approaches. Details can be found in the “Pelagic Organism Decline Progress Report: 2007 Synthesis of Results.” Many studies initiated either by the POD work team or others are still in progress and will continue to provide important POD information.

Lake Davis Northern Pike Eradication

Lake Davis, in the upper Feather River watershed, was treated for the second

time in a decade in an attempt to eliminate invasive northern pike. If left unchecked, it was feared the pike would escape the lake and make their way downstream to Lake Oroville and eventually, the Sacramento River system.

Lake Davis is an important SWP storage reservoir as well as a water supply for nearby communities and a recreational lake. DFG treated the lake with the piscicide rotenone in September 2007. Closure of the lake’s outlet at the dam assured no treated water would escape into Big Grizzly Creek, below. Following treatment and complete dispersal of the treatment compounds, DFG plans to restock the lake with trout and reopen it to the public in 2008, while continuing to monitor for the possible presence of northern pike.

DWR Scientists Discover New Invertebrate Species

As a result of biological fieldwork conducted in 2004 and 2005, a previously unknown invertebrate species was determined to comprise a large proportion of “insect drift” present in the Sacramento River’s Yolo Bypass. The discovery of *Hydrobaenus saetheri* was formally published in 2007.

During the DWR research, difficulties were encountered in identifying the midge species. DWR scientists consulted with a world-renowned midge expert at U.C. Davis who determined that it was a new species of midge. The Yolo Bypass conveys water only during high-water events on the river and the *Hydrobaenus* larva only hatch during these intermittent inundations. When present in the bypass, the midge larvae are a significant food source for young Chinook salmon and Sacramento splittail.

SWP Security Measures

Security and protection of the SWP remain primary goals for DWR. After the September 2001 attacks, DWR further

increased security, including regulating access to, and closely monitor activities at SWP facilities and DWR offices. SWP facilities are now limited to the visitor centers and noncritical facilities such as the Delta Fish Facilities, Feather River Fish Hatchery, and administration building overlooks. All SWP recreational reservoirs are open to the public, but boats are not allowed within 500 feet of dams or any associated structures. Signs at each recreational reservoir alert the public to zones not accessible to them.

SWP operations are closely monitored and DWR staff are vigilant in maintaining a secure environment. Security patrols are more frequent than previously, and plans are in place to address potential or actual acts of terrorism. Security system improvements continue, in conjunction with Reclamation and other federal and State agencies.

SWP Milestones through the Decades

Fifty Years Ago–1957

In February 1957, the Legislature made the first appropriation of \$25,190,000 to the DWR for actual construction of the SWP.

Preparation for the construction of Oroville Dam began in May 1957. The first contract covered constructing tunnels 4 and 5 on the Western Pacific Railroad relocation, necessary to clear the dam and reservoir sites.

The State Water Resources Board published Bulletin 3, “The California Water Plan”—the first California Water Plan. It presented preliminary plans for developing all of the state’s water resources to meet its ultimate water needs.

Twenty Years Ago–1987

Construction continued on the first phase of the California Aqueduct East Branch

enlargement project, to provide an additional flow of 1,500 to 1,683 cubic feet per second (cfs). Raising the canal lining to accommodate the increased flow in Stage I was completed in 1987.

Contracting and design work continued on several projects, including Harvey O. Banks Delta Pumping Plant completion, Phase II of the North Bay Aqueduct, Pearblossom Pumping Plant enlargement, Mojave Siphon Powerplant construction and Devil Canyon Powerplant expansion.

In March 1987, DWR, DFG, USBR, and Suisun Resource Conservation District signed the Suisun Marsh Preservation Agreement (SMPA) to mitigate for impacts on Marsh salinity from the CVP, SWP, and other upstream diversions.

In November, after more than 25 years of negotiations and Congressional approval, DWR and Reclamation sign the Coordinated Operations Agreement. It ushers in a new era of cooperation in operating the SWP and CVP.

Ten Years Ago–1997

In early 1997 major floods hit California. The 1997 flood caused 48 of California’s 58 counties to be declared disaster areas and nearly \$2 billion in damages. Oroville Dam released a record 160,000 cfs through the spillway.

In response to concerns raised by the flooding, the Governor formed the Flood Emergency Action Team (FEAT). The final FEAT report published in 1997 outlined FEAT’s findings after gathering input from the public and evaluating existing flood control facilities and emergency agency responses, and listed their recommendations to enhance the capability to reduce impacts from future flood events.

In early February 1997, based on a 99-percent exceedence, DWR approved 100 percent of the water delivery requested by the 29 long-term State Water Contractors. Although one of the driest springs on record followed and adequate water supply became a growing concern, final allocations remained at 100 percent through working with the contractors, rescheduling, and drawing groundwater banked by the SWP in Kern County groundwater basins.

On July 18, 1997, nearly 300 State and local leaders gathered to celebrate the completion and dedication of the 100-mile long Coastal Aqueduct water project, which delivers SWP water to San Luis Obispo and Santa Barbara counties. The project was a joint effort between DWR and the Central Coast Water Authority.



Chapter 1

The State Water Project

The California Aqueduct.

This chapter primarily provides background on the State Water Project (SWP), including brief descriptions of SWP facilities, planning, construction, power operations, financing, contracting agencies, and the project's many uses and functions. It also provides a glimpse of California history, with a look at the processes and decisions that went into the creation of the largest state-built water project in the country.

Chapters 2 through 15 provide more detail on significant events and specific topics related to management of the SWP in calendar year 2007. At the end of the bulletin, Appendix B presents data and computations used to determine the SWP Contractors' Statements of Charges for 2009.

Information in this chapter was contributed by the Division of Operations and Maintenance and the State Water Project Analysis Office.

California's diverse geography contains both the highest and lowest elevations in the coterminous United States, with a resulting diversity of climate that ranges from desert to alpine to subtropical. In a typical year, some areas receive as little as 2 inches of rain, while others receive more than 100 inches. This diversity of geography and climate creates an intricate and constantly changing pattern of water supplies, which, in turn, creates enormous challenges in managing this vital resource.

The State Water Project

Like present-day Californians, the earliest settlers faced the problem of how best to conserve, control, and deliver water. Remains of aqueducts, canals, and dams are still found near some of California's original missions. The first recorded aqueduct, built in 1770 to serve the San Diego mission, was 6 miles long. In the early twentieth century, several cities, including San Francisco and Los Angeles, built aqueducts to convey water from the Sierra Nevada to other parts of the State.

In 1951, after many years of discussion and study, the Legislature authorized construction of a water storage and supply system to capture and store rainfall and snowmelt runoff in Northern California and deliver it to areas of need throughout the State. 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 in general obligation bonds, as authorized in the act, thereby securing funds to build the State Water Project (SWP). In 1962, the first water was delivered through a portion of the South Bay Aqueduct to two long-term contracting agencies in Alameda County.

Today the SWP, built, operated, and managed by the Department of Water Resources (DWR), is the largest state-built,

multipurpose, user-financed water project in the country. It was designed and built to deliver water, control flooding, generate power, provide recreational opportunities, and enhance habitat for fish and wildlife. SWP water irrigates about 750,000 acres of farmland, mainly in the south San Joaquin Valley. Approximately 25 million of California's estimated 37 million residents benefit from SWP water.

Precipitation and Runoff

The water stored and delivered by the SWP originates from rainfall and snowmelt runoff in Northern and Central California's watersheds, where most of the State's precipitation occurs.

Since 1968, DWR has monitored and recorded annual precipitation and runoff, because precipitation, snowpack, and the rate and amount of snowmelt help determine how much water the SWP can deliver in any given year. The DWR-designated water year is October 1 through September 30.

Water Delivery Facilities

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. Although initial transportation facilities were essentially completed in 1973, other facilities have since been built, and still others are either under construction or are planned to be built, as needed.

The SWP facilities include 30 dams (29 of which impound water), 20 reservoirs, 29 pumping and generating plants, and approximately 700 miles of aqueducts in total. Figure 1-1 shows the names and locations of primary water delivery facilities.

Existing long-term SWP water supply contracts call for the annual delivery of up to 4,129,306 acre-feet (af; one acre-foot is approximately 325,851 gallons) of Table A water during 2007 through SWP facilities, gradually increasing to a maximum of 4,172,786 af by 2016. Some changes have occurred since the long-term water contracts were signed in the 1960s, including population growth variations, differences in local use, local water conservation programs, and conjunctive-use programs. The SWP delivered 1,986,455 af of approved 2007 Table A water to long-term SWP water contractors' service areas in 2007. Demands for SWP water are expected to increase as California's population continues to grow.

Project Design

Water from rainfall and snowmelt runoff is stored in SWP conservation facilities and delivered via SWP transportation facilities to water agencies and districts in the Southern California, Central Coastal, San Joaquin Valley, South Bay, North Bay, and Upper Feather River areas.

Three small reservoirs—Lake Davis, Frenchman Lake, and Antelope Lake—are the northernmost SWP facilities. Situated on Feather River tributaries in Plumas County, these lakes are used primarily for recreation. They also provide water to the City of Portola and local agencies that have water rights agreements with DWR.

Downstream from these lakes lies Lake Oroville, the keystone of the SWP. Lake Oroville conserves water from the Feather River watershed. Created by Oroville Dam, the tallest earthfill dam in the Western

Hemisphere, Lake Oroville is the project's largest storage facility with a capacity of about 3.5 million af.

Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern portion of California's great Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta, comprising 738,000 acres of land interlaced with channels that receive runoff from 40 percent of the State's land area. The SWP, federal Central Valley Project (CVP), and local agencies all divert 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, which was completed in 1988. Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. Banks Pumping Plant lifts water from Clifton Court Forebay into the California Aqueduct, which flows to Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct to supply 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 delivered to Bethany Reservoir from Banks Pumping Plant flows into the California Aqueduct. This 444-mile-long main aqueduct conveys water to the agricultural lands of the San Joaquin Valley and to the urban regions of Southern California.

The California Aqueduct winds along the west side of the San Joaquin Valley. It transports water to O'Neill Forebay, Gianelli Pumping-Generating Plant, and San Luis Reservoir. San Luis Reservoir has a storage capacity of more than 2 million af and is jointly owned by DWR and the Bureau of Reclamation (Reclamation). DWR's share of gross storage in the reservoir is 1,062,183 af.



Figure 1-1 Names and Locations of Primary Water Delivery Facilities, December 31, 2007

Generally, water is pumped into San Luis Reservoir from late fall through early spring, where it is temporarily stored for release back to the California Aqueduct to meet summertime peaking demands of SWP and CVP water contractors.

Both SWP water not stored in San Luis Reservoir and water eventually released from San Luis flows south through the San Luis Canal, a portion of the California Aqueduct jointly owned by DWR and Reclamation.

As the water flows through the San Joaquin Valley, numerous turnouts convey it to farmlands within the service areas of the SWP and CVP. Along its journey, this water is lifted more than 1,000 feet by four pumping plants—Dos Amigos, Buena Vista, Teerink, and Chrisman—before reaching the foot of the Tehachapi Mountains.

In the southern San Joaquin Valley, near Kettleman City, Phase I of the Coastal Branch Aqueduct serves agricultural areas west of the California Aqueduct. In August 1997, completion of Phase II extended the Coastal Branch Aqueduct to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, home to roughly two-thirds of California's population. Before it can be delivered, the water must first cross the Tehachapi Mountains. Fourteen 80,000-horsepower pumps at 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. The water enters 8.5 miles of tunnels and siphons as it flows into Antelope Valley, where the California Aqueduct divides into two branches: the East Branch and the West Branch.

The East Branch carries water through Alamo Powerplant, Pearblossom Pumping Plant, and Mojave Siphon Powerplant into

Silverwood Lake in the San Bernardino Mountains. From Silverwood Lake, water flows through the San Bernardino Tunnel to Devil Canyon Powerplant. Water continues down the East Branch through the Santa Ana Pipeline to Lake Perris, the southernmost SWP reservoir.

The East Branch Extension is a nearly 33-mile pipeline linking parts of service areas for San Bernardino Valley Municipal Water District and San Geronimo Pass Water Agency to the California Aqueduct. The East Branch Extension, Phase I, carries water from Devil Canyon Powerplant Afterbay to Cherry Valley, bringing water to Yucaipa, Calimesa, Beaumont, Banning, and other communities. Phase II, when completed, will assist with this delivery.

Water in the West Branch flows through Oso Pumping Plant, Quail Lake, and then from the Peace Valley Pipeline through Warne Powerplant into Pyramid Lake in Los Angeles County. From there it flows through the Angeles Tunnel, Castaic Powerplant, Elderberry Forebay, and into Castaic Lake, terminus of the West Branch. Castaic Powerplant is operated by the Los Angeles Department of Water and Power.

The energy needed to operate the SWP, the largest single user of electrical power in California, comes from a combination of its own hydroelectric and coal-fired generating plants and power purchased from and exchanged with other utilities. The coal-fired plant and the project's eight hydroelectric power plants, including three pumping-generating plants, produce enough electricity in a normal year to supply about two-thirds of the SWP's necessary operating power.

Tables 1-1 through 1-5 present statistical information about primary storage facilities, primary dams, pumping plants, power plants, and aqueducts. Additional information regarding power operations can be found in Chapter 10, Power Resources.

Table 1-1 Physical Characteristics of Primary Storage Facilities

Facility	Data at Absolute Maximum Elevation		
	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	15,810	167
Thermalito Forebay	11,800	630	10
Thermalito Afterbay	57,000	4,300	26
Thermalito Diversion Pool	13,400	320	10
Clifton Court Forebay	31,300	2,180	8
Bethany Reservoir	5,100	180	6
Lake del Valle	77,100	1,060	16
San Luis Reservoir	2,027,800	12,520	65
SWP storage, 1,062,183 af			
O'Neill Forebay	56,400	2,700	12
SWP storage, 29,500 af			
Los Banos Reservoir	34,600	620	12
Little Panoche Reservoir	5,600	190	6
Quail Lake	7,600	290	3
Pyramid Lake	171,200	1,300	21
Elderberry Forebay	32,500	500	7
Castaic Lake	323,700	2,240	29
Silverwood Lake	75,000	980	13
Lake Perris	131,500	2,320	10

Future Planning and Construction

SWP aqueduct facilities were initially designed and constructed to provide service to all agencies to meet their water delivery needs up to 1990. Project water conservation reservoirs were planned to be constructed in stages as water demands increased. Oroville and San Luis were the first SWP conservation reservoir facilities constructed. Additional facilities were scheduled to meet increased demands. It was anticipated that population

growth in delivery service areas and water supply areas of origin would influence the final schedule for additional SWP facilities. Increasingly, issues such as escalating costs, environmental concerns, and increased non-SWP demands for limited water supplies have become important factors affecting the planning and construction of new facilities.

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

Planners are also concerned about climate change and its potentially serious effects on water resources. Temperature increases may affect water demand and aquatic ecosystems. Projected increases in air temperature may lead to changes in the amount, timing, and form of precipitation—rain or snow, changes in the volume and timing of runoff, Delta water quality changes due to sea-level rise, and changes in the amount of irrigation water needed due to modified evapotranspiration rates.

The ability of the SWP and CVP to meet the water demands of their customers and the environment depends on the accumulation of mountain snow and subsequent spring and summer snow-melt runoff. A warming climate may reduce this natural water storage mechanism.

To address these concerns, DWR and Reclamation formed a joint Climate Change Work Team to provide qualitative and quantitative assessments of the potential risks and effects of climate change on California's water resources. The team will regularly update decision makers on climate

Table 1-2 Physical Characteristics of Primary Dams

Facility	Crest Elevation (Feet)	Structural Height (Feet)	Crest Length (Feet)	Structural Volume (Thousands 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 Forebay	233	88	14,350	3,000
Los Banos Detention	384	167	1,370	2,100
Little Panoche Detention	676	152	1,440	1,210
Pyramid	2,606	400	1,090	6,800
Elderberry Forebay	1,550	200	1,990	6,000
Castaic	1,535	425	4,900	46,000
Cedar Springs	3,378	249	2,230	7,600
Perris	1,600	128	11,600	20,000
Crafton Hills	2,932	95	500	144

Table 1-3 Pumping Plant Characteristics

Facility	Number Of Units	Normal Static Head (Feet)	Total Flow at Design Head (cfs)	Total Motor Rating (hp)
Thermalito	3 (p-g) ^a	85-102	9,120	120,000
Hyatt	3 (p-g) ^a	500-625	5,610	519,000
Barker Slough	9	95-120	228	4,800
Cordelia	11	138		
Banks	11	236-252	10,670	333,000
South Bay	9	566	330	27,750
Del Valle	4	0-38	120	1,000
Gianelli	8 (p-g) ^a	99-327	11,000	504,000
Dos Amigos	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,050
Badger Hill	6	151	454	11,750
Devil's Den ^b	6	521	134	10,500
Bluestone ^b	6	484	134	10,500
Polonio Pass ^b	6	533	134	10,500
Buena Vista ^b	10	205	5,405	144,500
Teerink ^b	9	233	5,445	150,000
Chrisman ^b	9	518	4,995	330,000
Edmonston ^b	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	540	2,575	203,200
Greenspot	4	382	50	3,900
Crafton Hills	3	613	40	4,000
Cherry Valley	2	130	75	300

^aThe term p-g indicates pumping-generating units.

^bThese plants have one unit in reserve.

Table 1-4 Power Plant Characteristics, by Type and Facility

Type and Facility	Number of Units	Normal Static Head (Feet)	Total Flow at Design Head (cfs)	Net Dependable Capacity (MW)	Nameplate Capacity (MW)
Hydro					
Thermalito Diversion Dam	1	63-77	615	3	3
Thermalito	4 (3 p-g) ^a	85-102	17,400	114	114
Hyatt	6 (3 p-g) ^a	410-676	16,950	645	645
Gianelli (total)	8 p-g ^a	99-327	16,960	363	424
Alamo	1	115-141	1,740	15	17
Warne	2	719-739	1,600	67	74
Mojave Siphon	3	81-136	2,880	29	30
Devil Canyon	4	1,406	2,940	235	276
Castaic	7 (6 p-g) ^a	900-1,050	20,820	1,128	1,254
Coal					
Reid Gardner, Unit 4 (total) SWP share of generation ^c	1 ^b			234	275

^a The term p-g indicates pumping-generating units.

^b Life of the plants is expected to extend through 2013.

^c SWP ownership share in Reid Gardner, Unit 4, is 67.8%.

Table 1-5 Total Miles of Aqueducts

Facility	Channel and Reservoir	Canal and Siphon	Pipeline and Discharge Line	Tunnel	Total
Grizzly Valley Pipeline	0.0	0.0	6.0	0.0	6.0
Thermalito Power Canal and Tail Channel	1.5	1.9	0.0	0.0	3.4
North Bay Aqueduct	0.0	0.0	27.6	0.0	27.6
South Bay Aqueduct (including del Valle Branch)	0.3	10.7	31.9	1.7	44.6
<i>Subtotal</i>	<i>1.8</i>	<i>12.6</i>	<i>65.5</i>	<i>1.7</i>	<i>81.6</i>
California Aqueduct					
Clifton Court Forebay to O'Neill Forebay	4.5	61.9	0.3	0.0	66.7
O'Neill Forebay to Kettleman City	4.1	101.4	0.2	0.0	105.7
Kettleman City to Edmonston Pumping Plant	0.0	120.1	0.9	0.0	121.0
Edmonston Pumping Plant to Tehachapi Afterbay	0.0	0.2	1.9	7.9	10.0
Tehachapi Afterbay to Lake Perris	4.0	97.8	34.3	3.9	140.0
<i>Subtotal</i>	<i>12.6</i>	<i>381.4</i>	<i>37.6</i>	<i>11.8</i>	<i>443.4</i>
California Aqueduct Branches					
Coastal Branch	0.0	14.1	98.7	2.7	115.5
West Branch	9.7	9.3	5.8	7.1	31.9
East Branch Extension					
Devil Canyon Powerplant to Greenspot Pumping Station	0.0	0.0	16.2	0.0	16.2
Greenspot Pumping Station to Noble Creek Terminus	0.0	0.0	16.4	0.0	16.4
<i>Subtotal</i>	<i>9.7</i>	<i>23.4</i>	<i>137.1</i>	<i>9.8</i>	<i>180.0</i>
Total	24.1	417.4	240.2	23.3	705.0

change impacts, the ability of existing facilities to accommodate these impacts, and available mitigation measures.

In response to changes brought about by population growth, environmental concerns, climate change, and other factors, DWR continues to plan, design, and construct transportation and power-producing facilities for the SWP. For a more information on current SWP planning and construction, see Chapter 12, Engineering and Real Estate. Information about prior construction activities can be found in previous issues of Bulletin 132 available online at <http://www.water.ca.gov/swpao/bulletin.cfm>.

Methods of Financing

Project facilities have been constructed with several general types of financing: general obligation bonds and tideland oil revenues (under the Burns-Porter Act, which was approved by the Legislature in 1959, and the bond issue approved by voters in 1960); revenue bonds; and capital resources revenues. Repayment of these funds, and the operations, maintenance, power, and replacement costs associated with water supply, are paid by the 29 agencies and districts that have long-term contracts with DWR for the delivery of SWP water. Costs are repaid as debt service on the bonds comes due.

Long-Term Contracting Agencies

From 1963 through 1967, 32 agencies or districts signed long-term water supply contracts with DWR. 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 in accordance with its long-term water supply contract. Therefore, only 29 agencies and districts now have long-term contracts with DWR as of December 31, 2007.

The contracts initially provided for a combined maximum annual Table A amount of 4,230,000 af of water supply. As a result of contract amendments in the 1980s and the Monterey Amendment, the current combined maximum annual Table A amount by 2016 totals 4,172,786 af. The contracts are in effect for the longest of the following periods:

- the project repayment period, which extends to the year 2035;
- 75 years from the date of the contract; or
- the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

Figure 1-2 shows the name and location of each contracting agency and district and lists the first year of SWP delivery service for each. Table 1-6 presents more detailed information about each contracting agency.

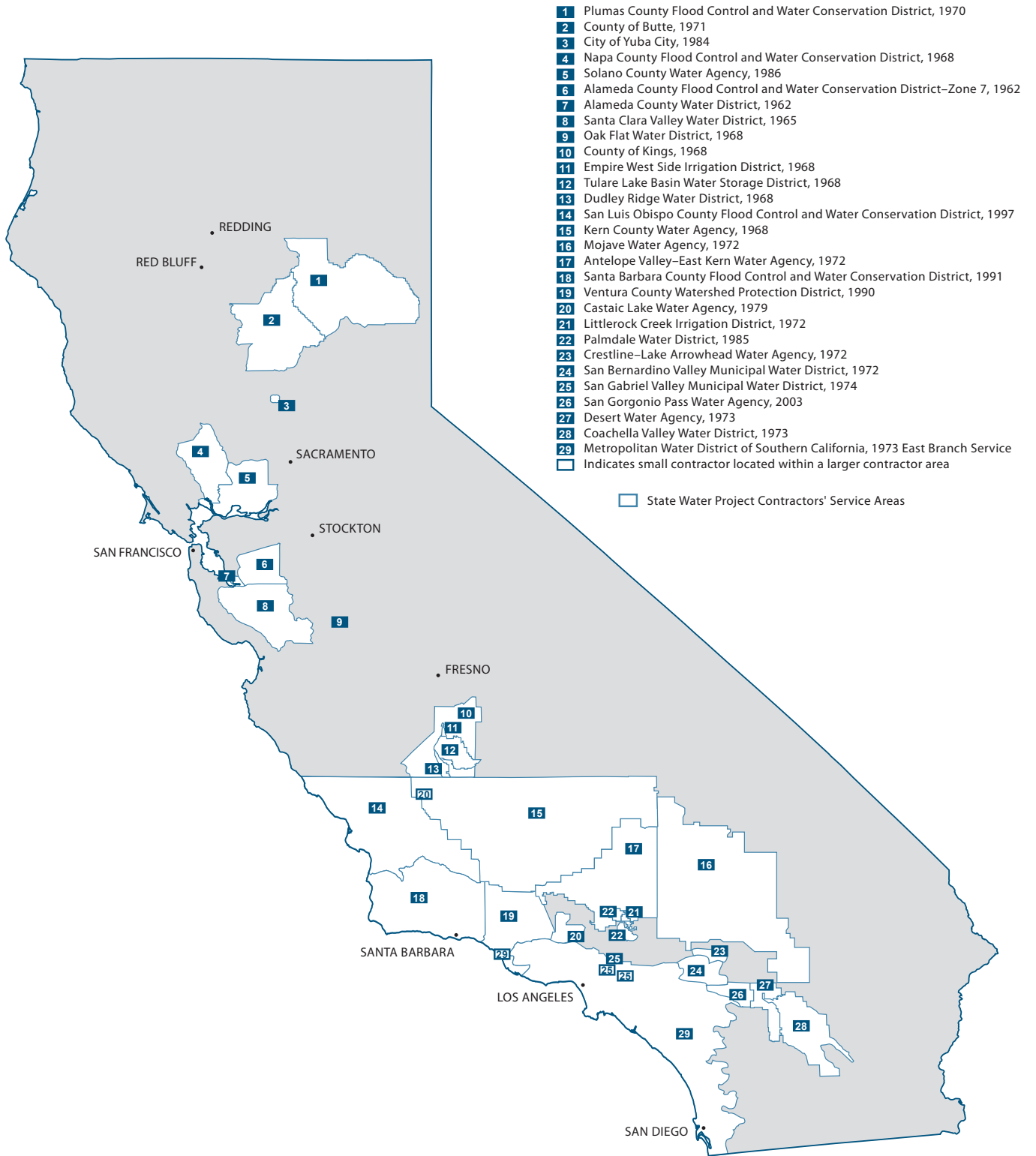


Figure 1-2 Names, Locations, and First Year of Service of Long-Term Contracting Agencies, December 31, 2007

Table 1-6 Long-Term Water Supply Contracting Agencies, by Area, as of December 31, 2007

Contracting Agency	Cumulative Deliveries (af) ^a	Annual Table A (af)	Payments (Dollars)	Gross Area (Acres)	Assessed Valuation (Dollars) ^b	Estimated Population
Upper Feather River Area						
City of Yuba City	24,827	9,600	4,325,801	9,332	4,200,000,000	62,083
County of Butte	14,342	1,200	1,204,644	1,049,280	18,896,423,781	219,427
Plumas County Flood Control and WCD	10,472	720	1,529,127	1,676,056 ^c	2,060,744,342	21,200
<i>Subtotal</i>	<i>49,641</i>	<i>11,520</i>	<i>7,059,572</i>	<i>2,734,668</i>	<i>25,157,168,123</i>	<i>302,710</i>
North Bay Area						
Napa County Flood Control and WCD	234,096	22,875	78,324,445	510,010	25,242,440,033	135,500
Solano County Water Agency	626,962	47,356	108,371,983	537,600	47,700,000,000	424,823
<i>Subtotal</i>	<i>861,058</i>	<i>70,231</i>	<i>186,696,427</i>	<i>1,047,610</i>	<i>72,942,440,033</i>	<i>560,323</i>
South Bay Area						
Alameda County Flood Control and WCD–Zone 7	1,240,907	80,619	144,262,820	275,900	36,762,000,000	202,000
Alameda County WD	1,111,996	42,000	94,948,728	67,139	45,908,552,780	330,800
Santa Clara Valley WD	3,550,860	100,000	294,556,842	849,000	303,314,230,928	1,748,976
<i>Subtotal</i>	<i>5,903,763</i>	<i>222,619</i>	<i>533,768,390</i>	<i>1,192,039</i>	<i>385,984,783,708</i>	<i>2,281,776</i>
San Joaquin Valley Area						
County of Kings	118,509	9,305	5,623,307	893,300	8,170,055,752	151,381
Castaic Lake Water Agency	471,637	12,700	—	8,700	4,532,936	0
Dudley Ridge WD	2,115,395	57,343	71,820,684	37,600	85,400,000	36
Empire West Side Irrigation District	111,855	3,000	3,510,093	7,400	^d	11
Kern County Water Agency	32,234,985	998,730	1,598,462,009	5,224,000	64,149,863,242	754,900
Oak Flat WD	195,941	5,700	5,687,051	4,500	^d	10
Tulare Lake Basin Water Storage District	4,582,035	95,922	143,138,935	189,519	152,288,305	23
<i>Subtotal</i>	<i>39,830,357</i>	<i>1,182,700</i>	<i>1,828,242,078</i>	<i>6,365,019</i>	<i>72,562,140,235</i>	<i>906,361</i>
Central Coastal Area						
San Luis Obispo County Flood Control and WCD	41,888	25,000	62,753,468	2,122,240	37,363,525,861	260,727
Santa Barbara County Flood Control and WCD	248,309	45,486	400,447,650	1,775,296	49,196,921,210	421,625
<i>Subtotal</i>	<i>290,197</i>	<i>70,486</i>	<i>463,201,118</i>	<i>3,897,536</i>	<i>86,560,447,071</i>	<i>682,352</i>
Southern California Area						
Antelope Valley-East Kern Water Agency	1,641,669	141,400	399,549,509	1,525,547	25,685,000,000	365,000
Castaic Lake Water Agency ^e	705,909	82,500	231,573,480	124,800	27,070,976,711	249,600
Coachella Valley WD	920,751	121,100	238,616,444	639,857	57,138,070,411	350,879
Crestline-Lake Arrowhead Water Agency	47,829	5,800	22,340,762	55,100	1,500,527,807	25,000
Desert Water Agency	1,089,759	50,000	214,380,804	209,760	10,094,961,100	71,168
Littlerock Creek Irrigation District	18,995	2,300	5,608,856	10,000	438,155,825	2,900
Metropolitan WD of Southern California	29,026,337	1,911,500	8,185,268,479	3,314,080 ^f	1,998,260,031,413	18,365,245
Mojave Water Agency	268,751	75,800	203,872,984	3,136,000	28,464,178,622	433,000
Palmdale WD	211,364	21,300	59,815,214	119,680	1,470,701,596	109,845
San Bernardino Valley Municipal WD	638,471	102,600	437,380,255	224,000	28,115,559,357	600,000
San Gabriel Valley Municipal WD	329,131	28,800	123,023,167	18,297	11,720,110,333	210,145
San Geronio Pass Water Agency	9,936	8,650	80,546,232	140,800	507,540,188	65,500
Ventura County Watershed Protection District	45,805	20,000	48,749,302	308,252	22,701,024,063	460,000
<i>Subtotal</i>	<i>34,954,707</i>	<i>2,571,750</i>	<i>10,250,725,485</i>	<i>9,826,173</i>	<i>2,213,166,837,426</i>	<i>21,308,282</i>
Total	81,889,723	4,129,306	13,269,693,070	25,063,045^g	2,856,373,816,596	26,041,804

^aAll water delivered to long-term SWP contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.

^bStatutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100% of full value for the 1981–1982 fiscal year and fiscal years thereafter.

^cTotal of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.

^dAssessed valuation not available on an agency area breakdown.

^eDistrict includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.

^fTotal for Metropolitan, including Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.

^gIncludes duplicate values. Some areas that are within two or more agencies are included in each agency's total.



Chapter 2 Delta Resources

General aerial of patterns in the Delta.

Significant Events in 2007

The Department of Water Resources (DWR), in cooperation with federal and State agencies, completed a pilot salmon outmigration study in the North Delta.

DWR completed value engineering studies for the Franks Tract Project and the through-Delta facility.

The Governor issued a list of immediate and interim actions to be included as part of a comprehensive water package to improve Delta conditions.

The Delta Vision Blue Ribbon Task Force was appointed by the Governor in February 2007. The final vision document, "Our Vision for California's Delta," was adopted November 30, 2007.

In spring 2007, the State saw the first voluntary shutdown of the State Water Project (SWP) pumps in the Delta to protect fish.

In December 2007, a federal court imposed interim rules that significantly restrict the operations of both the SWP and the Central Valley Project (CVP) while a new biological opinion for Delta smelt is written in 2008.

Decker Island Habitat Restoration Area, completed in 2007, is targeted specifically for the needs of endangered Sacramento splittail and delta smelt, providing 26 acres of tidal aquatic area.

The charter for the multiagency Delta Long-Term Management Strategy for the beneficial reuse of dredged material became effective in February 2007.

Information for this chapter was contributed by the FloodSAFE Environmental Stewardship and Statewide Resources Office, the Bay-Delta Office, and the Division of Flood Management.

The Sacramento-San Joaquin Delta is a unique environmental resource and a major source of water for millions of Californians. Over the past 40 years, the Department of Water Resources (DWR), and other State and federal agencies, have developed and implemented numerous programs to manage the Delta.

DWR's water management programs focus on solving problems in three areas of the Sacramento-San Joaquin Delta: the North Delta, West Delta, and South Delta (see Figure 2-1).

These programs share the following common goals:

- improve water supply reliability to the State Water Project (SWP), Central Valley Project (CVP), and Delta water users;
- determine levels of flow and salinity necessary to protect fish and wildlife habitat;
- devise methods to control flooding;
- protect fish and wildlife; and
- provide recreational activities.

Delta Water Management Programs

Future water deliveries to millions of Californians throughout the state will be affected by many factors, including two significant changes: Delta pumping restrictions and climate change. The first stage of the CALFED Bay-Delta Program (CALFED Stage 1), implemented from 2000 through 2007, focused on conveying water supply through the Delta. Specific projects and studies were undertaken during CALFED Stage 1 to determine the feasibility of a through-Delta approach.

In spring 2007, the State saw the first voluntary shutdown of the SWP pumps in the Delta to protect fish. Limited pumping resumed 10 days later, and 5 days after that, pumping was increased to resume water deliveries.

Unfortunately, these actions did not result in an increase in the abundance of delta smelt in fall 2007, suggesting that more than just water project operational changes in the Delta are needed to increase delta smelt abundance. In December 2007, a federal court imposed interim rules that would significantly restrict the operations of both the SWP and the CVP while a new Operations Criteria and Plan (OCAP) biological opinion (BO) for delta smelt was being written in 2008.

During 2007, new Delta planning efforts—including Delta Vision established by the Governor and the Bay Delta Conservation Plan (BDCP) process—reached important conclusions about the need to change the way water is conveyed across or around the Delta to better protect fish and provide a sustainable and reliable water supply for the State.

Four major concurrent Delta planning efforts are under way with objectives related to providing a sustainable Delta: Delta Vision, Delta Risk Management Strategy (DRMS), the CALFED Ecosystem Restoration Program (ERP) Conservation Strategy, and BDCP.

Delta Vision

On September 28, 2006, in conjunction with the signing of Senate Bill (SB) 1574, the Governor signed an executive order to initiate Delta Vision and establish an independent Blue Ribbon Task Force to develop a durable vision for sustainable management of the Sacramento-San Joaquin Delta. Executive Order S-17-06 directs the Delta Vision Committee to complete the vision by January 1, 2008 and a strategic plan by November 2008. The Delta Vision process

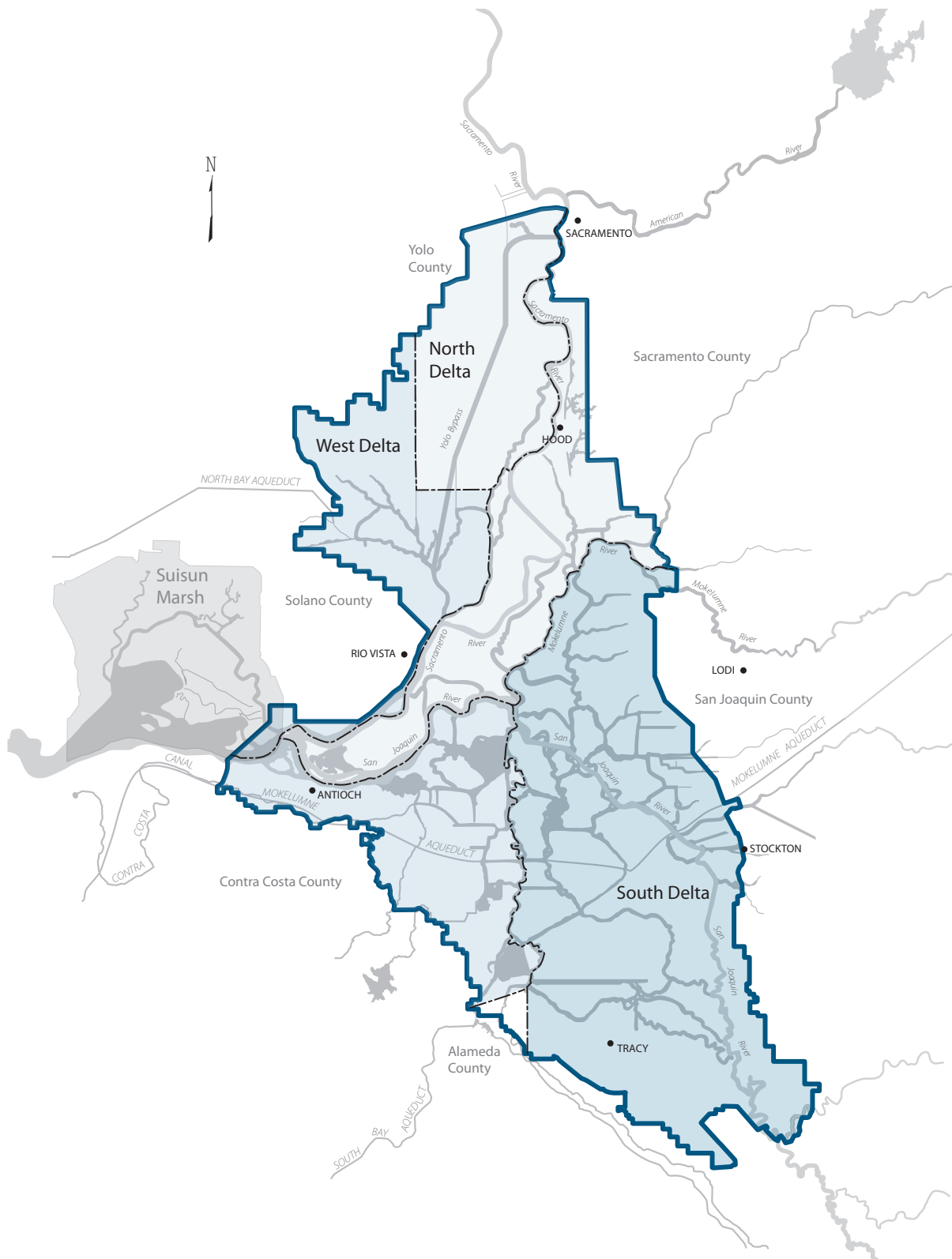


Figure 2-1 The North, West, and South Delta as Defined in Public Resources Code Section 29735

will look more broadly at the sustainability of the Delta.

The Delta Vision Blue Ribbon Task Force was appointed by the Governor in February 2007 and met frequently throughout the year in public meetings to receive public and scientific input on how the Delta issues must be addressed. After many meetings, the Task Force issued three successive refined drafts of “Our Vision for California’s Delta.” The third draft included 12 interrelated recommendations and several near-term actions to protect the Delta. The vision document was adopted November 30, 2007 and released December 17, 2007. For more information visit the Delta Vision website at: <http://deltavision.ca.gov/index.shtml>.

Delta Risk Management Strategy

The 2000 CALFED record of decision (ROD) presented its Preferred Program Alternative describing actions, studies, and conditional decisions to help resolve issues in the Delta. Included in the CALFED Stage 1 implementation of the preferred alternative was completion of a Delta Risk Management Strategy (DRMS) that would look at sustainability of the Delta and assess major risks to Delta resources from floods, seepage, subsidence, and earthquakes. DRMS would also evaluate the consequences and develop recommendations to manage the risk.

The DRMS preliminary findings have been reviewed by a CALFED scientific panel. The review has led to a reevaluation of some of the initial DRMS analyses. Results of the reevaluation will be incorporated into the final report, to be completed in April 2008. Delta Vision, the CALFED ERP, and BDCP depend on the best available information from DRMS to support their own processes. DRMS is a source of scientific and technical information on the Delta and Suisun Marsh levees for other studies and initiatives such as Delta Vision, BDCP, and the CALFED end of Stage 1 assessment.

CALFED Ecosystem Restoration Program Conservation Strategy

The CALFED Ecosystem Restoration Program (ERP) Conservation Strategy (CS) is a biological view of where restoration of important habitat types could occur to restore ecosystem form and processes to the maximum extent. The CS is also incorporating information from other Delta-related planning efforts (e.g., DRMS, Suisun Marsh Implementation Plan, CALFED ERP end of Stage 1 assessment, and recovery plans for federally-listed species) and technical and public input.

Bay Delta Conservation Plan

BDCP has a different and more specific purpose than do DRMS and Delta Vision.

BDCP is being developed as a joint federal Habitat Conservation Plan and State Natural Community Conservation Plan. The purpose of BDCP is to promote the recovery of sensitive species and their habitats in the Delta in a way that also will provide for the protection and reliability of water supplies. Among other things, the plan will provide:

1. a comprehensive habitat conservation and restoration program for the Delta and
2. the basis for permits under federal and State endangered species laws for the activities covered by the plan, based on the best available science.

The BDCP steering committee has been working since April 2007 to evaluate different conceptual approaches to the development of the BDCP. After considering a wide variety of potential strategy options, 10 conservation strategies were analyzed based on biological, planning, and other criteria, then narrowed to four conservation options to be evaluated in detail. See the BDCP sidebar for a description of the four options.

The BDCP effort produced a series of technical papers on the merits of different concepts in Delta water conveyance. By the end of 2007 the concept of dual conveyance seemed to be widely agreed

upon to help reliably convey water for export while providing a level of protection for native Delta fish and water quality for Delta farmers.

Bay Delta Conservation Plan Proposed Conservation Strategy Options

BDCP conservation measures are those actions that, collectively, are expected to achieve the BDCP biological goals and objectives. Conservation measures address conveyance and water operations; protection, enhancement, and restoration of physical habitats that support covered species; and reductions in the effect of other stressors on covered species. The BDCP Conservation Strategy (CS) proposes two types of water operations conservation measures: (1) construction of new operational control facilities and (2) operations of new operational control facilities or changes to the operations of existing operational control facilities.

The CS Workgroup developed four CS options based on existing scientific information about environmental stressors affecting covered fish species and Delta ecosystem processes. The CS Workgroup recommended these options to the Steering Committee for approval to further evaluate their feasibility and effectiveness in conserving the covered species and other components of the ecosystem.

Option 1: Existing through-Delta conveyance. This option includes use of existing through-Delta conveyance with physical habitat restoration in the North and West Delta and Suisun Marsh (approximately 28 percent of the BDCP planning area).

Option 2: Improved through-Delta conveyance. This option includes improving through-Delta conveyance with operable barriers on some channels, separating water supply conveyance flows from the San Joaquin River, and providing habitat restoration in the North, West, Central, and South Delta and Suisun Marsh (approximately 35 percent of the BDCP planning area).

Option 3: Dual conveyance. This option is similar to Option 2 with the addition of an isolated conveyance facility from the Sacramento River to the South Delta export facilities.

Option 4: Isolated facility. This option includes construction of an aqueduct from the Sacramento River to the South Delta export facilities, which would allow habitat restoration throughout the Delta and Suisun Marsh (approximately 75 percent of the BDCP planning area).

For more information, visit the BDCP website at:
<http://baydeltaconservationplan.com>.

North Delta Program

Since 2003, DWR has been involved in evaluating several proposed modifications included in the CALFED ROD. These modifications include changes in the North Delta's conveyance facilities to improve Delta water quality, fisheries, and water supply reliability, as well as modifications to improve flood protection and ecosystem health.

CALFED North Delta actions include:

- evaluation and implementation of improved operational procedures for the Delta Cross Channel (DCC) to address fishery and water quality concerns;
- evaluation of a screened through-Delta facility (TDF) on the Sacramento River of up to 4,000 cubic feet per second (cfs);
- evaluation of flow and salinity in Franks Tract to improve fish protection and improve water quality through installation of operable barriers in the Franks Tract region; and
- design and construction of floodway improvements to provide conveyance, flood control, and ecosystem health (North Delta Flood Control and Ecosystem Restoration Project).

In 2007, DWR, in cooperation with federal and State agencies, completed the field work and data processing of a pilot salmon outmigration study. This pilot study was conducted to assess the feasibility for the comprehensive Delta Regional Salmon Outmigration Study. DWR conducted water quality modeling analyses and prepared conceptual design layouts for alternatives considered for the Franks Tract Project and the TDF. To evaluate the alternatives, DWR conducted value engineering studies for both the Franks Tract Project and TDF. Reclamation, through its North/Central Delta Improvement Study (NoCDIS), is evaluating the feasibility of using conveyance and operations actions in the north and central

region of the Sacramento–San Joaquin River Delta near Franks Tract to improve water quality and fish conditions. In addition to DWR's evaluation of alternatives, Reclamation's NoCDIS plan of study (August 2007) considers other additional alternatives in the north and central Delta. These efforts were in support of the assessments required under CALFED to address concerns over water quality impacts from DCC operations, technical viability of a TDF, and resolution of fisheries concerns about a TDF. The *Delta Conveyance Improvement Studies Summary Report*, released by DWR in December 2007, presents key findings for cooperative CALFED Stage 1 studies to evaluate Franks Tract, TDF, and DCC reoperation project actions. In addition, this report describes continuing and planned project studies.

More information and study reports are available on the DWR Bay-Delta Office website: <http://baydeltaoffice.water.ca.gov>.

North Delta Flood Control and Ecosystem Restoration Project

North Delta Flood Control and Ecosystem Restoration improvements, a CALFED Stage 1 action, provides flood control and ecosystem restoration in the North Delta. These improvements support other CALFED goals, which include water supply reliability, recreation, and agricultural land preservation. DWR is the State implementing agency, and many of the proposed CALFED elements for the project are similar to elements of earlier North Delta planning efforts. These earlier projects were suspended in deference to the CALFED program.

Project Area. The project area (Figure 2-2) is approximately 197 square miles where DWR is considering alternatives for flood control and restoration actions. The following criteria were used to develop project area boundaries.

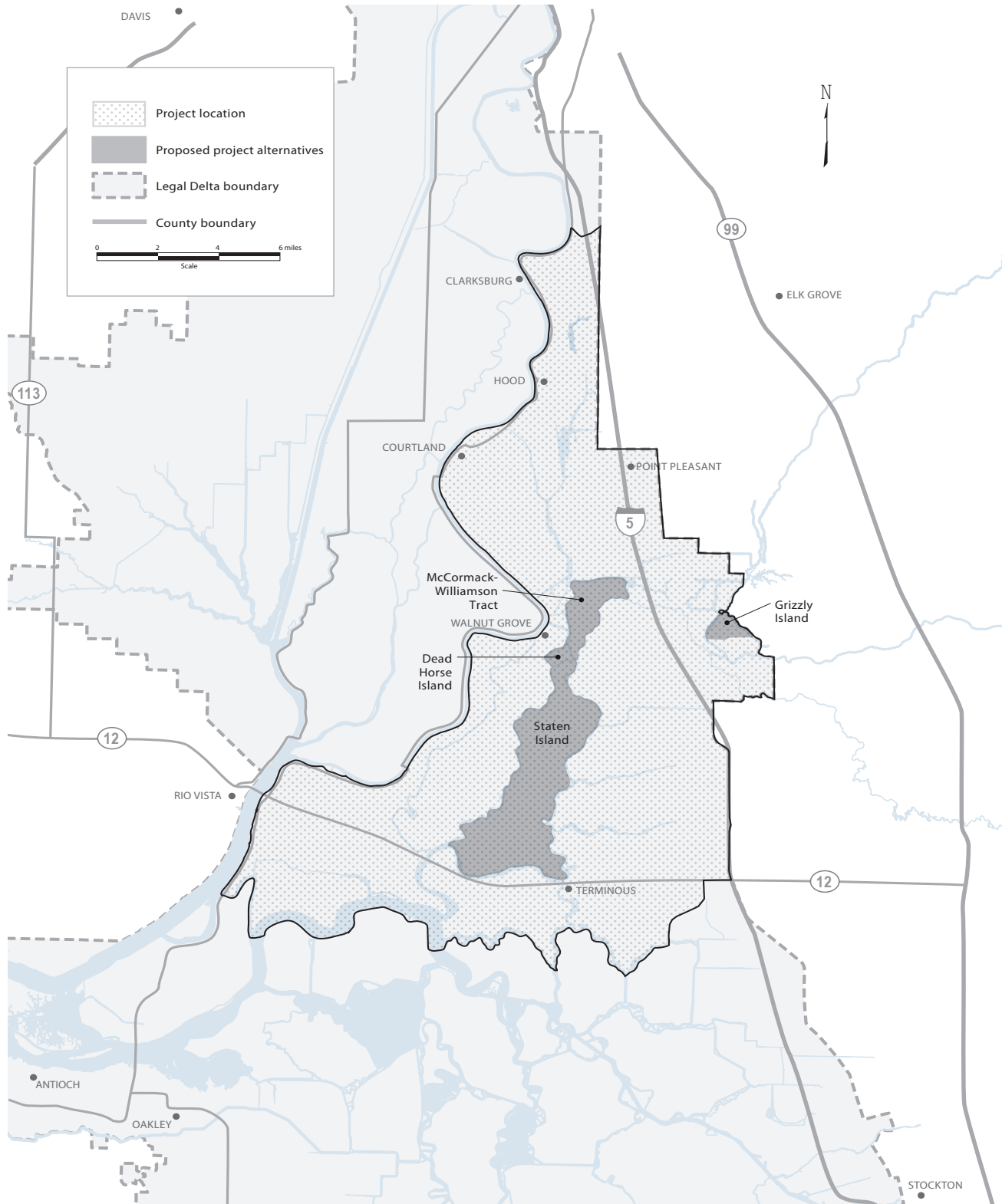


Figure 2-2 North Delta Flood Control and Ecosystem Restoration Project, Project Area

- The project area must include the footprint area of each alternative.
- The project area should be hydrologically contiguous.
- The project area should include portions of all waterways where existing flow patterns could be substantially affected by one or more of the alternatives.
- The project area should be compatible with flood control planning and implementation responsibilities of other flood control agencies.

Project Status. During 2007, DWR continued overseeing preparation of the public draft EIR. With assistance from consultants, DWR developed responses to comments received on the administrative draft EIR and completed the public draft EIR in November 2007. The draft EIR is available on the project website.

Proposed project actions and alternatives are subdivided into two basic groups for analysis in the EIR.

Group I consists of modifications to levees on McCormack-Williamson Tract, downstream levee raising to offset potential hydraulic impacts caused by these modifications, restoration of McCormack-Williamson Tract and the Grizzly Slough property, and dredging of the Mokelumne River.

Group II consists of proposed project actions on Staten Island and levee modifications and dredging along the Mokelumne River.

DWR staff worked with federal regulatory agency scientists and academic experts to complete development of three ecological conceptual model alternatives for the Group I actions. Details of the conceptual models are in Appendix D of the public draft EIR.

A preferred project alternative will be chosen through the EIR process and will be identified in the final EIR.

Key schedule milestones completed during 2006 and 2007 include the completion of the administrative and public drafts of the EIR.

For more information, visit the North Delta Flood Control and Ecosystem Restoration Project website at:

<http://www.water.ca.gov/floodmgmt/dsmo/sab/ndp>.

West Delta Program

Objectives of the West Delta Program include the following:

- effectively manage SWP-owned lands on Sherman and Twitchell islands (approximately 13,000 acres total);
- improve the integrity of local levees;
- implement land-use management techniques to control subsidence and soil erosion on Sherman and Twitchell islands; and
- provide diverse habitat for wildlife, especially waterfowl.

DWR is a major landowner on Twitchell and Sherman islands and holds two of the three trustee positions for Reclamation Districts 1601 (Twitchell Island) and 341 (Sherman Island). Consequently, DWR participates in the management and operation of each district, with the goal of improving conditions and accountability. The reclamation districts provide levee maintenance, island drainage, and some internal water supply. These districts assess the landowners for the operational needs of the public districts.

South Delta Improvements Program

During the late 1990s, DWR pursued the Interim South Delta Program (ISDP), intending to accelerate construction of South Delta facilities to improve Delta water conditions. During the same period, the CALFED Bay-Delta Program worked on an independent long-term solution. DWR

released a draft EIS/EIR for ISDP in July 1996; however, a final EIS/EIR was never produced. In 1999, the South Delta facilities became a key component of the CALFED Bay-Delta Program. Subsequently, ISDP was renamed the South Delta Improvements Program (SDIP), and additional program objectives and purposes, as described below, were added.

DWR and Reclamation suspended most planning and permitting activities during 2007 because the Endangered Species Act (ESA) consultation for the OCAP needs to be completed for the program to move forward. Reclamation and DWR worked together to prepare the biological assessment required to enter into formal consultation.

The SDIP consists of physical/structural and operational components. SDIP Stage 1, the physical/structural component, would consist of constructing and utilizing permanent operable gates and conveyance dredging. The SDIP Stage 2 operational component would consist of changes in export regulations, allowing an increase in water deliveries and delivery reliability for SWP and CVP water contractors.

DWR and Reclamation identified the following project objectives and purposes for SDIP:

- reduce the movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook salmon into the South Delta via Old River (SDIP Stage 1);
- maintain adequate water levels and water quality through improved circulation for agricultural diversions in the South Delta, downstream of the Head of Old River (SDIP Stage 1);
- increase water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta (SDIP Stage 2); and

- provide opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay to 8,500 cfs (SDIP Stage 2).

Because of the decline in abundance indices for pelagic organisms and until more is known about the effects of SDIP Stage 2 on delta smelt and other protected fish species, DWR is recommending that only SDIP Stage 1 actions be completed now, thus deferring SDIP Stage 2.

The SDIP Stage 1 physical/structural component consists of the following elements:

- construct and operate a fish-control gate at the Head of Old River to reduce the downstream movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook salmon into the South Delta via the Head of Old River;
- construct and operate up to three flow-control structures (gates) at Middle River (near the confluence of Middle River with Victoria Canal), Grant Line Canal (near the confluence of Grant Line Canal and Old River), and Old River (just east of the Delta-Mendota Canal Intake) to improve existing water level and circulation patterns in South Delta water channels;
- dredge various channels in the South Delta, including Middle and Old rivers, to improve conveyance and dredge areas surrounding agricultural diversions to improve their function; and
- extend up to 24 agricultural diversion intake facilities to improve their function.

SDIP elements originally placed in the ROD included increasing diversions through Clifton Court Forebay (first to 8,500 cfs and then to 10,300 cfs), dredging and installing operable tidal barriers in the South Delta,

installing a fish barrier at Head of Old River, and constructing the first phase of a new intake and fish screen into Clifton Court Forebay. DWR deferred the increase in diversions of up to 10,300 cfs and the associated new fish screens as components of the SDIP due to major funding issues, as well as significant technical uncertainties associated with the design and construction of the new fish screens.

On February 15, 2006, the State Water Resources Control Board (SWRCB) issued a Cease and Desist Order (Order WR 2006-0006) requiring DWR and Reclamation to construct permanent gates in the South Delta or take alternative measures for achieving the water quality objectives by 2009. Additionally, the order requires DWR and Reclamation to report to SWRCB if there is a threat of noncompliance of the water quality requirements, and to report the reasons for the noncompliance and actions taken to avoid noncompliance. SWRCB will then determine if enforcement actions are necessary. DWR must also submit quarterly progress reports on the permitting and construction of SDIP Stage 1.

Preferred Plan

The preferred plan for SDIP is to construct the physical/structural component as soon as permits are obtained and defer the operational component until more is known about the project's potential effects on the delta smelt and other protected fish species.

Temporary Barrier Facilities

Temporary rock barriers will continue to be installed annually, during low flow conditions, until the four proposed permanent gates are operational. The barriers are installed at four sites (see Figure 2-3), as follows.

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

The Head of Old River barrier prevents the San Joaquin River flow from entering Old River and flowing toward export facilities. This additional flow in the San Joaquin River helps guide San Joaquin salmon to the ocean in the spring and improves dissolved oxygen levels for upstream salmon migration in the fall. The other barriers have culverts with flap gates that improve water levels and circulation in South Delta channels during the irrigation season.

Since 1963, the Head of Old River barrier has been installed in the fall. Since 1992, this barrier has also been installed intermittently in the spring, although high San Joaquin River flows sometimes prevent installation. The Old River barrier near Tracy has been seasonally installed since 1991; the Middle River barrier has been seasonally installed since 1987; and the Grant Line Canal barrier has been seasonally installed since 1996.

Other South Delta Actions

Besides SDIP, actions in the South Delta include implementing flood and ecosystem improvements in the lower San Joaquin River and pursuing construction of potential interties between the SWP California Aqueduct and CVP Delta-Mendota Canal.

Delta Flood Control

Many important assets in the Sacramento-San Joaquin Delta are protected from flooding by levees. Without the levees, much of Delta as we know it today would be an inland sea. The levees serve many needs. They protect valuable wildlife habitat,

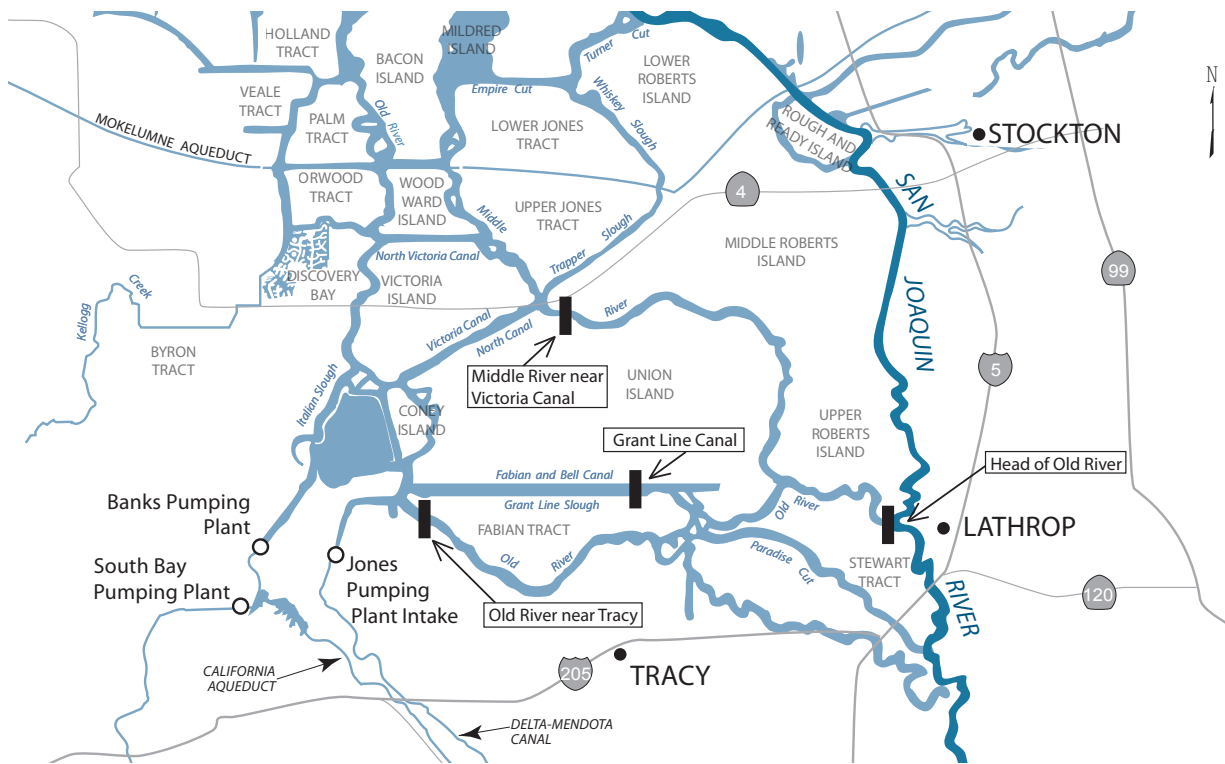


Figure 2-3 Temporary Barrier Locations

farms, homes, urban areas, recreational developments, highways, railroads, natural gas fields, utility lines, a major aqueduct, and other public developments. They are critical to the protection of in-Delta water quality and water quality for approximately 25 million Californians who receive a portion of their water from the Delta. The State Legislature recognized the importance of the Delta and enacted the Delta Flood Protection Act of 1988 (SB 34 [Water Code Sections 12300 et seq., and 12980 et seq.]). With SB 34, the Legislature declared that “. . . the Delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance.”

Since 1988, the Delta Levees Program has managed approximately \$234 million in State-appropriated funds. These monies, combined with local funds, have realized approximately \$305 million in

levee improvements (through State Fiscal Year 2006–2007).

In SB 34, the Legislature declared its intent to appropriate \$12 million annually for the Delta Flood Protection Fund. Six million dollars of the appropriation is for local assistance under the Delta Levee Maintenance Subventions Program. The remaining \$6 million is for the Delta Levees Special Flood Control Projects, including subsidence studies and monitoring on Bethel, Bradford, Jersey, Sherman, and Twitchell islands; Holland, Hotchkiss, and Webb tracts; and the towns of Thornton and Walnut Grove.

In 1996, Assembly Bill (AB) 360 was signed into law, expanding the area covered by the Delta Levees Program to include the remainder of the legal Delta and northern Suisun Bay from Van Sickle Island to Montezuma Slough.

Bond appropriations of \$25 million from Proposition 204 (enacted in 1996) and \$30 million from Proposition 13 (enacted in 2000) provide supplemental funding.

In November 2002, Proposition 50 was approved. It provides \$70 million in additional funding to implement the Delta Flood Protection Program as adopted in CALFED, where the program is known as the Levee System Integrity Program (LSIP).

Proposition 84, approved by voters in November 2006, allocates \$275 million to the Delta over the next four years.

Proposition 1E, also approved by voters in November 2006, adds funding for Delta levee improvements.

CALFED Levee System Integrity Program

CALFED LSIP goals and objectives are described below.

Base Level Protection

According to the CALFED ROD, all Delta levees should be built to the U.S. Army Corps of Engineers (Corps) Delta-specific levee standard (Public Law [PL] 84-99). This standard provides protection against flooding in a 100-year flood event. The minimum freeboard is 1.5 feet for levees protecting agricultural land. A typical improved levee section would have a 16-foot crown width, a waterside slope of 2 horizontal to 1 vertical, and a landside slope designed for the depth of peat soils under the levee. Generally, the landside slope would be between 3:1 and 5:1.

This program provides funding to help local levee maintaining agencies improve all Delta levees to the PL 84-99 standard. About 500 out of 1,100 miles of Delta levees, including approximately 400 miles of project levees, are at or above the PL 84-99 standard.

During CALFED Stage 1 (implemented 2000–2007), about 200 additional miles of levees were planned to be brought up to the PL 84-99 level of protection, provided there is sufficient funding. Additional Proposition 84 funds became available to the Delta Levee Maintenance Subventions Program in Fiscal Year 2006–2007.

Levee Upgrades

Upgrading the Delta levees is an integral part of the CALFED LSIP plan being implemented through the DWR Delta Flood Protection Program.

DWR and the Corps signed an agreement in 2001 to co-manage the CALFED LSIP, including the Delta Flood Protection Program. This agreement allows close coordination of efforts and assures compatibility with CALFED goals and objectives.

Levee improvements beyond the PL 84-99 standard, where appropriate, will follow or complement the completion of base level protection depending on continuation of the program and funding availability. Results from DRMS will enable DWR to prioritize future work.

Special Improvement Projects

This program will enhance levee stability by raising the levee crest above the PL 84-99 standard. This work will be completed on levees that have particular importance in the State. Priorities include protecting life and personal property (more than 400,000 people live in Delta towns and cities); water quality (preventing salinity intrusion); the Delta ecosystem; and agricultural production. No projects were been completed in 2007, as available funding was used toward the backlog of deficient levee sections.

Suisun Marsh Flood Protection and Ecosystem Enhancement

This program provides levee integrity, ecosystem restoration, and water quality benefits by supporting maintenance and improvement of the levee system in the Suisun Marsh. The Suisun Marsh Levee Investigation was undertaken in January 1999, at the request of the CALFED Policy Group, to determine whether adding Suisun Marsh levees into the LSIP would contribute to CALFED program goals. The team identified significant links between Suisun Marsh levee maintenance and achievement of CALFED drinking water quality and ecosystem restoration goals. Furthermore, modeling research indicates a significant risk of negative water quality impacts in the Delta if Suisun Marsh levees are inadequately maintained and allowed to fail.

CALFED LSIP actions for the Suisun Marsh will be developed during preparation of the Suisun Marsh Plan. Full implementation of the Suisun Marsh portion of LSIP awaits completion of the Suisun Marsh Charter, independent funding, and authority in the Water Code, or other law, for the program authorization.

Delta Flood Emergency Preparedness and Response Plan

DWR is currently developing a Delta Flood Emergency Preparedness and Response Plan to improve its ability to prepare for, respond to, and recover from multiple-island levee failure within the Sacramento-San Joaquin Delta caused by a flood or seismic event. The plan objective is to minimize recovery time from such an event through preparedness, response, and actions taken.

Delta Levee Maintenance Subventions Program

The Delta Levee Maintenance Subventions Program provides funds to provide up to 75 percent of the eligible costs of levee

maintenance for levee work critical to the long-term survival of Delta islands, State and private infrastructure, and the State water supply. This program assures continuance of the Delta's ability to provide its many statewide and local benefits. Within CALFED's LSIP, the Delta Levee Maintenance Subventions Program provides funding, as a reimbursement, to local Delta reclamation districts for levee maintenance and improvement.

Each year, up to 70 participating local agencies prepare work plans and file funding applications with the Central Valley Flood Protection Board (CVFPB). The applications and work plans are reviewed by DWR, which then makes recommendations and requests CVFPB approval for the program funding levels. CVFPB approves each district's maximum possible reimbursement and maximum advanced reimbursement amounts. After CVFPB approval, agreements are executed between CVFPB and each participating district. These agreements state that eligible work will be completed during the current fiscal year. All work must be in compliance with appropriate State and federal laws, including the California Environmental Quality Act (CEQA), ESA and California Endangered Species Act (CESA), Section 1600 of the Fish and Game Code, and Section 404 of the Clean Water Act, and must have confirmation from the Department of Fish and Game (DFG) that a net long-term habitat improvement of riparian, fisheries, and wildlife habitat will result.

Delta Levees Habitat Improvement

As part of the CALFED LSIP, the FloodSafe Environmental Stewardship and Statewide Resources Office continues to move forward in creating valuable habitat in the Delta. By the end of 2007, the program had developed 283.7 acres of various types of habitat, 9,410 linear feet of shaded riverine aquatic habitat for mitigation, and 24.4 acres and 14,328 linear feet of shaded riverine aquatic for enhancement.

Completed mitigation and enhancement projects include the following:

- Medford, Bethel, and Kimball islands;
- Terminous, Wright Elmwood, Palm, and Thornton-New Hope (Grizzly Slough) tracts;
- Twitchell Island setback levee;
- Twitchell Island mitigation areas;
- Staten Island berm and channel islands;
- Canal Ranch attached berm;
- lower Sacramento River revegetation, Grand Island, in participation with the Corps;
- Decker Island Phase I and Phase II construction and tidal wetlands restoration at Horseshoe Bend along the lower Sacramento River;
- Tyler Island bank stabilization demonstration; and
- Delta In-Channel Demonstration Project.

The Delta In-Channel Demonstration Project was undertaken with support from CALFED to determine the feasibility of “environmentally friendly” structures for controlling erosion and protecting Delta habitat associated with in-channel islands. The three in-channel island test sites were Webb Tract Sites I and III and Little Tinsley Island. The project demonstrated the feasibility of protection and restoration of Delta priority landforms and populations of special-status species using environmentally friendly biotechnical treatments.

Other projects underway include the following:

- long-term management of Meins Landing for conversion to tidal marsh and enhancement of salt marsh harvest mouse habitat;
- bird monitoring at the Decker Island restoration site;
- construction of a setback levee on Sherman Island;

- Sherman Island Parcel 11 Revegetation Project;
- Dutch Slough tidal marsh restoration; and
- Bradford Island Tract 19 mitigation area monitoring and maintenance.

Proposed projects include Delta levees habitat mitigation, flooded islands, McCormack-Williamson Tract, Elk Slough, and Veale Tract.

DWR, DFG, and reclamation districts are successfully providing avoidance or mitigation of habitat losses and net long-term habitat improvement in the Delta. Reclamation districts have been very cooperative in helping DWR meet its mitigation and enhancement needs. Decker Island Habitat Restoration Area, completed in 2007, is targeted specifically for the needs of endangered Sacramento splittail and delta smelt, providing 26 acres of tidal aquatic area. Continued monitoring is determining the amount of fishery and avian use of the restoration site, evaluating the hydrogeomorphic performance of the site, and providing valuable data for future restoration work.

DWR and DFG will continue to work with the reclamation districts to preserve existing habitat and improve the quantity and quality of newly developed habitat in the Delta.

Delta Special Flood Control Projects Program

The Delta Special Flood Control Projects Program under CALFED assists the eight western islands, portions of the Suisun Marsh, the towns of Thornton and Walnut Grove, and other locations in the Delta with flood protection and levee stability repairs. The California Water Commission approved a report of initial actions in September 1989, and it approved the long-term actions and priorities in May 1990. The long-term actions and priorities serve as a guide for DWR to determine how best to use appropriations to

protect these islands. Long-term actions and priorities include the following:

- rehabilitation of threatened levees through the use of imported dredged material;
- verification of elevations in the Delta through the use of global positioning system (GPS) equipment and light detection and ranging (LiDAR);
- upgrading levees to the standards included in Bulletin 192-82; and
- considering projects to achieve net long-term habitat improvement for fish and wildlife.

While DWR seeks cost sharing for all projects, the actual reimbursement depends on each reclamation district's ability to pay. DWR provides up to 100 percent of the cost. Districts receiving these funds are required to participate in a habitat improvement program to ensure net long-term habitat enhancement.

Levee restoration projects, habitat projects, and other special projects in 2007 included work performed on the western Delta islands and New Hope Tract.

Reuse of Dredged Material for Delta Levees

As local sources of fill material for levee repair are depleted, new economical sources must be located. DWR has worked to find more opportunities to reuse clean, dredged materials in the Sacramento-San Joaquin Delta.

As part of this effort, a charter for the multiagency Delta Long-Term Management Strategy (LTMS) for the beneficial reuse of dredged material became effective in February 2007. The LTMS is designed to improve operational efficiency and coordination of the collective and individual agency decision-making responsibilities, resulting in approved dredging and dredged material management actions in

the Delta. Regular LTMS meetings include representatives from DWR, the Corps, the U.S. Environmental Protection Agency, the Regional Water Quality Control Board (RWQCB), the ports of Stockton and Sacramento, and other interested parties. LTMS is evaluating potential beneficial reuse opportunities, particularly from the proposed Sacramento and Stockton Deep Water Ship Channel projects, and has prepared a draft summary of Delta dredged material placement sites and a draft Delta-wide map of existing sediment placement sites.

To facilitate the permitting process for dredging and dredged material placement and reuse, a draft joint permit application for dredging and dredged material placement/reuse has been developed, an interagency agreement between DWR and RWQCB is underway, a sediment background study is being planned, and development of general order Waste Discharge Requirements to help streamline RWQCB's approval process has been initiated.

LTMS long-term goals include the following:

- developing a streamlined permitting process for dredging and dredged material reuse;
- developing a consolidated guidance document addressing sampling, tests, protocols, and methods for assessing sediment and dredged material characterization;
- developing a sediment management plan designed to help anyone who wants a better understanding of methodologies for assessing and characterizing sediments and determining appropriate disposal options;
- developing a programmatic biological assessment for sensitive Delta species;
- drafting a programmatic EIR/EIS for the Delta LTMS; and
- identifying and permitting additional sediment placement and beneficial reuse sites in the Delta.

For more information, visit the LTMS website: <http://www.deltaltms.com>.

Subsidence Investigations

Historically, draining and cultivating Sacramento-San Joaquin Delta marshlands caused the peat soil to break down and compact. The peat has oxidized and subsided since the mid-1800s when the land was first drained and levees constructed. The surface of organic soils in the Delta is now between 10 and 29 feet below sea level. The Legislature recognized the problem and, with the initiation of the Delta Flood Protection Act of 1988, DWR began monitoring subsidence and studying its causes and the means for reversing its effects.

DWR and the U.S. Geological Survey (USGS) are conducting an ongoing subsidence investigation in the Delta. Preliminary data indicate the following:

- land management practices substantially influence subsidence rates;
- cultivation practices that raise soil temperature and lower the water table dramatically increase oxidation of the peat soils;
- conversion of highly organic peat soils to carbon dioxide gas (oxidation) appears to be the recent primary cause of subsidence;
- permanently flooded shallow wetlands decrease release of gaseous carbon by as much as 80 percent, thereby mitigating subsidence; and
- permanently flooded shallow wetlands also promote the growth of wetland vegetation that adds biomass back into the system.

Current studies of subsidence mitigation and growth of wetland vegetation suggest that shallow permanent flooding will be part of the process to reverse subsidence through biomass accretion.

A Farm Scale Wetlands Demonstration Project has been proposed for 2008. It would be located adjacent to the existing Subsidence Reversal Demonstration Project and is intended to determine the land accretion and carbon sequestration rates associated with wetland farming within the western Delta. The rationale for this study stems from work performed since 1997 at the Twitchell Wetlands Research Facility. This research has shown that wetland restoration can accrete a net average of 2 inches of land surface per year and potentially sequester 25 tons of carbon per acre per year. Implementation of the wetlands demonstration project includes construction of a farm scale wetland, between 300 and 1,000 acres, within the western Delta.

In addition to tules, rice is a wetland crop with an existing agricultural market that has the potential to accrete land mass and sequester carbon. The Subsidence Mitigation Through Rice Cultivation Research project will determine whether growing rice reverses subsidence without deleterious effects to the environment and is economically feasible in the Delta. The project area is a 320-acre parcel on Twitchell Island and is planned to operate for 6 years (2008 through 2013).

DWR continues to work with the CALFED Science Program to develop best management practices to control and reverse subsidence and will work with local districts and landowners to implement cost-effective measures.

For current information related to these projects, please visit http://www.water.ca.gov/floodsafe/fessro/levees/west_delta/subsidence.cfm.

Delta Agricultural Water Agencies

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, Contra Costa County Water Agency, East Contra Costa Irrigation District, and Byron-Bethany Irrigation District. In 1981, North Delta Water Agency and East Contra Costa Irrigation District signed water rights management contracts with DWR. DWR negotiated contracts and requested negotiations with other agencies to provide water level, circulation, and quality needs in certain areas.

South Delta Water Agency Contract

In September 1990, DWR completed negotiations for a long-term agreement with South Delta Water Agency and Reclamation. Under this proposal, the South Delta contract, the parties agreed to proceed with the design, construction, and operation of certain barrier facilities in the South Delta channels. These facilities resolved those portions of the lawsuit that South Delta Water Agency filed in 1982 regarding the alleged effects of export pumping by SWP and CVP on water levels, quality, and circulation in the South Delta.

DWR has installed and operated temporary barrier facilities in the South Delta to improve area conditions, as well as collect data needed to design and operate permanent barrier facilities. Ongoing efforts are being made to improve water levels, circulation, and water quality in South Delta channels. These efforts include modifying and dredging around local diverters' intakes, conducting a series of computer modeling studies, and modifying barrier flap gate operations. Other alternatives being considered include changing barrier heights at Middle River by 1 foot, dredging portions on upper Middle River, and installing portable pumps at Paradise Cut. Data collected in the Temporary Barriers Program were used to assess the barriers' ability to reduce or eliminate adverse water levels and improve local hydraulic circulation patterns.

Western Delta Municipal Water Users

DWR signed contracts with Contra Costa Water District in 1967 and the City of Antioch in 1968. These contracts compensate Contra Costa and Antioch for purchasing water of usable quality when such water is not available from Mallard Slough and the San Joaquin River.

According to the contract terms, DWR compensates each agency for the additional costs of purchasing a substitute water supply from the Contra Costa Canal. This water is purchased to replace water supplies of usable quality which are lost due to SWP operations. Credits for the number of days of above-average water supplies of usable quality, from Mallard Slough and the San Joaquin River, accrue to offset the number of below-average days in future years.



Photo: Leslie Hamamoto

Chapter 3

Environmental Programs

Woolly rose mallow, *Hibiscus lasiocarpus* var. *occidentalis*.

Significant Events in 2007

Invasive quagga mussels were found in the Lower Colorado River in January 2007.

Winter and spring 2007 were among driest on record since 1994. Low outflow likely contributed to record low abundance indices for several pelagic fishes in the upper San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

In May 2007, a federal judge found the existing biological opinion on the effects of coordinated operations of the Central Valley Project and State Water Project on the delta smelt was inadequate and ordered U.S. Fish and Wildlife Service to issue a new delta smelt biological opinion by September 2008.

Northern pike eradication efforts at Lake Davis led to the temporary closure and large scale rotenone application there in September 2007.

On November 20, 2007, the Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead was signed.

The State Water Resources Control Board approved a 1-year transfer of up to 125,000 acre-feet to the Department of Water Resources in 2007, the second pilot year transfer under the Lower Yuba River Accord (Yuba Accord).

The Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources was signed on December 4, 2007 as one element of implementing the Yuba Accord.

Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Environmental Services, the Division of Operations and Maintenance, and the Division of Integrated Regional Water Management.

The Department of Water Resources (DWR) has developed and implemented several programs to avoid, minimize, or offset adverse environmental impacts resulting from construction and operation of State Water Project (SWP) facilities.

Operations for Species of Concern

A primary consideration in the operation of the SWP is avoiding, minimizing, and offsetting adverse impacts to species of concern, species listed as threatened or endangered by a State or federal agency, or species proposed for listing). The SWP is operated pursuant to biological opinions issued under the federal Endangered Species Act (ESA), as well as consistency determinations or incidental take permits issued under the California Endangered Species Act (CESA). A key to avoiding and minimizing adverse impacts to these species is maintaining flexibility in SWP operations, which is done mainly through the Environmental Water Account (EWA). EWA provides protection to Delta fisheries through changes in SWP and Central Valley Project (CVP) operations, while maintaining water supply reliability to the projects' water users. Operational responses can include Delta Cross Channel gate closure, export curtailments, changes in delivery schedules, increased reservoir releases, preferential use of certain facilities, or a combination of these actions. (Additional information about EWA can be found later in this chapter and in Chapter 7, Supply Development and Reliability and Chapter 9, Water Contracts and Deliveries.)

San Joaquin River Activities

DWR and the Bureau of Reclamation (Reclamation) coordinate to increase flows in the San Joaquin River during the pulse flow period, from April 15 through May 15, to benefit fall-run Chinook salmon emigrating from the San Joaquin River Basin.

This plan, known as the Vernalis Adaptive Management Plan (VAMP), is a 12-year federal and State research component of the San Joaquin River Agreement. VAMP calls for intensive fisheries sampling in the lower San Joaquin River during the pulse flow period. Studies coordinate variable export pumping rates with fisheries collection efforts to estimate the relative survival of marked salmon moving through the Delta under VAMP during the pulse flow period. The goal is to conduct operational changes and associated studies from 1999 to 2010 to determine if a relationship exists between river flow, Delta exports, and salmon survival throughout the southern Delta. The resulting information will be used to determine if changing San Joaquin River flows and Delta exports in the spring can significantly benefit San Joaquin River fall-run Chinook salmon.

Actions associated with VAMP were implemented between April 22 and May 22, 2007. The VAMP test period was delayed one week from the default period of April 15 through May 15 to allow test fish to increase to a size that would accommodate implantation of acoustic tags. Flow and fisheries monitoring were conducted in the lower San Joaquin and Old rivers and the Delta.

Temporary Barriers

VAMP-participating agencies install temporary barriers in the San Joaquin River to provide an adequate water supply for South Delta water diverters, improve water quality in the Stockton Deep Water Channel, and prevent entrainment of juvenile Chinook salmon at the South Delta facilities.

In 2007, a temporary barrier was installed at the Head of Old River in the spring from April 20 to June 6 and in the fall from October 17 to November 29. The spring season barrier improves conditions for out-migrating juvenile Chinook salmon while the fall barrier prevents adult salmon from migrating into the area.

Temporary agricultural barriers are installed to increase water levels in the South Delta for local water users. In 2007, barriers were installed at Middle River from April 10 to November 20; at Old River near Tracy from April 18 to November 18; and at Grant Line Canal from May 10 to November 29.

Brief background information about the temporary barriers can be found in Chapter 2, Delta Resources.

San Joaquin River Restoration Program

In 2006 the San Joaquin River Restoration Program (SJRRP) was established to implement the court settlement to restore 153 miles of the San Joaquin River from Friant Dam to the confluence of the Merced River. The agencies responsible for the implementation of the program include Reclamation, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), DWR, and the California Department of Fish and Game (DFG). During 2007 many organization and management actions were initiated to provide a structure for the SJRRP. A Program Management Plan was completed in May 2007 to provide a framework and strategy that the implementing agencies will use to collaborate and adaptively implement the program. Four technical work groups were formed to support the SJRRP: Water Management, Engineering and Design, Environmental Compliance and Permitting, and Fisheries Management.

In August 2007, both the National Environmental Policy Act (NEPA) and

California Environmental Quality Act (CEQA) processes were initiated for the overall program with Reclamation as the NEPA lead agency and DWR as the CEQA lead agency. A Notice of Intent and a Notice of Preparation for a draft program environmental impact statement (EIS)/environmental impact report (EIR) were issued. Scoping and other outreach meetings were conducted, beginning the first phase of implementing the SJRRP.

More information about SJRRP is available on the program's website: <http://www.restoresjr.net>.

Environmental Water Account

The Environmental Water Account (EWA) was established in the CALFED programmatic EIS/EIR Record of Decision. The EWA is a cooperative management program for fishery protection, restoration, and recovery needs. Water assets acquired through banking, borrowing, transferring, and arranging conveyance are used to augment stream flows and Delta outflows; modify water exports during critical stages of fish life cycles; and replace water supply that may be interrupted by changes to water operations associated with fish protective actions.

Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) was announced in 2005 to settle long-standing litigation over instream flows in the Yuba River in relation to fisheries. The purpose of the Yuba Accord is to resolve instream flow issues associated with the operation of the Yuba River Development Project (Yuba Project [includes New Bullards Bar Dam and Reservoir, and several small water and hydroelectric facilities located above and below Englebright Dam]) in a way that protects and enhances lower Yuba River fisheries and local water supply reliability. The Yuba Project provides revenues for local flood control and water supply projects,

water for the CALFED EWA for protection and restoration of Sacramento-San Joaquin Delta fisheries, and improvements in statewide water supply management, including dry year water supplies for participating SWP and CVP contractors.

The pilot programs are essential for the Yuba Accord's development. Under the 2006 and 2007 programs, the Yuba Project released water from New Bullards Bar Reservoir to meet significantly higher minimum instream flows for the fisheries resources of the lower Yuba River.

The Yuba Accord pilot programs include water sales to the CALFED Bay-Delta Program EWA to benefit the fisheries resources of the Bay-Delta. Revenues from these sales help fund the cost of the Yuba Accord's EIR/EIS and implementation of the Yuba Accord, as well as other activities, such as Yuba Project's share of costs for ongoing flood protection efforts in Yuba County.

The State Water Resources Control Board (SWRCB) approved a second 1-year pilot program for the Yuba Accord in February 2007. Yuba Project filed a separate petition under Water Code Section 1700 to change the effective date of the long-term flow requirements to April 1, 2008. Order WR 2007-0002 approved Yuba Project's petition to change the effective date of the interim instream flows under Permit 15026 to April 1, 2008.

The Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources was signed on December 4, 2007 as one element of implementing the Yuba Accord. In accordance with the agreement, DWR paid Yuba \$30,900,000 for 60,000 acre-feet (af) of Component 1 water per year for 2008 through 2015 (480,000 af in total) for EWA program purposes. In addition, DWR began the process of executing agreements with

participating SWP and CVP contractors for dry year water under the Yuba Accord.

Oroville Facilities Relicensing

DWR continued to seek a new 50-year license from the Federal Energy Regulatory Commission (FERC) to generate hydroelectric power while meeting existing commitments and complying with laws and regulations regarding water supply, flood control, the environment, and recreational opportunities. Though the previous license expired on January 31, 2007, the project continued to operate under an annual license issued by FERC.

USFWS issued a terrestrial biological opinion (BO) for the Oroville Facilities Relicensing Project (FERC File Number 2100), Butte County, California, on April 9, 2007. This BO addressed the continued operation of the Oroville facilities for power generation and the terms and conditions of the new FERC license and the *Settlement Agreement for Licensing of the Oroville Facilities* (Settlement Agreement). USFWS determined the project could affect five federally listed species within the project area: valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, giant garter snake, and bald eagle. Effects include 12 acres of elderberry shrub habitat, 9.5 acres of vernal pool habitat, 450 acres of giant garter snake habitat, and unknown effects on bald eagle nesting sites. However, given a number of conservation measures proposed by DWR, USFWS determined that the project would not jeopardize these species.

On July 11, 2007, DWR submitted the biological assessment and essential fish habitat assessment evaluating the effects of the Settlement Agreement and issuance of a new FERC license on federally listed anadromous fish. Anadromous species addressed in the biological assessment include Central Valley spring-run Chinook

salmon, California Central Valley steelhead, southern distinct population segment (DPS) of North American green sturgeon, Central California Coast steelhead, and Sacramento River winter-run Chinook salmon.

Habitat Expansion Agreement

On November 20, 2007, the *Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead* (HEA) was signed. This agreement, a component of the relicensing Settlement Agreement, states that DWR and Pacific Gas & Electric Company (PG&E) (the licensees) will restore or expand spawning, rearing, and holding habitat to accommodate a net increase of 2,000 to 3,000 spring-run Chinook salmon in the Sacramento River basin. This agreement was signed as an alternative to Federal Power Act, Section 18 fish passage prescriptions which may be required by NOAA Fisheries. The signing of the HEA begins a 2-year collaborative process in which DWR and PG&E will assess and select a project or projects that will accomplish this threshold, using a number of predetermined criteria outlined in the HEA. DWR and PG&E will be required to submit a Draft Habitat Expansion Plan by November 20, 2009, at which time the other signatories to the Settlement Agreement will be given an opportunity to comment on the plan prior to final approval from NOAA Fisheries.

DWR and PG&E entered into the Habitat Expansion Coordination Agreement (HECA), also effective November 20, 2007, to ensure that DWR and PG&E coordinate their decision-making and implementation of actions to achieve the goals of the HEA, as well as share costs incurred during the planning and implementation of habitat expansion actions. The HECA, which defines the roles and responsibilities of DWR and PG&E for implementing the HEA, ensures that DWR and PG&E fulfill their obligations under the HEA and achieve the HEA habitat

expansion goals in an efficient and cost-effective manner.

For more information, visit the Oroville Relicensing website at <http://www.water.ca.gov/orovillerelicensing> or the HEA website at <http://www.sac-basin-hea.com>.

Invasive Species

Northern Pike Containment and Eradication, Lake Davis

Northern pike is a nonnative aggressively invasive fish species illegally introduced into two of the SWP's Upper Feather Reservoirs during the 1980s and 1990s. The risk posed by northern pike, and innovative measures undertaken by DFG and DWR to contain and prevent its spread, were described in detail in Bulletin 132-07. The selected option to eradicate northern pike from the SWP's Lake Davis, and prevent its potentially catastrophic spread into other waters of the State, was implemented in September 2007.

Lake Davis is located in Plumas County on Big Grizzly Creek, a tributary to the Middle Fork Feather River. The 84,000 af capacity reservoir, formed by Grizzly Valley Dam, is operated by DWR for the primary purposes of recreation, fish and wildlife enhancement, and water supply.

Northern pike were discovered in Lake Davis in 1994. DFG subsequently implemented the first Lake Davis pike eradication project in October 1997, a controversial application of the fish pesticide ("piscicide") rotenone. However, pike were rediscovered in Lake Davis in 1999, having either survived treatment or having been illegally reintroduced.

After a multiyear, stakeholder-driven effort directed at containment and control, DFG proposed a second pike eradication project for Lake Davis and its tributary waters. In January 2007, DFG completed and certified a

final EIR/EIS, selecting a project alternative that minimized impacts to ongoing recreation and the other natural and cultural resources associated with the reservoir. The selected project alternative was chemical treatment (rotenone) of the lake and its upper tributaries.

Throughout 2007, staff from DWR worked with DFG to implement the eradication project. DWR and DFG executed an interagency agreement on August 24, 2007 which outlined the responsibilities of DFG and DWR to maintain an adequate water supply to parties with water rights downstream of Grizzly Valley Dam, provide access to DWR property, provide for streamflow curtailment, and for DWR assistance to DFG as necessary including Big Grizzly Creek fish relocation efforts. Over the course of the summer, the level of Lake Davis was drawn down to 43,000 acre-feet to help reduce the amount of chemicals required and to improve the effectiveness of the piscicide. DWR executed an amendment to the DWR-DFG Big Grizzly Creek minimum flow agreement on July 27, 2007 and obtained a temporary urgency change to its water rights for Lake Davis from SWRCB on August 29, 2007 to allow the cutoff of all releases and deliveries from the dam during treatment.

In cooperation with the Forest Service (Plumas National Forest), the area surrounding Lake Davis was closed following the Labor Day 2007 holiday weekend. Grizzly Valley Dam discharge to Big Grizzly Creek was suspended by DWR on September 25, 2007 to prevent discharge of the piscicide chemicals to downstream waters. Over two days, DFG applied several thousand gallons of rotenone products to the reservoir and its upstream tributaries.

The selected chemical neutralization option was natural degradation in the lake which required that the outlet from the Dam remain closed until no trace of the chemicals

remained. DPH and DFG continued to conduct water and sediment monitoring to ensure there was no detectable residuals remaining of chemical constituents before the lake could be returned to service as a drinking water source. Plumas County and the City of Portola proceeded with plans for construction of a new water treatment plant at Lake Davis, for delivery of the county's SWP allocation from Lake Davis. DFG and DWR committed to additional seasons of post-project monitoring to ensure eradication project success. This includes continued operation of the Northern Pike Containment System (see Bulletin 132-07), at the outlet of Lake Davis on Big Grizzly Creek, to provide ongoing assurance that if any northern pike survive, neither adults, larvae, or eggs have the opportunity to move downstream.

Quagga Mussel Monitoring

The quagga mussel, *Dreissena rostriformis bugensis*, and the closely related zebra mussel, *D. polymorpha*, are invasive aquatic species. The mussels colonize hard or soft substrates, but tend to attach to structures, clogging power generation facility cooling and pumping plant systems and trash racks, screens, internal piping, strainers, and filters used in municipal, industrial, and agricultural water delivery systems. The resulting damage to infrastructure can cost billions of dollars in maintenance or repair.

Quagga mussels are prolific invaders and can have major ecological impacts on the water bodies they invade. Being very efficient water filterers, they can change the base of the food web by removing substantial amounts of phytoplankton and suspended particulates from the water. They can attach to other clam and mussel species, eventually smothering and out competing them. A widespread, high density population of quagga mussels may contribute to algal blooms. Potential economic impacts include the cost of training, monitoring, and control efforts by public agencies, nonprofit

organizations, and private entities and lost revenue due to decreased property values, impacts on fisheries, or decreased use of water for swimming, boating, fishing, and other recreational activities. Once the mussels establish themselves in a water body, they are difficult to eradicate, making prevention vital. Introduction of mussels into SWP facilities and water bodies is a serious threat.

The adult and juvenile mussels are spread when they are inadvertently moved from one water body to another in or on trailered boats or any type of aquatic vehicles or equipment. Larval mussels also spread by drifting downstream. Quagga mussels can quickly infest a water body, and once they are established, there is no economically feasible method of eradication, therefore the best course of action is preventing the spread of mussels by cleaning and drying aquatic equipment before using it in another water body.

Quagga mussels were discovered in January 2007 in Lake Mead, and subsequent surveys found them in Lakes Mohave and Havasu and part of the Colorado River Aqueduct (CRA) that serves Southern California. It was the first discovery of these mussels west of the Continental Divide. They are believed to have entered the Colorado River system in boats trailered there from infested waters in the Midwest. In August 2007 they were discovered in San Diego and Riverside county reservoirs served by the CRA.

Immediately following the quagga mussel discovery, an interagency Incident Command System (ICS) was established, led by DFG and supported by DWR, Department of Food and Agriculture, Department of Boating and Waterways, and USFWS. The assembled Quagga Mussel Incident Response Team implemented a detection and delineation survey for quagga mussels in prioritized waterways in California,

mobilized agricultural inspection stations to focus on boat inspections, conducted a feasibility assessment of eradicating the quagga mussel in the Lower Colorado River, and developed a strategic plan for statewide mussel detection, management, and control. DWR began monitoring the SWP for quagga mussels shortly after the mussels were first detected in California. No mussels were found in the SWP or its associated watersheds. Metropolitan Water District of Southern California (Metropolitan) began surveying and monitoring the CRA, first discovering mussels in March 2007 and eventually finding mussels throughout the entire CRA system. The City of San Diego's survey activities discovered mussels in the San Diego Aqueduct.

Considering there is no ecologically and economically feasible method of eradicating widespread mussel infestations in large water systems, early management efforts focused on: (1) monitoring to establish the extent of the invasion; (2) mandatory boat inspections at all agricultural inspection stations; (3) public outreach to prevent the inadvertent transport of mussels by recreational boaters; and (4) outreach and mussel identification training of State and water district staff, including biologists, maintenance craftsmen, infrastructure inspectors, and law enforcement officers. DWR offered several training workshops on quagga mussel surveying techniques and identification. The ICS demobilized in March, but federal and State agency representatives who were involved in the incident continued to work on action items identified by the Quagga Mussel Incident Response Team.

In April 2007, a science advisory panel was convened to plan California's response to the invasion. Their report, *California's Response to the Zebra/Quagga Mussel Invasion in the West*, released in May 2007, contains science advisory panel recommendations in three operational areas: control and eradication in currently infested waters; containment

within those waters; and monitoring to detect new infestations. The report also included recommendations for future research priorities. The report recommends that agencies proceed with advance planning for responding to new infestations and reducing the impacts from infestations that are not prevented or eradicated.

More information about the quagga mussel is provided on agency websites.

DFG, <http://www.dfg.ca.gov/invasives/quaggamussel>

USGS, <http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel>

DWR, http://www.water.ca.gov/environmentalservices/invasive_species.cfm

Biological Opinions Issued on the CVP/SWP Operating Criteria and Plan

The CVP and SWP Long-Term Operations Criteria and Plan (OCAP) incorporates measures to provide protection for ESA listed fish species. In July 2006, Reclamation requested reinitiation of ESA Section 7 consultation with NOAA Fisheries and USFWS regarding future combined CVP and SWP operations. During 2007, DWR, Reclamation, NOAA Fisheries, USFWS, and DFG met regularly to develop a formal consultation initiation package. Two biological opinions from 2004 remained in effect in the interim.

U.S. Fish and Wildlife Service Biological Opinion

In 2004 USFWS issued a BO finding that the proposed coordinated operations of the SWP and CVP would have no adverse effect on the continued existence and recovery of the delta smelt and its critical habitat. In May 2007, a federal judge ruled that the 2004

OCAP BO did not adequately protect delta smelt, and that it was unlawful because it did not ensure that appropriate mitigation actions would take place, it was not based on the best available scientific information, it specified take limits that failed to consider recent declines in abundance, and it failed to consider impacts to critical habitat. The court remanded the 2004 BO and ordered a new OCAP BO be completed by September 2008.

The court issued an interim remedial order in December 2007 which modified CVP and SWP operations for the protection of delta smelt until the new BO is completed. The order set limits on net upstream (reverse) flow in Old and Middle rivers due to CVP and SWP exports in order to reduce the risk of entrainment of delta smelt at the pumps.

NOAA Fisheries Biological Opinion

In 2004, NOAA Fisheries issued a BO concluding that continuation of OCAP is not likely to jeopardize the continued existence of spring-run Chinook salmon or steelhead in the Central Valley. Since that opinion was issued, there have been new species listings and new critical habitat designations for listed species.

During this time, reasonable and prudent measures to minimize take of spring-run Chinook salmon and steelhead outlined in the 2004 BO were followed, as outlined in Bulletin 132-07.

Delta Export Curtailment

A team of interagency scientists known as the Delta Smelt Working Group (DSWG) met throughout 2007 to review smelt distribution and abundance based on monitoring and survey data and to recommend actions for water project operations that would reduce salvage. In January 2007, the DSWG recommended maintaining a net upstream (negative) combined OMR flow no greater than 5,000 cubic feet per second (cfs) throughout winter and spring, until the

Endangered Species Acts

Section 7 of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat, formal consultation is required. Federal agencies must consult with either the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service. As part of the consultation process, wildlife agencies issue a biological opinion (BO). Where appropriate, a BO provides an exemption for the take of listed species. If an action is determined by an agency to jeopardize a species or adversely modify critical habitat, agencies suggest Reasonable and Prudent Alternatives that the action agency may take to avoid the likely jeopardy or adverse modification (Title 16, United States Code Sections 1531–1544 [1973]). The California Endangered Species Act is substantially similar in all aspects (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 ensuring federal and State agencies adopt measures to protect the species during the design, construction, and operation of projects and in taking other forms of agency action; and prohibiting the unauthorized take of endangered species.

risk of smelt entrainment abated. Due to low delta smelt abundance indicated by monitoring surveys, DSWG provided an additional recommendation on May 14 of no net negative OMR flow until Delta temperatures reach the lethal threshold for delta smelt.

In 2007, 2,343 delta smelt were salvaged by SWP and 348 were salvaged by CVP. This represents an increase in salvage at both facilities compared with a combined annual salvage of 336 at both facilities in 2006.

The Bay-Delta Conservation Plan

The Bay-Delta Conservation Plan (BDCP) is a current effort by DWR, Reclamation, Mirant Delta, LLC, and the State and federal water contractors to attain long-term take authorization under the CESA and

ESA while providing for the conservation and management of covered species in the Sacramento-San Joaquin Delta. When completed, the BDCP will provide a plan to restore and protect water supply, water quality, and ecosystem health within a stable regulatory framework. The BDCP will be composed of a Habitat Conservation Plan and a Natural Community Conservation Plan. The Resources Agency acts as facilitator for the BDCP Steering Committee, which consists of the applicants or potentially regulated entities mentioned above, fish and wildlife agencies (DFG, USFWS, NOAA Fisheries), and some nongovernmental organizations.

The BDCP Planning Agreement was signed on October 6, 2006 by all members of the steering committee, and a draft work plan was drawn up that outlines the tasks to be completed by the primary consultant,

Science Applications International Corporation (SAIC).

During 2007, the BDCP Steering Committee assembled an independent science panel which produced the first BDCP *Independent Science Advisors Report* in September. During the first half of 2007, the Steering Committee developed a list of 10 conceptual conservation strategies, evaluated those strategies, and shortened that list to four Conservation Strategy Options which were published in the *Options Evaluation Report*. In November, the Steering Committee produced a document titled *Points of Agreement for Continuing into the Planning Process* which will guide formulation of a comprehensive conservation strategy during 2008.

For more information, see Chapter 2, Delta Resources, or visit the BDCP website: <http://baydeltaconservationplan.com>.

Decisions on Endangered Species

North American Green Sturgeon

The Southern DPS of North American green sturgeon, *Acipenser medirostris*, was listed as threatened under the federal ESA in 2006 (see Bulletin 132-07). On April 17, 2007, the Center for Biological Diversity filed a notice of intent to sue NOAA Fisheries for failing to designate critical habitat for the Southern DPS of green sturgeon, as required by the ESA. A settlement agreement was reached, and proposed critical habitat designation is expected in 2008.

Delta Smelt

In 2006, the Center for Biological Diversity, Bay Institute, and Natural Resources Defense Council filed a petition with USFWS to uplist delta smelt, *Hypomesus transpacificus*, from threatened to endangered species status under the federal ESA (Bulletin 132-07). A similar petition was filed with the California Fish and Game Commission (FGC) in February 2007. The petitions state that record

low abundance levels, population viability analysis, loss of habitat, and increasing occurrence of multiple known threats are evidence that the species is at risk of extinction.

On May 24, 2007, the Center for Biological Diversity filed a notice of intent to sue the USFWS for failure to respond to the 2006 petition. On June 7, 2007, the California FGC accepted the petition to consider uplisting the delta smelt to endangered species status under CESA, initiating a 12-month review of the species' status.

Longfin Smelt

On August 8, 2007, the Bay Institute, Center for Biological Diversity, and the Natural Resources Defense Council petitioned the USFWS to list the Bay-Delta population of longfin smelt as threatened or endangered under the federal ESA, and petitioned FGC to list the fish statewide under CESA. The petition cites four consecutive years of record low population abundance indices (Figure 3-1), reduced genetic integrity, and threats by water management practices as reasons that warrant the proposed listing.

Trends in Fish Abundance

Figure 3-2 shows the abundance index for delta smelt, from 1967 through 2007, based on fall midwater trawl sampling. Using only the first two tow net surveys, delta smelt abundance indices are calculated as the product of the total catch at each site and a weighting factor that represents the estimated water volume for the site, divided by 1,000. The fall abundance index provides one of the best indicators of the status of the adult delta smelt population. The 2007 index was the second lowest on record. Since 2002, abundance indices for this species have been lower than expected.

Figure 3-3 shows estimates of returning adult winter-run Chinook salmon from 1967 through 2007. These estimates are referred

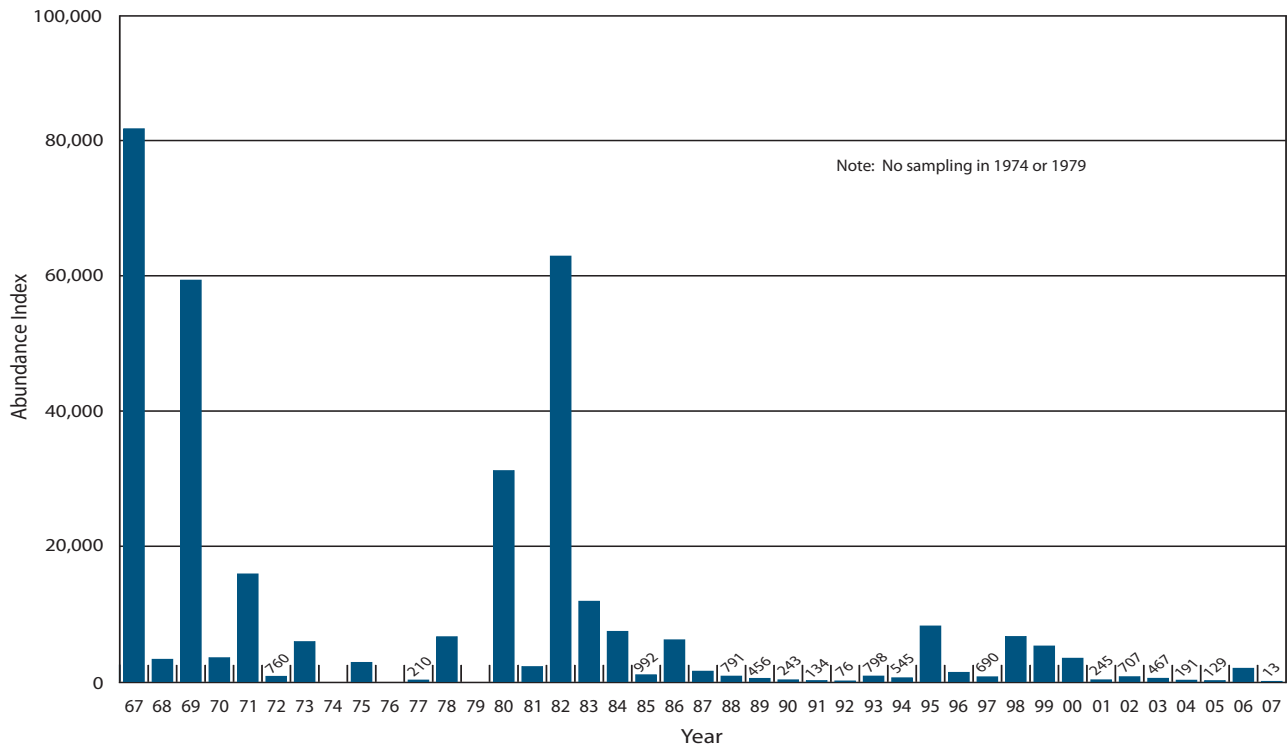


Figure 3-1 Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2007

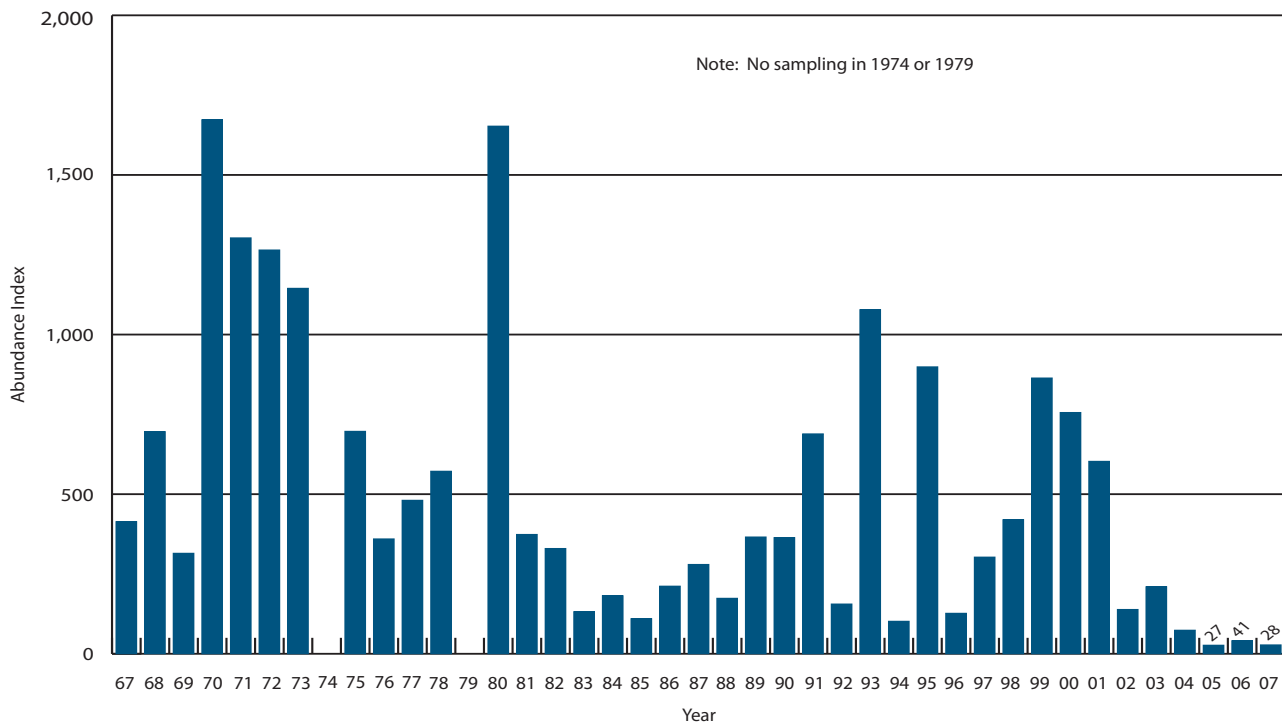


Figure 3-2 Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2007

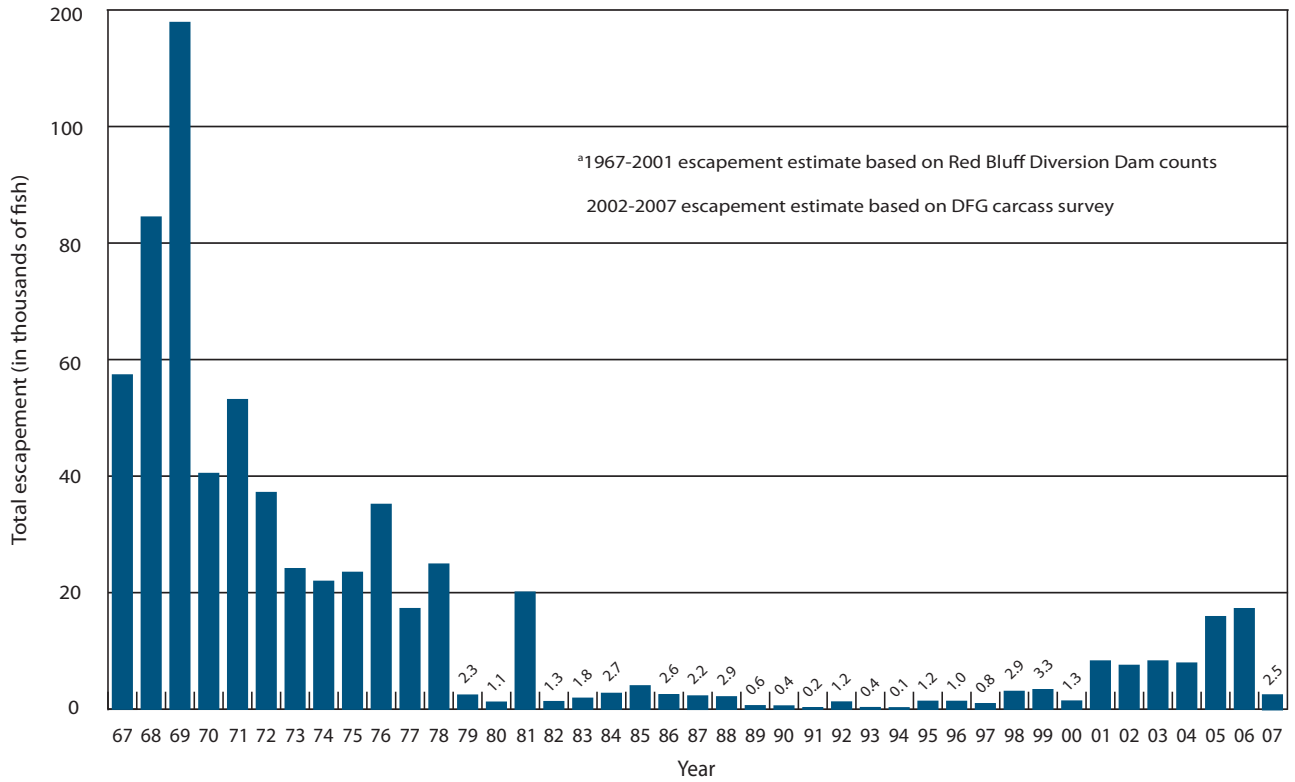


Figure 3-3 Estimated Total Adult Winter-Run Chinook Salmon Escapement, 1967–2007^a

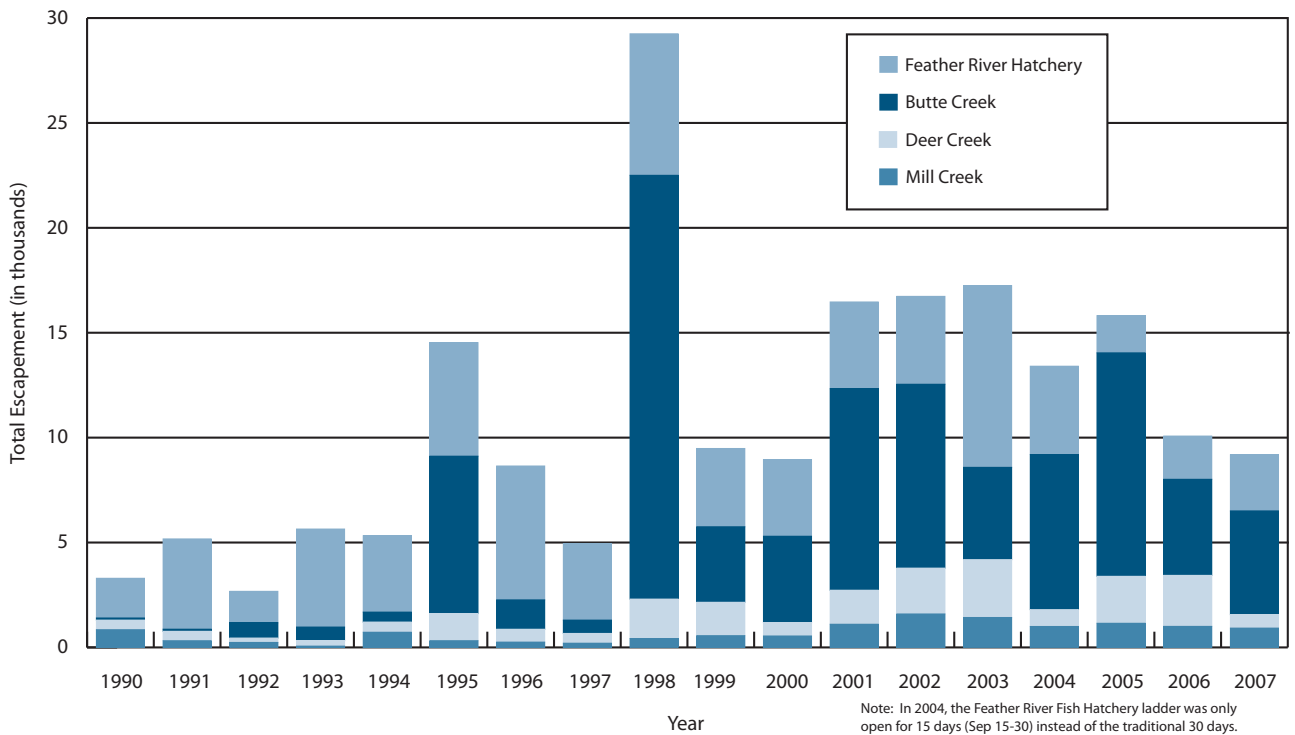


Figure 3-4 Estimated Spring-Run Chinook Salmon Escapement, 1990–2007

to as escapement estimates—the number of adults that escape mortality and return to spawn. The Sacramento River winter-run Chinook salmon escapement estimates are generated using data from the DFG carcass survey. DFG has been using the carcass survey data to generate escapement estimates since 2002. Prior to 2002, Red Bluff Diversion Dam counts were used to generate the escapement estimate. The estimated winter-run Chinook escapement for 2007 was 2,488, which is a drastic decline from the increasing trend that began in 2001. It is about half of the parent stock of 2004. Figure 3-4 shows estimates of returning adult spring-run Chinook salmon, from 1990 through 2007. Individual estimates are shown for the principal spring-run spawning streams, Mill Creek, Deer Creek, and Butte Creek, and the Feather River Fish Hatchery (FRFH).

The escapement estimates are shown separately for each stream, because the Feather River estimate is based on returns to the FRFH, where the genetic integrity of spring-run Chinook salmon is uncertain. The estimated escapement for 2007 was 2,675 for FRFH and about 6,500 for the other streams combined. The 2007 FRFH escapement was only about 63 percent of the 2004 parent stock escapement estimate. The escapement of naturally spawned fish for Mill, Deer, and Butte creeks is about 71 percent less than the 2004 parent stock.

Due to lack of comprehensive monitoring programs, there are no reliable escapement estimates for wild Central Valley steelhead.

Feather River Fish Studies

In the early 1990s, the Feather River fish studies were initiated to document and monitor fish populations in the lower Feather River. Early efforts focused on studies to identify flow requirements for Chinook salmon and steelhead. The program progressively expanded since the mid-1990s

in preparation for the FERC relicensing of the SWP Oroville-Thermalito Complex. Field program elements have expanded to include the operation of rotary screw traps, acoustic and radio telemetry, salmon escapement surveys, spring-run Chinook tagging, and otolith thermal marking studies.

Rotary Screw Traps

Over the last 10 years, DWR has used rotary screw traps (RST) as the primary method to assess the general abundance and timing of emigrating juvenile salmon and steelhead in the lower Feather River. This long-term monitoring effort yields valuable baseline information about juvenile salmonid production in lower the Feather River and the effects of project operations on abundance and migration timing.

Emigration timing and speed measurements confirm that most naturally produced juvenile Chinook salmon move rapidly through the upper reaches of the lower river. Consistent with select years of trapping data, turbidity may influence the emigration timing of naturally produced juvenile salmon. However, other studies demonstrate that the timing of adult spawning plays a large role in determining juvenile salmon emigration patterns as well.

The 2007 season was fished throughout the emigration period (December through June). Two RST locations were used to assess the timing and general abundance of juvenile Chinook salmon, steelhead, and other fish species emigrating the Feather River. Within the low-flow channel (LFC; Fish Barrier Dam to Thermalito Afterbay Outlet), one RST at Steep Riffle (river mile [RM] 61) provided a passage estimate of 4,496,445 juveniles. Within the high-flow channel (HFC; Thermalito Afterbay Outlet [TAO] to the confluence with Honcut Creek), one RST located just below Sunset Pumps at RM 38 was unable to produce a passage estimate due to gaps in the data resulting from high-flow events. Although Chinook

salmon and steelhead were the primary targets of trapping efforts, records were kept on all fish species caught. Thirty-one species were caught during the trapping season. Chinook salmon was the dominant species, comprising approximately 98 percent of the catch.

Acoustic and Radio Telemetry

Acoustic and radio telemetry gathers baseline information on the migration and holding patterns of adult Chinook salmon in the river. A telemetry study was conducted to collect additional data to evaluate the relationship between water temperature and migration patterns of pre-spawning adult Chinook salmon in the Feather River below the Fish Barrier Dam.

Chinook salmon with spring-run life history enter freshwater in early summer and hold in their natal tributaries for up to several months before spawning. In order to collect additional data to evaluate water temperature and migration patterns of pre-spawning adult Chinook salmon, spring-run adult Chinook salmon are captured and radio tagged to document their habitat use. Because the water temperature regime associated with the ongoing operation of the Oroville facilities may expose pre-spawning adult Chinook salmon to elevated water temperatures during the migration and holding period, radio tagging was implemented to determine whether the pools downstream of the Thermalito Afterbay Outlet (TAO) provide water temperatures suitable for holding. Between May 3 and June 25, 2007, 45 adult Chinook salmon received an esophageal implant of a radio tag at the FRFH. Of the 45 tags deployed, 40 were subsequently located. A total of 12 tags were recovered: five were recovered during the escapement survey, two were recovered at the FRFH, and five were reported by anglers. The total gross distance traveled by the tagged fish ranged from 0 to

68.4 river miles. The largest surveyed net movement was 19.5 river miles downstream.

Salmon Escapement Survey

The purpose of the salmon escapement survey is to evaluate the abundance, distribution, and timing of in-river Chinook salmon spawning.

The survey provides information crucial to monitoring, management, and conservation of the Feather River's salmon populations. The data are used to identify trends in population and age structure, track patterns in spawning distribution, determine proportions of hatchery versus wild fish, and explore environmental effects on salmon survival rates. Estimating the number of salmon returning to spawn is the basic goal of the carcass survey. This estimate is based on a weekly mark and recapture experiment in which salmon carcasses are tagged, chopped, and placed back into the river. The rate at which tagged carcasses are recovered (the recovery rate) relative to the number of carcasses checked for tags (chopped) provides the basis for an estimate of the total population.

The 2007 Chinook salmon spawning escapement survey began September 4 and continued through December 9. Due to the low numbers of returning fish, the data from the LFC and HFC were pooled to generate one estimate for the lower Feather River. A pooled Peterson estimator is used to calculate the escapement estimate. For the lower Feather River, the estimate was 21,862. There were an estimated 321 grilse (fish \leq 65 cm fork length). These estimates include both fall-run and spring-run Chinook salmon since their spawning is currently not fully segregated on the Feather River. Approximately 96 percent of the spawning population utilized the LFC. This is higher than any of the previous years monitored since DWR began surveys in 2000. Since

2000, the long-term average for the LFC's spawning population is 67 percent.

Spring-run Salmon Tagging

The spring-run Chinook salmon tagging program at the FRFH is an attempt to better segregate spawning of spring- and fall-run Chinook salmon in the hatchery. The program also investigates potential differences in spawning distribution and timing of the early arriving spring-run salmon in the river and contributes to a better understanding of spring-run salmon life history in the Feather River. Early arriving spring-run salmon entering the hatchery were marked with individually numbered Hallprint dart tags for identification purposes. Once marked, fish were released back in the river and allowed to over-summer there. During the hatchery spawning season, the mark enabled the hatchery to distinguish the early arriving spring-run from the fall-run fish, so that spring-run fish could be spawned separately from the fall-run. The mark also enabled the escapement survey crew to differentiate between spring- and fall-run salmon, so that any potential differences or trends in spawning behavior of the two runs could be analyzed.

Between May and July 2007, 9,756 spring-run Chinook salmon were marked. During the marking period, 1,527 marked spring-run salmon were recaptured in the FRFH and returned back to the river. When spawning commenced in the fall, a total of 2,873 marked fish were recovered: 1,849 at the FRFH, 773 in the river escapement survey, and 251 by anglers. The FRFH successfully spawned 1,403 (76 percent) marked spring-run salmon that returned to the hatchery.

Otolith Thermal Marking Studies

The Chinook salmon run in the Feather River consists of Central Valley spring-run and fall-run, both heavily supplemented by the FRFH. In order to more effectively determine the

composition of the run (spring-run versus fall-run) and the origin of the fish (hatchery versus naturally produced), DFG and DWR developed an otolith thermal marking program (OTM) for the FRFH. Thermal marking provides an efficient method to mark 100 percent of the fish produced at the hatchery.

In 2005–2006, 100 percent marking of spring- and fall-run Chinook began. By 2009–2010 the entire cohort of spawning salmon will be thermally marked (ages 2 through 5 years) and otolith analysis will begin. With the continuation of this program DWR will be able to definitively determine the origin and the proportions of spring- and fall-run within the river and the hatchery. With known origin and race, more advanced otolith analyzing techniques can be employed to investigate potential differences in life history strategy for fall- and spring-run, as well as hatchery and naturally produced Chinook. This will provide valuable information to evaluate the effectiveness of past management decisions aimed at the recovery of natural-origin Chinook and guide future restoration actions.

Pelagic Organism Decline in the Upper San Francisco Estuary

By the early 2000s, long-term monitoring by the Interagency Ecological Program (IEP) had revealed marked declines in numerous pelagic (open water) fishes in the upper San Francisco Estuary (the Delta and Suisun Bay). This decline has collectively become known as the Pelagic Organism Decline (POD).

Since 2005, IEP scientists have been coordinating studies investigating potential causes of POD. Initial research efforts identified possible stressors on fish populations and mechanisms for population declines (see Bulletin 132-06).

In 2007, abundance indices calculated from several IEP monitoring programs continued to indicate record and near-record lows for resident pelagic fishes of the upper estuary, including delta smelt, longfin smelt, striped bass, and threadfin shad. These declines had several significant management consequences, including limits to pumping to protect delta smelt. Research continued on a suite of studies to further evaluate and refine the four components of the basic POD conceptual model. A synthesis of results through 2007 highlighted new findings in the context of the conceptual model.

1. Previous abundance—Species that were previously able to recover from low adult abundance levels in pre-POD years now show limited resilience.
2. Habitat—Turbidity, salinity, and temperature are significant habitat characteristics for POD species. Additional factors such as contaminants and toxic algal blooms represent emerging issues for species such as delta smelt.
3. Top-down effects—Predation by striped bass and largemouth bass and entrainment by the CVP and SWP seem to be unlikely single causes of the POD. Salvage of pre-spawning delta smelt and longfin smelt may be influenced by reverse flows at Old and Middle rivers and turbidity as a trigger for upstream migration.
4. Bottom-up effects—The species composition of zooplankton has changed during recent years, perhaps affecting feeding success of the POD fishes. Studies underway are focusing on the availability and quality of introduced zooplankton as a food source.

The full report, *Pelagic Organism Decline Progress Report: 2007 Synthesis of Results*, is available from <http://www.water.ca.gov/iep/activities/research.cfm>.

Additional information can be found in the *Pelagic Fish Action Plan*, published in March 2007, available from the Delta Initiatives website at <http://www.water.ca.gov/deltainit>.

Fish-Related Mitigation Projects

In 1986, DWR and DFG signed the Delta Pumping Plant Fish Protection Agreement (Delta Fish Agreement) to annually provide funds to offset direct losses of Chinook salmon, steelhead, and striped bass at Banks Pumping Plant. The Delta Fish Agreement is commonly referred to as the Four Pumps Agreement because it was adopted as part of the mitigation package for four additional pumps at the Banks Pumping Plant. Direct losses are defined as losses of fish that occur from the time fish are drawn into Clifton Court Forebay until the surviving fish are returned to the Delta. In principle, DFG and DWR intended this agreement to offset direct losses of all fish caused by the diversions of water by the pumping plant starting in 1986. However, at that time, information on impacts and measures to offset those impacts was sufficient only to deal with Chinook salmon, steelhead, and striped bass. The agreement allowed for addressing impacts on other fish species once impacts could be identified and measures could be developed that would offset such impacts.

The process which led to this agreement included an advisory committee of representatives from interest groups concerned with fish resources affected by the SWP, including but not limited to representatives of the SWP water contractors, sport and commercial fishing groups, and environmental groups. The agreement formalized the Delta Pumping Plant Fish Advisory Committee and outlined how project proposals would be reviewed and selected for funding.

The Delta Fish Agreement gives priority to mitigation measures for habitat restoration and other nonhatchery measures.

Under the agreement, DWR calculates fish loss as prescribed in the agreement, and approved mitigation projects earn fish mitigation credits to satisfy the fish loss mitigation provisions in the agreement. Mitigation is on a fish-for-fish basis.

The agreement provides for two funding components. One component is the Annual Mitigation Account for compensating the annual fish losses. It has no expiration date. The second is a \$15 million lump sum provided by DWR for additional projects to compensate for post-1986 losses. The agreement specifies that the \$15 million must be expended by December 29, 1996.

The Delta Fish Agreement has been amended three times:

- Amendment 1 (1996)—extended the period to expend the remaining \$9 million of the \$15 million to December 29, 2001;
- Amendment 2 (2001)—extended the period to expend the remaining \$5 million of the \$15 million to December 31, 2004; and
- Amendment 3 (2004)—extended the period to expend the remaining \$3.6 million of the \$15 million to December 31, 2007.

DWR and DFG work with the Fish Advisory Committee to review the success of the agreement in offsetting the direct effects of diversions by the Banks Pumping Plant. If warranted, the agreement can be renegotiated to fulfill SWP's responsibilities to compensate direct fish losses. The agreement requires DWR and DFG to conduct an annual review and provide the results in an report.

Since 1986, DWR has spent \$45 million on mitigation projects developed under the Delta Fish Agreement. Mitigation fund expenditures through December 31, 2007, were \$34.7 million for the Annual Mitigation Account and \$12.6 million for the \$15 million Lump Sum Account. Funds approved but unexpended from each account were \$10.7 million and \$2.3 million, respectively. The remaining funds are allocated for new or previously implemented, longer-term projects. Some of the mitigation projects initiated, approved, or implemented in association with the agreement and its amendments are shown in Table 3-1.

On May 7, 2007, DWR and DFG entered into a memorandum of understanding (MOU) in order to facilitate and expedite completion of the reinitiated ESA Section 7 consultation for the SWP and CVP long-term OCAP. In Paragraph 7 of the MOU, DWR and DFG agreed to begin negotiations to amend the Delta Fish Agreement for a fourth time to include additional fish species not previously covered, address indirect and direct losses of those fish species, and find methods to develop mitigation credits for such take.

The Delta Fish Agreement has been an effective tool in mitigating direct impacts and has offset more than 100 percent of the mitigation losses as determined by DFG for salmon (182 percent) and steelhead (126 percent) and approximately 99 percent for striped bass. The program is in a period of project maintenance and replacement as older mitigation projects end. Fish passage projects and migration flows and enhanced enforcement to protect spring-run Chinook salmon continue to be priority projects, as do natural production projects for steelhead.

Table 3-1 Delta Fish Agreement Mitigation Projects Funded, Approved, or Implemented

Project	Project Description	Project Location
1986 Delta Fish Agreement		
San Joaquin River System		
San Joaquin fish barrier, 1992–2009	Fish barrier to improve salmon spawning and rearing habitat and migration pathways in the San Joaquin Basin	San Joaquin River Georgiana Slough
San Joaquin tributary diversion fish screens	Two screens installed as part of the San Joaquin River tributary diversion fish screening pilot project	Merced River
Merced River salmon habitat enhancement program	Gravel replacement and maintenance projects to provide benefits to fall-run salmon and steelhead; spawning and rearing habitat improvement; fish passage improvement; elimination of salmonid predator habitat; and improved channel, floodplain, and riparian areas	Merced River
Merced River hyacinth control	Pilot water hyacinth eradication project	Merced River
Merced River fish facility expansion	Expanding the fish facility to increase salmon production and cost-sharing in annual operating costs	Merced River
Spring-run salmon increased protection	Enhancing the enforcement of fish and game laws in the Delta and upstream to benefit salmon, steelhead, and striped bass, as well as increasing protection for spring-run Chinook salmon	various
Bay-Delta		
Striped bass stocking and net pen rearing	Planting hatchery-reared and net-pen-reared striped bass	Bay-Delta
Salmon acclimation pens	Operating an acclimation pen to improve the survival of hatchery-reared salmon during their release	San Pablo Bay
Delta-Bay Enhanced Enforcement Program (DBEEP)	Enhancing enforcement of fish and game laws in the Delta and upstream to benefit salmon, steelhead, and striped bass	Bay-Delta and upstream into the Sacramento and San Joaquin river basins
Grizzly Island fish screen	Constructing fish screen	Suisun Marsh
Suisun Marsh fish screens	Screening diversions in Suisun Marsh	Suisun Marsh
Sacramento River System		
Feather River salmon projects	Hatchery expansion; salmon passage	Feather River
Sacramento River spawning gravel	Gravel replacement and maintenance for salmon and steelhead	Sacramento River
Mill Creek spawning gravel	Gravel replacement and maintenance for salmon and steelhead	Mill Creek
Mill Creek water exchange project	Implementing a conjunctive-use project to improve salmon migration flows	Mill Creek and Deer Creek
Spring-run salmon passage projects	Constructing fish ladders and screens	Butte Creek
1996 Amendment		
San Joaquin River System		
San Joaquin tributary diversion fish screens	Screening diversions on the San Joaquin River tributaries	Merced River
San Joaquin salmon predator isolation	Predator isolation projects on San Joaquin River tributaries	various
Sacramento River System		
Spring-run salmon migration	Conjunctive-use project to improve spring-run salmon migration	Deer Creek

Table 3-1 Delta Fish Agreement Mitigation Projects Funded, Approved, or Implemented

Project	Project Description	Project Location
2001 Amendment		
San Joaquin River System		
Merced River salmon habitat enhancement project	Gravel replacement and maintenance projects to provide benefits to fall-run salmon and steelhead; spawning and rearing habitat improvement; fish passage improvement; elimination of salmonid predator habitat; and improved channel, floodplain, and riparian areas	Merced River
Salmon spawning habitat and channel restoration projects	Gravel augmentation, rehabilitation of spawning riffles, floodplain and channel rehabilitation	Tuolumne River
Stanislaus River salmon and steelhead habitat	Gravel replacement and maintenance to provide benefits to fall-run Chinook salmon and steelhead	Stanislaus River
Merced River wing deflector gravel	Salmon spawning gravel replenishment at wing deflector site	Merced River
Sacramento River System		
Spring-run salmon migration	Revised conjunctive-use project to improve spring-run salmon migration	Deer Creek
2004 Amendment		
San Joaquin River System		
Merced River fish facility operations and maintenance	Augmentation of the Delta Fish Agreement annual funding due to increased operating costs	Merced River
Merced River salmon habitat enhancement project—Robinson reach	Post-construction activities related to permit compliance and cost-share requirements	Merced River
Expansion of the Robinson reach conservation easement (Merced River salmon habitat enhancement project)	Placement of conservation easements on nearly 9,000 acres at the confluence of the Merced and San Joaquin rivers, covering approximately 5 miles of riparian habitat	Merced River
Merced River salmon habitat enhancement project	Complete design scenarios for additional phases of the project	Merced River
Stanislaus River salmon habitat	Increasing and improving spawning and rearing habitat for Chinook salmon and steelhead	Stanislaus River
Sacramento River System		
Deer Creek water exchange (operations and maintenance)	Groundwater exchange project designed to fulfill the water needs of local agricultural and domestic water users while achieving the fisheries flow objectives for salmon and steelhead	Deer Creek
Bay-Delta		
Delta-Bay Enhanced Enforcement Program (DBEEP)	Additional funding for focused enforcement efforts to protect anadromous species of concern in the Delta and upstream areas	Bay-Delta and upstream into the Sacramento and San Joaquin river basins
Suisun Marsh fish screens	Operation and maintenance of 14 fish screens in Suisun Marsh over a 12-year period	Suisun Marsh



Chapter 4

Water Quality Programs

Sisk Dam, San Luis Reservoir.

Significant Events in 2007

In September 2007, the Regional Water Control Board identified and amended the Water Quality Control Plan for the Sacramento River and San Joaquin River basins for pH and turbidity objectives to protect beneficial uses.

The Sacramento Valley Water Year Hydrologic Classification (40-30-30 Index) was dry. The San Joaquin Valley Water Year Hydrologic Classification (60-20-20 Index) was critical.

The State Water Resources Control Board convened a number of workshops to receive input and conduct detailed discussions related to the Pelagic Organism Decline (POD) in the Bay-Delta. The goal of the workshops was to collect information that might be used in updating the current Bay-Delta Plan. Following the workshops, SWRCB would determine whether there was adequate justification to convene proceedings to update the Bay-Delta Plan using the collected information.

Information in this chapter was contributed by the Division of Environmental Services and the Division of Operations and Maintenance.

The State Water Project (SWP) is the largest State-built, multipurpose water project in the United States. California's existence and continued prosperity depends on water. More than two-thirds of the people of California rely partly or wholly on the SWP for their daily water needs. The Department of Water Resources (DWR), Division of Operations and Maintenance currently maintains 15 automated water quality monitoring stations at key locations along the SWP. This network of automated stations continuously monitors a variety of water quality parameters throughout the system and provides real-time data to SWP water contractors. In addition, field grab samples collected weekly, monthly, quarterly, or annually from more than 30 SWP locations are routinely analyzed for a broad range of constituents at the State's Bryte Chemical Laboratory.

Delta Activities

The State Water Resources Control Board (SWRCB) establishes water quality objectives and monitoring plans to protect a variety of the beneficial uses of water. The water quality objectives are set at points of delivery under Article 19 of the long-term SWP water supply contracts. The California Department of Public Health (DPH) establishes maximum contaminant levels for treated drinking water.

Water quality in the Delta and Suisun Marsh is protected under SWRCB's Water Right Decision 1641 (D-1641), adopted in December 1999 (see the sidebar, State Water Resources Control Board). SWRCB's issuance of D-1641 is part of its implementation of the 1995 *Water Quality Control Plan (WQCP) for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) and, accordingly, this decision amends certain water rights of the water rights holders to help achieve the plan's objectives. The SWRCB ensures that these objectives are met in part by the inclusion of water quality monitoring requirements in D-1641 as conditions for operating the SWP and Central Valley Project (CVP).

DWR conducts extensive monitoring to protect beneficial uses of water in the Delta and Suisun Marsh, as required by D-1641. Figure 4-1 shows water quality compliance

and monitoring stations throughout the Sacramento-San Joaquin Delta required by D-1641.

Water Supply Conditions

Water Year Classifications and Water Supply Indexes

SWRCB's D-1641 contains water quality and flow standards that are conditioned by water year type and generally become less stringent in years with less precipitation. The water year classification system provides relative estimates of a basin's available water supply based on the amounts of rainfall, snowmelt runoff, and groundwater accretion rates. Water year types are classified as "wet," "above normal," "below normal," "dry," or "critical."

The Sacramento Valley Water Year Hydrologic Classification (40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (60-20-20 Index) were dry and critical, respectively, based on observed data for water year 2006–2007. (For a detailed discussion of water year 2006–2007, see Chapter 8, Water Supply.)

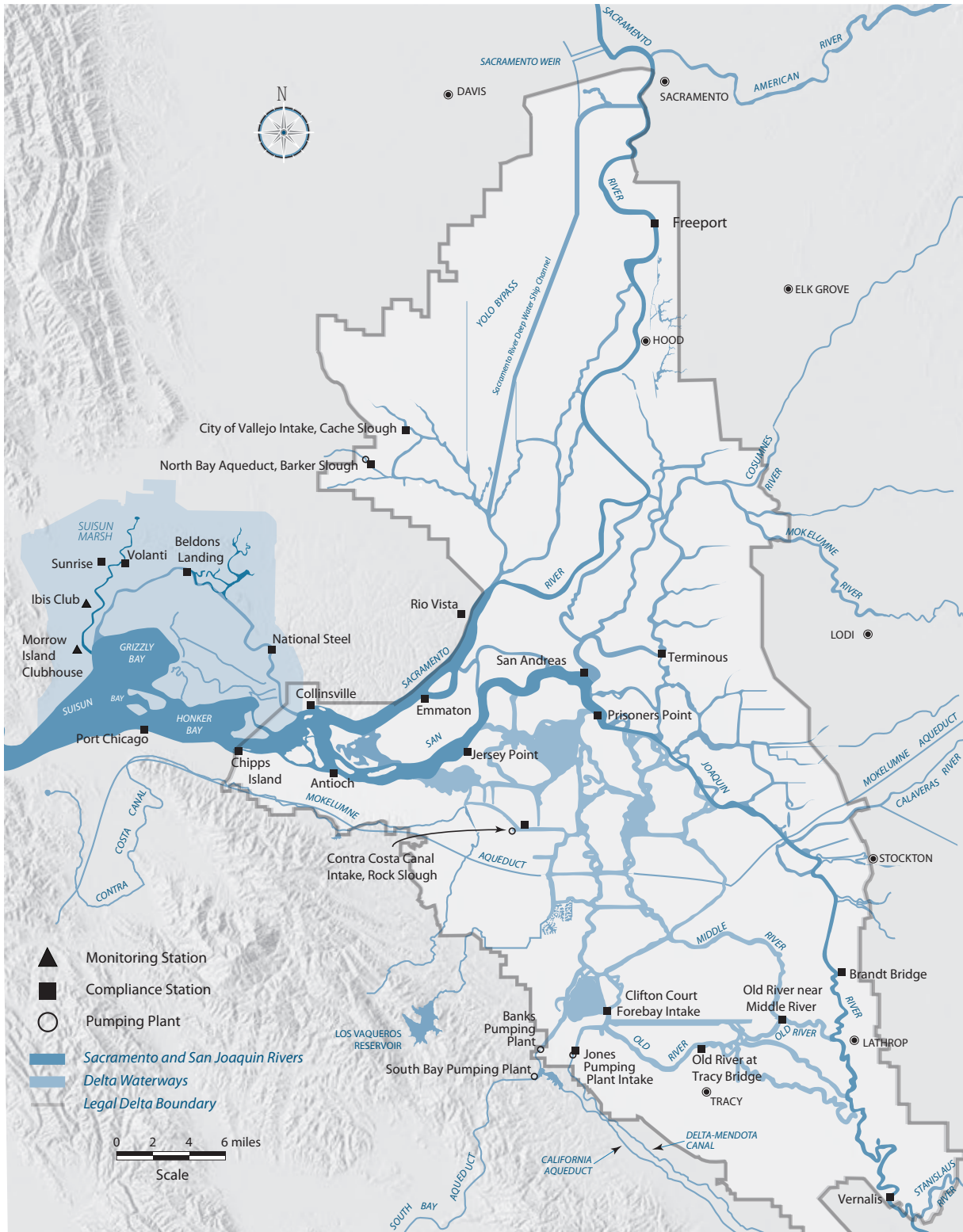


Figure 4-1 Decision 1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta

Operations under State Water Resources Control Board Water Right Decision 1641

In 2007, DWR and the Bureau of Reclamation (Reclamation) jointly operated the SWP and CVP in accordance with SWRCB's D-1641 which includes water quality, flow, and operational criteria for the Delta. Operations of the projects were coordinated with various objectives of the Bay-Delta Plan, Central Valley Project Improvement Act, and biological opinions for listed species.

As mentioned above, the water quality and flow criteria contained within D-1641 are conditioned by water year type. Specifically, the Sacramento Valley 40-30-30 Index water year type forecast on May 1 of each year determines the water year type for the implementation of flow and water quality criteria contained within D-1641. In 2007, the SWP and CVP were operated using water quality and flow criteria based on the May 1 forecast of dry for the Sacramento River Basin and critical for the San Joaquin River.

CALFED's Record of Decision mandates an Environmental Water Account (EWA) managed by DWR, Reclamation, the Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NOAA Fisheries) for the protection of listed fish species. Fish species currently listed under ESA and CESA include the winter and spring runs of Chinook salmon, delta smelt, steelhead, and green sturgeon.

Real-time monitoring of fish movement and conditions in the estuary aids daily water management and provides timely protection of targeted fish species from entrainment at the Delta pumping facilities. (See Chapter 3, Environmental Programs, for a discussion of other environmental issues.)

Delta Cross Channel Gates

The Delta Cross Channel gates are operated in accordance with SWRCB D-1641. In 2007, the gates were open for 196 days to allow fresher Sacramento River water to flow into interior Delta channels toward the SWP and CVP export facilities. Reclamation's standard operating procedures call for gate closure when flow on the Sacramento River at Freeport reaches between 20,000 cubic feet per second (cfs) and 25,000 cfs to reduce flooding potential on the Mokelumne River and to prevent scouring on the downstream side of the gate structure. D-1641 contains measures that require gate closure under certain conditions from November 1 through May 20 for fisheries protection as requested by USFWS, NOAA Fisheries, and DFG.

Water Quality Standards

Water quality objectives in D-1641 are categorized by the beneficial uses they are intended to protect, including municipal, industrial, agricultural, and fish and wildlife. DWR operators adjust upstream releases and Delta exports in order to meet D-1641 water quality and flow standards. D-1641 contains salinity standards (recorded as electrical conductivity [EC]) for three stations in the South Delta downstream of Vernalis. The stations are primarily influenced by San Joaquin River flow and in Delta diversions. San Joaquin River flows are not influenced by SWP upstream reservoirs, but local water levels may be influenced by SWP exports and circulation may be influenced by the annual placement of South Delta barriers.

Municipal and Industrial Objectives

D-1641 includes a year-round 250 milligrams per liter (mg/L) (maximum mean daily) chloride objective that is in effect at Delta export locations (Contra Costa Canal Pumping Plant No. 1, Clifton Court Forebay, Jones Pumping Plant, Cache Slough at the City of Vallejo Intake, and Barker Slough). Chloride levels remained below the objective throughout 2007.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB), established by the California Legislature in 1967, protects water rights and water quality by setting statewide policy, overseeing appropriate water rights, coordinating with and supporting Regional Water Quality Control Board (RWQCB) efforts, and reviewing petitions that contest RWQCB actions. The five SWRCB members are appointed by the Governor and confirmed by the Senate. Each member fills a different specialized position. SWRCB is responsible for four major programs.

- Water quality: In cooperation with RWQCB, to preserve, protect, enhance, and restore water quality.
- Water rights: SWRCB issues permits for water rights specifying amounts, conditions, and construction timetables for diversion and storage.
- Financial assistance: SWRCB has several financial programs to assist local agencies and individuals prevent or clean up pollution of the State's water. These include loans and grants for constructing municipal sewage and water recycling facilities.
- Enforcement: SWRCB and its nine RWQCBs are responsible for enacting enforcement when the laws and regulations protecting our waterways are violated.

Under their water quality authority, SWRCB and RWQCBs adopt water quality control plans (WQCPs) for the 16 planning basins in the State. The WQCPs contain water quality objectives for flow, salinity, dissolved oxygen (DO) levels, and other parameters necessary for the protection of various beneficial uses, such as municipal and industrial, agricultural, and fish and wildlife. SWRCB implements these objectives in a number of ways, depending on the circumstances, including imposing conditions on water right permits and licenses. Current water quality objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) and Suisun Marsh are contained in the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, dated December 13, 2006 (Bay-Delta Plan, 2006).

The first major decision allocating primary responsibility to the State Water Project (SWP) and Central Valley Project (CVP) for meeting Delta water quality objectives was issued by SWRCB in 1978 in the *Water Right Decision 1485 (D-1485): Sacramento-San Joaquin Delta and Suisun Marsh*, which also implemented the WQCP for the Delta and Suisun Marsh. A stated purpose of D-1485 was to protect water quality at least to levels that existed without the SWP and CVP. D-1485 affected DWR and Bureau of Reclamation (Reclamation) water rights permits by placing the entire burden of meeting the Delta water quality and flow objectives on the SWP and CVP. Following its adoption, D-1485 was challenged in court by various water users and the federal government. The decision in that case (Racanelli Decision) criticized a number of the fundamental principles within D-1485, including combining the water rights and water quality functions in one proceeding and limiting the evaluation of objectives and responsibilities to the SWP and CVP impacts and operations alone.

(continued)

The SWRCB held a series of workshops and hearings beginning in March 1994 to revise the water quality objectives. The SWRCB urged interested parties to negotiate to develop alternatives for revising the objectives. These negotiations resulted in the Principles for Agreement on Bay Delta Standards (December 15, 1994). On February 28, 1995, Reclamation and DWR filed a petition with SWRCB to change their water rights to conform to the Principles for Agreement. SWRCB issued a notice of public hearing for April 18, 1995, regarding the establishment of appropriate objectives to protect the beneficial uses of the Bay-Delta Estuary. SWRCB adopted an updated *WQCP for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (1995 Bay-Delta Plan) on May 22, 1995 which included many elements of the Principles for Agreement. Elements of the 1995 Bay-Delta Plan include water quality objectives and flow objectives in the Delta, objectives for the Suisun Marsh, and salinity control actions in the San Joaquin Basin. Certain objectives in the updated plan conflicted with those in D-1485. Water Rights Order WR 95-06 was adopted on June 8, 1995. This order amended certain portions of D-1485 to conform to the objectives in the 1995 Bay-Delta Plan. It also provided that both the SWP and CVP could use either agency Delta pumping plant to divert project water in order to increase fish protection and maintain project delivery capability (referred to as Joint Point operations). WR 95-06 had a term of only 3 years, the time estimated for completion of the Bay-Delta proceedings and adoption of a comprehensive new water rights decision. The water rights proceedings extended beyond the 3-year estimate, and SWRCB adopted WR 98-09 on December 3, 1998, to extend the terms and conditions of WR 95-06. On December 29, 1999 (Revised March 15, 2000), SWRCB adopted Decision 1641 (D-1641). The CVP and SWP agreed to meet standards in Order WR 95-06 until SWRCB adopted a new comprehensive water right decision.

In December 1995, SWRCB released a revised Notice of Preparation describing a preliminary set of alternative approaches to achieve the requirements of the 1995 Bay-Delta Plan. The SWRCB held public workshops and, on September 12, 1996, released a summary of alternatives under consideration in the Bay-Delta Plan draft environmental impact report (EIR). The summary covered the alternatives under analysis and the assumptions SWRCB was making in order to model the alternatives.

On December 2, 1997, SWRCB released the draft EIR associated with implementing the requirements of the 1995 Bay-Delta Plan. SWRCB evaluated seven alternative methods of allocating responsibility for meeting flow objectives contained in the 1995 Bay-Delta Plan.

In July 1998 SWRCB convened a series of Bay-Delta water rights hearings to consider the assignment of responsibility among water right holders to implement the flow-dependent objectives in the 1995 Bay-Delta Plan.

SWRCB divided the hearing into eight phases, with each phase focusing on a particular subject or subjects. (See Bulletin 132-00, Chapter 7, for a summary of what each phase addressed.) Phases 1 through 7 were conducted July 1, 1998 through December 21, 1999. During that time, SWRCB certified the EIR for the 1995 Bay-Delta Plan (Resolution 99-117, November 1999). On December 29, 1999, SWRCB issued D-1641 on the subjects considered in the water rights hearing Phases 1 through 7. D-1641 replaced D-1485. D-1641 modified the water rights permits of a number of water districts, DWR, and Reclamation to implement the objectives contained in the 1995 Bay-Delta Plan.

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D-1641 also authorized the proposed joint points of diversion under CVP and SWP water rights, approved agreements among the parties allocating responsibility for meeting the flow-dependent objectives, contained changes in the responsibilities to meet Suisun Marsh objectives, and approved changes in place and purposes of use of certain CVP water right permits. D-1641 is the current water rights decision governing operations of the SWP and CVP. Primary responsibility for meeting the objectives in the 1995 Bay-Delta Plan remains with the SWP and CVP. (See Bulletin 132-01, Chapter 7, for a summary of the highlights of D-1641.) In March 2000 SWRCB amended D-1641 with WR 2000-02 to address issues raised by several parties related to D-1641.

The Bay-Delta water rights hearings were to resume in August 2000 to conduct Phase 8 to complete the assignment of the remaining responsibilities for meeting the flow-dependent objectives in the 1995 Bay-Delta Plan. However, after completion of the previous 7 phases of the hearing, parties subject to Phase 8 anticipated delays associated with resolving Phase 8 issues. The Upstream Water Users, USBR, DWR, and the Downstream Water Users recognized there would be institutional water quality benefits if parties subject to Phase 8 could provide a mechanism for satisfying existing Bay-Delta water quality and flow objectives by developing a cooperative water management partnership. With this goal, the parties signed the Agreement Regarding Resolution of Phase 8 Issues, Development and Management of Water Supplies, and Binding Commitment to Proceed Pursuant of Specified Terms, known as the Stay Agreement (April 3, 2001). The Stay Agreement proposed goals and principles to resolve issues of the flow-related standards that would have been the subject of Phase 8. The agreement includes a commitment by USBR and DWR to meet the objectives required under D-1641 so long as the agreement remains in effect and for a year thereafter. Phase 8 was later dismissed by SWRCB (WR 2001-05, adopted April 26, 2001, and WR 2002-12, adopted October 17, 2002) after the remaining responsibilities to meet the flow-dependent objectives were resolved through a negotiated agreement known as the Sacramento Valley Water Management Agreement, signed in March 2003 (see Chapter 7). (See the discussion of Phase 8 in Bulletin 132-03, Chapter 7.)

In January 2004 SWRCB began its periodic review of the 1995 Bay-Delta Plan and conducted a series of workshops in 2004 and 2005 to obtain information on specific topics addressed in the plan. SWRCB commenced proceedings in September 2006 to amend the 1995 Bay-Delta Plan. The 2006 WQCP (2006 Bay-Delta Plan) was adopted December 13, 2006 (Resolution No. 2006-0098). The 2006 Bay-Delta Plan was approved by the State Office of Administrative Law on June 27, 2007.

An additional municipal and industrial water quality objective for chloride at the Contra Costa Canal Intake, near Rock Slough, specifies that the chloride level must be below 150 mg/L for a given number of days during the year, dependent upon the water year forecast.

Agricultural Objectives

D-1641 contains agricultural salinity objectives, which varies by location. The salinity objectives, recorded as EC, are based on both water year type and a 14-day running average during the irrigation season, from April to mid-August, at Emmaton, Jersey Point, Terminous, and San Andreas

in the western and central Delta. The agricultural salinity objectives at these Delta locations becomes less stringent under dryer conditions. Emmaton and Jersey Point met the objective in 2007. (Data for Terminous and San Andreas were not available.)

In the south Delta, the salinity objectives are based on a 30-day running average. The 0.7 millisiemens per centimeter (mS/cm) objective for the South Delta was not met at Brandt Bridge, Old River, and Middle River. The SWP and CVP are jointly required by D-1641 to meet the agricultural EC objective imposed at these South Delta compliance locations. (See also, Chapters 2 and 7.)

Estuarine Habitat Protection Standard

The estuarine habitat protection standard incorporates modified X2 criteria (geographic isohaline) first established in the 1994 delta smelt biological opinion (BO). The upstream movement of 2 ppt isohaline (2 parts per thousand of salt in the water), measured as 2.64 mS/cm at the surface, is maintained within a certain range of positions in the estuary by adequate Delta outflow. These positions (Collinsville, Chipps Island, Port Chicago, or Martinez) are associated with an abundance of fish and biota.

The requirement for meeting X2 criteria at Collinsville applies to all the days during the months of February through June. The number of days per month when the daily averaged EC maximum (2.64 mS/cm) is in effect at Chipps Island or Port Chicago is conditioned by the previous month's Eight River Index. This may alternately be met with a maximum 14-day running average EC of 2.64 mS/cm or with specific Delta outflow, set as a 3-day average Net Delta Outflow Index (NDOI) of 7,100 cfs, 11,400 cfs, or 29,200 cfs, when the X2 position is at Collinsville, Chipps Island, or Port Chicago, respectively. The Port Chicago standard becomes effective when the Port Chicago 14-day EC average, immediately prior to the

first day of the month, is less than or equal to 2.64 mS/cm.

The Eight River Index, from January through May 2007, in million acre feet (maf), was 0.85, 2.14, 2.06, 1.73, and 1.67, respectively. The X2 habitat protection objective at Chipps Island was required and met for 11 days in February, 31 days for March, and 25 days in April.

Additionally in 2007, the X2 habitat protection objective at Port Chicago was triggered for the month of March only with 16 days required and met for this period.

Net Delta Outflow Index Standard

Delta outflow cannot be measured directly due to the tidal influence in the Delta. Instead, an approximation of Delta outflow is calculated using measured inflows, exports, and estimated Delta water use. The NDOI was introduced in the 1995 Bay-Delta Plan and is now part of D-1641. NDOI calculates Delta outflow using inflows of the Sacramento River, the Yolo Bypass system, the eastside stream system (consisting of the Mokelumne, Cosumnes, and Calaveras rivers), the Sacramento Regional Treatment Plant, and a measurement of San Joaquin River flow at Vernalis.

Excess outflow conditions, as defined by the Coordinated Operations Agreement, allow for greater flexibility in project operations. During 2007, Delta water conditions began and ended in excess, totaling an accumulated 150 days.

D-1641 sets specific minimum monthly NDOI standards, for the protection of fish and wildlife, based on water year type. In 2007, the monthly mean NDOI was highest in February, averaging 21,700 cfs. The monthly mean NDOI remained above 4,000 cfs during all months of the year, with the lowest monthly mean NDOI occurring in October, with 4,036 cfs. All NDOI standards were met in 2007.

River Flow Standards

D-1641 includes minimum flow requirements measured in the Sacramento River at Rio Vista. These flow standards, incorporated from the winter-run salmon BO, set flow requirements based on the May 1 Sacramento Valley water year classification forecast. Water year 2006-2007 was forecast to be dry, requiring mean monthly flows of 3,000 cfs for September, 4,000 cfs for October, and 4,500 cfs for November and December. During these periods, the 7-day running average could not be more than 1,000 cfs below the monthly standard. The actual mean monthly flows were 8,833 cfs for September, 5,381 cfs for October, 4,924 cfs for November and 6,742 cfs for December, meeting all Rio Vista flow objectives in 2007.

If the X2 objective is required to be at or west of the Chipps Island location, dry year base Vernalis flows are set at 2,280 cfs from February to April 14 and from May 16 through June 30. The base flow objective is relaxed to 1,420 cfs when X2 is required to be east of Chipps Island.

D-1641 requires the San Joaquin River spring pulse flow for April 15 to May 15 at Vernalis. This spring pulse flow requirement varies based on the location of X2 during April. However, the CALFED Operations Group may vary the actual timing and duration of the pulse attraction flow based on real-time monitoring data. The *Vernalis Adaptive Management Plan* (VAMP), part of the San Joaquin River Agreement and approved in D-1641, contains SWRCB-approved alternate spring pulse flow and export limits. Typically, Reclamation and DWR use this alternate in lieu of D-1641 limits. The pulse flow objective for the spring 2007 VAMP period was 3,200 cfs. The San Joaquin Valley water year type was critical, therefore VAMP was a single-step operation, with no fall pulse flow.

Export Standards

D-1641 includes an export limitation for the SWP and CVP. It limits Delta exports to a ratio of Delta inflow to combined water project exports and is expressed as a maximum export rate in percentage of Delta inflow. The maximum percentage of Delta inflow diverted varies by month; for example, in February, it is conditioned by the previous month's Eight River Index. During the San Joaquin River spring pulse flow season, VAMP export rates are typically used as an alternative to the D-1641 spring export limitation, and the CALFED Operations Group may impose additional export restrictions.

The actual export amount is calculated using the 3-day average that combines the inflow rate for Clifton Court Forebay (excluding Byron-Bethany Irrigation District diversions from Clifton Court Forebay) added to the Jones Pumping Plant diversion. The export-to-inflow ratio limit is reported as either a 3-day or 14-day running average. A 14-day running average of inflows is used unless storage withdrawals from upstream reservoirs are being made for export, in which case a 3-day average of inflows is used. In all water year types, the maximum combined export rate from February through June is 35 percent of Delta inflow. This rate may be relaxed in February, during years with less precipitation, to between 35 and 45 percent. From July through January, the export-to-inflow ratio rises to 65 percent.

During January 2007, combined SWP and CVP exports averaged about 44.5 percent of Delta inflow, meeting the 65 percent limitation.

During the more restrictive period from February through June (35 percent objective), exports averaged about 22 percent.

From July through the following January, the SWP and CVP exported about 49 percent,

16 percent less than the allowed 65 percent. From July through December 2007, the combined inflow diverted averaged 53 percent.

South Delta Temporary Barriers

The South Delta Temporary Barriers Project, initiated as a test project in 1991, was extended for 5 years in 1996, and extended again for 7 years in 2001. The project was created partially in response to a 1982 lawsuit filed by the South Delta Water Agency and consists of four rock barriers across South Delta channels.

These temporary seasonal barriers are designed to improve local water levels and circulation patterns, protect fishery resources, and improve water quality. They are placed across Middle River, Old River near Tracy, Grant Line Canal, and at Head of Old River. Additional background information can be found in Chapter 2, Delta Resources.

The installation of the Middle River barrier was completed on April 10, 2007, and the Old River barrier near Tracy installation was completed on April 23. The spring barrier at Head of Old River, which functions as part of VAMP, was installed in April (installation completed April 26). The Grant Line Canal barrier was partially installed by April 17, with the installation completed on May 11. The Middle River barrier was notched on September 21, and removal was completed by November 29. Removal of the Old River near Tracy barrier and the Grant Line Canal barrier was completed on November 18 and 29, 2007, respectively.

The barrier placed at Head of Old River in the fall, which helps keep upstream migrating adult salmon from straying out of the San Joaquin River into interior Delta channels, can help improve dissolved oxygen (DO)

conditions in the Stockton Ship Channel. The Head of Old River barrier installation was completed October 18, and removal was completed November 29.

Special Study and Biological Surveys

DWR conducts several special studies and biological surveys each year. This includes a special study in the Stockton Ship Channel during the late summer and early fall to monitor the occurrence of low DO levels. Low DO levels can potentially cause physiological stress to fish and block the migration of salmon into the San Joaquin River. DWR also conducts biological surveys of benthic organism density and diversity, and of phytoplankton biomass and community composition in the Sacramento-San Joaquin Delta, Suisun Bay, and San Pablo Bay.

Fall Dissolved Oxygen Study in the Stockton Ship Channel

Historically, during the late summer and early fall, DO levels in the eastern and central portions of the Stockton Ship Channel have dropped below both the 5.0 mg/L and 6.0 mg/L water quality objectives set by SWRCB and the RWQCB, respectively. These low DO levels are a result of several factors, including low San Joaquin River inflows, warm water temperatures, high biochemical oxygen demand, reduced tidal circulation, and intermittent reverse flow conditions in the San Joaquin River at Stockton.

To help reduce the severity of these low DO conditions, DWR normally installs a temporary rock barrier across the Head of Old River during periods of projected low fall flows in the San Joaquin River. The barrier increases net flows in the San Joaquin River past Stockton by reducing the upstream diversion of flows down Old River.

Head of Old River barrier construction began on October 8 and was completed on October 18. Barrier removal began on November 9 and was completed on November 29.

Methods

Monitoring of DO concentration in the Stockton Ship Channel was conducted by boat on 13 monitoring runs, from June 15 to December 12, 2007. During each run, 14 sites were sampled at low water slack tide from Prisoners Point in the Central Delta to the Stockton Turning Basin at the terminus of the ship channel. Because monitoring results differ within the channel, sampling stations were grouped into western, central, and eastern regions. The findings of previous fall studies have shown that fall DO levels are typically robust and high (7.0 to 9.0 mg/L) in the western channel; transitional, variable (4.0 to 7.0 mg/L), and stratified in the central channel; and low (3.0 to 5.0 mg/L) and stratified in the eastern channel. The western channel begins at Prisoners Point and ends at Columbia Cut. The central channel begins one-half mile east of Columbia Cut and ends at Fourteen Mile Slough. Finally, the eastern channel begins at Buckley Cove and ends at Rough and Ready Island. The turning basin is unique within the channel because it is east of the entry point of the San Joaquin River into the channel and isolated from down-channel flows.

Results

During the period of this study (June 15 to December 12), DO levels varied significantly within the channel (not including the turning basin) from a low of 4.2 mg/L to a high of 10.2 mg/L. In the western channel, DO concentrations were relatively high and stable, ranging from 6.9 to 10.1 mg/L. In the central channel, DO concentrations were variable, ranging from 4.5 to 10.2 mg/L. In the eastern channel, DO levels were the lowest, ranging from a low of 4.2 mg/L to a high of 10.2 mg/L.

DO concentrations in the Stockton Ship Channel fell below both the State's 5.0 mg/L and 6.0 mg/L objectives during June (stations 8 through 12), July (stations 8 through 12), August (stations 9 through 12), and September (stations 8 through 11 and station 13). All sites were above State DO objectives on subsequent sampling runs.

Higher San Joaquin River inflows, as well as the absence of intermittent reverse flows near Stockton, coincided with improved DO conditions. Further monitoring operations for the fall special study were suspended after December 12, 2007.

Benthic Survey

The benthic monitoring program documents changes in the composition, abundance, density, and distribution of the benthic biota within the upper San Francisco Estuary. Benthic biota are relatively long-lived and can respond to changes in physical factors within the estuary, such as fresh water inflows, salinity, and substrate composition. As a result, benthic data can provide an indication of physical changes occurring within the upper estuary. Because the operation of the SWP can impact flow characteristics of the estuary, and subsequently influence the density and distribution of benthic biota, benthic monitoring is an important biological survey conducted by DWR. In addition, benthic monitoring data are also used to detect and document the presence of newly introduced species within the upper estuary.

Benthic monitoring was conducted at 10 sampling sites distributed throughout the major habitat types within the estuary:

- Clifton Court Forebay Intake;
- San Joaquin River at Buckley Cove;
- San Joaquin River at Twitchell Island;
- Old River opposite Rancho Del Rio;
- Sacramento River below the Rio Vista Bridge;

- Sacramento River above Point Sacramento;
- Suisun Bay at Bulls Head;
- Grizzly Bay at Dolphin near Suisun Slough;
- San Pablo Bay near Pinole Point; and
- San Pablo Bay near the mouth of the Petaluma River.

Four bottom grab samples for benthic analysis and one sample for sediment analysis were collected monthly at each site during 2007. Samples were analyzed to identify organisms to the lowest possible identifiable taxon and to count all organisms collected.

DWR maintains a database of benthic organisms located within the upper estuary. The benthic database is dynamic and regularly undergoes peer review and update. When a new organism is identified at any of the sampling stations it is added to the database. In addition, the taxonomic names of organisms on the list are updated when sufficient evidence is produced to warrant such changes.

A total of 174 species of benthic macrofauna were collected in 2007 at the 10 sampling sites. Of the 174 species, the following 10 species represented 84.6 percent of all organisms collected:

- the amphipods: *Ampelisca abdita*, *Americorophium spinicorne*, *Corophium alienense*, *Gammarus daiberi* and *Americorophium stimpsoni*;
- the sabellid polychaete: *Manayunkia speciosa*;
- the turbidicid worms: *Varichaetadrilus augustipenis* and *Limnodrilus hoffmeisteri*; and
- the Asian clams: *Corbula amurensis* and *Corbicula fluminea*.

Of the 10 dominant species, *Corbula amurensis* and *Ampelisca abdita* represent

macrofauna that inhabit a typically higher saline environment and were found in San Pablo Bay, Suisun Bay, and Grizzly Bay. *Corophium alienense*, *Americorophium stimpsoni*, *Americorophium spinicorne*, and *Limnodrilus hoffmeisteri*, tolerate a wider range of salinity. They were collected both in the higher saline western sites and the more brackish to fresh water eastern sites such as the San Joaquin River at Twitchell Island and the Sacramento River above Point Sacramento. The remaining four species, *Gammarus daiberi*, *Varichaetadrilus augustipenis*, *Manayunkia speciosa*, and *Corbicula fluminea* are predominantly fresh water species and were collected at sites east of Suisun Bay.

Phytoplankton and Chlorophyll *a* Survey

Phytoplankton are small, free-floating or attached algae that can be tiny, single-celled organisms (less than 5 micrometers [μm] in diameter) or larger colonial organisms. Phytoplankton are an important source of food in the estuary for zooplankton, invertebrates, and some species of fish. Phytoplankton biomass is an indicator of the status of primary productivity in the estuary. Chlorophyll *a* is one of the main groups of pigments contained in the algal species that make up phytoplankton.

Monthly sampling of chlorophyll *a* concentrations and phytoplankton was conducted in 2007 by DWR's Bay-Delta Monitoring Branch at 13 stations throughout the upper San Francisco Estuary:

- Sacramento River at Greene's Landing/Hood and above Point Sacramento;
- San Joaquin River at Vernalis, Buckley Cove, and Potato Point;
- Old River opposite Rancho Del Rio;
- Disappointment Slough near Bishop Cut;
- Frank's Tract near Russo's Landing;
- Suisun Bay at Bull's Head near Martinez and off Middle Point near Nichols;

- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Chlorophyll *a* concentration was measured at the 13 monitoring stations to estimate overall phytoplankton biomass in the estuary. Phytoplankton samples were collected and analyzed separately to determine which species were present in the estuary.

Monthly chlorophyll *a* concentrations throughout much of the estuary were relatively low when compared to historical data. Of the 156 samples taken in 2007, 91.0 percent had chlorophyll *a* levels below 10 micrograms per liter ($\mu\text{g/L}$). Chlorophyll *a* levels below 10 $\mu\text{g/L}$ are considered limiting for zooplankton growth. The mean chlorophyll *a* concentration for all samples in 2007 was 5.48 $\mu\text{g/L}$, and the median value was 1.79 $\mu\text{g/L}$. In 2006, mean chlorophyll *a* concentrations were lower, with a mean of 3.58 $\mu\text{g/L}$ and a median of 2.06 $\mu\text{g/L}$. The maximum chlorophyll *a* concentration in 2007 was 108.00 $\mu\text{g/L}$, recorded in August at the San Joaquin River at Vernalis. This maximum was higher than the 2006 peak of 32.90 $\mu\text{g/L}$. The minimum chlorophyll *a* concentration in 2007 was 0.25 $\mu\text{g/L}$, recorded in November at the Sacramento River above Point Sacramento.

The samples with chlorophyll *a* levels above 10 $\mu\text{g/L}$ were all measured in the San Joaquin River at Vernalis, Buckley Cove, and Disappointment Slough near Bishop Cut. These monitoring sites, plus the monitoring sites in San Pablo Bay near Pinole Point and near the mouth of the Petaluma River, had the highest chlorophyll *a* concentrations measured in 2006.

Phytoplankton biomass and resulting chlorophyll *a* concentrations in some areas of the estuary may be influenced by extensive filtration of the water column by the

introduced Asian clam, *Corbula amurensis*. Well-established benthic populations of *C. amurensis* in Suisun and San Pablo bays are thought to have contributed to the low chlorophyll *a* concentrations (and increased water clarity) measured in these westerly bays since the mid-1980s.

In addition to monitoring for chlorophyll *a*, water samples were analyzed for pheophytin. Pheophytin *a* is a primary degradation product of chlorophyll *a*, and its relative concentration is useful for estimating the general physiological state of phytoplankton populations. When phytoplankton are actively growing, the concentrations of pheophytin are normally expected to be low in relation to chlorophyll *a*. The mean pheophytin *a* concentration for all samples in 2007 was 3.04 $\mu\text{g/L}$, and the median value was 1.37 $\mu\text{g/L}$. The maximum pheophytin *a* concentration was 39.90 $\mu\text{g/L}$, recorded at Disappointment Slough near Bishop Cut in February. The minimum pheophytin *a* concentration was 0.27 $\mu\text{g/L}$, recorded at the San Joaquin River at Potato Point in November.

Phytoplankton populations consisted of these categories (in order of abundance): centric diatoms (class Coscinodiscophyceae), Cyanobacteria (class Cyanophyceae), unidentified flagellates, green algae (classes Chlorophyceae, Ulvophyceae, and Zygnematophyceae), pennate diatoms (classes Bacillariophyceae and Fragilariophyceae), cryptomonads (class Cryptophyceae), euglenoids (class Euglenophyceae), haptophytes (class Prymnesiophyceae), chrysophytes (class Chrysophyceae), dinoflagellates (class Dinophyceae), and synurophytes (class Synurophyceae). Of the genera identified, the following were the 10 most common, in order of abundance: *Cyclotella*, unidentified flagellates, *Chroococcus*, *Aulacoseira*, unidentified centric diatoms, *Microcystis*, *Skeletonema*, *Monoraphidium*, *Planktosphaeria*, and *Achnanthes*.

Table 4-1 O&M SWP Automated Water Quality Monitoring Stations and Test Parameters

CDEC ID	Location	County	EC (μ S/cm)	Temp C	Turbidity (NTU)	pH	Fluoro ^a	UVA- 254 ^b
BKS	Barker Slough Pumping Plant	Solano	x	x	x	x	-	-
C13	Check 13	Merced	x	x	x	x	-	x
C21	Check 21	Kings	x	x	x	-	-	-
C29	Check 29	Kern	x	x	x	-	-	-
C41	Check 41	Kern	x	x	x	x	-	-
C66	Check 66	San Bernardino	x	x	x	-	-	-
CLC	Clifton Court	Contra Costa	x	x	x	x	x	-
CPP	Cordelia Pumping Plant	Solano	x	x	x	-	-	-
CSO	Castaic Lake Outlet	Los Angeles	x	x	x	x	-	-
DCO	Del Valle Conservation Outlet Works	Alameda	x	x	x	x	-	-
DV7	Del Valle Check 7	Alameda	x	x	x	x	x	-
DVC	Devil Canyon Headworks	San Bernardino	x	x	x	-	-	-
EDP	Edmonston Pumping Plant	Kern	-	-	-	-	-	x
HBP	Banks Pumping Plant	Alameda	x	x	x	x	x	x
PPP	Pacheco Pumping Plant	Merced	x	x	x	-	x	-
VSF	Vallecitos Turn-Out	Alameda	x	x	x	x	-	-

^aFluoro = fluorometry (measures chlorophyll)

^bUVA-254 = 254nm ultraviolet absorbance (measures dissolved organic carbon)

Activities Outside the Delta

Routine SWP water quality monitoring activities, as well as special studies, are conducted outside the Delta. These special studies are in response to increasingly stringent regulations facing water purveyors who rely on DWR to deliver high quality raw water. Most of these special studies were initiated because of the fish and wildlife and water quality concerns held by agencies that provide domestic water.

Water Quality Monitoring in the SWP

The DWR, Division of Operations and Maintenance (O&M) Water Quality Section monitors water quality throughout the SWP. The SWP water quality monitoring program exists due to increasingly stringent regulations, statewide drought conditions, threatened or endangered fish species, operational constraints, and increasing demands on SWP water supply, which

invariably affect the quality of the SWP aqueducts, forebays, lakes, and reservoirs. The program includes the analysis of over 200 different chemical, biological, and physical constituents at more than 40 stations.

SWP automated water quality monitoring stations continuously measure parameters such as turbidity, dissolved organic carbon, salinity, temperature, and fluorometry. Data generated from the autostations (Table 4-1) are used to assess spatial changes, short- and long-term trends, impacts from emergencies (e.g., spills and pipe ruptures), and the influence of operations and hydrology. Data from the automated stations is collected from dataloggers via the O&M water quality server. The data are automatically subjected to quality assurance and quality control (QA/QC) measures and posted hourly to the California Data Exchange Center (CDEC) website at: <http://cdec.water.ca.gov/>.

Table 4-2 O&M SWP Water Quality Grab Sample Locations

WDL Station Code	Station Name	WDL Station Code	Station Name
AN001000	Antelope Lake	KB000386	Dyer Reservoir (DYR), Check Siphon 1
KA000331	Banks Pumping Plant	FR001000	Frenchman Lake
KG000000	Barker Slough Pumping Plant	LD001000	Lake Davis
CAS00000	Castaic Dam Control Building	PE001000	Lake Perris, Inlet
CA001000	Castaic Lake	PE002000	Lake Perris, Outlet
CA002000	Castaic Lake Outlet Tower	PE003000	Lake Perris, Alisandro Island
CA003000	Castaic Lake	PE004000	Lake Perris, Moreno Palm Beach
KA007089	Check 13	PE005000	Lake Perris, Dam
KA017226	Check 21	PE006000	Lake Perris, Back-side of the Island
KA024454	Check 23	OR001000	Lake Oroville
KA024454	Check 29	SL000000	Pacheco Pumping Plant
KA029021	Check 39	PY001000	Pyramid Lake
KA030341	Check 41	PY002000	Pyramid Lake
KA040341	Check 66	PY003000	Pyramid Lake
KA000000	Clifton Court Forebay	SL001000	San Luis Reservoir, Trash Racks
KC000934	Coastal Branch	SL005000	San Luis Reservoir, Tunnel Island
KG002111	Cordelia Pumping Plant	KB004207	Santa Clara Terminal Tank
KB001638	Del Valle Check 7	KB000000	South Bay Pumping Plant (SBU)
DV000000	Del Valle Conservation Outlet (DCO)	SI001000	Silverwood Lake, Inlet
DV001000	Del Valle Reservoir	SI002000	Silverwood Lake, Outlet
DMC06716	Delta Mendota Canal, North of McCabe Road	TA001000	Thermalito Afterbay
KA041134	Devil's Canyon Headworks	TF001000	Thermalito Forebay
KA041288	Devil's Canyon Afterbay	KB002240	Vallecitos

The routine water quality grab samples collected from numerous SWP locations (Table 4-2) help identify pollutants and provide data to evaluate trends as well as quantify upstream and downstream impacts from several known and unknown sources that can contribute to water quality degradation. The grab samples are shipped to DWR's Bryte Chemical Laboratory for analysis and processing. Constituents analyzed can include dissolved solids, nutrients, minerals such as chloride, sulfate, and sodium, trace metals, herbicides, pesticides, organic substances, and phytoplankton (Table 4-3). The grab sample data are available publicly at: <http://www.water.ca.gov/waterdatalibrary/>.

Table 4-4 displays laboratory results for select stations from SWP water quality monitoring. Grab sample data from 2007 has been averaged for Thermalito Afterbay, the North Bay Aqueduct, the Central Valley Project's Delta-Mendota Canal, and the California Aqueduct.

Of the 156 pesticides, herbicides, and other organic compounds analyzed, six compounds had concentrations above the laboratory reporting limit. Compounds with confirmed detections were diuron, simazine, atrazine, metolachor, 2,4-dichlorophenoxyacetic acid (2,4-D) and dimethyl tetrachloroterephthalate (DCPA or dacthal) (Table 4-5).

Table 4-3 O&M SWP Grab Sampling Schedule

Station Name	Station Number	Depth (meters)	Major Minerals	Project Standard ^a	Nutrients	Total Organic Carbon	Dissolved Organic Carbon	UV-254	Suspended Solids	Turbidity	Bromide	Taste & Odor (MIB-geosmin)	Phytoplankton	Pesticides & Herbicides ^b	MTBE (Purgeable organics)	Radical	Total Dissolved Solids (TDS)	Copper (Dissolved)	Priority Pollutants	Total & Fecal Coliform	Pathogens EPA 1623	Iron and Manganese	Reservoir Profile	Asbestos	Automated Station ^c	Tytronics UVA Monitor	Title 22 ^d	Constituents of Concern ^e					
Feather River Watershed																																	
Antelope Lake	AN001000		A	A	A								A									A											
Frenchman Lake	FR001000		A	A	A								A									A											
Lake Davis	LD001000		A	A	A								A									M ³											
Lake Oroville	OR001000		Q	Q	M ²	Q	Q	Q	Q	Q			M	Q	Q																		
Thermalito Forebay	TF001000		Q	Q					Q		Q		A																				
Thermalito Afterbay	TA001000		M	M ²					Q																								
South Bay Aqueduct																																	
South Bay Pumping Plant																																	
Dyer Reservoir																																	
Del Valle Check No. 7	KB001632		M	M	M	M	M		M	M	M	M	M	M																			
Del Valle Reservoir	DV001000	0.5	Q	M	Q	Q	Q		Q	Q	Q	M	M	M	M					M	M												
	DV001000	4										M	M	M	M																		
	DV001000	8										M	M	M	M																		
Del Valle Conservation Outlet	DV000000		M ¹	M ¹	M ¹	M ¹	M ¹		M ¹	M ¹	M ¹	W ¹	M	M	M					M ¹													
Valecitos	KB002250		M ¹	M ¹	M ¹	M ¹	M ¹		M ¹		Q ²	Q ²	Q ²																				
Santa Clara Terminal Tank	KB004207		Q ²	Q ²																													
North Bay Aqueduct																																	
Barker Slough Pumping Plant	KG000000		M	M	M	M	M		M	M	M	M	M	T	M																		
Cordelia Reservoir	KG002111		Q	Q					Q	Q	Q	Q	Q																				
San Luis Joint Use Facilities																																	
Pacheco Pumping Plant	SL000000		M	M	M	M	M				W	W	M																				

Table 4-3 O&M SWP Grab Sampling Schedule

Station Name	Station Number	Depth (meters)	Major Minerals	Project Standard ^a	Nutrients	Total Organic Carbon	Dissolved Organic Carbon	UV-254	Suspended Solids	Turbidity	Bromide	Taste & Odor (MIB-geosmin)	Phytoplankton	Pesticides & Herbicides ^b	MTBE (Purgeable organics)	Radiological	Total Dissolved Solids (TDS)	Copper (Dissolved)	Priority Pollutants	Total & Fecal Coliform	Pathogens EPA 1623	Iron and Manganese	Reservoir Profile	Asbestos	Automated Station ^c	Tytronics UVA Monitor	Title 22 ^d	Constituents of Concern ^e		
California Aqueduct																														
Clifton Court Forebay	KA000000		M	M	M	M	M	M	M	M	M	M	M	T	M	Q								Q	#	#				
Banks Pumping Plant	KA000331		M	M	M	M	M	M	M	M	M	M	M	T	M									Q	#	#				
Check 12	KA006633		M	M	M	M	M	M	M	M	M	M	M	T		Q								Q	#	#				
O'Neill FB Outlet (Check 13)	KA007089		M	M	M	M	M	M	M	M	M	M	M	T		Q								Q	#	#				
Check 21	KA017226		M	M	M	M	M	M	M	M	M	M	M	T										Q	#	#				
Coastal Branch	KC000934		M	M	M	M	M	M	M	M	M	M	M	T											#		B			
Check 23	KA019705		M	M	M	M	M	M	M	M	M	M	M	T											#		B			
Check 29	KA024454		M	M	M	M	M	M	M	M	M	M	M	T											#					
Check 39	KA029021		M	M	M	M	M	M	M	M	M	M	M	T		Q								Q	#	#				
Check 41	KA030341		M	M	M	M	M	M	M	M	M	M	M	T										Q	#	#				
Check 66	KA040341		M	M	M	M	M	M	M	M	M	M	M	T			M	M						#	#					
Devil Canyon Headworks	KA041134		M	M	M	M	M	M	M	M	M	M	M	T										#	#					
Devil Canyon Afterbay	KA041288		M	M	M	M	M	M	M	M	M	M	M	T										#	#					
Central and Southern SWP Reservoirs																														
San Luis Reservoir - Trashracks	SL001000	3	M	M	M	M	M	M	M	M	M	M	M																	
San Luis Reservoir - Tunnel Island	SL005000		Q	M	M	M	M	M	M	Q	M	W	W ³																	
Pyramid Lake	PY001000												W ³																	
	PY003000												W ³																	
	PY005000												W ³																	
Castaic Lake	CA001000		Q	M	M	M	M	M	M	Q	M		W ³																	
	CA002000		Q	M	M	M	M	M	M	Q	M		W ³																	
Silverwood Lake	SI001000		Q	M	M	M	M	M	M	Q	M		W ³																	
	SI002000		Q	M	M	M	M	M	M	Q	M		W ³																	

Table 4-3 O&M SWP Grab Sampling Schedule

Station Name	Station Number	Depth (meters)	Major Minerals	Project Standard ^a	Nutrients	Total Organic Carbon	Dissolved Organic Carbon	UV-254	Suspended Solids	Turbidity	Bromide	Taste & Odor (MIB-geosmin)	Phytoplankton	Pesticides & Herbicides ^b	MTBE (Purgeable organics)	Radiochemical	Total Dissolved Solids (TDS)	Copper (Dissolved)	Priority Pollutants	Total & Fecal Coliform	Pathogens EPA 1623	Iron and Manganese	Reservoir Profile	Asbestos	Automated Station ^c	Titronics UVA Monitor	Title 22 ^d	Constituents of Concern ^e		
Lake Perris	PE001000 PE002000 PE005000			Q	M M M	M M M			Q	M		W ³ W ³ W ³					M					W ³ W ³ W ³								
Castaic Dam Control Bldg Warne Powerplant	CAS00000 WEWPP																M		Q						# #					
Central Valley Project																														
Delta Mendota Canal	DMC06716		M	M	M M M	M M M									T															
Sampling Frequency:																														
A=Annual																														
Q=Quarterly (Feb, May, Aug, Nov)																														
Q1=Feb, May, Aug-Dec																														
Q2=Monthly during Del Valle Releases or else Q																														
M=Monthly																														
M1=Monthly during Del Valle Releases																														
M2=Monthly (Apr-Nov)																														
M3=Monthly (May-Sep)																														
M4=Weekly in Winter or else Monthly																														
B=Bi-weekly during Pump-ins																														
T=Mar, Jun, Sep																														
#=Location of Automated WQ Station																														
#*=Future planned stations																														

^a Project Standard: Alkalinity, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chloride, Chromium, Copper, Fluoride, Iron, Lead, Magnesium, Manganese, Mercury, Nitrate, Selenium, Silver, Sodium, Solids (Dissolved), Specific Conductance, Sulfate, Turbidity, and Zinc

^b Herbicides and Pesticides: Chlorinated organics, Organo-phosphorus pesticides, Herbicides, Carbamates, and Miscellaneous pesticides

^c Automated Station: http://www.water.ca.gov/swp/waterquality/AutostationData/Autostation_map.cfm

^d Title 22: 22 CCR Section 64431 or as modified for a particular project

^e Constituents of Concern: Arsenic, Bromide, Chromium, Manganese, nitrate (as NO₃), sulfate (SO₄), total organic carbon (TOC), dissolved organic carbon (DOC), total dissolved solids (TDS)

Table 4-4 Mean Water Quality at Selected SWP Grab Sample Locations, 2007

Constituent	Units ^a	Detection Limit	California Aqueduct									
			Thermalito Afterbay at Outlet	North Bay Aqueduct, Barker Slough Pumping Plant	Delta-Mendota Canal Upstream of McCabe Road	Banks Delta Pumping Plant	O'Neill Forebay Outlet (Check 13)	Kettleman City (Check 21)	Near Highway 119 (Check 29)	Tehachapi Afterbay (Check 41)	Devil Canyon Head Works	
Alkalinity	mg/L as CaCO ₃	1	40	97	69	80	73	72	73	74	74	74
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR
Arsenic	mg/L	0.001	<0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Bromide	mg/L	0.01	<0.01	0.04	0.22	0.21	0.24	0.24	0.24	0.22	0.23	0.22
Calcium	mg/L	1	8	17	18	23	19	19	19	21	22	22
Chloride	mg/L	1	<1	19	73	77	80	80	80	73	73	74
Chromium	mg/L	0.001	<0.001	<0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001
Copper	mg/L	0.001	<0.001	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.002	0.003
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hardness	mg/L as CaCO ₃	1	34	95	95	115	98	94	98	98	98	98
Iron	mg/L	0.005	<0.005	0.008	0.019	0.008	0.008	0.007	0.008	<0.005	<0.005	0.006
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/L	1	3	13	12	14	12	13	12	11	10	11
Manganese	mg/L	0.005	<0.005	0.015	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.026
Nitrite + Nitrate	mg/L as N	0.01	<0.01	0.38	0.59	NR	0.58	0.58	0.58	0.79	0.82	0.73
Organic Carbon, Dissolved	mg/L as C	0.5	NR	3.3	3.2	3.0	2.8	2.8	2.8	2.5	2.5	2.8
Organic Carbon, Total	mg/L as C	0.5	NR	7.1	3.3	3.1	2.9	2.9	2.9	2.7	2.5	2.9
Phosphate-Ortho	mg/L as P	0.01	<0.01	0.09	0.06	NR	0.06	0.06	0.06	NR	0.05	0.05
Phosphorus-Total	mg/L	0.01	<0.01	0.22	0.10	NR	0.08	0.09	0.08	0.07	0.06	0.09
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	0.001	0.001
Sodium	mg/L	1	3	24	50	58	54	54	54	54	54	54
Specific Conductance	µS/cm	1	87	304	454	528	475	486	475	472	462	492
Sulfate	mg/L	1	2	24	32	51	33	34	33	38	37	37
Total Dissolved Solids	mg/L	1	51	173	260	296	268	269	268	263	265	274
Turbidity	N.T.U.	1	3	131	11	12	6	7	6	7	5	4
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

^a mg/L = milligrams per liter; µS/cm = microsiemens per centimeter; N.T.U. = nephelometric turbidity unit; NR = No data recorded at this location.

NOTE: A grab sample is a single sample chosen to represent the conditions in a given matrix (usually natural water) at a specific location, depth, and time. All reported constituents are the yearly mean of laboratory analytical values sampled monthly from January to December. The yearly mean may be based upon one to twelve samples for the list of constituents.

Table 4-5 Pesticides, Herbicides, and Other Organic Substances Detected in the SWP, 2007

Sampling Location ^a	Sampling Station ID No.	Sample Date	Chemical Detected ^b	Concentration (µg/L) ^c
North Bay Aqueduct Barker Slough Pumping Plant	KG000000	3/21/07	Diuron	0.81
			Simazine	0.16
Delta Mendota Canal Upstream of McCabe Road	DMC06716	6/20/07	Diuron	0.72
		3/21/07	Diuron	2.35
			Simazine	0.13
		6/20/07	Atrazine	0.02
			Diuron	0.31
			Metolachlor	0.1
Banks Delta Pumping Plant	KA000331		Simazine	0.03
		9/19/07	2,4-D	0.6
		3/21/07	Diuron	0.81
			Simazine	0.12
		6/20/07	Diuron	0.66
O'Neill Forebay Outlet (Check 13)	KA007089		Metolachlor	0.2
			Simazine	0.05
		9/19/07	2,4-D	0.3
		3/21/07	Diuron	0.69
California Aqueduct Near Kettleman City (Check 21)	KA017226	6/20/07	Simazine	0.10
		9/19/07	2,4-D	0.4
		3/20/07	Diuron	1.25
California Aqueduct Near Highway 119 (Check 29)	KA024454		Simazine	0.12
		6/19/07	Simazine	0.06
		9/18/07	2,4-D	0.3
		3/20/07	Diuron	1.20
			Simazine	0.12
California Aqueduct At Tehachapi Afterbay (Check 41)	KA030341	6/21/07	Simazine	0.03
		9/19/07	2,4-D	0.4
			Dacthal (DCPA)	0.12
		3/28/07	Diuron	0.99
California Aqueduct At Devil Canyon Headworks	KA041134		Simazine	0.10
		6/20/07	Simazine	0.05
		9/19/07	2,4-D	0.3
		3/26/07	Diuron	1.36
			Simazine	0.07
		6/20/07	Simazine	0.05

^a Water at these locations was sampled during March, June, and September.

^b Only chemicals found in detectable amounts at the sampling stations are included in this table. Refer to the document entitled "Analytical Methods for Organic Chemicals" for a complete listing of all organic chemicals included in the laboratory analysis. This document is available online at <http://www.water.ca.gov/swp/waterquality/GrabSample/index.cfm>.

^c µg/L = micrograms per liter

Groundwater Turn-ins

Use of local groundwater is authorized by SWP to allow recovery of previously stored project and nonproject water and provide short-term solutions to address urgent local water supply needs. The pump-in is allowed only if the quality of the groundwater meets certain minimum requirements. It must be demonstrated that the groundwater is of acceptable quality prior to pumping the groundwater into the SWP. Groundwater pump-in tends to be authorized more frequently in dry years. In 2007, California experienced variations in water supply both locally and statewide because of prolonged drought conditions. A total of 359,048 acre-feet (af) of groundwater was accepted into the California Aqueduct between mileposts 70.88 and 245 from March to December 2007 by Arvin-Edison Water Storage District, Kern County Water Agency, Semitropic Water Storage District, Wheeler Ridge Water Storage District, and Kern Water Bank Authority.

Municipal Water Quality Investigations Program

The Sacramento-San Joaquin Delta provides drinking water for more than 25 million people in California. Because the Delta and its tributaries are located in a relatively unprotected watershed, water quality degradation is possible from many sources, including industrial and municipal wastewater discharges, storm water runoff from cities, agricultural discharges, recreational activities, abandoned mines, and illegal dumping. The Municipal Water Quality Investigations (MWQI) program was established to evaluate the suitability of Delta water as a drinking water source, to identify sources of water quality degradation, and to evaluate means of eliminating or preventing degradation.

Program participants include the municipal water contractors of the SWP and Contra

Costa Water District. Program advisors include representatives of participating agencies, the U.S. Environmental Protection Agency (EPA), DPH, and California Urban Water Agencies.

Real Time Data and Forecasting Comprehensive Program

The MWQI program expanded from monitoring, problem identification, and assessment to working toward a Real Time Data and Forecasting Comprehensive Program (RTDF-CP). This process began in 2006 and continued moving forward in 2007. The program goal is to enhance coordination, collaboration, and resource sharing among the various DWR water quality monitoring and modeling groups and with outside agencies and entities generating drinking water quality data or requiring real-time data to increase efficiency within their organizations.

There are seven elements associated with this effort:

- organizational coordination and collaboration between DWR monitoring and forecasting groups;
- coordination and collaboration with outside agencies to enhance real-time monitoring activities;
- real-time data acquisition through monitoring;
- enhancement of forecasting and fingerprinting of drinking water quality through use of computer models;
- information management and dissemination;
- emergency response preparedness as related to drinking water quality; and
- scientific support studies.

Additional resources were required to implement this program, and a request for additional position authority was submitted for the 2007–2008 fiscal year. Additional

staff were hired at the end of 2007, and as a result the RTDF-CP has been expanded to include staff in the Bay Delta Office, the SWP Operations Support Office, and the SWP Operations Control Office.

One RTDF-CP component is to evaluate the need for and feasibility of installing in situ equipment in locations that would provide useful information for utilities, that together with modeling could provide an “early warning system” of changes in water quality approaching drinking water intakes. One location identified for the installation of new in situ instrumentation for organic carbon monitoring is the Jones Pumping Plant at the Delta Mendota Canal. In 2007, MWQI entered into negotiations with the San Luis Delta Mendota Water Authority to construct a new water quality monitoring station at this location.

In addition to taking the first steps to install a new station at Jones Pumping Plant, the MWQI program continued operating three automated carbon analyzers in the Delta at the Banks Pumping Plant, Sacramento River at Hood, and the McCune station on the San Joaquin River. These analyzers automatically sample ambient water, determine the total and dissolved organic carbon concentrations, and send the data to Sacramento, where it is posted on the California Data Exchange (CDEC) website. In addition to carbon analyzers, automated ion chromatography instruments at the Banks and McCune stations began reporting bromide, chloride, sulfate, and nitrate data to CDEC. In 2006, these data were only available to users through MWQI staff.

To support forecasting efforts, a preliminary version of the DSM2-Aqueduct Extension Model was completed in 2007. This model will be refined to increase forecasting resolution and allow drinking water utilities to better react to short- and long-term changes in source water quality. Once complete, the model will also be capable

of running in a planning mode. This will allow water managers to evaluate changes in drinking water quality associated with changes in water supply operations and watershed pollution control strategies.

Reports

State of California drinking water regulations require certain public water purveyors to complete watershed sanitary surveys every five years. Watershed sanitary surveys must include a physical and hydrogeological description of the source watershed, a summary of source water quality monitoring data, a description of activities and sources of contamination, a description of any significant changes that have occurred since the last survey which could affect the quality of the source water, a description of watershed control and management practices, an evaluation of the system’s ability to meet applicable drinking water standards, and recommendations for corrective actions. The 2006 *State Water Project Watershed Sanitary Survey Report*, the fourth in a series for the SWP, provides information in the latest 5-year update from the original sanitary survey required by DPH in 1990. This update report was completed in June 2007 and can be downloaded from the MWQI website: <http://www.water.ca.gov/waterquality/drinkingwater/index.cfm>.

Special Studies

Organic Carbon Method Evaluation Study

Because accurate organic carbon data are so critical to drinking water operations, MWQI staff completed a series of experiments in 2007 that examined whether field instruments satisfactorily removed inorganic carbon—one area that the EPA has focused on as a source of error in organic carbon measurements. Based on the study results, sample preparation methods were modified at all real-time organic carbon instruments to ensure adequate removal of inorganic carbon.

Comparison of Organic Carbon Analyzers

In 2000, MWQI evaluated the water quality management implications of using different organic carbon analyzers in the Delta. The study tested whether analyzers using different methods were equally capable of measuring organic carbon in diverse environmental water samples from the Delta and its watersheds. The study also evaluated whether the different instruments might provide differing organic carbon concentration measurements which, in turn, could trigger different regulatory requirements. MWQI staff concluded that properly operating instruments using any of the standard methods were equally capable of analyzing organic carbon concentrations typically found in Delta waters. The study results were published in the May 2007 issue of the journal *San Francisco Estuary and Watershed Science*.

Natural Organic Matter Source Assessment

Understanding the sources of organic compounds to the Delta is just as important to drinking water stakeholders as knowing their concentrations. MWQI has partnered with the University of New Orleans and Lawrence Livermore National Laboratory in a CALFED-funded project to use carbon, nitrogen, and sulfur isotopes to determine the seasonal contribution of natural organic matter derived from peat islands to the carbon load in the SWP. Peat soils found on many Delta islands contain natural organic matter that is several thousand years old. The hypothesis is that this “old” carbon should be distinguishable from relatively “modern” carbon. Using age as a fingerprint, MWQI hopes to provide information on the relative sources of organic carbon at an export site like Banks Pumping Plant. Samples have been collected and analysis of the samples has begun. Knowing the relative contribution of different sources of organic carbon could help focus management practices so that organic carbon discharges are minimized.

Staten Island Wetlands Loading Investigation

To examine organic carbon loads from an agricultural context, DWR, the Bureau of Land Management, Ducks Unlimited, DFG, and the Nature Conservancy partnered on a CALFED grant to develop a wildlife friendly farm management project on the Delta’s Staten Island. The MWQI program was responsible for the project’s water quality component, which represented one of the first times that loading from a Delta peat island had ever been quantified. In June 2007, a final report on the water quality results was provided to CALFED. This study determined that organic carbon loads discharged from Staten Island were greater than discharges from a non-peat soil agricultural area (Colusa Basin Drain) on the Sacramento River, but that nutrient loads discharged from the island were much lower than this drain. Both organic carbon and organic nitrogen seasonal patterns were similar. The highest concentrations were observed during the winter, even though the greatest volume of water pumped off the island occurred in the summer. The total organic carbon loading was approximately 9.05 megagrams per square kilometer per year, while total nitrogen loading rates were approximately 1.57 grams per square meter per year.

Bryte Chemical Laboratory

Established in 1951, Bryte Chemical Laboratory is DWR’s primary analytical laboratory. Its main function is to analyze drinking, surface, ground, and waste water for the various water quality programs within DWR. Since 1990, the laboratory has been certified biannually by the DPH Environmental Laboratory Accreditation Program (ELAP) to perform water quality analyses following EPA or American Water Works Association (AWWA) analytical methods. This certification allows the laboratory to perform regulatory work that can be used for compliance purposes. The laboratory continues to perform the vast

majority of chemical and other related analyses required to support DWR's water quality programs. Every year, thousands of water samples are routinely analyzed for standard minerals, nutrients, metals, pesticides, herbicides, volatile organic compounds, and many other chemical constituents.

In 2007, the laboratory upgraded its capability and capacity to detect and analyze anions (chloride, sulfate, bromide, fluoride, nitrate) and ortho phosphate in water samples with the purchase of two fully automated and computer controlled integrated reagent-free ion chromatography instrument systems. The ion chromatographs are equipped with new technologically advanced automated eluent generation systems that minimize the time, labor, costs, and errors of manually prepared reagents.

The laboratory has continued to manage a variety of analytical contracts with other State agencies and several outside laboratories in accordance with the master contract policy approved in fiscal year 1994–1995. These contracts are used to perform analyses that are beyond the capability and capacity of the laboratory, such as solids and fish tissues. The laboratory works in conjunction with the DWR Municipal Water Quality Program QA/QC Section to replace these contracts as they expire each fiscal year. In 2007, the DFG contract for fish tissue analysis and the Metropolitan Water District of Southern California contract for taste and odor analysis were renewed.

SWP security and protection has continued to be a primary goal for DWR since the terrorist attack on September 11, 2001. To help protect the SWP from biochemical and chemical agents, the laboratory continued in 2007 to be an active member in a group of laboratories called the California Association of Mutual Aid Laboratories Network (CAMAL Net) headed by DPH. The laboratory

network's main objective is to voluntarily assist DPH in the analysis of chemical agents in water quality samples should a natural disaster or terrorist event occur in California. The assistance is only required should the analytical capacity of DPH be exceeded or to confirm the presence or absence of chemical agents in water quality samples provided by DPH. In 2007, Bryte Laboratory was classified as a Level II participating laboratory in the CAMAL Net organization. Level II only allows the laboratory to receive samples that are prescreened and determined to not be hazardous to laboratory personnel.

Suisun Marsh Activities

Suisun Marsh consists of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and sloughs. It is the largest contiguous brackish marsh remaining in the United States. 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 California Legislature, SWRCB, Reclamation, DFG, Suisun Resource Conservation District (SRCD), DWR, and other agencies have focused on preserving the Suisun Marsh as a unique environmental resource. Figure 4-2 shows the water quality monitoring and compliance sampling locations.

Blacklock Restoration Project

DWR received CALFED Ecosystem Restoration Program grant funds in 2001 to acquire 70 acres of what is referred to as the Blacklock property in December 2003. DWR, in cooperation with Reclamation, DFG, USFWS, and SRCD, implemented the Blacklock Restoration Project (location shown on Figure 4-2). This project restored diked, managed wetlands to tidal wetlands.



Figure 4-2 Compliance and Monitoring Stations and Water Management Facilities in the Suisun Bay and Marsh

Habitat Management, Preservation, and Restoration Plan for the Suisun Marsh (Suisun Marsh Plan)

On March 2, 1987, the Department of Water Resources (DWR), the Bureau of Reclamation (Reclamation), the Department of Fish and Game (DFG), and Suisun Resource Conservation District (SRCD) signed the Suisun Marsh Preservation Agreement (SMPA). The objective of SMPA is to assure that Reclamation and DWR mitigate for any adverse effects of the Central Valley Project (CVP) and State Water Project (SWP) on wetlands in the marsh, as well as a portion of the adverse effects of other upstream diversions. This objective is primarily accomplished by operation of large-scale facilities in the marsh to maintain a dependable supply of adequate quality water within Suisun Marsh channels. These large-scale facilities are currently operated and maintained by DWR. They include the Suisun Marsh Salinity Control Gates, Roaring River Distribution System, Morrow Island Distribution System, and Goodyear Slough Outfall (see Figure 4-2).

On August 4, 1995, the Suisun Marsh Coordinators, representing the four agencies party to SMPA, began discussions directed at updating the agreement. Representatives from Reclamation, DWR, DFG, and SRCD established a negotiating team, technical group, drafting committee, and environmental documentation team. Beginning September 1995, the SMPA negotiating team met monthly and made significant progress in developing the basis to amend the agreement. Representatives from the SWP and CVP water contractors actively participated in the negotiations. The Revised SMPA, dated June 20, 2005, reflects future hydrologic and salinity conditions in the Suisun Marsh as prescribed by the State Water Resources Control Board (SWRCB) 1995 Water Quality Control Plan and places more emphasis on improving water and land management practices and facilities operations, in partnership with the local managed wetlands landowners.

In 2001, the Suisun Principal Agencies, a group of agencies with primary responsibility for Suisun Marsh management, directed the formation of a charter group to develop a plan for the marsh that would balance the needs of CALFED, the SMPA, and other plans by protecting and enhancing existing land uses, existing waterfowl and wildlife values. The Principal Agencies are U.S. Fish and Wildlife Service (USFWS), Reclamation, DFG, DWR, National Marine Fisheries Service (NOAA Fisheries), SRCD, and CALFED Bay-Delta Program (CALFED).

The Principal Agencies directed the formation of a charter group to develop the Suisun Marsh Habitat Management, Preservation, and Restoration Plan, known as the Suisun Marsh Plan (SMP). In addition to the Principal Agencies, the charter group includes other regulatory agencies such as the U.S. Army Corps of Engineers (Corps), San Francisco Bay Conservation and Development Commission (BCDC), and the State and Regional Water Quality Control Boards.

(continued)

Development of the SMP has been a multiagency, collaborative process to design a plan that will balance the goals and objectives of CALFED, SMPA, and other management and restoration programs within the Suisun Marsh in a manner that is responsive to the concerns of all stakeholders and is based upon voluntary participation by private landowners. Landowners in the Marsh and other agencies that have a jurisdictional or other stake in the outcome of the SMP have been engaged in the process.

Overall, the SMP is intended to balance the benefits of tidal wetland restoration with other habitat uses in the marsh by evaluating alternatives that provide for a politically acceptable change in marsh-wide land uses, such as salt marsh harvest mouse habitat, managed wetlands, public use, and upland habitat. SMP will be a comprehensive plan designed to address the various conflicts regarding use of marsh resources, with the focus on achieving an acceptable multi-stakeholder approach to the restoration of tidal wetlands and the management of managed wetlands and their functions. As such, the SMP is intended to be a flexible, science-based, management plan for Suisun Marsh, consistent with the Revised SMPA and CALFED. It also is intended to set the regulatory foundation for future actions.

In July 2006, a natural breach in the levee occurred. It was determined that the planned breach should still be constructed to allow for full tidal flow and optimum sediment transportation. The planned breach construction occurred on October 3 and 4, 2006.

The project goals and objectives are to: (1) restore the area to a fully functioning, self-sustaining marsh ecosystem created through restoration of natural hydrologic, sedimentation, and biological processes; (2) increase the area and contiguity of emergent wetlands providing habitat for tidal marsh species; and (3) assist in the recovery of at-risk species. The final restoration plan for the project was published in June 2007.

A 10-year monitoring program at the site is being done in cooperation with State and federal agencies. There are 15 parameters being monitored, including sediment accretion, channel network evolution, vegetation development, water quality, methyl mercury, and avian use.

For more information about the Blacklock Project, visit the Suisun Marsh Program webpage at <http://www.water.ca.gov/suisun/restoration>.

Revised Suisun Marsh Preservation Agreement

In 1987, DWR, Reclamation, DFG, and SRCD signed the Suisun Marsh Preservation Agreement (SMPA). SMPA contains provisions for actions to control channel water and soil salinity to mitigate impacts of the SWP, CVP, and other upstream diverters on managed wetlands in Suisun Marsh. A Revised SMPA and Revised Mitigation and Monitoring Agreements were signed in 2005 to make channel water salinity requirements consistent with the SWRCB's D-1641 and replace additional large scale water management facilities with landowner water and management activities to meet the SMPA objectives in the western Marsh.

The Revised SMPA includes the following actions: operate the Initial Facilities and

Suisun Marsh Salinity Control Gates; meet channel water salinity standards consistent with D-1641; implement a water manager program; provide portable pumps; update Individual Ownership Adaptive Management Habitat Plans; establish a drought response fund; and realign and stabilize turnouts on the Roaring River Distribution System.

During 2007, SRCD continued to implement these activities.

The Suisun Habitat Management, Preservation, and Restoration Plan, known as the Suisun Marsh Plan (SMP) provides funding for private landowner wetland management activities that are included in both the SMP and Revised SMPA. (See the following section on SMP and the SMP sidebar.)

Suisun Habitat Management, Preservation, and Restoration Plan

During 2007, work continued on the Suisun Habitat Management, Preservation, and Restoration Plan (Suisun Marsh Plan [SMP]). High level representatives from the Suisun Marsh Charter Group agencies, met on a monthly basis to review potential actions and develop alternatives to be included in the SMP. The “writing group,” a team of staff level representatives of some of the Principal Agencies, also met monthly to develop impacts analyses for the EIS/EIR. The SMP EIR/EIS is being developed in coordination with the recommendations of the Delta Vision Process and with information and evaluation provided by the Delta Risk Management Study and other regional programmatic processes. Reclamation and USFWS have agreed to serve as joint National Environmental Policy Act lead agencies, and DFG has agreed to serve as the California Environmental Quality Act lead agency.

Operation and Maintenance

Initial Facilities Maintenance

Several facilities constructed by DWR operate in the Suisun Marsh. They are identified in the *Plan of Protection for the Suisun Marsh* (1984) and the 1987 SMPA. These facilities provide lower salinity water to managed wetlands. The initial facilities, including the Roaring River Distribution System, Morrow Island Distribution System (MIDS), and Goodyear Slough Outfall, were constructed in 1979 and 1980. The Suisun Marsh Salinity Control Gates were installed and became operational in 1988. (See Figure 4-2.)

Morrow Island Distribution System Fish Screen and Alternatives

MIDS is an interior ditch bordered by levees that was created to distribute water to managed wetlands. Relatively less saline water is taken from Goodyear Slough in the west through water control structures which transport the water into a ditch. Water is then distributed to managed wetlands through private landowner water control structures along the ditch. Water not used by the landowners exits into Grizzly Bay through water control structures in the east. MIDS is owned by the Department of the Interior, Reclamation, and DWR. DWR operates and maintains this facility.

In 1997, USFWS issued a BO for MIDS maintenance work. The BO required that Reclamation and DWR install a fish screen at the MIDS intake on Goodyear Slough.

The cost of adding a fish screen to the MIDS intake structure was likely to be high, and the effectiveness of such screening to conserve Suisun Marsh fish populations was unknown. Therefore, DWR and Reclamation studied fish entrainment from September 2004 through June 2006 to evaluate whether screening the diversion would provide substantial benefits to local populations of listed fish species. The study

objectives were to determine what species of fish and what life stages are entrained and to assess whether certain species of fish are more likely to be entrained than others.

Based on the study results, a fish screen at MIDS would likely have negligible benefits to sensitive fish populations. (See Bulletin 132-07, Chapter 4, for a summary of sampling results.) USFWS reinitiated consultation on the MIDS maintenance project. DWR and Reclamation are proposing to fulfill the outstanding terms and conditions of the USFWS-issued BO by acquiring and protecting in perpetuity aquatic habitat in Suisun Marsh. The status of this proposal remains on-going without new notable developments or changes.

Suisun Marsh Salinity Control Gates

The Suisun Marsh Salinity Control Gates are operated from October 1 through May 31, as needed, to meet salinity standards. When they are not in operation, they are placed in an open position to minimize fish concerns related to predation and impedance. In the past, the gates operation and installation or removal of the flashboards has varied due to salinity conditions, fisheries agencies' requests for sensitive species concerns, or special studies and repairs.

Gates Status for 2006–2007. During the 2006–2007 control season (October 2006 through May 2007), the gates did not operate until late January 2007 since salinity levels in fall 2006 were not of concern in the marsh. Operations of the gates commenced January 25, 2007 (flashboards installed on January 24, 2007) as salinity levels became a concern. Operations to control salinity continued until March 1, 2007. Thereafter, salinity levels were favorable due to high outflow in March 2007 and remained under control. The gates were not needed for the remainder of the control season (flashboards removed on April 23, 2007).

Past years' salmon passage studies indicate that boat lock gates being open during gate operations provides optimal fish passage. Starting with the 2005–2006 control season and thereafter, the boat lock gates will remain open during gate operations in support of fish passage and will only be closed for a short period to allow boat passage, as agreed by Reclamation, DWR, DFG, and SRCD and set forth in the Revised SMPA (2005).

Monitoring

Water Quality and Compliance

Salinity levels during the 2006–2007 control season were well below the monthly standards. Details of the salinity levels in the marsh are available in the monthly report entitled, *Suisun Marsh Monitoring Program Channel Water Salinity Report*, at: <http://www.water.ca.gov/suisun/dataReports>.

Suisun Marsh Expenditure History

Suisun Marsh expenditures and reimbursements administered by DWR for calendar years 1968 through 2007 are summarized in Table 4-6. From 1968 through December 31, 2007, DWR disbursed more than \$123.7 million of SWP funds for planning, design, environmental documentation, construction, maintenance, monitoring, mitigation, and permit compliance in support of implementing the Plan of Protection for Suisun Marsh through the SMPA and for meeting standards set by SWRCB. Reclamation has reimbursed DWR about \$46.6 million (38 percent), and the State's General Fund has reimbursed about \$9.4 million (8 percent). These figures do not include up-front payments made by Reclamation for staff and other direct costs, as well as about \$5.7 million in Reclamation interest payments during 1988 and 1989.

Annual figures are reported in Table 4-6 for DWR's up-front payments, Reclamation reimbursements, General Fund reimbursements, and DWR's cumulative expenditure balance.

Table 4-6 Suisun Marsh Expenditures and Reimbursements Administered by DWR (in dollars)

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment ^a [4]	Reclamation Invoice Payment [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs ^c [8]	SWP Water Contractors' Costs [7] minus [8] [9]
1968	10,571					10,571	359	10,212
1969	34,181					34,181	1,162	33,019
1970	23,343					23,343	794	22,549
1971	1,042					1,042	35	1,007
1972	47					47	2	45
1973	0					0	0	0
1974	0					0	0	0
1975	2,709					2,709	92	2,617
1976	32,960					32,960	1,121	31,839
1977	37,475					37,475	1,274	36,201
1978	350,831					350,831	11,928	338,903
1979	3,660,099					3,660,099	124,441	3,535,658
1980	5,005,759					5,005,759	170,283	4,835,476
1981	2,964,974					2,964,974	101,311	2,863,663
1982	2,955,705			(2,500,000)		455,705	101,111	354,594
1983	2,754,094					2,754,094	93,643	2,660,451
1984	2,418,344					2,418,344	82,388	2,335,956
1985	2,332,773					2,332,773	79,432	2,253,341
1986	6,495,322					6,495,322	220,843	6,274,479
1987	13,600,701					13,600,701	462,424	13,138,277
1988	7,456,364			(17,368,725) ^b	(2,039,752)	(11,952,113)	253,516	(12,205,629)
1989	2,341,960	(9,478,000)	6,634,600	(1,219,691) ^b	(283,857)	(2,004,988)	79,643	(2,084,631)
1990	3,030,010			(695,450)		2,334,560	101,460	2,223,100
1991	6,223,042			(2,925,429)		3,297,613	210,454	3,087,159
1992	2,737,259			(1,174,655)		1,562,604	91,951	1,470,653
1993	2,979,255			(238,130)		2,741,125	99,897	2,641,228
1994	3,192,213			(1,962,549)		1,229,664	107,281	1,122,383
1995	2,721,978			(647,138)		2,074,840	91,218	1,983,622
1996	3,391,678			(1,482,396)		1,909,282	113,244	1,796,038
1997	3,634,267			(1,520,219)		2,114,048	121,132	1,992,916
1998	5,342,834			(1,107,501)		4,235,333	177,132	4,058,201
1999	8,867,742			(2,696,200)		6,171,542	301,424	5,870,118
2000	2,857,534			(3,300,053)		(442,519)	98,145	(540,665)
2001	2,623,227			(444,009)		2,179,218	89,494	2,089,724
2002	3,752,265			(791,319)		2,960,946	124,379	2,836,566
2003	3,258,583			(2,389,979)		868,604	107,556	761,038
2004	2,874,629			(952,940)		1,921,689	94,885	1,826,804
2005	3,940,876			(1,409,296)		2,531,580	130,049	2,401,531
2006	5,790,721			(868,449)		4,922,272	193,303	4,728,968
2007	4,085,998			(939,879)		3,146,119	134,845	3,011,274
Total	123,783,585	(9,478,000)	6,634,600	(46,634,007)	(2,323,609)	71,982,569	4,174,336	67,808,232

^a Under State Assembly Bill 1442, the General Fund paid 20% of the Suisun Marsh costs through June 1988, which amounts to \$9,478,000. This payment includes \$2,843,400, which represents 6% of the costs through June 1988 paid by the General Fund. This amount has reduced the costs billed to the SWP water contractors. The remaining \$6,634,600 received from the General Fund represents DWR's recreation project purpose share of 14%.

^b Excludes interest payments made by Reclamation.

^c Allocation factors for capital recreation costs have changed from 14% to 3.4% and Operations & Maintenance recreation costs from 14% to 3.3%.



Chapter 5

Local Assistance

Wetlands in the Delta.

Significant Events in 2007

By the end of 2007, 78 water districts, three environmental interest groups, and more than 55 other interested groups had signed the Agricultural Water Management memorandum of understanding (MOU) as members of the Agricultural Water Management Council (Ag Council).

DWR received 29 urban water management plans.

From January through December of 2007, 4,117 documents were screened by the Environmental Document Review Section.

Information in this chapter was contributed by the Division of Statewide Integrated Water Management, the Division of Environmental Services, and the Division of Integrated Regional Water Management.

The Department of Water Resources (DWR) manages the Davis-Grunsky Act Program, water use efficiency, agricultural drainage, environmental impact document review, and Water Conservation Bond Law programs, and participates in several other programs that assist local agencies and benefit State Water Project (SWP) contractors.

Davis-Grunsky Act Program

The Davis-Grunsky Act, authorized in 1960 as part of the Burns-Porter Act, provides construction loans for local domestic water projects and agricultural water conservation projects. It also provides grants for recreation and fish and wildlife enhancement. Loans and grants may be given to rehabilitate dams and reservoirs.

DWR's ongoing administration of the program provides oversight of the 32 recreation grant projects to ensure compliance with the contracts. Administration costs are recovered from the revenues provided by the repayment of Davis-Grunsky Act loans. The recreation grant contracts are being amended to reflect actual facilities constructed and the modification of DWR's fee oversight function.

Water Use Efficiency

The Water Use and Efficiency Branch in the Division of Statewide Integrated Water Management (DSIWM) activities include providing technical assistance to local agencies; managing water use efficiency financial assistance programs; managing the California Irrigation Management Information System (CIMIS); reviewing, tracking, and reporting on urban and agricultural water management plans; and managing drainage and water recycling/desalination projects.

California Irrigation Management Information System

CIMIS is a network of automated weather stations that collects weather data and transmits it to a central repository in Sacramento each day. After performing quality control and calculations, the data are made available to the public for such diverse purposes as irrigation scheduling, resource planning, research, and modeling.

In 2007, DWR's CIMIS network remained at 130 stations, with approximately 70 percent of the stations belonging to local cooperators. The demand for CIMIS data has increased steadily since its establishment in 1982. The number of registered data users has grown from 661 in 1989, to more than 7,000 in 2007.

Approximately 225,000 reports were generated from the database through its website (<http://wwwcimis.water.ca.gov>) for information in 2007. Users can register online, access archived data, download data files, and peruse content about the CIMIS program and other helpful metadata and information. A separate but concurrently operating database and web application is operating for redundancy to protect the data.

Other ongoing CIMIS enhancements include the nonideal site weather station network study and the incorporation of the Geostationary Operational Environmental Satellite (GOES) model producing statewide daily reference evapotranspiration (ET₀) maps. In addition, the staff is updating CIMIS

brochures, evapotranspiration calculations, other methods of data acquisition and dissemination, data quality refinements, and technical assistance.

Recycling and Water Desalination Branch

The goal of DSIWM's Recycling and Water Desalination Branch is to improve water use efficiency by promoting increased use of nonconventional water sources—namely recycled water and desalinated brackish and ocean waters—through planning, technical, and financial assistance. As part of a balanced water portfolio, nonconventional water sources will help meet existing and future water supply and environmental needs. The branch's mission consists of increasing the safe and beneficial use of recycled water, advancing energy-efficient treatment and desalination technologies, and encouraging economically and environmentally acceptable use of desalinated brackish and ocean waters.

In 2007, the Recycling and Water Desalination Branch activities included the following:

- provided timely water recycling and desalination information reports;
- continued to develop new knowledge on water recycling and desalination activities and projects in California;
- developed the Proposition 50 desalination grant agreements for 24 projects awarded in the 2006 funding cycle for a State share of \$21.5 million;
- continued to develop and manage grant agreements for the 24 different projects, which were awarded through the second 2004 cycle of the desalination grant program;
- continued to provide technical knowledge on water recycling and water desalination issues, including responses to questions from policy makers, regulators, State and local agencies, and the public on permitting issues; public health regulations; types, locations, and amounts of water reuse occurring, and desalinated water production and use;
- provided technical assistance on the recycled water section in the *Model Water Efficient Landscape Ordinance* —AB 1881;
- visited 11 of the Proposition 50 projects, as part of management responsibilities;
- participated in the Grant Management and Bond Accountability Project meetings
- participated in the Sacramento Water Recycling Advisory Committee (WRAC), and WRAC meetings;
- represented DWR in several meetings, workshops, and conferences and published technical papers on water recycling and made presentations about California's water recycling and desalination activities to DWR's visitors;
- assisted the California Building Standards Commission's staff to address comments from the public as well as the Green Building Code Advisory Committee, concerning proposed water use efficiency standards, and the use of recycled water and gray water in green buildings. The standards are to be included in the proposed California Green Building Standards Code as part of Title 24;
- assisted with the implementation of several Recycled Water Task Force recommendations;
- served on several project advisory committees to guide various desalination projects managed by WaterReuse Research Foundation and the Water Research Foundation (formerly the American Water Works Association Research Foundation or AwwaRF);
- published several articles on various water recycling and water desalination issues in the DWR's *Water Conservation News*;
- participated in the Reclamation's brine-concentrate management study. The study conducted a survey of the current state of Southern California's brine-

concentrate treatment and disposal facilities, regulatory requirements, and emerging/secondary constituent issues; evaluated and compared treatment and disposal methods that could meet forecasted trends in brine-concentrate management for coastal and inland areas; and provided a comparative review of recommended projects for coastal and inland areas to meet expected brine-concentrate treatment and disposal requirements; and

- continued work on the desalination planning guidebook in collaboration with the California State University Sacramento, Center for Collaborative Policy that includes guidelines for developing environmentally acceptable water desalination projects that meet regulatory and permitting requirements. The guidebook is an important resource for project proponents and communities. The planning process outlined in the guidebook is intended to identify and address the siting, regulatory, technical, environmental, and other issues to be considered in determining whether and how to proceed with a desalination project; and
- continued work on the WateReuse Curriculum Committee in collaboration with the WateReuse Foundation and other California public agencies who have the common goal of educating California youth in various aspects of water recycling. The Committee's goal is to produce water cycling education information and resources.

Proposition 50 Water Use Efficiency Grant Program

Proposition 50 provided approximately \$105 million for the Water Use Efficiency Grant Program for three years. The Water Use Efficiency Grant Program provided funds for implementation of all urban Best Management Practices (BMPs) and agricultural Efficient Water Management

Practices (EWMPs) that would result in local, regional, and statewide benefits. Some State benefits are water conservation, flow and timing, water quality, and energy. The first Proposition 50 Water Use Efficiency grant cycle was in 2005 and resulted in 72 cooperative agreements with funding for urban and agricultural projects. The second Proposition 50 Water Use Efficiency grant cycle started in 2006 and resulted in initiation of development of 52 cooperative agreements. These cooperative agreements were finalized during 2007.

For both grant cycles, a competitive proposal solicitation package (PSP) was developed along with a comprehensive review and evaluation of the project proposals. The PSP defines project benefits, eligible projects, eligible applicants, funding caps, reporting, and other contract requirements. Both grant cycles were two-step processes. Applicants were required to submit a Concept Proposal in Step 1, and successful Concept Proposals were invited to submit a Full Proposal in Step 2. All submittals were made on-line through the Financial Assistance Application Submittal Tool (FAAST).

Agricultural Water Management Plans

By the end of 2007, 78 water districts, 3 environmental interest groups, and more than 55 other interested groups had signed the Agricultural Water Management memorandum of understanding (MOU) as members of the Agricultural Water Management Council (Ag Council). The agricultural signatories represent more than 4.9 million acres of irrigated agricultural land statewide.

In 2007, the Ag Council endorsed an additional three agricultural water management plans that had been submitted by agricultural water suppliers. These plans have since become the basis for the districts'

water conservation efforts. The districts with endorsed water management plans are expected to prepare and submit a biennial progress report to the Ag Council from the date their plan was endorsed. DWR staff provides technical review and evaluation of these plans. DWR also reviewed four biennial progress reports for the Ag Council.

DWR staff provided technical assistance to water districts to prepare water management plans and to implement EWMPs, as well as administrative and programmatic assistance to both the council and water districts.

Three-Way Cooperative Agreement— Ag Council

In 2001, DWR set up a three-way cooperative agreement among itself, Reclamation, and CALFED, and managed the State-funded portion of the agreement. This agreement provided funding to the Ag Council for three years to help implement the MOU. The management and implementation of tasks in the agreement were closely coordinated with Reclamation's Mid-Pacific Region. This activity, with a \$1.2 million budget, was shared equally between DWR and Reclamation. By the end of 2005, all DWR funds were spent for relevant tasks identified in the three-way cooperative agreement. The work continued with the federal share of funds and tasks. By the end of 2007, all provisions of this agreement were completed and the agreement is no longer in effect. No attempts have been made to reestablish this cooperative effort.

Urban Water Management Plans

DWR received 29 urban water management plans in 2007. The 2005 Urban Water Management Plan (UWMP) Guidebook and DWR 2005 UWMP Review Sheets were posted on the Urban Water Management website and provided to urban water suppliers throughout the State. In addition, technical assistance was available on how to prepare a UWMP.

Agricultural Drainage Program

The Agricultural Drainage Program's mission is to seek in-valley solutions to the surface and subsurface agricultural drainage water problems in the State, particularly the San Joaquin Valley, and to improve water quality in the San Joaquin River by promoting measures to reduce salinity and discharge of harmful elements.

Even though the San Joaquin Valley Drainage Implementation Program (SJVDIP) has been idle since 2003, DWR continues to implement many of its recommendations through its Agricultural Drainage Program. DWR works in partnership with California universities, CALFED, Reclamation, resource conservation districts, watershed groups, water and drainage districts, and many other local, State, and federal entities. These activities include the following:

- developing, educating, and promoting the use of Integrated On-Farm Regional Drainage Management systems in the San Joaquin Valley;
- providing technical assistance and collaborating with water and drainage districts and local entities to reduce and control surface and subsurface agricultural drainage water;
- maintaining research and demonstration projects to develop drainage reuse systems, including the development of cost-effective, salt-tolerant crops (including energy crops), drainage treatment, disposal technologies, and salt separation and utilization;
- monitoring the quality and distribution of shallow groundwater levels in drainage-impaired areas of the San Joaquin Valley;
- promoting agricultural water and energy use efficiency programs in drainage-impaired lands to reduce the volume of surface and subsurface drainage water and expand regional water supplies;

- maintaining programs to help improve water quality on the San Joaquin River; and
- providing grants for control of agricultural drainage water and the reduction of its toxic elements, using propositions 13, 50, 204, and DWR project funding.

The Agricultural Drainage Program is divided into two major activities: management of Proposition 204 (Drainage Management Subaccount) and the San Joaquin Valley Agricultural Drainage Program.

Proposition 204 (Drainage Management Subaccount)

In 1996, Proposition 204, The Safe, Clean, Reliable Water Supply Act, authorized the transfer of approximately \$6.1 million from the State Water Resources Control Board (SWRCB) to the California Department of Food and Agriculture (CDFA). In 1997, CDFA, SWRCB, and DWR signed an MOU that established a process for utilizing the funds designated for agricultural drainage water management activities. In 1999, CDFA and DWR signed an interagency agreement to transfer the funds to DWR for developing and implementing programs consistent with Water Code Section 78645, as outlined in the MOU. The program's goal is to develop methods of using and concentrating salts and reducing trace element contaminants in the State's subsurface agricultural drainage water.

Each year, DWR solicits proposals from public entities seeking funding for research. A technical review committee (TRC) reviews and screens the proposals. DWR submits the proposal packages to an oversight committee made up of representatives from DWR, CDFA, and SWRCB for final approval. Ultimately, DWR is responsible for preparing and managing contracts for the approved

proposals. In 2007, the TRC selected the following proposals for funding:

- *High Recovery Membrane Desalting of San Joaquin Valley Brackish Water by Feed Flow Reversal RO*, University of California, Los Angeles (UCLA).
- *Identification of Key Microalgal Species for Selenium Volatilization and Biofuel Production in an IFDM Pilot System*, University of California, Davis (UCD).
- *Opportunistic Real Time Management of Saline Discharge Conjoined with San Joaquin River Restoration*, University of California, Merced (UCM).
- *Nitrogen Management Strategies that Enhance the Sustainability of Drainage Water Reuse Strategies with Canola and the Production of its Bio-based Products*, U.S. Department of Agriculture (USDA).

San Joaquin Valley Agricultural Drainage Program

This program consists of several activities, including drainage monitoring and evaluation, drainage treatment, integrated on-farm drainage management, drainage reduction and reuse, environmental services, and the San Joaquin River Water Quality Improvement Program.

Agricultural Drainage Program Tour

In April 2007, at the Westlands Water District field office in Five Points, Agricultural Drainage Program staff presented the program's current activities to representatives from the State Water Contractors and DWR upper management. After the presentation, the group traveled to Red Rock Ranch (RRR), where they observed the various cooperative projects described in this section.

Drainage Monitoring and Evaluation

Drainage monitoring and evaluation involves collecting and evaluating information on the quality, quantity, and movement of drainage

water. In 2007, the following activities were conducted:

- Monitor shallow groundwater levels and flows, and collect water quality data for drainage water from Westside San Joaquin Valley tile drain sumps. In Kern County, groundwater levels are measured quarterly for approximately 200 wells.
- Prepare shallow groundwater and irrigation methods maps of drainage-impaired areas using drainage monitoring data in conjunction with land use and irrigation methods data.
- Provide assistance for the collection of groundwater, soil, and operational data for the integrated on-farm drainage management project at RRR in western Fresno County.
- Maintain a website that includes information on drainage programs and activities, salinity and shallow groundwater maps, Proposition 204 grants, and links related to other agricultural drainage programs (<http://www.water.ca.gov/drainage/>).

Drainage Treatment

Development of Membrane Treatment of Agricultural Drainage Water. DWR continues to fund research on the use of membrane treatment for desalting agricultural drainage water under a multiyear contract with the UCLA Department of Chemical Engineering.

Grassland Area Farmers: Westside Regional Drainage Plan. DWR continues to participate in a multiagency cooperative effort with Grassland Area Farmers to comply with the objectives of the Central Valley Regional Water Quality Control Board's (CVRWQCB) *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin*. One of the key components of the plan is drainage water treatment.

Agricultural Subsurface Drainage: Salt Recovery, Purification, and Utilization.

DWR continues to support research into concentrating and purifying drainage salts for marketing purposes.

Selenium Removal from Agricultural Subsurface Water. DWR continues to participate in cooperative research with the University of California Salinity/Drainage Program (<http://lib.berkeley.edu/WRCA/WRC/>). Activities include a multiyear study for mitigating selenium ecotoxic risk in agricultural drainage systems.

ForeverWater Distillation Unit. Testing began on a promising new thermal desalination technology device that could be useful for desalination of agricultural drainage water. The patented device was constructed by a Fresno-based company called ForeverWater Inc. The pilot 100 gallon per hour unit featured high grade stainless steel. When in full design, it is expected to draw less than 20 watts at 440 volts 60-cycle per gallon produced. The unit was built for continuous operation with a full control panel and on/off switch, and features vapor compression heat recycling, steam stripping, distillation, and cyclone demisting. Preliminary results look promising, although the energy used during the test was nearly 100 watts per gallon. The company plans design changes to improve efficiency.

Performance Evaluation of Combined Solar Technologies Agricultural Drainage Water Desalination and Power Production Pilot Demonstration Project in Westlands Water District. Combined Solar Technologies (CST) of Pacific Grove, California, built a demonstration project that uses both natural gas/hydrogen-fired and solar-derived thermal energies that can both generate electricity and reclaim water. The pilot project report presented data collected from two test sites outfitted with solar-thermal/gas-powered brine reduction systems built by CST.

The pilot system at RRR was designed to treat agricultural drainage water from field irrigation. The feed-water total dissolved solids (TDS) ranged from 11,408 milligrams per liter (mg/L) to 221,000 mg/L. Tests were conducted in collaboration with DWR and UCD Department of Biological and Agricultural Engineering. The system consisted of one experimental natural gas/hydrogen-fired brine boiler, one experimental hot-fluid-type boiler, one 12-horsepower CST engine driving a 10 kilowatt (kW) generator, and one 800-square-foot parabolic trough. Testing occurred during most of 2006, processing a total of 36,902 gallons of drainage water. The majority of the water averaged a TDS of 12,000 mg/L; however, about 8,000 gallons had a TDS of 66,000 mg/L, and 250 gallons had a TDS of 223,000 mg/L. The gas-fired boiler and the hot-fluid boiler both underwent testing. Boiler efficiency ranged from 70 percent to 86 percent.

An 800-square-foot parabolic solar-concentrating array powered the hot-fluid boiler in August and September. As part of this research, a CST evaporator system prototype was field-tested using feed-water from an agricultural drainage sump.

Interpretation of the pilot test results indicate the process developed by CST can provide additional water resources through a zero liquid discharge (ZLD) reclamation process with minimal net fossil fuel-based energy inputs, possible energy output, and substantial cost savings. Boiling drainage water for power and desalination process has not been previously attempted.

Integrated On-Farm Drainage Management

DWR's San Joaquin District's Integrated On-Farm Drainage Management (IFDM) became a permanent activity when the Integrated Drainage Management Section was created in 2001. Its objective is to

provide technical assistance on IFDM systems through advisory, technical, and oversight committees. IFDM is a drainage management system based on sequential reuse of saline drainage water to irrigate crops of progressively increasing salt tolerance. Each sequential reuse reduces the volume of drainage water and increases the salt concentration. Drainage water too saline for irrigation can be applied to a variety of discharge points. The IFDM program funds, administers, and monitors contracts with State, federal, university, and local entities to learn more about IFDM systems. Findings indicate that IFDM systems have less significant environmental impacts than other options and they reduce the volume of drainage water. The program is investigating the use of accelerated evaporation systems (solar evaporators) for zero discharge systems and evaluating the feasibility of using salt-gradient solar pond systems as a way of removing salt and generating heat or electricity for agricultural use.

IFDM program staff also:

- Coordinate IFDM research activities and data collection with other agencies.
- Assist growers and local agencies in planning and developing IFDM systems.
- Investigate new techniques for zero discharge, including enhanced evaporation techniques and extraction of salts from reused drainage water at a solar still facility at RRR.
- Participate in joint investigations with Reclamation to determine the feasibility of nanofiltration as a pretreatment for desalination of subsurface drainage water using reverse osmosis (RO) technology and the feasibility of using a patented biotreatment process to remove selenium from agricultural subsurface drainage water.
- Provide assistance to research projects for the development of crops, including research being performed at RRR by

California State University, Fresno, to assess the suitability of various salt-tolerant forages and halophytes for the sequential reuse of drainage water, forage quality, productivity, and water use.

- Cooperate with the USDA in an investigation to determine crop production using an active drainage management system that employs *in situ* use of shallow groundwater and subsurface drainage water.

DWR continues to work cooperatively with Reclamation to investigate the long-term interaction of irrigation, rainfall, and local and regional groundwater with the movement of salts and selenium in the RRR soils. The project will use a three-dimensional numerical model for fully integrated subsurface and surface flow and solute transport. DWR continues to monitor a series of observation wells at RRR and surrounding areas, collect water quality samples, and measure groundwater levels to provide data for the model. Other activities include the following:

- assisting growers, water and drainage districts, and regional entities, by providing information on salt-tolerant grasses and IFDM design specifications;
- assisting SWRCB to develop policies for the management of drainage water, salt, and selenium; and
- improving enhanced evaporation features of the pilot solar evaporator.

DWR continues to collect data on evaporation rates of subsurface drainage water using dyes, nozzles, screens, and other devices and materials. The purpose is to develop design specifications for evaporating and recovering salts from drainage water in the solar evaporator, to determine optimum weather parameters to operate it, and to study methods to minimize and control potential salt drift. A white paper

summarizing results of previous research was released (<http://www.water.ca.gov/drainage/ifdm/downloads.cfm>).

DWR continues to assist Reclamation with performing project tasks for the HydroGeoSphere project at RRR. To facilitate development of the conceptual model, DWR staff collected topographic survey data of RRR and the surrounding area to determine elevation points and to locate fixed works such as sumps, pumps, and wells. Model results from this case study will be useful for the formulation of optimal design and management guidelines for IFDM systems.

DWR is continuing research on *Prosopis alba*, an Argentine mesquite tree, in cooperation with the Forestry Research Station at Catholic University of Santiago del Estero (CUSE) in Argentina. *Prosopis alba*, which originated from the plantations of CUSE, is a highly salt-tolerant tree species that holds promise for ameliorating subsurface drainage problems in western San Joaquin Valley soils. There is good potential for investment of the agriforestry component in an IFDM system. The lumber is coveted by the furniture industry in Argentina and has a value of \$1,000 per ton of sawn lumber. Research and development is needed to perfect the process for the reliability of massive production of elite *Prosopis alba* for large-scale reforestation. CUSE provided approximately 2,000 scarified *Prosopis alba* seeds to initiate plantation trials in the San Joaquin Valley. After inspection and quarantine in a USDA facility, the seeds were taken to a plant nursery to produce plants needed for trials at five locations within drainage-impaired lands.

DWR staff continues to collect operational data from IFDM projects at RRR and AndrewsAg for analysis of performance. DWR staff provided technical information and assistance on an agriforestry planting program in Kern County on farms with salinity and shallow groundwater problems.

Saline Drainage Water can be Managed by Growing Forages. In a project funded in part by Proposition 204, UCD continues to evaluate drainage water reuse. At a 30-hectare site in Kings County, saline-sodic drainage and other wastewaters are being used for forage and livestock production. Bermuda grass (*Cyanodon dactylon*) was planted in 1999 and grazed rotationally. Livestock trials were carried out for 3 years (2001–2003). Irrigation and grazing has continued up to the present. Forage sampling occurred at sites reflecting soil variation. Samples were analyzed for quality and mineral content. Bermuda grass grew well at moderate salinity levels. No adverse livestock health effects were observed. More recent work focuses on the use of crop simulation modeling to explore the yield potential of Bermuda grass under saline irrigation and other soil conditions.

Central Valley Salinity Management Program

In 2006, CVRWQCB and SWRCB initiated a comprehensive effort to address salinity problems in California's Central Valley and adopt long-term solutions that would lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is an effort to develop and implement a comprehensive salinity management program. The CV-SALTS goal is to maintain a healthy environment and a good quality of life for all Californians by protecting our most essential and vulnerable resource: water. DWR is involved in the process by providing expertise in salinity management through participation in the committees and activities of the Central Valley Salinity Policy Group. This group provides guidance and technical support on specific issues (Technical Advisory Committee, Social and Economic Impact Study Committee, and Public Education and Outreach Committee) and overall direction and management (Steering Committee) for

the development of a comprehensive Central Valley Salinity Management Plan.

Drainage Reduction and Reuse Program

DWR's Drainage Reduction and Reuse Program offers technical assistance, information, and other resources to growers and irrigators for applying irrigation water efficiently to reduce both excessive deep percolation and drainage water from the immediate on-farm source, while maintaining salt balance in the root zone.

The program objective is being achieved through on-farm demonstration projects, studies, research, training, and workshops on scheduling irrigation, management, advances in irrigation technologies, evaluating irrigation systems, reusing drainage water, and managing salinity.

Environmental Services

DWR's San Joaquin District Environmental Services Section investigates and reports on short- and long-term use and operation of evaporation ponds, IFDM, and other systems used for disposal and management of drainage water. Environmental investigations include the following:

- RRR research projects that involve required biological monitoring activities in accordance with Waste Discharge Requirements permits;
- assisting landowners in locating information required for preparing California Environmental Quality Act (CEQA) documentation necessary for obtaining permits and authorization for implementing, monitoring, and operating drainage reduction, treatment, and disposal projects;
- mapping agriforestry and herbaceous plots in drainage-impacted areas, using global positioning system (GPS) technology, which is then imported into a geographic information system (GIS) format linked to a database created to

track key information associated with development of the vegetation plots;

- responding to information requests from landowners wanting a better understanding of the CEQA and the National Environmental Policy Act (NEPA) public review process, so they can more meaningfully comment on upcoming State and federal drainage related projects; and
- reviewing quarterly and annual environmental monitoring reports related to evaporation pond operation and investigation.

Wetlands Study. As per CVRWQCB data, wetlands discharges contributed about 9 percent of the total salt load in the San Joaquin River at Vernalis. The contribution is likely to be higher today as additional water supply and land are acquired for wetlands wildlife refuges through the Central Valley Project Improvement Act (CVPIA), Environmental Water Account (EWA), and other programs. Timing of wetlands releases with assimilative capacity of the San Joaquin River could result in significant water quality improvements. However, little has been done in this regard due to concerns over disrupting existing, proven wetlands management practices.

Research is underway to determine if improved wetlands management practices can be achieved for the benefit of both wildlife and San Joaquin River water quality. Current research has focused on real-time water quality monitoring and adaptive management. Research goals are to coordinate timing of wetland discharges when assimilative capacity is available. In addition to funds provided by CALFED for the study of the *Effect of Delayed Wetlands Drawdown on Moist Soil Plants*, DWR is collaborating with the Department of Fish and Game (DFG) and private wetlands in a study to assess other aspects of delayed wetlands drawdown. The studies on delayed wetlands drawdown will be complemented

by a study funded by DWR under Proposition 204.

DWR's San Joaquin District Environmental Services Section, in a collaborative effort with DFG and other entities, is collecting biological data in seasonal San Joaquin Basin wetlands within the Grasslands Ecological Area. Information collected will be used in determining management actions that will create the opportunity for blending saline west-side and agricultural return flows with high quality east-side reservoir releases into the San Joaquin River. The objective is to improve compliance with State water quality objectives while protecting wetlands ecosystem integrity.

Wetlands managers typically begin draining managed wetlands (a primary source of saline discharge) in mid-to-late March, the same time that farmers need relatively high quality water for irrigation of salt-sensitive crops. However, modifying water release to a later drawdown date (mid-to-late April) during the San Joaquin River's assimilative capacity could be detrimental to wetlands ecosystem health. Timing and duration of drawdown is planned for optimum germination and seed production of swamp timothy (*Crypsis schoenoides*), a plant that is widely managed for, and preferentially selected by, some waterfowl and shorebirds.

Swamp timothy seed production is being estimated through soil core sampling. Six paired wetlands sites are being studied to compare the potential changes in wetlands vegetation associated with a late drawdown date. Sampling started in fall 2006 and will be continue to be taken through spring 2009. Meetings were conducted with staff from the Grassland Water District and DFG. Scientific sampling began in fall 2007.

San Joaquin River Water Quality Improvement Program

DWR's Agricultural Drainage Program, in collaboration with other agencies, continues

its significant efforts to improve water quality in the San Joaquin River to benefit the State and DWR water contractors. These efforts are intended to control salinity and selenium discharges upstream of Vernalis. They include promoting on-farm and regional water management to reduce subsurface drainage, real-time water quality management to maximize the assimilative capacity of the San Joaquin River, and timing wetlands discharges for when there is assimilative capacity in the San Joaquin River.

On-Farm and Regional Drainage Management Activities. Drainage management involving source control and drainage reuse has proven effective in reducing salt loads in the San Joaquin River. This is demonstrated by the efforts of the Grassland Area Farmers on the Grassland Bypass Project (GBP). Since GBP implementation, drainage discharges have decreased from 58,000 af to about 30,000 af, and salt loads have been reduced from 210,000 tons to 117,000 tons. The reductions are possible because DWR funded, through Proposition 13, an important GBP component, the San Joaquin River Improvement Project. The project consists of about 4,000 acres of lands dedicated for reuse of subsurface drainage water generated by Grassland Area Farmers to grow salt-tolerant crops. DWR continues providing technical assistance for improving and developing this important part of the GBP project.

DWR collaborates with many entities in efforts to control, reduce, or eliminate drainage water discharges into the San Joaquin River. Such efforts include the West Side Regional Drainage Plan, Reclamation's San Luis Drainage Feature Reevaluation to provide drainage service to the San Luis Unit of the Central Valley Project (CVP), and the IFDM program maintained by DWR and collaborating agencies.

Real-Time Water Quality Monitoring Program. The Real-time Water Quality Monitoring Program (RTWQMP) collects flow, EC, and temperature data from several satellite-linked and web-accessible stations on the mainstem of the San Joaquin River and its tributaries to forecast flow and water quality conditions. The information provided can be used by San Joaquin River water managers and stakeholders for improving management and coordination of eastside reservoir releases and agricultural and wetland drainage flows, to achieve water quality objectives at San Joaquin River compliance points. In the early stages, the RTWQMP was funded by Reclamation and then by CALFED. Currently, DWR has assumed responsibility for funding most of the RTWQMP for the San Joaquin River.

Forecasting flow and salinity conditions on the San Joaquin River, allows decision makers to take advantage of assimilative capacity of the river when available. Data collected from the network of monitoring stations is used with the San Joaquin River Input-Output Day (SJRIODAY) model to generate biweekly forecasts of salinity and flow conditions on the river near Vernalis and other upstream stations. DWR publishes the information weekly on its website. Figure 5-1 shows an example of the information generated.

In October 2007, DWR met with Reclamation, RWQCB, and other interested parties to establish the Real-time Management Partners. This multiagency group works cooperatively to make real-time management a viable tool to manage discharges of salinity sources to benefit the water quality of the lower San Joaquin River and the Delta.

Concepts for Collaboration Drainage Resolution Issues. Given the uncertainty and timing of implementation of drainage service to the CVP San Luis Unit service

Vernalis Total Dissolved Solids (TDS) Assimilative Capacity—Week 3/12/07

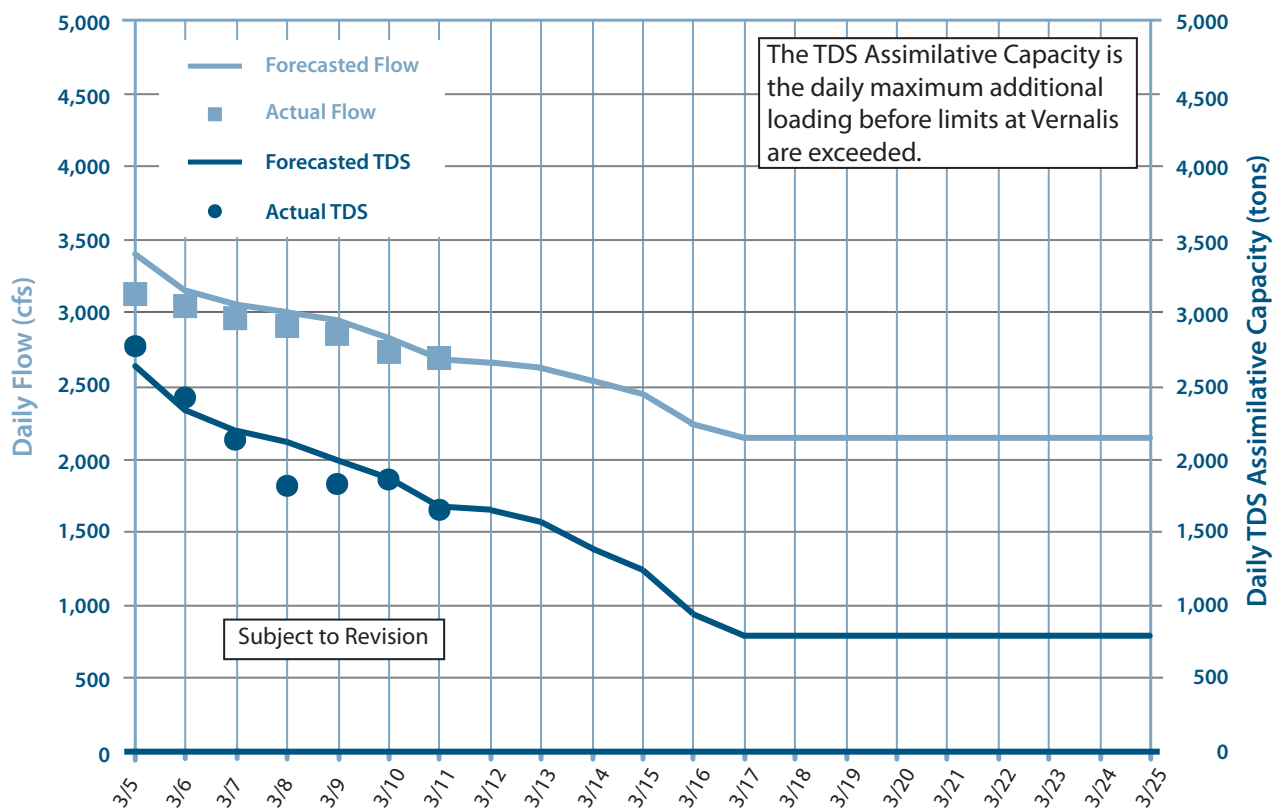


Figure 5-1 San Joaquin River Input-Output Day Modeling Forecast Example

area, Reclamation, and the federal water contractors began a Collaborative Resolution effort along with State and environmental interests to explore creative alternatives for resolving drainage issues. The concepts discussed included an alternative which would relieve Reclamation of their obligation to provide drainage to the San Luis Unit by having water service contractors assume responsibility for providing a drainage program in their respective service areas. The concepts discussed included: means of providing drainage; relieving of capital obligations; transferring water facilities or water rights to local entities; restrictions on water right Permit No. 12860; CVPIA restoration fund payments; points of

delivery; environmental benefits; and effects on Reclamation’s legal obligations including environmental compliance. DWR participated in the discussions as an interested observer, and identified a number of issues with this proposal that could affect the SWP.

International Water Technology Transfer Conference in Riverside, California. The Agricultural Drainage Program staff prepared a poster for the conference. The poster included an illustration of research, development, and demonstration projects providing useful technologies in managing agricultural drainage water and drainage-related effects.

Featured projects include the following:

- design of the Integrated on-Farm Drainage Management (IFDM) system and solar evaporator;
- methods to remove selenium and other constituents found in drainage water;
- selection of salt-tolerant forages for quality and productivity;
- methods for salt separation, purification, and utilization;
- characterization and utilization of saline biomass;
- planting trials of *Prosopis alba*;
- application of HydroGeoSphere, a three-dimensional numerical model; and
- demonstration of brine boiler and solar thermal concentration system.

Salinity Objectives in the South Delta. Staff from the Agricultural Drainage Program continued to participate with a DWR team in relation to the SWRCB public process to review salinity objectives in the South Delta. Activities included discussions and revisions of strategies and preparations for multiple SWRCB meetings on the subject; documents submitted to SWRCB regarding southern delta salinity objectives; funding sources establishing objectives and methods of implementing them, a draft plan by the San Joaquin River Group Authority (SJRGA) on process with SWRCB, coordination with other organizations SWC, Reclamation, CVP contractors, SJRGA; and development of specific comments and presentations for DWR to make to SWRCB. Agricultural Drainage Program staff has been working with the Grassland Area Farmers to help them reduce subsurface agricultural drainage water discharges into the San Joaquin River.

An Economic Analysis of Solar Evaporators and Evaporation Ponds. The University of California performed an economic analysis of solar evaporators and evaporation ponds. From a construction perspective, the solar evaporators are slightly more expensive due

to the costs associated with the catchment basin. From an engineering perspective, the costs associated with reporting waste under the evaporation pond option result in substantially larger cost differences. From an annual O&M perspective, operating evaporation ponds is somewhat more expensive than solar evaporators.

Also, as the amount of drainage requiring disposal increases, the average cost for disposal decreases. This result is consistent across all farm sizes, interest rates, and hazing requirements analyzed, and suggests that the capital costs are indeed a large part of the costs of operating these drainage options. As the amount of drainage water requiring disposal continues to increase, the cost curves will level out. A flexible model was generated for evaluating the costs of implementing a solar evaporator versus an evaporation pond.

Among other factors, the model allows the user to vary the size of the farm, the drainage distribution, environmental issues, and the types of costs to consider. A general observation, based on the costs analyzed in this report, is that solar evaporators are a more cost-effective alternative than evaporation ponds.

The next phase in the analysis would be to develop a more general average cost function by acre of disposal and drainage water disposed to serve as inputs into a larger regional agricultural programming model. While the cost comparison between these two alternatives is unlikely to change (i.e., solar evaporators will be less expensive than evaporation ponds), a more accurate assessment of the costs of disposing of drainage water could be determined.

Use of Solar Evaporators for Drainage Management—Senate Bill (SB) 1347.

SB 1347 was passed by the Legislature and signed by the Governor in September 2006. The bill amended and added sections

of Health and Safety Code, Article 9.7 Integrated On-Farm Drainage Management (IFDM). This bill added or revised definitions, regulations, and procedures pertaining to the operation of solar evaporators. The solar evaporator is the final component of the IFDM system to evaporate all drainage water and isolate the salt. The IFDM system was developed to improve drainage conditions and reduce salt accumulation in soils. Implementation of IFDM technology has demonstrated the cultivation of higher value crops and increased yields through soil improvement of salt-laden lands. The IFDM system is a viable alternative for landowners who may not choose to participate in a voluntary land retirement program for drainage-impacted lands. Additionally, the IFDM system has been implemented to eliminate discharge of agricultural drainage water to evaporation ponds.

This legislation is of interest to DWR because of its involvement with agricultural drainage issues, specifically Integrated Drainage Management (IDM) program activities. In cooperation with RRR and the Westside Resource Conservation District (WRCD), DWR developed a solar evaporator pilot demonstration project or module at RRR. Over a 3-year period, multiple methods of operation were tested at various stages to optimize the operation of the pilot solar evaporator. Data collected during the pilot demonstration phase were used to develop plans and specifications for a full capacity farm-scale solar evaporator. The research, development, and demonstration of IFDM has advanced the science, technology, and benefits to water managers, individual growers, and political leaders throughout the San Joaquin Valley by providing a practical example of integrated farming and engineering methods to protect the quality of rivers, surface and groundwater resources, soils, and the environment.

SB 1347 received the support of the WRCD, Community Alliance with Family

Farmers, and Association of California Water Agencies (ACWA). The bill text and chaptered version can be viewed at http://www.leginfo.ca.gov/cgi-bin/postquery?bill_number=sb_1347&sesss=0506&house=B&author=machado.

Lysimeter Studies. Drainage funding supported in-part the on-going lysimeter studies of shallow-rooted truck crops at the West Side Research and Extension Center (WSREC), Five Points. The study uses two recently installed lysimeters: one monitors the evapotranspiration of a large field of grass that serves as an irrigation scheduling reference crop; the other is in a field that is rotated into various common locally grown, shallow-rooted crops. The most recent crop studied was garlic.

Detailed evapotranspiration studies of shallow-rooted crops will allow for the determination of seasonal crop water use, water supply thresholds, and ultimately, the development of crop coefficients that will be transferable for use throughout West Side irrigated agriculture. Using these crop coefficients will allow growers to more efficiently apply irrigation water, reduce drainage, and enhance yields. Crops studied using the lysimeter in previous years included head lettuce, broccoli, and peppers. This funding is also allowing further study and refinement of a reference grass crop located in the San Joaquin Valley and its correlation to CIMIS-based grass reference estimates. The results should allow for better calibration of local CIMIS disseminated ET_0 used by local agriculture to schedule crop irrigation.

San Luis Unit Drainage Management Monitoring, Compliance, and Adaptive Management Plan—United States Fish and Wildlife Service Office—Sacramento. The U.S. Fish and Wildlife Service (USFWS) developed the draft Conceptual Monitoring, Compliance, and Adaptive Management Plan for the San Luis Unit Drainage Management

Plan (Conceptual Monitoring Plan) to start the process for addressing resource impacts and the need for a drainwater monitoring and compliance plan. The Sacramento Fish and Wildlife Office coordinated with stakeholders to develop the plan with review and input from State (including DWR) and federal agencies, Westlands Water District and others. Reclamation's 2006 final environmental impact statement (EIS) for the San Luis Drainage Feature Reevaluation (SLDFR) identified a drainage plan. In 2007, Westlands proposed an alternative drainage plan based on the selected alternative in the 2007 record of decision (ROD) for the SLDFR EIS. The Conceptual Monitoring Plan compares and contrasts the SLDFR ROD and Westlands plan alternatives and recognizes issues that need to be resolved before a detailed monitoring and compliance plan can be completed. Acknowledging that a complete drainage plan project description with details on size, location, and management of facilities is not available, the Conceptual Monitoring Plan identifies assumptions, guiding principles, and objectives for developing a framework for a monitoring plan and describes project designs, regulations, guidelines, and triggers appropriate for the plan.

Critical Process Requirements for Membrane Desalination of Agricultural Drainage in the San Joaquin Valley. In November 2007, UCLA completed the report under Proposition 204 funding and with DWR staff collaboration. The study investigated the potential use of RO desalting for reducing brackish agricultural drainage discharge salinity and thus provide for the reclamation and reuse of this water. A systematic approach was developed to determine product water recovery limits with respect to the source water chemistry. This approach used thermodynamic solubility analysis and diagnostic RO scaling experiments.

Analysis of available San Joaquin Valley water quality monitoring data revealed

substantial seasonal and spatial water quality variations. Water sources in a number of locations were nearly saturated with gypsum. Theoretical analysis of RO recovery limits due to mineral scaling of certain salts (e.g., calcite, gypsum, and silica) suggested that RO recovery would be limited to between 54 percent to 68 percent. The analysis also revealed that if limitations due to mineral scaling could be alleviated, recovery limits resulting from osmotic pressure would be relatively high.

The analysis was supplemented by experiments using field water samples from five different San Joaquin Valley locations. The selected locations were representative of the range of water compositions throughout the San Joaquin Valley. Membrane RO desalination test results were in reasonable agreement with recovery limits estimated through thermodynamic solubility analysis. RO desalination is a feasible technology for desalting San Joaquin Valley drainage water.

Given the spatial and temporal water quality in the San Joaquin Valley, a distributed system of desalination facilities would be the most appropriate approach for field-scale deployment of RO desalination. Such systems would require effective monitoring and mitigation technologies. Pilot field studies would be necessary in order to evaluate the ability of RO to operate at reasonable recoveries and handle variable water quality.

Zero Liquid Discharge for Inland Desalination.

The project objective was to investigate technologies with the potential to reduce the cost and energy consumption for inland desalination with zero liquid discharge (ZLD). The core challenge is developing more economical methods for managing desalination concentrate without discharge from the site. The established technologies are thermal desalination and evaporation ponds. The capital cost for each is high and thermal desalination is very energy intensive.

Given the disadvantages of established ZLD technologies, it was important to investigate membrane desalination for concentrate treatment. However, unlike thermal desalination, membrane desalination cannot be used to recover concentrate without first treating the concentrate to reduce its precipitation potential. Furthermore, not all of the concentrate can be recovered by membrane desalination, and the residual must still be treated with downstream processes such as thermal desalination and evaporation in ponds. Consequently, the ZLD process train proposed in this research comprised the following: primary RO concentrate treatment process or processes, secondary RO, brine concentrator (thermal desalination), and an evaporation pond.

This report establishes parameters for ZLD treatment performance and cost based on water quality characteristics. A simple procedure for calculating feasibility level costs for ZLD concentrate treatment is presented. Utility managers can use this information as a basis for deciding whether to proceed with a desalination feasibility study. The report was prepared by Black & Veatch Corporation, and jointly funded by the Water Research Foundation and the California Energy Commission, under Agreement 3010. Agricultural Drainage Program staff participated in the technical review of the report as a member of the Project Advisory Committee for this project.

Environmental Impact Document Review

The Environmental Document Review Section in DWR's Division of Environmental Services screens State Clearinghouse documents and circulates SWP-related materials for review by DWR's four regional offices in the Division of Integrated Regional Water Management (DIRWM), Division of Operations and Maintenance (O&M), and the Division of Engineering. Other divisions and

offices are notified of activities and are asked to comment when their expertise is required.

Some environmental impact documents handled by the State Clearinghouse concern proposed activities that would affect the SWP. State Clearinghouse documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

From January through December of 2007, 4,117 documents were screened by the Environmental Document Review Section; 1,073 were referred for detailed review. Of these referrals, 750 assignments were made when the projects were at the Notice of Preparation or Early Consultation stage and 119 assignments were for negative declarations, CEQA environmental impact reports, and NEPA environmental impact statements. O&M received 142 formal referrals and one for information. The State Water Project Analysis Office (SWPAO) received 15 formal referrals and 6 for information. In addition to the information referrals made to O&M and SWPAO, 767 other information referrals were made to other DWR staff.

DWR comments submitted to the CEQA or NEPA lead agencies addressed a number of issues, including runoff from proposed developments; safety and water supply; encroachment on physical facilities; impacts to cross drainage facilities; and proposed plans to acquire, convey, sell, and transfer SWP water. During 2007, several requests for additional data were made to lead agencies when the environmental document did not contain enough information. Additional departmental actions, involving encroachment permit submittals and informal comments, took place but were not tracked by the Environmental Document Review Section. During 2007, 14 projects involving tribal gaming issues were assigned to the DIRWM for review. These projects are of special concern to the State and require a

specific review process. While none of these projects affected the SWP in 2007, they have a potential for causing future concerns.

During 2007, the Environmental Document Review Section tracked documents related to development along the California Aqueduct, levee encroachment, water transfers and other water supply issues, wastewater treatment, quarry development, electrical transmission lines near SWP facilities, and development of a high speed rail network.

In 2007, referrals were down by 17 percent from 2006. Part of this reduction may be due to a 9 percent decrease in documents received from the State Clearinghouse. Part of this reduction may also be attributable to an increase in administrative-type projects such as master plans, implementation plans, and transportation plans, a 60 percent increase over 2006—from 79 to 127 combined, and others, as many of these documents would be of little or no interest to DWR.

Water Conservation Bond Laws

To assist local agencies in obtaining financing for their water management programs, California voters approved eight bond laws between 1984 and 2006 authorizing DWR to provide low-interest loans and grants to fund project feasibility studies or construction activities.

- The Clean Water Bond Law of 1984 (Proposition 25) authorized \$10.5 million for water conservation projects.
- The Water Conservation and Water Quality Bond Law of 1986 (Proposition 44) authorized \$75 million for water conservation and groundwater recharge projects.
- The Water Conservation Bond Law of 1988 (Proposition 82) authorized \$60 million for water conservation,

groundwater recharge, and new local water supply improvements.

- The Safe, Clean, Reliable Water Supply Act of 1996 (Proposition 204) authorized \$55 million for water conservation, groundwater recharge, and local water supply projects.
- The Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Bond Act of 2000 (Proposition 13) authorized \$535 million for agricultural and urban water conservation, groundwater recharge, infrastructure rehabilitation, groundwater storage, and interim reliable water supply projects and studies.
- The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50, Chapter 8) authorized \$500 million for the Integrated Regional Water Management (IRWM) grant program to be implemented jointly by DWR and SWRCB.
- The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84), approved by the voters in the November 7, 2006, General Election, authorized \$1 billion for IRWM Planning and Implementation.
- Disaster Preparedness and Flood Prevention Bond Act (Proposition 1E), passed by voters November 2006, provides \$300 million for IRWM Stormwater Flood Management.

Under these programs, grants and construction loans are available with repayment of up to 20 years at reduced interest rates for most programs.

Propositions 25, 44, and 204

Funding is fully obligated.

Proposition 82

Water supply loan funding is still available.

Proposition 13

Agricultural water conservation loan funding is still available.

All loan and grant funds for the Groundwater Recharge, Infrastructure Rehabilitation, Urban Water Conservation, Groundwater Storage, and Interim Reliable Water Supply programs have been obligated.

Proposition 50

In 2007, DWR and SWRCB awarded approximately \$307 million dollars to 16 agencies in the first round of IRWM implementation grants. Of the \$307 million, DWR awarded \$157 million. DWR and SWRCB developed guidelines and a PSP for the second round of funding for implementation grants. Draft guidelines and a PSP for Round 2 were released in April 2007, and the final versions were released in June 2007.

Propositions 84 and 1E

Staff continued developing the IRWM grant program, funded by Proposition 84 and Proposition 1E, which included performing public scoping meetings. In addition to other approval criteria for most of the Water Conservation Bond Law programs, applicants must demonstrate that project benefits equal or exceed project costs. Typical projects fall under the following categories.

Local Water Supply

Projects in this category are constructed to increase water supplies, and include new conveyance and/or storage facilities; groundwater extraction facilities, well-field development; and desalination facilities (ocean or brackish groundwater recovery).

Integrated Regional Water Management

Projects in this category protect communities from drought, protect and improve water

quality, and improve water security by reducing dependence on imported water.

Water Conservation Bond Laws— Projects and Funding

Table 5-1 totals the number of projects and funds committed for each of the water bond laws through December 2007.

Table 5-1 Cumulative Water Conservation Bond Laws—Projects and Funding through 2007

Bond Law	Bond Law Subaccount (Type of Project)	Number of Projects^a	Funding^a (millions of dollars)
Clean Water Bond Law of 1984 (Prop 25)	Water Conservation	7	9.74
Water Conservation and Water Quality Bond Law of 1986 (Prop 44)	Water Conservation	24	41.60
	Groundwater Recharge	10	28.04
	<i>Subtotal</i>	34	69.64
Water Conservation Bond Law of 1988 (Prop 82)	Water Conservation	7	17.44
	Groundwater Recharge	8	24.30
	Local Water Supply	5	11.90
	<i>Subtotal</i>	20	53.64
Safe, Clean, Reliable Water Supply Act of 1996 (Prop 204)	Water Conservation	2	7.00
	Groundwater Recharge	5	22.10
	Local Water Supply	23	23.48
	<i>Subtotal</i>	30	52.58
Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Bond Act of 2000 (Prop 13)	Agricultural Water Conservation	13	1.18
	Urban Water Conservation	54	28.00
	Groundwater Recharge	24	28.30
	Infrastructure Rehabilitation	42	56.40
	Groundwater Storage	41	180.00
	Interim Reliable Water Supply	13	169.31
<i>Subtotal</i>	187	463.19	
Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Prop 50)	Local Groundwater Assistance	84	18.40
	Integrated Regional Water Management	45	176.49
	<i>Subtotal</i>	129	194.89
Total of All Projects		407	843.68

^a Construction and feasibility study loan and grant commitments as of December 31, 2007.



Chapter 6

Legislation and Litigation

Flags flying at the California State Capitol.

Significant Events in 2007

Significant legislation coordinating the collection, management, and use of water measurement data passed in 2007. While these bills do not directly impact the State Water Project (SWP) or project operations, they may impact SWP contractors or their customers.

Information for this chapter was provided by the Assistant Director, Legislative Affairs Office, and the Office of the Chief Counsel.

The Department of Water Resources (DWR) monitors State and federal legislation that affects management of the State Water Project (SWP). Legislative bill tracking involves reviewing legislation at its introduction, evaluating amendments in State Assembly and Senate committee hearings, and monitoring its enactment into law. The DWR Assistant Director for Legislation monitors proposed legislation. The Office of the Chief Counsel tracks State and federal litigation that impacts management of the SWP. The DWR Chief Counsel also manages legal cases that involve SWP operations.

Legislation

State Legislation

No legislation directly impacting the SWP or SWP operations passed in 2007. However, the following 2007 bills could affect SWP contractors or their customers.

AB 1404 (Laird) Water Measurement Information (Chapter 675, Statutes of 2007)

This bill requires DWR, the State Water Resources Control Board (SWRCB), the CALFED Bay-Delta Program (CALFED), and the State Department of Public Health to coordinate the collection, management, and use of water measurement information. It also requires these agencies to prepare and submit a report to the Legislature evaluating the feasibility of developing a coordinated water measurement database. The bill requires agricultural water suppliers to report water delivery data, and it conditions eligibility for specific grants or loans on compliance with these reporting requirements.

AB 1406 (Huffman) Recycled Water: Toilet and Urinal Flushing: Condominiums (Chapter 537, Statutes of 2007)

This bill permits the use of recycled water in condominium projects that are created on or after January 1, 2008, as currently used in apartment buildings.

AB 1420 (Laird) Water Demand Management Measures: Water Management Grant or Loan Funds (Chapter 628, Statutes of 2007)

This bill requires urban water suppliers to implement demand management measures (DMMs) described in the urban water management plan in order to be eligible for specified water management grants and loans. This bill requires DWR to convene an independent panel to provide recommendations to the Legislature on new DMMs (conservation measures), technologies, and approaches.

Federal Legislation

There was no significant federal legislation affecting management of the SWP in 2007.

Litigation

As of December 31, 2007, DWR was involved in, or closely monitored, a number of court cases and other actions related to the management of the SWP.

Sacramento-San Joaquin Delta Delta Smelt

Previously, a coalition of environmental groups challenged the biological opinion issued by the U.S. Fish and Wildlife Service (USFWS) which found that SWP and Central Valley Project (CVP) operations did not jeopardize the continued existence

of the delta smelt. (*Natural Resources Defense Council, et al. v. Gale A. Norton, et al.* (U.S. District Court for the Eastern District of California, 2005, Case No. 05 CV 01207 OWW (LJO)).) In the new action of *Natural Resources Defense Council, et al. v. Kempthorne, et al.*, the plaintiffs claim the USFWS opinion fails to adequately consider or address the effects on delta smelt provided in soon-to-be-renewed long-term water service contracts. The plaintiffs also claim the opinion improperly relies on uncertain future mitigation measures and the adaptive management process without adequate evidence that the measures will be undertaken and be effective. The case seeks to have the U.S. Department of the Interior and USFWS withdraw the opinion and not take any action in reliance upon it.

DWR intervened to protect its interests in the biological opinion relevant to the operations of the SWP, filing an answer to an amended complaint on October 24, 2006. Deadlines were set for filing motions for summary judgment for the end of December 2007, with hearings scheduled for March 2008.

Another similar case was filed October 4, 2006, *Watershed Enforcers, a project of California Sportfishing Protection Alliance, a non-profit corporation v. California Department of Water Resources, Lester Snow, Ralph Torres, David Starks, David Duval and L.D. Elmore* (Alameda County Superior Court, Case No. RG06292124). Watershed Enforcers asserts that DWR lacks authority for the losses, also known as “take,” of the endangered delta smelt and winter- and spring-run salmon. DWR believes that a number of agreements/plans starting as early as 1986 with the Department of Fish and Game (DFG) provide for SWP compliance with the California Endangered Species Act (CESA) and the federal Endangered Species Act (ESA) allowing “incidental take” of these fish. For the past 12 years, DWR has been operating the SWP while actively addressing and mitigating environmental impacts,

including incidental take. Plaintiffs claim that DWR is not operating consistent with CESA because it has not obtained a permit, a consistency determination, or completed a conservation plan. On March 22, 2007, the court gave DWR 60 days to obtain take authorization from DFG. DWR appealed. The parties also negotiated a joint motion for stay of the appeal through December 2008 to coordinate the federal biological opinion reconsultation and issuance of a new biological opinion by the end of 2008. DWR will then seek a consistency determination from DFG, in effect mooting the appeal.

In another case (*Pacific Coast Federation of Fishermen's Associations/Institute for Fisheries Resources, The Bay Institute, BayKeeper, and Its Deltakeeper Chapter, California Trout, Friends of the River, Natural Resources Defense Council, Northern California Council of the Federation of Fly Fishers, and Sacramento River Preservation Trust, all non-profit organizations and the Winnemem Wintu Tribe v. Carlos M. Gutierrez, in his official capacity as Secretary of Commerce, William T. Hogarth, in his official capacity as Assistant Administrator for Fisheries, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Dirk Kempthorne, in his official capacity as Secretary of the Interior, and William E. Rinne, in his official capacity as Acting Commissioner, United States Bureau of Reclamation and (Intervenors/Defendants) San Luis & Delta Mendota Water Authority, Westlands Water District, California Farm Bureau Federation, Glenn-Colusa Irrigation District, et al. and State Water Contractors, et al*), the plaintiffs, nine environmental groups, served a 60-day notice to the federal defendants, NOAA, of alleged violations of ESA on May 31, 2006.

DWR was not named as a defendant in this case and has not intervened as party defendants in this matter, although it intends to do so in the remedy stages of the case, providing similar input and contribution to the delta smelt case. The defendants in this

case attempted to consolidate the smelt and salmon/steelhead cases but the motion was denied. The smelt litigation went forward and an interim remedy order was issued on December 14, 2007. A similar litigation path is anticipated in this case.

Plaintiffs' amended complaint alleges that the survival and population stability of five salmon and steelhead species are threatened by the current and planned joint operations of the CVP and SWP. Plaintiffs allege the operations of the water projects continue to block fish passage to hundreds of miles of upstream spawning and rearing habitat; further reduce and degrade the remaining habitat due to water diversions; create high temperatures and changes in dissolved oxygen ratios and silt load; and draw large numbers of fish into the Central and South Delta as a result of operations of the Delta Cross Channel and the CVP and SWP pumps. Plaintiffs claim a percentage of salmon and steelhead are killed through direct entrainment from project water diversions and from other unscreened diversions resulting in a lower survival rate. Plaintiffs request the court declare the 2004 CVP/SWP Operations Opinion unlawful and issue an injunction from implementation of project operations as described in the 2004 opinion.

A motion for summary judgment was heard before federal Judge Wanger on October 3, 2007. The judge has taken this matter under submission since conclusion of the hearing and advised the parties that he will issue an order after finalizing the order in the related smelt case.

State Water Resources Control Board Hearing

In February 2005, DWR and the Bureau of Reclamation (Reclamation) petitioned the State Water Resources Control Board (SWRCB). This petition requested a temporary change and delay of the effective date to implement the southern Delta

agricultural water quality objective contained in SWRCB's Water Right Decision 1641 (D-1641). This objective was scheduled to begin on April 1, 2005. A second petition was submitted to request a change of the implementation date to April 1, 2008. (This date matches the date the southern Delta permanent gates are scheduled for operation.) SWRCB denied the first petition. No action was taken on the second petition.

On May 3, 2005, SWRCB notified DWR and Reclamation of its intention to issue a cease and desist order. This requested order sought to stop a potential violation of the southern Delta agricultural water quality objective of 0.7 millimhos per centimeter (mmhos/cm) electrical conductivity (EC) by DWR and Reclamation. This water quality objective was scheduled to be in effect annually, from April 1 through August 31, beginning in 2005. D-1641 conditioned the operation of the SWP and CVP with implementation of this agricultural objective. DWR and Reclamation requested a hearing on the cease and desist order. In October and November 2005, DWR and Reclamation presented evidence and argued that the cease and desist order should not be issued.

On February 15, 2006, SWRCB issued a cease and desist order requiring DWR and Reclamation to take corrective actions to obviate the threat of noncompliance with conditions in D-1641 that implement the 0.7 mmhos/cm EC water quality requirement by constructing the permanent gates or equivalent measures by July 1, 2009. The order also requires DWR and Reclamation to report to SWRCB if they exceed or threaten to exceed the water quality requirements and to report the reasons for the exceedance. SWRCB will then determine if enforcement actions are necessary. The cease and desist order also allows Joint Point of Diversion operation if DWR and Reclamation comply with the conditions of their water rights and SWRCB's order.

SWRCB was asked to reconsider its cease and desist order. However, the board did not take any action on this request, and the cease and desist order became a final order on May 16, 2006. On June 15, 2006, Reclamation and the State and federal water contractors filed a complaint in federal district court against SWRCB challenging the cease and desist order. DWR and SWRCB agreed to toll the date for DWR to file to allow time for the parties to negotiate a settlement of the issues. Reclamation and the water contractors have also entered into tolling agreements pending negotiations. Negotiations between the parties resulted in a letter from the SWRCB Executive Director that clarified the cease and desist order and extended DWR's time to file an action against the order to May 1, 2007.

In January 2007, SWRCB began workshops to review the southern Delta agricultural water quality objectives that are the subject of the cease and desist order and the litigation. This review is consistent with the Executive Director's letter to DWR regarding these objectives. The review is expected to require about 2 years to complete, after which SWRCB may consider modification of the objective in its Water Quality Control Plan and in DWR and Reclamation's water rights.

CALFED Litigation

The CALFED record of decision (ROD) issued on August 28, 2000, was challenged by environmental groups and agricultural interests in both State and federal courts. The ROD established a number of program measures to help resolve conflicts over the use of water in the Delta. Initially, three complaints were filed in State courts: *Laub v. Davis, et al.* (California Farm Bureau Federation (Farm Bureau) and three individuals); *Regional Council of Rural Counties v. State, et al.* (Regional Council of Rural Counties (RCRC) and South and Central Delta); and *Municipal Water District of Orange County v. Resources Agency*. In 2004, the parties to the third suit settled,

based on an agreement that emphasizes the importance of the CALFED Science Program and provides notice to the Water District of Orange County about CALFED stakeholder participation opportunities. The other two cases were coordinated in the Sacramento County Superior Court.

The remaining parties claimed the CALFED programmatic environmental impact statement/environmental impact report (EIS/EIR) violated CEQA, the National Environmental Policy Act (NEPA), and the federal Administrative Procedure Act. The Superior Court found in favor of the plaintiffs. The State agencies appealed, and oral argument was held on August 30, 2005. The two cases were consolidated on appeal, and the Appellate Court reversed the lower court (*In Re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings*, Court of Appeals, Third District, Consolidated Case Nos. C044267 and C044577).

The California Supreme Court agreed to hear the case. DWR argued that CEQA does not require a lead agency to analyze a suggested alternative to its proposed project if the proposal would fail to achieve the project's fundamental purpose. EIRs for general projects, like the broad CALFED 30-year plan, are a general analysis, whereas EIRs for detailed projects like subdivisions require a more in-depth analysis.

All briefing has been completed. The parties are waiting for the Supreme Court to set oral argument.

The issue of whether the federal agencies violated NEPA is pending in federal district court.

Hydropower

Hyatt-Thermalito

On April 29, 2005, 14 of the 29 State Water Contractors brought suit against DWR. These contractors claimed the method used by

DWR to allocate costs and revenue of its Hyatt and Thermalito Power Plants (Hyatt-Thermalito) at Lake Oroville violated the terms of long-term water supply contracts. (*Alameda County Flood Control & Water Conservation District, Zone 7 et al. v. State of California Department of Water Resources* (Sacramento County Superior Court, Case No. 05ASO1775).) In December 2005, entities representing 13 other contractors intervened in the lawsuit in opposition to the claims of the plaintiffs and in support of DWR's method of allocating costs and revenue. If the water contractors who filed the lawsuit are ultimately successful, this could result in contractors requiring the most pumping for delivery of their State Water Project water to pay more to DWR, while those contractors requiring less pumping would pay less.

The plaintiffs' motion to file an amended complaint adding causes of action for: (1) making the plaintiffs whole; (2) alleging defendants could not profit at the plaintiffs' expense; (3) breaching the agreement of good faith and fair dealing implicit with every contract; and (4) contending defendants received money which should have been paid to the plaintiffs, was granted on September 14, 2006. The plaintiffs have also expanded the list of desired remedies to include a court ordered trust, injunction, equitable lien, and attorney fees. In addition, the amended complaint joined two other State water contractors.

After a hearing on October 13, 2006, the court granted DWR's motion to bifurcate the case into two separate phases, i.e., liability and damages. The court has agreed to entertain motions for protective orders seeking to stay discovery on damages until conclusion of the liability phase. Pretrial discovery on the issues of contract interpretation and liability commenced in April 2007. Depositions of DWR employees were taken. On September 21, 2007, at a Case Management Conference, the first phase of the trial on contract interpretation was scheduled for May 12, 2008.

Other Cases

Several cases pending resolution may affect SWP operations and costs. The first case involves a Federal Energy Regulatory Commission (FERC) ruling that the cost of certain Pacific Gas & Electric Company (PG&E) transmission facilities should be integrated into gridwide charges to California Independent System Operator (CAISO) customers, including DWR. DWR has appealed these charges on the basis that the facilities primarily benefit PG&E—not the grid as a whole—and the cost allocation mechanism should reflect this fact (*California Department of Water Resources v. Federal Energy Regulatory Commission* (U.S. Court of Appeals for the Ninth Circuit, No. 04-76131)). The Court of Appeals ruled against DWR, finding that if a facility serves any network function, its cost may be charged gridwide.

The *California Department of Water Resources v. Federal Energy Regulatory Commission* (U.S. Court of Appeals for the Ninth Circuit (No. 04-73577)) case involved a challenge to the manner in which the costs for the transfer of transmission facilities are allocated. FERC approved the transfer of the transmission facilities of Anaheim and Riverside to CAISO. As part of this transfer, costs for the facilities are spread to the users of the grid, including DWR. DWR is contesting the cost allocation mechanism in a current FERC proceeding. This appeal preserved the ability of DWR to contest costs in the administrative cost allocation proceeding. As a result of the decision in the PG&E transmission case (No. 04-76131), DWR dismissed this appeal.

The *California Department of Water Resources v. Federal Energy Regulatory Commission* (U.S. Court of Appeals for the Ninth Circuit (No. 05-74488)) case involved a challenge to the FERC decision concerning transmission access charge methodology. This charge is imposed on users of the CAISO grid to recover the embedded costs of

the grid. DWR has appealed these charges, primarily on the basis that FERC failed to use a time-of-use methodology. Briefs have been filed; however, oral argument has not been scheduled yet.

Colorado River

Two lawsuits related to the Colorado River have potential implications for California water supply.

The first lawsuit is *Imperial Irrigation District v. All Interested Persons* and eight related cases (Judicial Council Coordination Proceeding No. 4353, Sacramento County Superior Court). This lawsuit is a series of nine claims, which have been coordinated into a single proceeding, before the Sacramento County Superior Court. These lawsuits challenge the Quantification Settlement Agreement (QSA) and associated actions taken to implement the QSA. The QSA is a collection of 38 agreements that resolve disputes among water users in Southern California regarding their rights to California's shrinking share of Colorado River water. The QSA facilitates California's plan to reduce its use by settling disputes regarding priority and use. For example: (1) transfer of conserved agricultural water from the Imperial Irrigation District to San Diego County Water Agency for urban uses; (2) establishing water budgets for the parties; and (3) providing for the mitigation of environmental impacts and the restoration of the Salton Sea. Proceedings in the Superior Court have been stayed, pending oral argument before the Third District Court of Appeal, on Imperial County's petition for writ of mandate.

On June 14, 2007, the Court of Appeal affirmed the lower court's dismissal of the litigation. A petition for rehearing filed by Imperial County was denied. In October, in accordance with the direction from the trial court, SWRCB sought dismissal of the air districts' writ of mandate under the same

indispensable party theory that dismissed Imperial County's action. Imperial Valley landowners filed a motion for preliminary injunction, seeking to enjoin the Imperial Irrigation District water transfer. The hearing is set for January 31, 2008.

Consejo de Desarrollo Economico de Mexicali, A.C. et al. v. Norton, et al. (U.S. District Court, District of Nevada, Las Vegas (No. CV-S-05-0870-KJD-PAL)) is a challenge to Reclamation lining the All American Canal. The All American Canal lining is a water conservation project that is an integral part of the QSA. The State, through DWR, is contributing \$220 million to the canal lining project. Mexican business leaders and California environmental groups filed a lawsuit that challenges the actions of the Secretary of the Interior and the Commissioner of the Bureau of Reclamation to authorize the All American Canal improvement project. This complaint seeks declaratory and injunctive relief. Claiming the conservation project will mean the loss of 100,000 af of recharge water per year, the plaintiffs assert a deprivation of water rights, including claims based on constitutional violations, Mexican federal law, and others. The plaintiffs also challenge the action based on violations of NEPA, the Administrative Procedure Act, the ESA, the Migratory Bird Treaty Act, and environmental mitigation obligations under the authorizing legislation (San Luis Rey Act (P.L. 100-675)) for the conservation project.

On February 9, 2006, the court dismissed all but one of the plaintiffs' causes of action, leaving only the claim challenging federal NEPA compliance. On February 23, 2006, plaintiffs filed a First Amended Complaint. The court's ruling on the defendants' subsequent summary judgment motion held that NEPA does not require a supplemental EIS on the canal lining project because the impacts in Mexico are beyond agency control and the impacts in the United States are too speculative. The case was appealed

to the Ninth Circuit, which on August 25, 2006, issued an injunction halting the project pending a December 6, 2006, court hearing.

While the matter was under advisement before the Ninth Circuit, new federal legislation was passed requiring the canal lining to proceed without further delay. The federal defendants filed a motion to dissolve the injunction and dismiss the appeal as moot as to half of the remaining claims.

The Ninth Circuit heard oral argument on the motion on February 21, 2007, and on April 6, 2007, the court vacated the injunction and remanded the case back to the federal district court for dismissal. The court ruled: (1) that the 2006 Administrative Procedure Act rendered the federal NEPA, ESA, Migratory Bird Treaty Act, and Settlement Act claims moot; (2) that the district court lacked jurisdiction over the takings claim, which should have been asserted before the Court of Federal Claims; and (3) that the remaining claims were barred by sovereign immunity. The Ninth Circuit, further, denied all pending motions as moot.

Castaic Lake Water Agency

California Water Impact Network (CWIN) and the Friends of the Santa Clara River, both nonprofit environmental organizations, filed a Petition for Writ of Mandate against Castaic Lake Water Agency (Castaic Lake) in Ventura County. This Petition for Writ of Mandate challenged Castaic Lake's approval of a project to store up to 24,000 af of allocated 2002 Table A water, in the Semitropic Groundwater Storage Program, before the end of 2004. As reported in Bulletin 132-06, the CEQA process followed by DWR and Castaic Lake was upheld by the 2nd District Court of Appeal and the time for appeal to the California Supreme Court has run out. The plaintiffs alleged the approval of the project violated CEQA, the Urban Water Management Planning Act, and the Public

Trust Doctrine. The plaintiffs alleged that DWR should have been the lead agency in the preparation of an EIR. The Friends of the Santa Clara River had also filed a Reverse Validation Action in Sacramento County, which sought to set aside the agreement. Following the resolution of the CEQA case in Ventura County, plaintiffs filed a motion to dismiss the Sacramento case.

CWIN and the Planning and Conservation League (PCL) also challenged a new EIR certified by Castaic Lake for the permanent transfer of 41,000 af of SWP Table A water to Castaic Lake from Kern County Water Agency (Kern) member unit, Wheeler Ridge-Maricopa Water District. These lawsuits were filed on January 24 and January 26, 2005. The original EIR, which was certified by Castaic Lake for this transaction, was successfully challenged in *Friends of the Santa Clara River v. Castaic Lake* on the grounds that it tiered off the decertified Monterey Agreement EIR. In response to the Los Angeles Superior Court's Order on remand in that case, Castaic Lake decertified its original EIR on December 27, 2002, and issued a Notice of Preparation for a new EIR on January 22, 2003. The new EIR, which does not tier off any EIR for the Monterey Agreement, was certified on December 23, 2004. DWR entered into contract amendments with both Castaic Lake and Kern, which implemented this transfer in 1999. DWR has been basing its SWP allocations to Castaic Lake on the increased Table A amount.

DWR is primarily concerned with the CWIN and PCL arguments that: (1) DWR, and not Castaic Lake, should be the lead agency under CEQA for this transaction and (2) the EIR should tier off of the not-yet-complete Monterey Plus EIR. Other issues raised by CWIN and PCL are that the EIR is inadequate under CEQA for a number of reasons, including violation of the Urban Water Management Planning Act and the Public Trust Doctrine, and it represents a prejudicial abuse of discretion.

The two cases were consolidated and a hearing on the merits was held on March 19, 2007. On May 22, 2007, the judge ruled in favor of Castaic Lake and the respondents in all but one aspect. He found that Castaic Lake could be the lead agency and did not have to wait for DWR to complete the Monterey Plus EIR to proceed. However, the judgment found that the 2004 EIR had one defect. It failed to show the analytic route as to how and why various allocations of SWP water are relevant and would occur. He required Castaic Lake to set aside its approval of the EIR and to comply with CEQA either through a new EIR or other environmental documentation, including an addendum. Plaintiffs have filed an appeal from the trial court decision. Castaic Lake has filed a cross-appeal. The parties have agreed to suspend actions on attorney fees until after a Court of Appeal decision.

Environmental Review Acts

The National Environmental Policy Act (NEPA) (Title 42 United States Code Sections 4321–4347 [1970]) and the California Environmental Quality Act (CEQA) (California Public Resources Code Sections 21000–21177 [1970]) require government agencies to document and consider environmental consequences of their actions in their decision-making processes. 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 (EIS), including a discussion of mitigation measures and alternatives, for federal actions that could significantly affect environmental quality.

CEQA is patterned after NEPA. Under CEQA, agencies are required to (1) disclose, through an environmental impact report (EIR), the significant impacts a proposed project would have on the environment, and (2) identify ways to reduce or avoid environmental damage.

CEQA applies 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 of Water Resources conducts many projects in cooperation with federal agencies. In these 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 does impose substantive duties on all California government 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 they cannot. When a project is subject to both CEQA and NEPA, both laws encourage agencies to cooperate in planning the project and preparing joint environmental documents.

The environmental review process allows citizens to learn about a proposed project and its potential significant effects and to participate in the decision-making process by providing feedback on agency information. The review process requires agencies to:

- describe the proposed project and the purpose or need for it;
- identify the lead and cooperating agencies involved in the project;
- invite interested parties to participate in the process;
- determine the scope of study with input from responsible agencies and the public;
- 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;

Environmental Review Acts (*continued*)

- adopt a monitoring plan to ensure compliance with mitigation measures; and
- prepare a list of permits required to implement the project if it is approved.

The scoping phase, which occurs early in the review process, is particularly important because it enables government agencies to identify issues and topics to be considered or addressed in the EIS or EIR.

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, however, does encourage public involvement at this stage. Members of the public may raise issues and identify additional alternatives, environmental effects, methods of assessment, and mitigation measures during the scoping phase and continue to participate in the review process for the draft environmental document. Thus, the CEQA process may lead to changes in a project through the development, consideration, and adoption of alternatives or enforceable mitigation measures to avoid or reduce any potential significant adverse effects on the environment.

If the project is approved, the lead agency publishes a document discussing all the factors considered in reaching its decision to proceed with the proposed action. It also discusses whether all practical means to avoid or minimize environmental harm have been adopted, and if not, the reasons they were not.



Chapter 7

Water Supply Development and Reliability

The Delta Cross Channel near the town of Locke on the Sacramento River.

Significant Events in 2007

The Department of Water Resources (DWR), in cooperation with federal and State agencies, completed a pilot salmon outmigration study in the North Delta. DWR also conducted value engineering studies for the Franks Tract Project and the Through-Delta Facility Project.

The Governor issued a list of immediate and interim actions, including the Franks Tract Project, to be included as part of a comprehensive water package to improve Delta conditions.

The draft environmental impact report/environmental impact statement (EIR/EIS) for the Proposed Lower Yuba River Accord was released to the public on June 26, 2007, for a 60-day public review and comment period. The final EIR/EIS for the proposed accord was released to the public on October 23, 2007.

The draft supplemental EIS/EIR to the Environmental Water Account (EWA) final EIS/EIR became available on October 26, 2007.

DWR prepared an addendum on October 29, 2007, to the previously certified EWA EIS/EIR for the purpose of continuing actions described in the EIS/EIR for an additional year, to December 31, 2008.

Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Integrated Regional Water Management, the Division of Statewide Integrated Water Management, and the Bay-Delta Office.

The Department of Water Resources (DWR) is working to improve the reliability of State Water Project (SWP) supplies and the long-term water contract annual Table A water allocations delivered to SWP water contractors. Staff is engaged in planning activities to develop additional water supplies and storage capacity.

Developing new water supplies and storage projects that are economically, environmentally, and technically sound, while satisfying institutional requirements and political concerns, presents significant challenges. Many concerns center on possible adverse effects that additional storage and delivery facilities may have locally and on the Sacramento-San Joaquin Delta. In the SWP conveyance system, the Delta is the critical link between water supplies in the Sacramento Valley and deliveries to the rest of the Central Valley and Southern California.

DWR works with the State and federal governments, local agencies, and public interest stakeholder groups to ensure water supply reliability now and in the future. To meet SWP water contractors' needs for sufficient water supplies, DWR is engaged in planning, developing, and providing local assistance with the objective of augmenting future SWP water supplies.

Supply Development and Reliability

Some of the activities DWR is engaged in to augment future SWP supplies include:

- implementing programs to transfer water, such as the Dry Year Water Purchase Program, the Environmental Water Account (EWA), and facilitating transfers between SWP long-term contractors and other agencies, including Central Valley Project (CVP) contractors;
- assisting in the development and implementation of local and regional conjunctive use programs in the Sacramento Valley;
- constructing a groundwater monitoring network and a subsidence monitoring network to detect potential impacts caused by pumping associated with groundwater substitution transfers;
- managing the Feather River watershed above Lake Oroville to reduce sedimentation in the lake and preserve storage capacity; and
- investigating and evaluating storage projects.

Water Conveyance Through the SWP

DWR encourages and facilitates temporary transfers of water using SWP conveyance facilities for long-term SWP water contractors and other agencies to help meet local, State, and environmental water supply needs. As a practical matter, SWP facilities are often needed to convey transfer water from the existing place of use to the place of use of the transferee. State law requires DWR to make unused SWP capacity available for transfers upon payment of fair compensation, provided that (1) no legal user of water will be injured; (2) there will be no unreasonable effect on fish, wildlife, or other instream beneficial uses; and (3) there will be no unreasonable effect on the overall economy or the environment of the county from which the water is being transferred (California Water Code [CWC] Section 1810). Water transfers can involve transfers and

exchanges among SWP long-term water contractors, between SWP water contractors and non-SWP entities, or between two or more non-SWP entities.

The transferability of water depends on many factors including the source of the water being transferred, what is being done to make water available, when the water can be made available, and the type of water right the existing user holds. Several CWC provisions authorize temporary transfers and put conditions on those transfers to protect those not involved in them. Short-term transfers, of less than one year, are authorized under Sections 1725–1732. Long-term transfers, for periods greater than one year, are authorized by Sections 1735–1737. Other CWC sections specify conditions under which water can be transferred and legal protections for those transferring water. For information regarding specific transfers or exchanges, please see Chapter 9, Water Contracts and Deliveries.

Transfer and Exchange Evaluations

An important element of any water transfer is determining what quantity of water, if any, is transferable. Several CWC provisions (e.g., Sections 1702, 1706, 1725, and 1736), are intended to protect other legal users of water and fish and wildlife from the possible adverse effects of a water transfer. These provisions reflect the concept that changes can be made to water supply as long as there is no injury to others as a result of the change (the “no injury rule”). The no injury rule in State water law is intended to protect other water right holders from a water user’s expansion of water use beyond what has been used historically under that water user’s existing water rights. Hence, under the no injury rule, only “new water” is transferable (i.e., water that adds to the downstream water supply as a result of the transfer). To protect other users, a transfer would not be authorized to the extent that it would reduce the amount or timing of

water that would have been available to downstream users, regardless of the water priority of those users.

CWC Section 1810(d) requires DWR to consider potential impacts of a transfer to legal users, to instream uses, and to the economy of the area from which the water would be transferred. DWR must also determine whether to allow use of its surplus water conveyance capacity for a transfer. DWR reviews each request to transfer water through SWP facilities to assure that only new water will be transferred.

Transfer water is typically developed through four methods: surplus water released from storage facilities, substitution of groundwater for transferred surface water, idling agricultural land, and undertaking conservation activities that develop new water. Transfers may result in direct impacts and third party impacts (on parties not involved in the transfer). Certain CWC provisions were enacted to limit potential impacts. For example, additional groundwater pumping from a groundwater substitution program can potentially affect other groundwater users in the area. CWC Section 1745.10 generally requires that transfers of surface water where groundwater will be pumped to make up for the transferred surface water: (1) be consistent with a groundwater management plan adopted pursuant to State law for the affected area or (2) do not create or contribute to conditions of long-term overdraft in the affected groundwater basin.

Injury can also occur due to stream depletion induced by pumping wells near a stream. The amount of water depleted from the stream as a result of the increased pumping must be deducted from the amount of water transferred or the groundwater pumping is not truly an addition to the surface water supply, and the net surface water flows will not increase as assumed. Consequently, to

evaluate possible impacts from groundwater substitution transfers, DWR requires that users proposing to transfer water through groundwater substitution provide the information required to estimate the effects on the surface water system. Each type of transfer has its own set of potential impacts that must be evaluated to protect parties not involved in the transfer.

With the exception of short-term transfers done under CWC Section 1725, which go through the State Water Resources Control Board (SWRCB), water transfers are subject to compliance with the California Environmental Quality Act (CEQA), and, possibly, the National Environmental Policy Act (NEPA). The CEQA/NEPA and SWRCB processes provide opportunities for public review and comment on water transfer proposals.

Staff in the State Water Project Analysis Office, Division of Operations and Maintenance, Division of Integrated Regional Water Management, and the Office of the Chief Counsel evaluate proposed water transfers to determine whether they will impact the SWP, other water users, the environment, or the area from which the water will be transferred.

SWP Delivery Reliability Report

To assist local agencies assessing their overall water supplies, DWR prepares a biennial draft and final report entitled *The State Water Project Delivery Reliability Report*. For the 2007 draft report, DWR provided current data on the SWP's ability to deliver water under 2007 conditions and for projected conditions. The 2007 final report will be issued in 2008, and the next draft update of this biennial report is expected in 2009.

Water delivery reliability depends on three factors: the availability of water at the source, the ability to convey water from

the source to the desired point of delivery, and the level of demand. Information in *The State Water Project Delivery Reliability Report 2007-Draft* for projected conditions is based on four climate change scenarios. In addition, the analysis of the ability to convey water from the source to the point of delivery assumes only SWP facilities and permits existing in 2007. To provide a conservative estimate of water delivery reliability, no planned facility improvements to the SWP are assumed. Lastly, the level of demand, amount, and pattern of demand for SWP water were derived from historical data and information received from SWP water contractors.

The probability that a given level of SWP annual Table A water will be delivered from the Delta for conditions both in 2007 and projected to exist in 2027 is shown on Figure 7-1. The following can be deduced for year 2027 conditions:

- In 75 percent of the years, annual SWP Table A water delivery is estimated to be at or above the range of 1.86 to 2.08 million acre-feet (maf) per year (45 to 50 percent of 4.13 maf).
- In 50 percent of the years, delivery is estimated to be at or above the range of 2.97 to 3.21 maf per year (72 to 78 percent of 4.13 maf).
- In 25 percent of the years, delivery is estimated to be at or above the range of 3.69 to 3.82 maf per year (89 to 92 percent of 4.13 maf).

Detailed information on the assumptions, data, and results of additional studies, as well as other scenarios for annual Table A amounts, can be found in the reliability report at http://www.water.ca.gov/pubs/swp/swp_delivery_reliability_report_2007/swpdrr07.pdf.

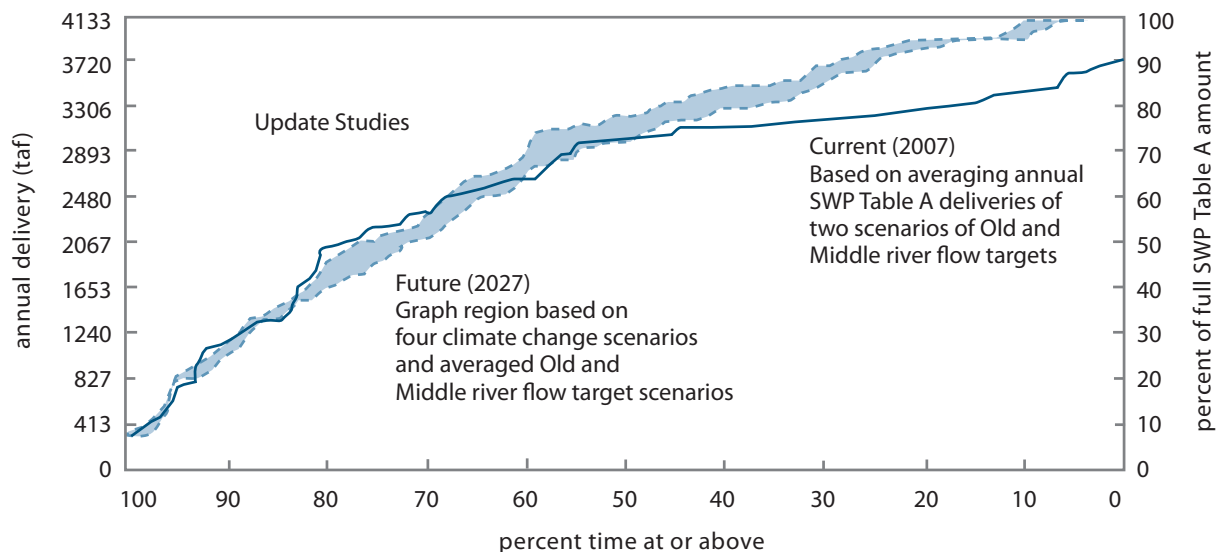


Figure 7-1 SWP Table A Water Delivery Probability for Years 2007 and 2027

SWP Future Water Supply Program

The Future Water Supply (FWS) Program is managed to coordinate DWR’s efforts to ensure the success of the Sacramento Valley Water Management Program (SVWMP). The FWS Program also provides technical support within DWR for the Lower Yuba River Accord (Yuba Accord) and the EWA by monitoring and assessing the conditions of the Sacramento Valley groundwater basin and the effects the Yuba Accord and the EWA have upon the basin. These activities emphasize coordination with local agencies, which have become increasingly active in developing groundwater management programs and asserting control over water supply development and management. To develop water management alternatives that benefit all water rights holders in the Sacramento Valley, DWR provides technical assistance to local agencies through the FWS Program and technical and financial assistance through the Conjunctive Water Management Program. DWR’s goal for these

efforts is to build consensus for local and regional conjunctive use.

The FWS Program’s Upper Feather River watershed management component evaluates the state of the Feather River watershed above Lake Oroville and identifies actions that can be taken within the watershed to increase base-flow runoff and reduce sedimentation. The initial effort explored ways to improve local water supplies without adversely affecting SWP supply or operations. Activities included installing monitoring equipment and gathering pertinent data on stream flows, water quality, erosion, and land use. The data were used to formulate reports and studies for future action. The work received strong local support.

Sacramento Valley Water Management Program

DWR, the Bureau of Reclamation (Reclamation), water users in the Sacramento River Basin (upstream water

users), and water contractors of the SWP and CVP (downstream water users) have been working to implement the SVWMP since the Short-Term Settlement Agreement (*Short-Term Agreement to Guide Implementation of Short-Term Water Management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assist in Meeting the Requirements of the 1995 Water Quality Control Plan and to Resolve Phase 8 Issues*) became effective in February 2003. For more information on the development and implementation of the SVWMP, and issues surrounding the Short-Term Settlement Agreement, see Bulletins 132-02, 132-03, and 132-04, available at <http://www.water.ca.gov/swpao/bulletin.cfm>.

During 2007, the Sacramento Valley Water Management Agreement (SVWMA) Management Committee, consisting of representatives from DWR, Reclamation, upstream water users, and downstream water users, renewed their commitment to implement the SVWMP. DWR continued to participate in developing the SVWMP EIS/EIR in collaboration with Reclamation and their consultant. However, progress on the environmental document was hindered by concerns that assumptions were not sufficiently defined to conduct baseline (pre-project) conditions computer modeling of SWP and CVP operations for the environmental analysis. Many simultaneously occurring factors regarding the Delta contributed to this uncertainty. These included:

- pelagic organism decline (POD) in the Delta;
- Operations Criteria and Plan (OCAP) litigation;
- OCAP Endangered Species Act (ESA) reconsultation;
- Bay-Delta Conservation Plan (BDCCP) development; and
- Delta Vision recommendations.

DWR continued to implement the SVWMP monitoring plan. Activities included constructing monitoring wells for Yuba County Water Agency (Yuba), Glenn County, and other local agencies that had received grant awards from DWR for this purpose. The wells in Yuba County monitor the conjunctive use activities of the Yuba Accord. The wells in Glenn County will help determine how implementing the SVWMP affects local hydrologic conditions. DWR continued to collect, maintain, and analyze groundwater level data throughout the Sacramento Valley to establish a basis of comparison for the projects that are proposed to operate as part of the SVWMP, the EWA, and the Yuba Accord.

SWP Water Rights Activities

Water Rights Permits

SWP operations are governed by the terms and conditions contained in DWR's water rights permits and licenses along with other State and federal regulatory restrictions, such as biological opinions (BO) for the protection of endangered species. DWR currently holds 15 water right permits for the operation of the SWP and upper Feather River facilities, five of which specifically authorize SWP operations at the Oroville/Thermalito and Delta facilities, including the North Bay Aqueduct, for water supply purposes. Each permit specifies the authorized quantities of direct diversion and diversion to storage, place of use, and time within which the permitted quantities must be put to beneficial use. A change in any of the terms and conditions contained in the water right permits and licenses requires SWRCB approval.

Diversion and use of SWP water throughout the SWP service area has steadily increased since initial operations in the 1960s. However, due to a number of factors, including operational and regulatory constraints, the beneficial use of water has

not yet reached the maximum quantities anticipated for full development of the SWP. When the full permitted quantity of water authorized under the water right permits has not been utilized by the date specified in the permit, a petition for time extension must be submitted to the SWRCB.

Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

The Delta and Suisun Marsh are located where California's two major river systems, the Sacramento and San Joaquin, converge to flow westward to meet incoming seawater tides flowing through the San Francisco Bay. The watershed of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) is a critical source of water supply for much of California. The watershed is a source of drinking water for two-thirds of the State's population; it supplies some of the State's most productive agricultural areas; and it provides water for fish, wildlife, and other public trust uses of water within and upstream of the estuary.

Water originating in the Bay-Delta watershed is delivered to areas within the watershed and to areas south and west of the estuary. The primary water distribution systems that release stored water into the Delta and directly divert water from the Delta are the SWP, operated by DWR, and the federal CVP, operated by Reclamation. Numerous other water storage and diversion projects affect the inflows and outflows of the Bay-Delta Estuary.

SWRCB regulates both the quality of water in the Bay-Delta Estuary and the diversion and use of water released into and diverted from the Bay-Delta Estuary for water supply. SWRCB coordinates its regulatory authorities under State laws governing water quality and water rights to ensure that water quality is protected for all beneficial uses when water is diverted from the estuary. The *Water*

Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) establishes water quality objectives for flow, salinity, dissolved oxygen levels, and other parameters for the protection of beneficial uses such as municipal and industrial, agricultural, and fish and wildlife. SWRCB reviews volumes of testimony and evidence to establish water quality objectives for these uses, then implements the objectives in part or in whole, depending on the circumstances, through conditions on water right permits and licenses.

DWR has worked cooperatively with SWRCB for more than 50 years to support development of appropriate water quality standards for the Bay-Delta Estuary and to identify which water sources are required to meet those standards. The current objectives are contained in the 2006 Bay-Delta Plan, adopted December 13, 2006. In 1999, SWRCB adopted Water Right Decision 1641 (D-1641) (later modified by Order WR 2000-02) to implement the objectives in the 1995 Bay-Delta Plan. SWP licenses and permits were amended to include the terms and conditions outlined in D-1641.

SWRCB may initiate water right proceedings to allocate responsibility to meet established objectives among water right holders who divert water from the watersheds of the Bay-Delta Estuary. They may also establish terms and conditions on the use of affected water rights. SWRCB prepares appropriate documentation under CEQA, in addition to documentation included with the 2006 Bay-Delta Plan.

For more information about the SWRCB, see Chapter 4, Water Quality Programs.

SWRCB Bay-Delta Proceedings—2007 Activities

In 2007, SWRCB proceedings examined a number of issues in the Bay-Delta Estuary

relating to water quality, salinity, fishery protection, and pelagic organism decline, which have the potential to affect Delta water supply and reliability.

South Delta Salinity

On January 16, 2007, SWRCB convened a workshop to receive information and conduct detailed discussions on the south Delta agricultural salinity objectives. SWRCB specified that the information provided focus on salinity objectives and a corresponding program of implementation. SWRCB also requested that participants recommend studies they believe are needed regarding salinity in the southern Delta. Based on the information in these recommendations, SWRCB would evaluate whether additional studies and other efforts could support an amendment to the Bay-Delta Plan.

To improve water circulation, levels, and quality for agricultural uses, South Delta Water Agency (SDWA) has been relying on a proposed physical solution of permanent operable gates to be installed in the southern Delta. Although these permanent gates may continue to be the preferred solution for implementing southern Delta agricultural objectives, information provided to SWRCB during the D-1641 water rights hearings showed that these gates will not effectively control salinity under dry year conditions and will not have a significant effect on water quality at some of the compliance locations. Therefore, it was recommended that SWRCB consider including in the 2006 Bay-Delta Plan and its program of implementation additional methods other than the permanent operable gates to achieve these objectives.

On April 24, 2007, DWR, in coordination with Reclamation and in compliance with Condition 4 of SWRCB Order WR 2006-0006, submitted a "Report of Potential Exceedence of South Delta Water Quality Agricultural Objective" to SWRCB. Condition 4 discusses

potential exceedence of the agricultural water quality objective at three compliance monitoring stations in the South Delta. Since actions causing exceedence were beyond the reasonable control of DWR and Reclamation, the letter did not offer any corrective actions at that time.

Later in the year, in response to DWR's letter regarding potential exceedence of the South Delta agricultural objectives, SWRCB requested a feasibility study of increased San Joaquin River flows. This feasibility study would include water releases from New Melones Reservoir, water recirculation through the Delta Mendota Canal, and other water releases in the San Joaquin basin. SWRCB indicated that there was substantial evidence that salinity issues within the South Delta were due to Reclamation operations and therefore recommended that Reclamation participate in identifying and developing potential solutions.

On May 4, 2007, DWR participated in an SWRCB meeting regarding Southern Delta salinity objectives and discussed DWR modeling capabilities, time frames for studies, and more specific definitions of operations.

For a more thorough discussion of salinity issues and objectives in the South Delta, see Chapter 4, Water Quality Programs.

Fishery Protection Plan

On February 8, 2007, SWRCB approved the Revised Fishery Protection Plan (Fishery Plan) for Joint Point of Diversion (JPOD), dated December 26, 2006. The Fishery Plan is required by SWRCB D-1641 and must be approved by SWRCB prior to the commencement of Stage 2 JPOD operations. The Fishery Plan was approved subject to conditions that included compliance with updated BOs. A JPOD would afford increased opportunities for the CVP to fill San Luis Reservoir (a joint storage facility) when there

are high winter flows through the Delta. There are times when the pumping rate at Banks Pumping Plant is significantly less than the maximum allowable rate. The JPOD provisions would allow unused capacity at Banks Pumping Plant to be made available to Reclamation for filling the CVP share of San Luis Reservoir early. A shift towards increased Delta pumping capability earlier in winter, such as might be provided for by a JPOD, could result in additional decreases in project pumping during the early spring, if both SWP and CVP shares of San Luis Reservoir are full, since typical demands during this time are relatively low.

Pelagic Organism Decline

On March 22, 2007, SWRCB convened a workshop to consider POD in the Bay-Delta Estuary. The workshop covered current studies and available results; proposed studies and projected time lines for implementation; status of the scientific peer review of the work plan prepared by the POD team; and interim actions SWRCB needs to consider, based on available information. During the workshop, DWR presented related documents, including the 2007 *Pelagic Fish Action Plan*, *Interagency Ecological Program 2006–2007 Work Plan to Evaluate the Decline of Pelagic Species in the Upper San Francisco Estuary*, and response to the CALFED Science Program Review Panel Report to the IEP Management Team on POD. The pelagic fish action plan was prepared in coordination with the Department of Fish and Game (DFG).

For more information on POD, see Chapter 3, Environmental Programs.

CALFED Bay-Delta Program

The California Bay-Delta Authority (CBDA) oversees the implementation of the CALFED Bay-Delta Program for the 25 State and federal agencies working cooperatively to improve the quality and reliability of

California's water supplies, while restoring the Bay-Delta ecosystem.

The California Bay-Delta Act of 2003 established the CBDA as the governance structure and charged it with providing accountability, ensuring balanced implementation, tracking and assessing the CALFED Bay-Delta Program progress, using sound science, assuring public involvement and outreach, and coordinating and integrating related government programs.

The CALFED Bay-Delta Program mission is to develop and implement a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta. DWR supports this effort to develop and manage the State's water resources to meet SWP water delivery commitments and to benefit both the public and the environment.

The CALFED Bay-Delta Program is envisioned as a 30-year plan and is implemented through 11 major program elements. The first 7-year phase of implementation, Stage 1, includes planning for proposed large facilities and implementation of lesser facilities. DWR is the State lead agency for the storage program element, which consists of surface storage studies and groundwater programs and projects.

Storage Program

The storage program is a comprehensive program with potential benefit for the SWP consisting of actions related to surface and groundwater storage. The Division of Statewide Integrated Water Management and the Division of Integrated Regional Water Management have been working with CALFED agencies to enhance storage and conjunctive-use programs that support local project development via loans and grants. The storage program is part of an ongoing evaluation of how storage, both groundwater

CALFED Bay-Delta Program

The San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) Estuary is the largest estuary on the West Coast. It is a maze of tributaries, sloughs, and islands, and a haven for more than 750 plant and wildlife species. It is also the hub of California's two largest water distribution systems—the Central Valley Project, operated by the U.S. Bureau of Reclamation, and the State Water Project, operated by the Department of Water Resources. Together, these water development projects divert approximately 20 to 70 percent of the natural flow in the system, depending on the amount of runoff available in a given year. This, along with other issues, such as population growth and pollution, have had a serious impact on water supply and quality and on the fish and wildlife resources in the estuary. Although there is consensus that the Bay-Delta Estuary is important as both a reliable source of water and as fish and wildlife habitat, there was none for resolving conflicts regarding methods of management, conservation, increasing system capacity, and protecting the region's ecology.

In June 1994, in the quest for solutions to the resource problems in the Bay-Delta, State and federal agencies signed an agreement to: (1) coordinate their actions to meet water quality standards to protect the Bay-Delta Estuary; (2) coordinate the operation of the State Water Project and the Central Valley Project more closely with recent environmental mandates; and (3) develop a process to establish a long-term Bay-Delta solution to address four categories of problems—ecosystem quality, water quality, water supply reliability, and levee system vulnerability. This agreement, *Principles for Agreement on Bay-Delta Standards between the State of California and the Federal Government* (Bay-Delta Accord) signed in December 1994 by the State and federal governments, detailed interim measures for both environmental protection and regulatory stability.

The Bay-Delta Accord laid the foundation for the CALFED Bay-Delta Program, which began in May 1995. The *CALFED Bay-Delta Program, Final Programmatic Environmental Impact Statement/Environmental Impact Report* was released in July 2000, followed by the *Programmatic Record of Decision* in August 2000.

The California Bay-Delta Act of 2003 established the California Bay-Delta Authority as the new governance structure and charged it with providing accountability, ensuring balanced implementation, tracking and assessing the CALFED Bay-Delta Program progress, using sound science, assuring public involvement and outreach, and coordinating and integrating related government programs.

The CALFED Bay-Delta Program is designed to address the complex issues that surround the Bay-Delta and is a cooperative interagency effort involving 25 State and federal agencies with management or regulatory responsibilities for the Bay-Delta. It is an unprecedented effort to build a framework for managing California's most precious natural resource—water. Establishment of the CALFED Bay-Delta Program represents State and federal government in partnership, launching the largest, most comprehensive water management program in the world.

conjunctive use and surface storage, can meet California's urban, agricultural, and environmental supply reliability and water quality needs.

Surface Storage Investigations

Surface storage investigations are developing environmental documentation and feasibility studies for four of the five surface storage projects identified for further study in the CALFED Record of Decision (ROD).

State and federal scientists have detected a decline in the Delta's pelagic organisms. Consequently, Delta export pumping increases anticipated by the South Delta Improvements Program (SDIP) were not achieved, causing a reassessment of modeling studies, scope, and schedule for the surface storage projects.

In-Delta Storage Program. The In-Delta Storage Program would provide capacity to store approximately 217,000 af of water in the South Delta for a wide array of water supply, water quality, and ecosystem benefits. The project would include two storage islands (Webb Tract and Bacon Island) and two habitat islands (Holland Tract and Bouldin Island).

No work was done on this project in 2007, and further detailed study of the In-Delta Storage Program is suspended until a proposal is submitted by potential participants detailing their specific interests, needs, and objectives that would support reinitiation.

For more information about this project, see Chapter 7, Water Supply Development and Reliability, Bulletin 132-07, at <http://www.water.ca.gov/swpao/bulletin.cfm>.

Los Vaqueros Reservoir Expansion Project. Contra Costa Water District (Contra Costa) owns and operates the 100,000 af Los Vaqueros Reservoir just southwest of the

Sacramento-San Joaquin Delta. The Los Vaqueros Reservoir Expansion Project involves analysis of increasing reservoir storage by as much as 400,000 af, for a potential storage capacity up to 500,000 af.

The project objectives are to (1) improve Bay Area water supply reliability, (2) provide an environmental water supply to the long-term EWA or similar program, and (3) improve water quality for Bay Area water users.

Contra Costa ratepayers voted to support further studies of the Los Vaqueros Reservoir Expansion Project in a March 2004 advisory vote. In 2006, Reclamation, in coordination with DWR and Contra Costa, completed a report entitled *Initial Economic Evaluation for Plan Formulation*. Also in 2006, Contra Costa filed a Notice of Preparation under CEQA to prepare an EIR. Contra Costa is the lead agency under CEQA and, in coordination with Reclamation and DWR, will continue with the feasibility study and environmental documentation.

Shasta Lake Enlargement Investigation.

Reclamation, in coordination with DWR and other agencies, is conducting a feasibility study of expanding Shasta Dam and Reservoir, primarily to promote increased survival of anadromous fish populations in the upper Sacramento River and to increase water supply reliability. An enlargement of Shasta Dam would inundate additional lands around the existing reservoir and affect a portion of the McCloud River. California Public Resources Code Section 5093.542(c), the Wild and Scenic Rivers Act, states that, "except for participation by the DWR in studies involving the technical and economic feasibility of enlargement of Shasta Dam, no department or agency of the state shall assist or cooperate with, whether by loan, grant, license, or otherwise, any agency of the federal, state, or local government in the planning or construction of any dam, reservoir, diversion, or impoundment facility that could have an adverse effect on the

free-flowing condition of the McCloud River, or on its wild trout fishery.”

The State budget does not include funding for DWR to continue participating in this study. However, in 2007, Reclamation continued work on the feasibility study and an EIS and completed the Plan Formulation Report for federal review.

North-of-the-Delta Offstream Storage Investigation. DWR and Reclamation are working in partnership with local, State, and federal agencies to further study north-of-the-Delta offstream storage opportunities. The North-of-the-Delta Offstream Storage (NODOS) Investigation focuses on potential projects on the west side of the Sacramento Valley, including Sites Reservoir.

Storing water in offstream reservoirs during excess flow periods could provide opportunities to increase water storage in an environmentally sensitive manner. The stored water could then be made available to enhance water management flexibility in the Sacramento Valley and the Bay-Delta Estuary, reducing water diversions on the Sacramento River during critical fish migration periods, increasing the reliability of supplies for the Sacramento Valley and statewide, and providing storage and operational flexibility to augment environmental water supplies and adapt to climate change.

In 2007, DWR and Reclamation continued with the feasibility study and NEPA/CEQA process for the NODOS Investigation. In April 2007, DWR and Reclamation completed a supporting document entitled *A Conceptual Framework for Modeling of Physical River Processes and Riparian Habitat on the Sacramento River, California*.

Upper San Joaquin River Basin Storage Investigation. DWR and Reclamation, in coordination with other State and federal agencies, are evaluating opportunities for

increased storage in the upper San Joaquin River watershed. Storage could be added by expanding Millerton Lake by raising Friant Dam or by a functionally equivalent storage program. Potential objectives of the Upper San Joaquin River Basin Storage Investigation (USJRBSI) include (1) contributing to the restoration of the San Joaquin River, (2) improving the water quality of the San Joaquin River, and (3) facilitating additional conjunctive management and water exchanges that improve the quality of water deliveries for urban communities. Other benefits could include hydropower, flood control, and recreation.

In 2006, the parties to the San Joaquin River litigation reached agreement, significantly affecting the USJRBSI baseline assumptions. Following the settlement agreement, DWR and Reclamation developed an interim plan to revise the study assumptions, objectives, scope, and schedule. The revised objectives are to increase water supply reliability for agricultural and urban users and enhance San Joaquin River water temperature and flow conditions. Another key change to the investigation was the inclusion of water releases from Friant Dam dedicated to restoring fish populations in the San Joaquin River (as agreed to in the settlement) in the without-project conditions. DWR and Reclamation continued with the feasibility study and the NEPA/CEQA process for the reformulated USJRBSI.

In 2007, DWR and Reclamation completed geologic drilling investigations at potential dam and borrow sites and conducted habitat mapping and surveys of sensitive species. The U.S. Fish and Wildlife Service (USFWS) prepared a baseline habitat evaluation for the reservoir areas. A 2007 Study Update brochure was released by DWR and Reclamation summarizing these activities.

Conveyance Program

The Conveyance Program consists of projects proposed in the North and South Delta. These projects are discussed briefly below, but for more information about the North and South Delta, see Chapter 2, Delta Resources.

North Delta

The North Delta Program is composed of studies related to a through-Delta facility (TDF), Delta Cross Channel (DCC) Reoperation, a flow control facility in the Franks Tract region, and a project to improve flood management and the ecosystem along the Mokelumne River.

DWR, in cooperation with federal and State agencies, completed the fieldwork and data processing of a pilot salmon outmigration study, which was conducted to assess the feasibility of a comprehensive Delta salmon outmigration study. DWR also conducted water quality modeling analyses and prepared conceptual design layouts for alternatives considered for the Franks Tract Project and the TDF. To evaluate these alternatives, DWR conducted value engineering studies for both the Franks Tract Project and the TDF. Reclamation prepared a plan of study for the North/Central Delta Improvement Study for evaluation of the DCC, the Franks Tract Project, and the TDF.

With the North Delta Flood Control and Ecosystem Restoration Project (NDFCERP), solutions to improve flood management and the ecosystem are being considered, including setback levees, detention basins, dredging, and levee degradation for floodplain expansion.

In 2007, DWR, with the assistance of consultants, developed responses to comments received with the release of the 2006 Administrative Draft and completed the NDFCERP Draft EIR.

South Delta

Actions in the South Delta include the South Delta Improvement Program (SDIP), implementing flood control/ecosystem improvements in the lower San Joaquin River, and potential interties between the SWP California Aqueduct and the CVP Delta-Mendota Canal.

SDIP, a component of the CALFED Bay-Delta Program, as recommended in the ROD, is a two-stage project. Stage 1 proposes to reduce the movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook salmon into the South Delta via Old River and to maintain adequate water levels and water quality for agricultural diversions in the South Delta. Stage 2 would increase water deliveries and delivery reliability to SWP and CVP contractors south of the Delta and increase the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay to 8,500 cubic feet per second (cfs).

The SDIP Final EIR/EIS (2006) evaluated alternatives and proposed proceeding with SDIP Stage 1. This component involves constructing permanent operable gates and channel dredging in the South Delta.

DWR is proposing installation of these permanent gates to replace temporary structures currently installed and removed each year.

In 2007, Reclamation and DWR were developing a project description and biological assessment for the Operations Criteria and Plan (OCAP) that includes operation of the SDIP permanent operable gates. OCAP covers the operation of the CVP and SWP. Most planning and permitting efforts were either slowed or suspended during 2007, and permitting could not

move forward without OCAP BOs. Limited design work and modeling were completed during 2007.

Any action regarding SDIP Stage 2 will require further study and public input. Stage 2 planning was suspended during 2007.

Environmental Water Account

Established in 2000 by the CALFED ROD, EWA is a cooperatively managed program intended to provide protection to the fish of the Bay-Delta Estuary through environmentally beneficial changes and increased flexibility in SWP and CVP operations, while maintaining water supply reliability to the projects' water users. Responsibility for implementing EWA rests with the National Marine Fisheries Service, USFWS, and DFG (the management agencies), and with Reclamation and DWR (the project agencies).

The management agencies are responsible for recommending SWP/CVP operational changes beneficial to the Bay-Delta ecosystem and the long-term survival of fish species. The project agencies are responsible for acquiring and managing EWA assets and cooperating with the management agencies in administering EWA and implementing operational changes proposed by the management agencies, as appropriate.

Under EWA, fish protection is achieved by periodically curtailing project water exports from the Bay-Delta and replacing them later, generally within the same calendar year. This replacement for reductions in Delta exports during the winter and spring necessitates the acquisition of EWA assets, which are used to replace the project water supply, generally during the summer transfer period. EWA assets consist of variable assets, which are acquired through changes in operations; fixed assets, which are acquired through water purchases from willing water sellers;

source shifting, which involves deferral of scheduled delivery of water by willing participants; and other non-water assets, such as the ability to use 500 cfs dedicated pumping capacity at Banks Pumping Plant from July 1 to September 30.

In 2001, DWR and Reclamation initiated work on a joint EIS/EIR for the EWA, which considers the environmental impacts associated with use of EWA assets, impacts on both SWP and CVP operations through December 2007, and addresses multiyear EWA contracts with willing water sellers.

The EWA project and management agencies completed and approved the EIS/EIR for the short-term EWA pertaining to the acquisition and management of EWA assets between 2004 and 2007. The *Environmental Water Account Operating Principles Agreement* was originally executed among the five State and federal agencies in 2000, and in 2004, it was extended through December 31, 2007. The agreement has not been extended past 2007.

DWR and Reclamation continue to develop a supplemental EIS/EIR to the EWA Final EIS/EIR in response to changes in the environmental settings and the need to provide an evaluation of the effects associated with EWA operations from 2008 through 2011. The Draft Supplemental EIS/EIR to the EWA Final EIS/EIR became available on October 26, 2007. It analyzes three alternatives, including two action alternatives that involve acquisition of EWA assets via stored surface water, stored groundwater, groundwater substitution, and cropland idling purchases; with EWA assets management through source shifting, groundwater storage, and borrowing project water. The alternatives differ primarily in actions taken to protect fish and the quantities of assets acquired under each. The supplement reviewed all resource areas addressed in the 2004 EIS/EIR to determine whether any changes to the regulatory or environmental settings would change the

impact conclusions in the 2004 EIS/EIR. With the exception of fisheries and aquatic ecosystems, no other resource areas produced different conclusions or findings than that of the 2004 EIS/EIR.

An addendum to the 2004 EIS/EIR was prepared to continue through December 31, 2008, certain actions to obtain assets for EWA that have been previously implemented under the certified 2004 EIS/EIR. DWR proposed to extend three agreements to obtain EWA assets by amending two agreements with Metropolitan Water District of Southern California and one agreement with Kern County Water Agency in administering EWA and implementing operational changes proposed by the management agencies.

For more details on EWA deliveries, see Chapter 9, Water Contracts and Deliveries.

Lower Yuba River Accord

Yuba County Water Agency (Yuba) has pursued a negotiated settlement to resolve flow issues on the Yuba River associated with operation of the Yuba River Development Project. The result, the Lower Yuba River Accord (Yuba Accord), is structured to protect and enhance lower Yuba River fisheries and local water supply reliability. Additionally, Yuba has a goal to provide revenues for local flood control and water supply projects, and Reclamation and DWR have goals to obtain water for the EWA to use for protection and recovery of Delta fisheries and for improvements in statewide water supply reliability, including supplemental water for the CVP and SWP.

The Yuba Accord includes three major elements, all of which must be in place for the Yuba Accord to become effective: (1) the fisheries agreement, under which Yuba County Water Agency (Yuba) would revise the operations of the Yuba River Development Project to provide for higher

flows in the lower Yuba River under certain conditions to improve fisheries protection and enhancement and local water-supply reliability; (2) the conjunctive use agreements between Yuba and water districts within Yuba County for implementing a conjunctive use and water use efficiency program; and (3) an agreement between Yuba and DWR, pursuant to which DWR will have rights to beneficially use water made available by Yuba through the fisheries agreement, the conjunctive use agreements, and additional water releases from the Yuba project. Yuba asserts it would not and could not make these flows available from the Yuba project in the absence of the Yuba Accord and without the revenues provided to Yuba under the *Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources*.

Once the agreements are implemented, they will collectively provide significant environmental and economic benefits, including:

- higher instream flow requirements to protect lower Yuba River Chinook salmon, steelhead, and other fish species, ranging from 260,000 af in a dry year to more than 574,000 af in a wet year (an increase of 25,000 af in a dry year to more than 170,000 af in a wet year);
- improved water supply reliability for DWR and Reclamation, including a commitment of 60,000 af per year for the EWA and up to an additional 140,000 af in dry years for the SWP and CVP;
- a \$6 million long-term lower Yuba River fisheries monitoring, study, and enhancement program;
- improved water supply reliability for Yuba County farmers, along with a conjunctive water use program to improve water use efficiency for local farmers; and
- a secure funding source for Yuba and local irrigation districts to finance conjunctive water use and water use

efficiency activities, levee strengthening, and other water management actions in Yuba County.

On December 4, 2007, DWR signed an 18-year agreement with YCWA for the purchase of water for the EWA and for dry year water supplies to 22 SWP and CVP contractors. DWR purchased a total of 480,000 af of water from YCWA for delivery at the rate of 60,000 af annually from 2008 to 2015 to help offset Delta export pumping reductions to benefit at-risk fish species and improve water supply reliability. In December 2007, DWR signed agreements with several of the contractors for dry year supplies from YCWA and was in final negotiations for the remaining agreements.

See Chapter 9, Water Contracts and Deliveries, for additional details.



Chapter 8

Water Supply

Antelope Lake.

Significant Events in 2007

Water year 2006–2007 proved to be very dry, with much less than average precipitation and snowpack. Only 2 of the 5 wet season months, November through March, were above average in precipitation and two, January and March, were abnormally dry. As a result, statewide precipitation was only 65 percent of average in 2006–2007. The northern regions of the State did better than the southern regions, with precipitation amounts ranging from 83 percent on the North Coast to 29 percent in the Colorado Desert region. The mountain snowpack, too, was poor and peaked about a month early around the first of March at 60 percent of the normal April 1 snowpack water content. March was unusually warm and dry and by April 1 the pack had been reduced to 39 percent of average

Statewide river runoff totaled 53 percent of average in the 2006–2007 water year. Runoff in the Sacramento River and San Joaquin River regions was 55 percent and 43 percent of average, respectively. Feather River unimpaired inflow to Lake Oroville was 2.5 million acre feet (maf) (55 percent of average) for the water year, compared with 8.2 maf (178 percent of average) the previous year. Estimated statewide reservoir storage in water year 2006–2007 started out strong at 122 percent of average on October 1, as a result of a wet 2006, but declined during the year to 84 percent at the end of September.

The Sacramento Valley Water Year Hydrologic Classification (40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (60-20-20 Index) were dry and critical, respectively, based on observed data for water year 2006–2007.

Information in this chapter was contributed by the Division of Flood Management and the Division of Operations and Maintenance.

The Department of Water Resources (DWR) monitors precipitation, calculates runoff, and operates storage facilities during each water year. The official California water year runs from October 1 through September 30. DWR works during the water year to fulfill its key contractual obligations to the State Water Project (SWP) long-term water supply contractors.

Water Year 2006–2007

Precipitation and Snowpack

California experienced significantly less than average rainfall and mountain snowpack during water year 2006–2007. The State, as a whole, received precipitation at 65 percent of average in 2006–2007, as compared with 136 percent of average in 2005–2006. Figure 8-1 presents water year precipitation for the various regions of the State. The Northern Sierra 8-Station Index finished the water year with 37.2 inches of precipitation, which was 74 percent of average.

The statewide average snow water equivalent, based on snow sensors, reported for April 1 was 13 inches, or 45 percent of average. Snowpack peaked early on February 28 with 17 inches of snow water content. Historically, April 1 is the average annual date of peak snow accumulation.

Table 8-1 presents monthly precipitation totals for water year 2006–2007 at various gauges located throughout the State, listed north to south. For much of the State, the two wettest months were December and February, when precipitation totals nearly exceeded 200 percent of average in a few locations.

Mount Shasta City, in far Northern California, received 30.0 inches of precipitation for a water year total which was 83 percent of average. Precipitation was heaviest during the months of December, February, and July, with precipitation totaling 173, 171, and 224 percent of average, respectively.

Blue Canyon experienced precipitation above normal for 6 months of water year 2006–2007. The month of February accumulated the largest monthly precipitation for the water year, 19.2 inches, which was 197 percent of average. The highest percent of normal value for the water year was 238 percent, in September. However, this only amounted to 1.8 inches of precipitation.

In the San Joaquin and Tulare Lake watersheds, precipitation was less intense than in the north. The December storms did bring above-average (114 percent) precipitation to Yosemite Headquarters. The February storms totaled 127 percent of average at Grant Grove. However, water year precipitation totals in those two locations were 61 and 56 percent of their respective annual averages. In the South Central watershed, the cities of Los Angeles and San Diego were even drier, totaling 26 and 37 percent of their annual averages, respectively.

The monthly totals for the Northern Sierra 8-Station Index (see sidebar, Precipitation and Water Supply Indices) for water year 2006–2007 are presented in Table 8-2. Precipitation for the water year totaled 37.2 inches, which is 74 percent of average. Monthly precipitation totals for December, February, and July were above average at 101, 170, and 250 percent of average, respectively. January and March, conversely, each registered as the sixth driest on record for the index. Following the wet February, the rest of the water year was quite dry and unusually warm.



Figure 8-1 Statewide Precipitation by Hydrologic Region, 2006–2007 Water Year, as Percent of Average

Table 8-1 Monthly Precipitation Totals at Various Locations in California during Water Year 2006–2007

Monthly Precipitation (in inches)												
Station	2006			2007								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mount Shasta City	0.18	4.05	10.20	0.86	9.57	1.64	1.51	0.69	0.30	0.56	0.03	0.39
% of avg	8	88	173	13	171	37	54	41	28	224	10	49
Eureka Woodley Island	0.58	7.41	7.09	1.86	11.86	2.51	2.72	0.86	0.46	0.97	0.08	0.60
% of avg	19	134	111	29	229	48	95	48	75	882	33	79
Blue Canyon (DWR-2)	1.00	8.42	11.24	2.78	19.17	1.99	5.46	2.10	0.92	0.00	0.01	1.76
% of avg	27	107	107	22	197	23	109	77	105	0	3	238
Sacramento WB City	0.21	1.03	3.12	0.07	5.17	0.50	1.42	0.43	0.00	0.01	0.00	0.08
% of avg	23	51	98	2	158	21	96	93	0	33	0	38
San Francisco WB AP	0.63	3.05	5.31	0.72	4.79	0.52	1.44	0.43	0.00	0.02	0.00	0.09
% of avg	59	129	143	16	146	19	101	98	0	67	0	47
Yosemite Headquarters	0.65	1.51	7.48	0.82	4.72	1.86	1.88	0.67	0.15	0.00	1.92	0.69
% of avg	38	36	114	12	75	38	58	48	26	0	960	111
Fresno WB AP	0.08	0.23	1.33	0.59	2.29	0.97	0.49	0.05	0.00	0.00	0.02	0.02
% of avg	17	21	76	29	110	52	45	18	0	0	100	13
Grant Grove	0.84	0.93	4.54	1.65	9.19	2.82	2.77	0.21	0.00	0.00	0.02	1.58
% of avg	43	18	58	22	127	37	64	18	0	0	29	293
Los Angeles-WSO Airport	0.00	0.25	0.61	0.39	0.82	0.09	0.36	0.00	0.00	0.01	0.00	0.49
% of avg	0	18	29	14	28	5	39	0	0	100	0	272
San Diego NWS-Lindbergh	0.76	0.15	0.71	0.51	1.12	0.09	0.46	0.00	0.00	0.00	0.00	0.05
% of avg	181	13	37	25	58	6	61	0	0	0	0	28

Table 8-2 Northern Sierra 8-Station Precipitation for Water Year 2006–2007

	Month	Precipitation (inches)	Percent of Monthly Average Precipitation
2006	October	0.51	17
	November	5.65	90
	December	8.49	101
2007	January	1.44	16
	February	13.6	170
	March	1.65	24
	April	3.09	79
	May	1.16	55
	June	0.37	37
	July	0.50	250
	August	0.01	3
	September	0.74	82
	Total	37.21	74

Taking the entire water year into consideration, 60 percent of the water year total precipitation fell during December and February, essentially during three stormy periods: December 8 to December 27, 8.2 inches; February 6 to February 12, 6.8 inches; and February 20 to February 28, 6.6 inches.

Areas of the Central Valley received above normal precipitation in February only. Precipitation totals for the month were 5.2 inches for Sacramento (158 percent of average) and 2.3 inches for Fresno (110 percent of average).

The precipitation that fell during water year 2006–2007 resulted in a snowpack well below average throughout the State’s mountainous regions. Monthly statewide snowpack for the 2006–2007 water year is shown in Table 8-3. Snow water equivalents

shown in the table were obtained from daily snow sensor reports corresponding to the first day of each month.

The statewide average snow water equivalent reported for April 1 was 13 inches, (no statewide average for the courses

is available), or 45 percent of average (39 percent of average, if courses are used). Snowpack peaked early on February 28 with 17 inches of snow water content. Not only was the peak observed one month earlier than normal (April 1 is typically the average annual date of peak snow accumulation), it was 58 percent of the April 1 average.

Table 8-3 Statewide Snowpack for Water Year 2006–2007

Date	Snow Water Equivalent (in inches)	Percent of Average	Percent of April 1 Average ^a
2006	October 1	0	0
	November 1	0	0
	December 1	2	36
2007	January 1	6	61
	February 1	7	42
	March 1	17	66
	April 1	13	45
	May 1	6	27
	June 1	0	0

^a April 1 is the average date of peak statewide snowpack.

Runoff and Storage

Statewide river runoff totaled 53 percent of average in the 2006–2007 water year. The monthly runoff totals for the Sacramento River (see sidebar), San Joaquin River, Tulare Lake, and Feather River regions are shown in Table 8-4. The water year runoff totals for these regions were 55, 42, 37, and 55 percent of average, respectively.

From a water supply perspective, the most closely monitored period is April through July. April concluded with 51, 63, and 57 percent of normal runoff for the Sacramento River, San Joaquin River, and Tulare Lake regions, respectively. By the end of July, the April–July runoff volumes had

Table 8-4 Unimpaired Runoff for Water Year 2006–2007 (million acre-feet)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
SRR runoff	0.45	0.62	1.22	0.78	1.88	1.64	1.21	0.99	0.46	0.38	0.33	0.33	10.28
% average	86	70	69	30	71	57	51	43	37	63	78	80	55
SJR runoff	0.06	0.06	0.10	0.10	0.26	0.42	0.53	0.68	0.19	0.06	0.04	0.03	2.51
% average	101	43	38	22	55	69	63	48	18	13	28	41	42
TLR runoff	0.05	0.04	0.05	0.05	0.08	0.17	0.23	0.31	0.10	0.04	0.02	0.02	1.16
% average	102	64	44	30	40	62	57	42	16	12	24	34	37
Feather River runoff	0.10	0.14	0.28	0.18	0.47	0.44	0.31	0.23	0.11	0.11	0.09	0.08	2.54
% average	84	67	70	31	77	61	48	35	33	73	91	88	55
Statewide % average	82	61	76	30	68	64	54	46	26	35	59	69	53

SRR: Sacramento River Region

Sacramento River at Bend Bridge, Feather River at Oroville, Yuba River at Smartville, American River at Folsom

SJR: San Joaquin River Region

Stanislaus River below Goodwin, Tuolumne River at La Grange, Merced River below Merced Falls, San Joaquin River at Friant

TLR: Tulare Lake Region

Kings River at Pine Flat, Kaweah River at Terminus, Tule River at Success, Kern River at Isabella

WY: Water Year (Oct–Sep)

dropped to 47, 38, and 33 percent of average for the three respective regions.

The Sacramento Valley Water Year Hydrologic Classification (40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (60-20-20 Index) were “dry” and “critical”, respectively, based on observed data for water year 2006–2007 (see sidebar).

During water year 2006–2007, statewide reservoir storage was at its peak of 124 percent of average in October, following the very wet 2005–2006 water year, and declined steadily to a low of 85 percent of average during the summer months of

July to September. Monthly storage totals for the major Sierra reservoirs are shown in Table 8-5. End-of-water-year storage in the major Sierra reservoirs ranged from 108 percent of average in the New Melones Reservoir on the Stanislaus River to 27 percent of average in the Success Reservoir on the Tule River.

Water Year 2007–2008 October through December Water Conditions

The last three months of calendar year 2007 mark the beginning of a new water year, 2007–2008.

Table 8-5 Reservoir Storage for Water Year 2006–2007 (thousand acre-feet)

Reservoir	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta	3,119	3,127	3,335	3,374	3,772	4,011	3,901	3,601	3,141	2,560	2,134	1,879
% of avg	113	113	115	108	112	107	98	91	84	77	72	67
Oroville	2,760	2,680	2,793	2,795	3,009	3,123	3,078	2,965	2,644	2,194	1,823	1,568
% of avg	128	122	125	117	119	113	105	97	90	83	77	70
Folsom	538	488	482	468	589	693	740	787	656	490	376	323
% of avg	108	104	100	91	106	111	101	94	79	69	61	58
San Luis	1,461	1,651	1,922	1,943	1,896	1,792	1,567	1,023	510	412	477	639
% of avg	132	132	137	120	108	96	84	61	38	40	54	64
Pardee	167	165	163	161	176	182	183	193	191	196	187	179
% of avg	96	94	92	90	98	100	101	102	99	103	102	100
New Melones	1,988	1,994	1,992	1,977	2,001	1,979	1,909	1,778	1,673	1,573	1,492	1,437
% of avg	153	151	148	142	139	133	129	119	110	108	109	108
Don Pedro	1,612	1,597	1,600	1,607	1,644	1,641	1,610	1,612	1,525	1,401	1,301	1,266
% of avg	124	122	120	116	115	111	110	105	95	91	91	93
Millerton	241	253	248	237	209	246	295	347	300	226	186	200
% of avg	128	116	89	70	61	68	81	85	72	69	81	99
Pine Flat	410	435	468	492	513	560	640	698	508	267	187	185
% of avg	117	116	112	103	96	100	105	97	73	51	48	53
Kaweah	14	17	23	15	25	52	88	129	91	35	14	12
% of avg	130	135	149	72	103	134	122	112	89	69	73	95
Success	6	7	9	11	17	25	32	34	22	6	5	4
% of avg	65	69	72	60	67	74	71	61	41	17	23	27
Isabella	231	226	227	223	222	226	231	241	210	158	126	114
% of avg	145	150	147	132	123	116	103	82	68	59	60	62
Statewide % avg	125	120	120	110	110	110	105	95	90	85	85	85

Precipitation and Water Supply Indices

Northern Sierra 8-Station Index

In the northern Sierra Nevada, precipitation is indexed by averaging rain gauge totals at eight representative stations creating what is known as the Northern Sierra 8-Station Index. The eight stations are: Mount Shasta City, Shasta Dam, Mineral, Quincy, Brush Creek, Sierraville Ranger Station, Blue Canyon, and Pacific House. The 8-Station Index provides a representative sample of the major watersheds (upper Sacramento, Feather, Yuba, and American rivers) and serves as a wetness index for the Sacramento River hydrologic region.

Sacramento River Runoff

Sacramento River runoff is the sum of unimpaired flow in million acre-feet (maf) at the Sacramento River above Bend Bridge, Feather River at Oroville (inflow to Lake Oroville), Yuba River near Smartville, and American River below Folsom Lake. The Sacramento Valley unimpaired runoff represents the natural water production of the Sacramento River basin, unaltered by upstream diversions, storage, or export of water to or import of water from other basins.

Also known as the “Sacramento River Index,” this index was previously used to determine year type classifications under State Water Resources Control Board (SWRCB) Water Right Decision 1485. Also previously referred to as the “4 River Index” or “4 Basin Index”.

Eight River Index

This index is the sum of the unimpaired runoff from eight rivers—four in the Sacramento Valley (same as those used to calculate the Sacramento River Index) and four in the San Joaquin Valley: Stanislaus River inflow to New Melones Reservoir; Tuolumne River inflow to New Don Pedro Reservoir; Merced River inflow to Lake McClure; and San Joaquin River inflow to Millerton Lake.

This index determines the duration of the fish and wildlife salinity and flow standards at Chipps Island or Port Chicago from February through June.

Sacramento Valley 40-30-30 Index

SWRCB Water Right Decision 1641 (D-1641) applies the Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index), a water supply forecasting tool, to derive the water year type for the Sacramento Valley. Previously, the Sacramento River Index was used to classify types of water years. SWRCB first introduced the Sacramento Valley 40-30-30 Index in the 1991 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), and continued using it with the 1995 Bay-Delta Plan. D-1641 implements portions of the 1995 Bay-Delta Plan with respect to the operation of the State Water Project and the Central Valley Project. The Sacramento Valley 40-30-30 Index is used to determine the Sacramento Valley water year type for the purpose of implementing water quality objectives defined in D-1641. It also provides an estimate of the potential water supply originating in a basin from rainfall and snowmelt runoff, groundwater accretion, and reservoir carryover storage. The Sacramento Valley 40-30-30 Index incorporates seasonal differences in water contribution for the year and includes the prior year’s conditions in order to establish a more reliable index of water availability. The 40-30-30 factors represent the percentage weight given to the following:

- (1) 40%—the current year’s April through July Sacramento Valley unimpaired runoff;

- (2) 30%—the current year’s October through March Sacramento Valley unimpaired runoff; and
- (3) 30%—the previous year’s index with a cap of 10 maf (to account for required flood control reservoir releases during wet years).

The water year type is determined by where the index value falls on a scale specific to the Sacramento Valley (as defined in D-1641).

Classification	Index (maf)
Wet	Equal to or greater than 9.2
Above Normal	Greater than 7.8 and less than 9.2
Below Normal	Equal to or less than 7.8 and greater than 6.5
Dry	Equal to or less than 6.5 and greater than 5.4
Critical	Equal to or less than 5.4

Year types are set by the first-of-the-month forecasts beginning in February, and the Sacramento Valley 40-30-30 Index May 1 forecast determines the final water year type for implementing water quality and flow requirements contained in D-1641. The D-1641 objectives are conditioned by water year type and generally become less stringent during dryer years.

San Joaquin Valley 60-20-20 Index

D-1641 uses a similar method to determine the water year type for the San Joaquin Valley. The San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) uses (1) the current year’s April through July San Joaquin Valley unimpaired runoff (60 percent); (2) the current year’s October through March San Joaquin Valley unimpaired runoff (20 percent); and (3) the previous year’s San Joaquin Valley 60-20-20 Index (20 percent, with a cap of 4 maf to account for required flood control reservoir releases during wet years).

The water year type is determined by where the index value falls on a scale specific to the San Joaquin Valley (as defined in D-1641).

Classification	Index (maf)
Wet	Equal to or greater than 3.8
Above Normal	Greater than 3.1 and less than 3.8
Below Normal	Equal to or less than 3.1 and greater than 2.5
Dry	Equal to or less than 2.5 and greater than 2.1
Critical	Equal to or less than 2.1

The San Joaquin Valley 60-20-20 Index May 1 forecast determines the water year type for D-1641 San Joaquin River Vernalis flow standards.

October generally provided above average precipitation for the northern half of the state and below average rainfall for the southern half, November was extremely dry statewide, and December was slightly less than average throughout most of the state. At the end of October, water year runoff totals were 90, 47, and 46 percent of average for the Sacramento River, San Joaquin River, and Tulare Lake regions, respectively. By the end of December, runoff totals for the new water year were 47, 22, and 35 percent of average, respectively, for the same three regions.

State Water Project Storage

The State Water Project (SWP) operates a complex system of dams and reservoirs to collect and store water for future deliveries. Lake Oroville is the first of two primary SWP conservation facilities. Inflow into Lake Oroville comes from tributaries of the Feather River.

The San Luis Reservoir is the second primary SWP conservation facility. This Central California facility derives its inflow from pumping at the Gianelli Pumping-Generating Plant. San Luis is an off-stream storage reservoir. Most of the water is pumped into the reservoir from late fall to early spring. This water is temporarily stored, then released to the California Aqueduct to meet water contractor peaking demands in the summer months. The remaining SWP dams and reservoirs regulate the stored water supply in delivery patterns that are designed to fit local water demands.

Water Year 2006–2007 Storage Totals

At the end of the 2006–2007 water year, water storage in all SWP reservoirs was 2.72 maf or 50 percent of maximum storage, compared to 4.4 maf or 82 percent of maximum storage at the end of water year 2005–2006. The average end-of-month total storage for the 2006–2007 water

year in major SWP reservoirs was 3.98 maf. End-of-water-year storage on September 30, 2007, at Lake Oroville was 1.57 maf, which was about 1.26 maf less than the previous water year. The State's share of San Luis Reservoir storage at the end of the 2006–2007 water year was 445,112 af, as compared with 911,032 af in the previous water year. The combined storage in southern reservoirs was 618,703 af on September 30, 2007, as compared with 572,800 af at the end of the 2005–2006 water year.

Calendar Year 2007 Storage Totals

The total storage in major SWP reservoirs was about 2.45 maf at the end of calendar year 2007, as compared with 4.49 maf in 2006. The State's share of San Luis Reservoir storage was 663,928 af on December 31, 2007, as compared with 1,242,330 af at the same time in 2006. The combined storage in the southern reservoirs was 556,671 af on December 31, 2007, as compared with 458,487 af at the same time in 2006.

Lake Oroville

Lake Oroville is the keystone of the SWP. It has a maximum water storage capacity of 3,537,580 af. Runoff from Feather River drainage is collected and stored in this reservoir. This water is released to the Sacramento-San Joaquin Delta through Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

Water Year 2006–2007 Inflow

Lake Oroville inflow for the 2006–2007 water year totaled about 2.33 maf, which was 55 percent of the 30-year average (4.25 maf). Maximum daily inflow occurred on February 10, 2007, at 53,980 af. Minimum daily inflow occurred on September 21, 2007, at 238 af. Peak monthly total inflow (for the 2006–2007 water year) occurred in February 2007, at 378,419 af, 16 percent of the water year total of 2,330,851 af.

The maximum total in 30 years was in water year 1982–1983 at 8,853,572 af. The minimum total in 30 years was in water year 1976–1977 at 1,555,774 af. (See Figures 8-2 and 8-3 for calendar year and cumulative inflows, respectively, into Lake Oroville.)

Calendar Year 2007 Inflow and Storage

Total inflow into Lake Oroville during the calendar year was 2,026,586 af. Minimum storage occurred on December 31, 2007, at 1,226,833 af, 35 percent of its capacity. Maximum storage occurred on April 4, 2007, at 3,135,623 af, 89 percent of its capacity. End-of-year Lake Oroville storage was 1,226,833 af. Figure 8-4 compares end-of-month storage in Lake Oroville for the 2006 and 2007 calendar years.

2006–2007 Water Year San Luis Reservoir Operations

San Luis Reservoir is operated jointly by DWR and the Bureau of Reclamation per operating procedures adopted in June 1981. San Luis Reservoir has a normal operating capacity of 2,027,840 af. The SWP share of this capacity is 1,062,183 af.

San Luis Reservoir reached its maximum water year total storage on January 14, 2007, at 2,013,241 af, 99 percent of its normal maximum operating capacity. At the beginning of the water year, San Luis Reservoir contained 1,318,075 af, 65 percent of its capacity. SWP storage share at the beginning of the water year was 916,668 af. The highest end-of-month SWP share of water storage for the 2006–2007 water year occurred in December 2006, at 1,242,330 af. (See Figure 8-5.)

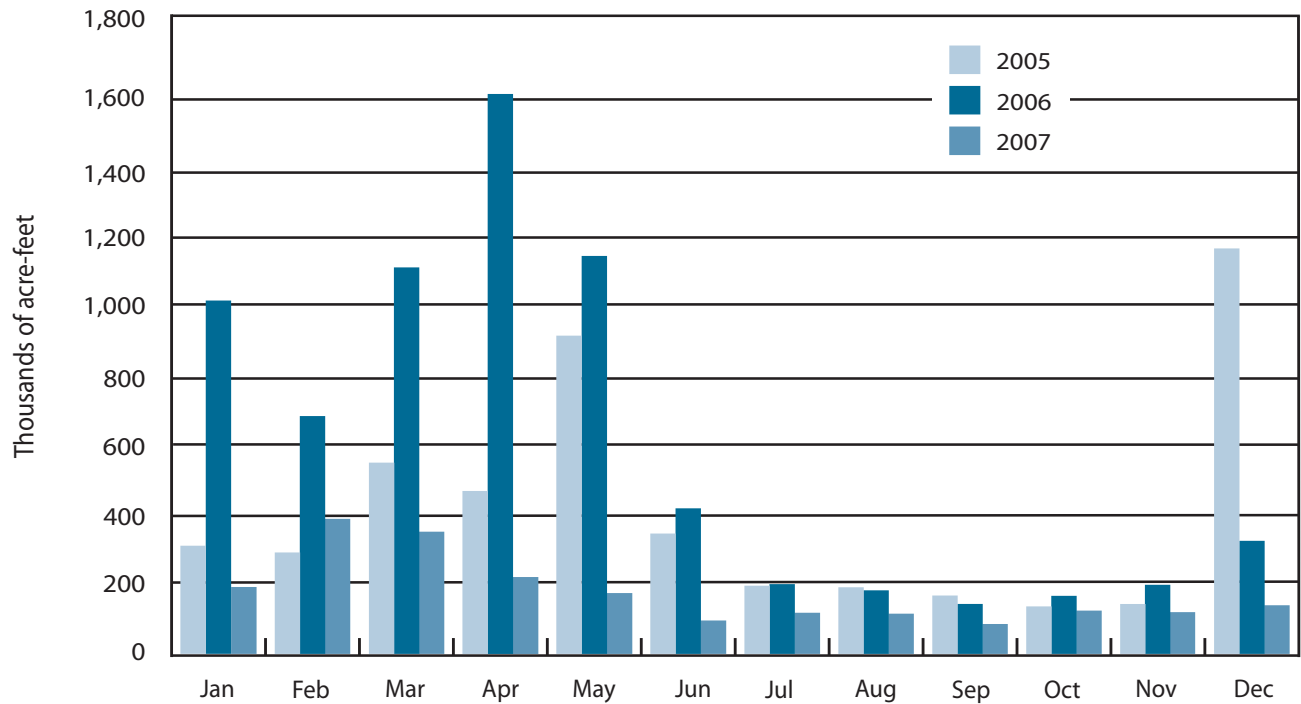


Figure 8-2 Monthly Inflow into Lake Oroville from the Feather River, 2005–2007 Calendar Years

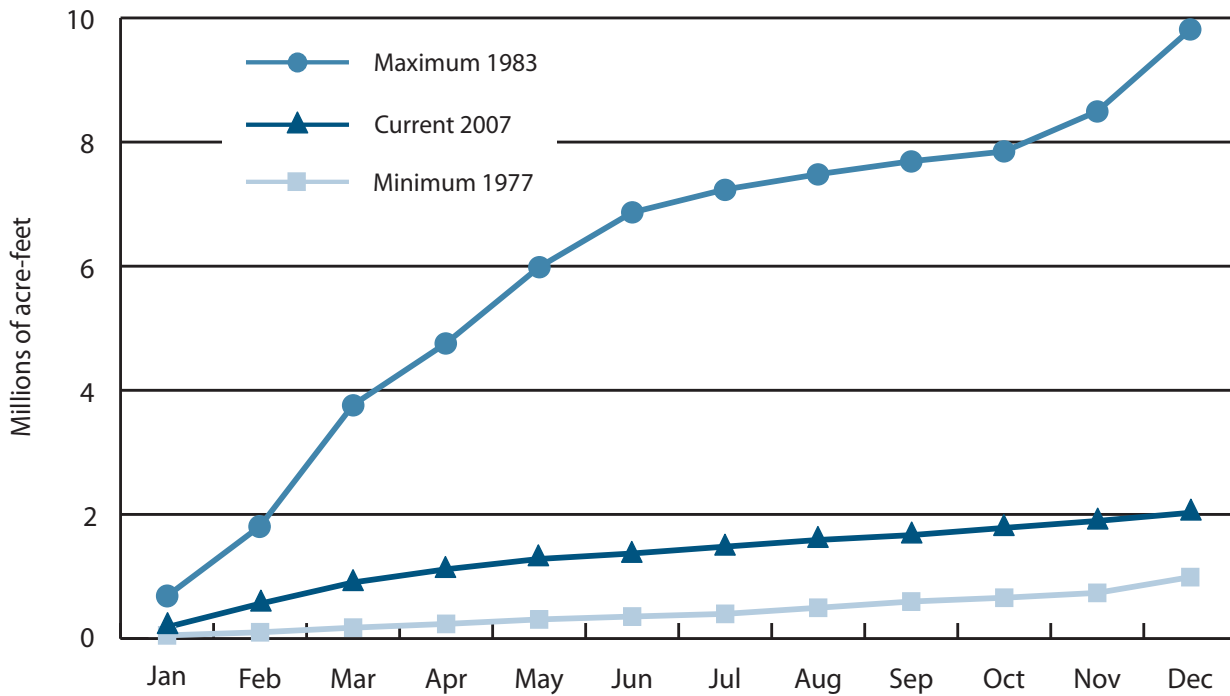


Figure 8-3 Cumulative Maximum, Minimum, and Current Lake Oroville Inflow

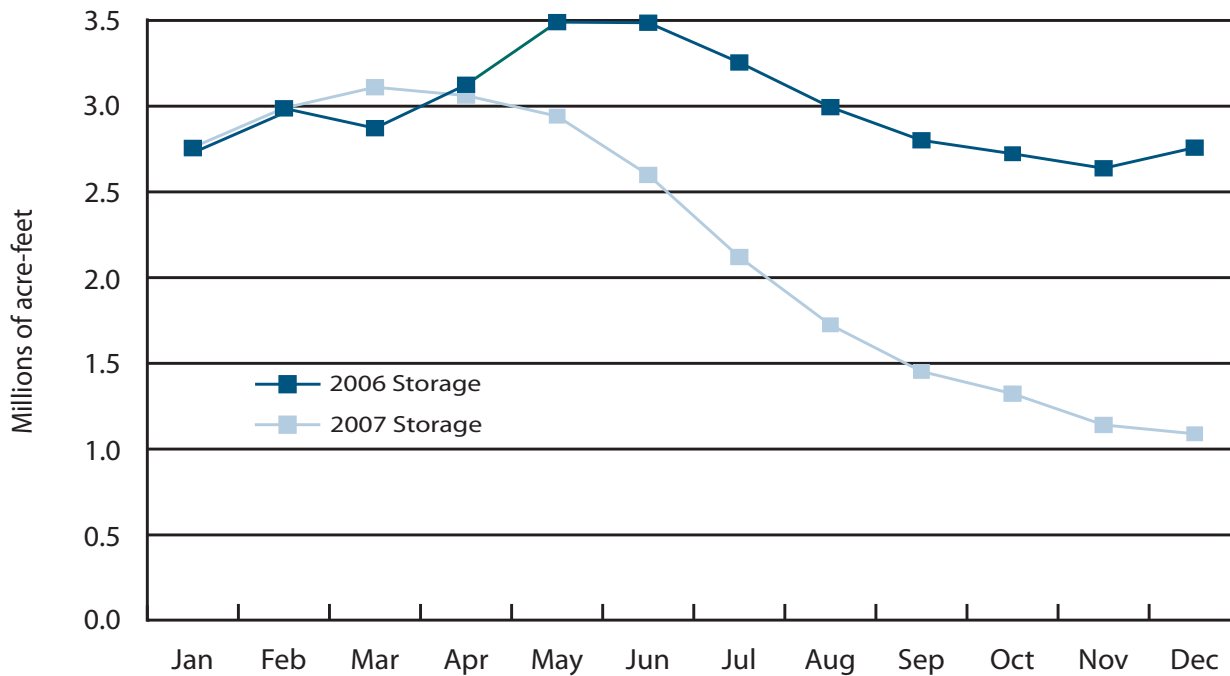


Figure 8-4 End-of-Month Storage in Lake Oroville, 2006 and 2007 Calendar Years

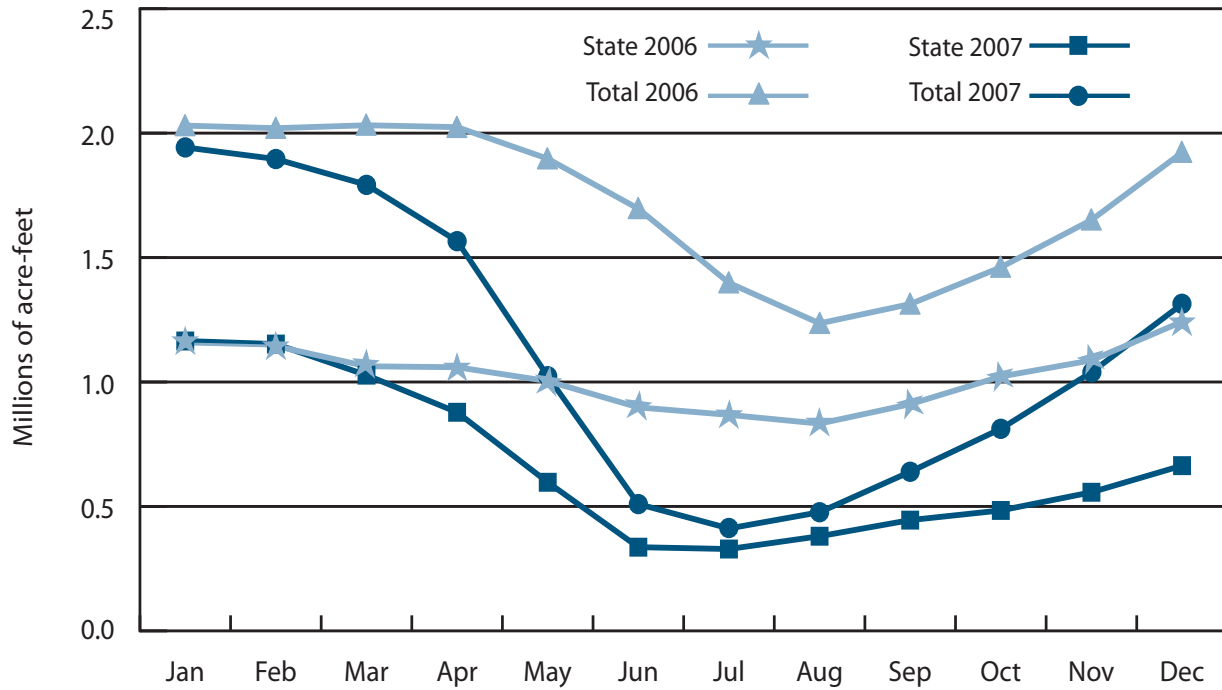


Figure 8-5 End-of-Month Storage in San Luis Reservoir, 2006 and 2007 Calendar Years

2006–2007 Water Year Lake del Valle Operations

Lake del Valle, which is situated off the South Bay Aqueduct, functions primarily as a storage facility for later water delivery into Santa Clara and Alameda counties. At the beginning of the water year, Lake del Valle held 35,742 af, which was about 46 percent of its maximum capacity of 77,106 af. Its highest storage during the 2006–2007 water year occurred on May 23, 2007, at 41,511 af. Its lowest storage occurred on December 18, 2006, at 24,644 af.

By the end of the water year, on September 30, 2007, storage in Lake del Valle was 32,724 af, 42 percent of maximum capacity of 77,106 af. There were no releases to Arroyo Valle and releases for the water year to the South Bay Aqueduct from Lake del Valle totaled 17,881 af.

2006–2007 Water Year Southern Reservoir Operations

During normal operating conditions, DWR maintains its four southern reservoirs—Pyramid, Castaic, Silverwood, and Perris—at or near full operating capacity to ensure uninterrupted delivery of water to Southern California contractors.

At the beginning of the water year, these reservoirs held 572,800 af, with 83 percent of their combined normal maximum operating capacity of 689,021 af. At the end of the water year, the reservoirs held 618,703 af, 90 percent of combined normal maximum operating capacity.

Diversions from the Delta

SWP diverts water from the Sacramento-San Joaquin Delta, through Banks and Barker Slough pumping plants, for delivery to SWP water contractors’ storage facilities. In 2007, the SWP diverted 2,396,391 af at

Banks Pumping Plant. Cross Valley Canal wheeling at Banks Pumping Plant totaled 24,221 af and Central Valley Project (CVP) water wheeled at Banks Pumping Plant by DWR during 2007 totaled 83,257 af. The CVP diverted 2,586,383 af at the Jones Pumping Plant and 111,350 af at the Contra Costa Pumping Plant. The combined Delta exports include all of these plants. Figure 8-6 shows the amounts of water pumped each month in 2007 at the Banks Pumping Plant. Figure 8-7 shows the monthly amounts of water diverted from the Delta in 2007 by the SWP and CVP. CVP diverts water to similar areas from the Delta through Jones Pumping Plant and Contra Costa Pumping Plant.

Water is delivered from Banks Pumping Plant to the South Bay Area through the South Bay Aqueduct and to the San Joaquin Valley, Central Coastal, and Southern California areas through the California Aqueduct. The SWP diverts water from Barker Slough Pumping Plant to the North Bay Aqueduct.

In 2007, the North Bay Aqueduct received 59,464 af of project water from the Barker Slough Pumping Plant.

Dos Amigos Pumping Plant diverts water from O'Neill Forebay to the California Aqueduct. Figure 8-8 shows monthly total amounts pumped at Dos Amigos Pumping Plant for calendar year 2007. Pumping peaked in July 2007 at 364,499 af.

Maximum daily Delta exports occurred on July 15, 2007, at 25,309 af. Combined SWP and CVP monthly Delta exports in 2007 varied from a low of 92,657 af in May, to a high of 695,362 af in August. In 2007, Delta exports totaled approximately 5.09 maf.

In 2007, water pumped through the Edmonston Pumping Plant for delivery to Southern California totaled 2,037,144 af. Figure 8-9 shows the amount of water pumped each month in 2007.

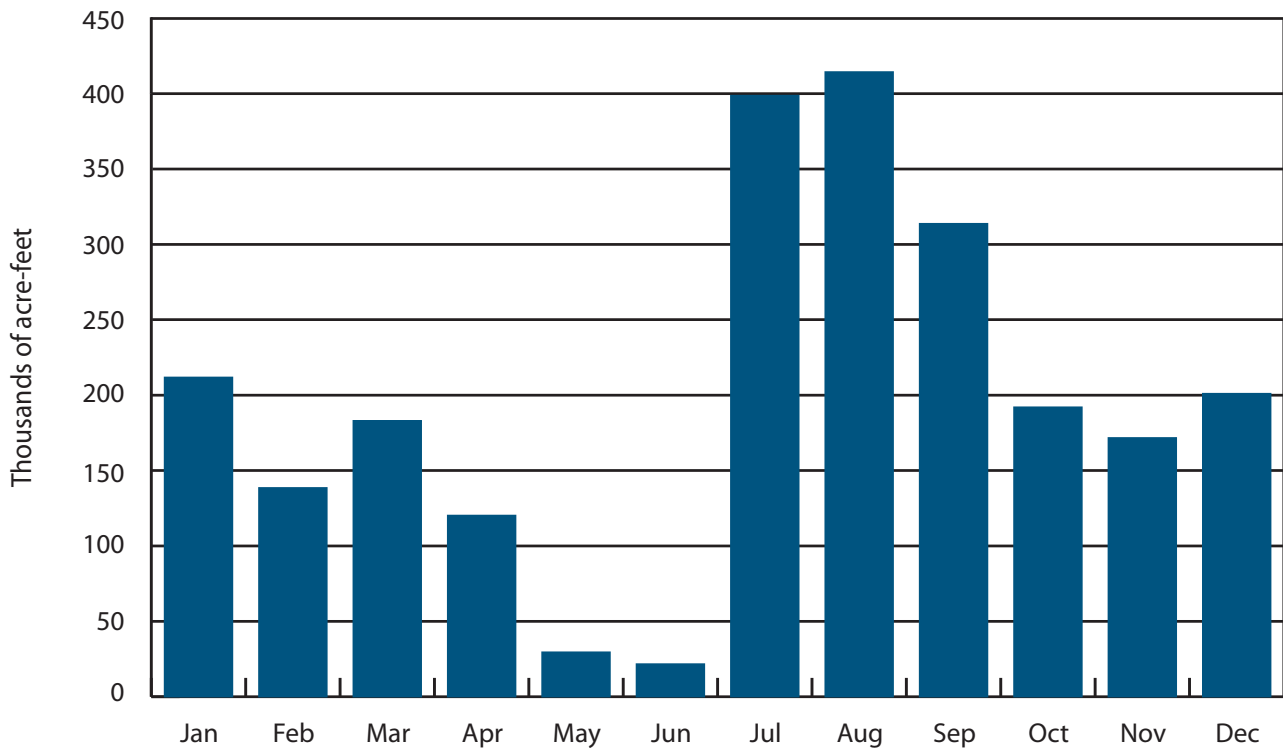


Figure 8-6 Water Pumped at Banks Pumping Plant, 2007 Calendar Year

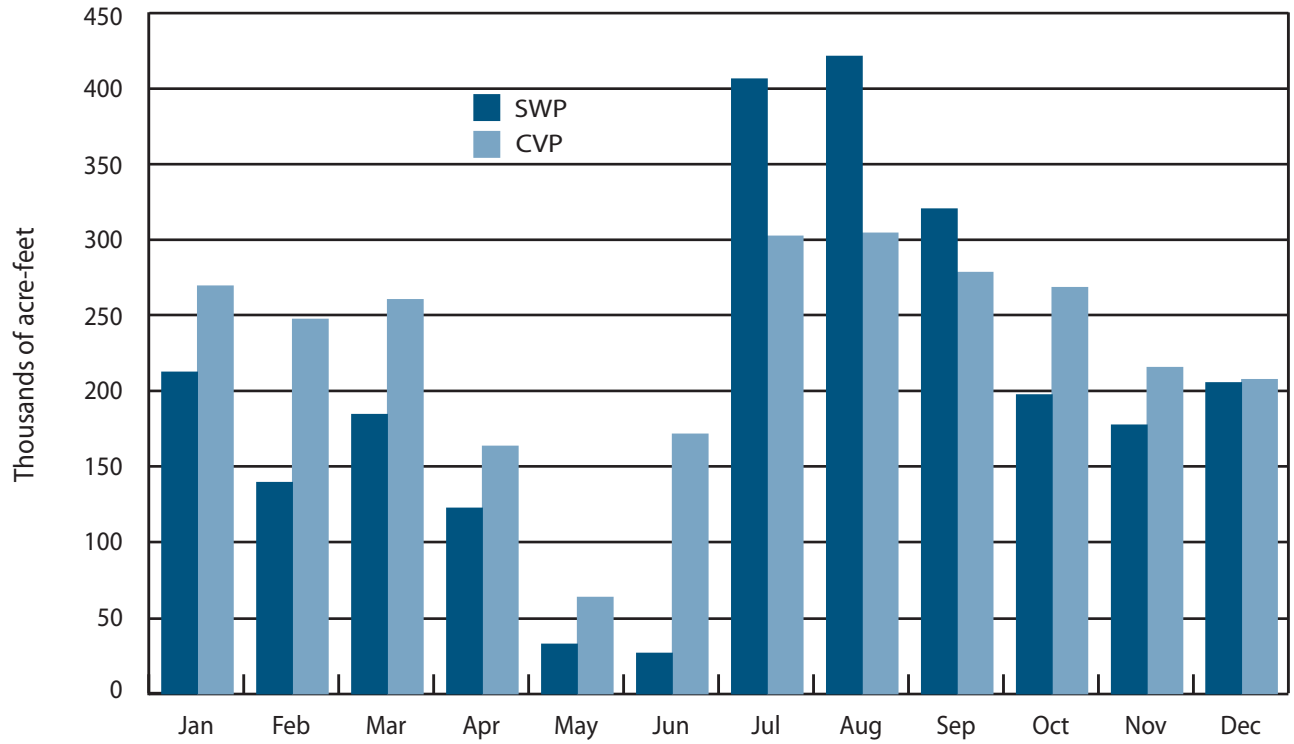


Figure 8-7 Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2007 Calendar Year

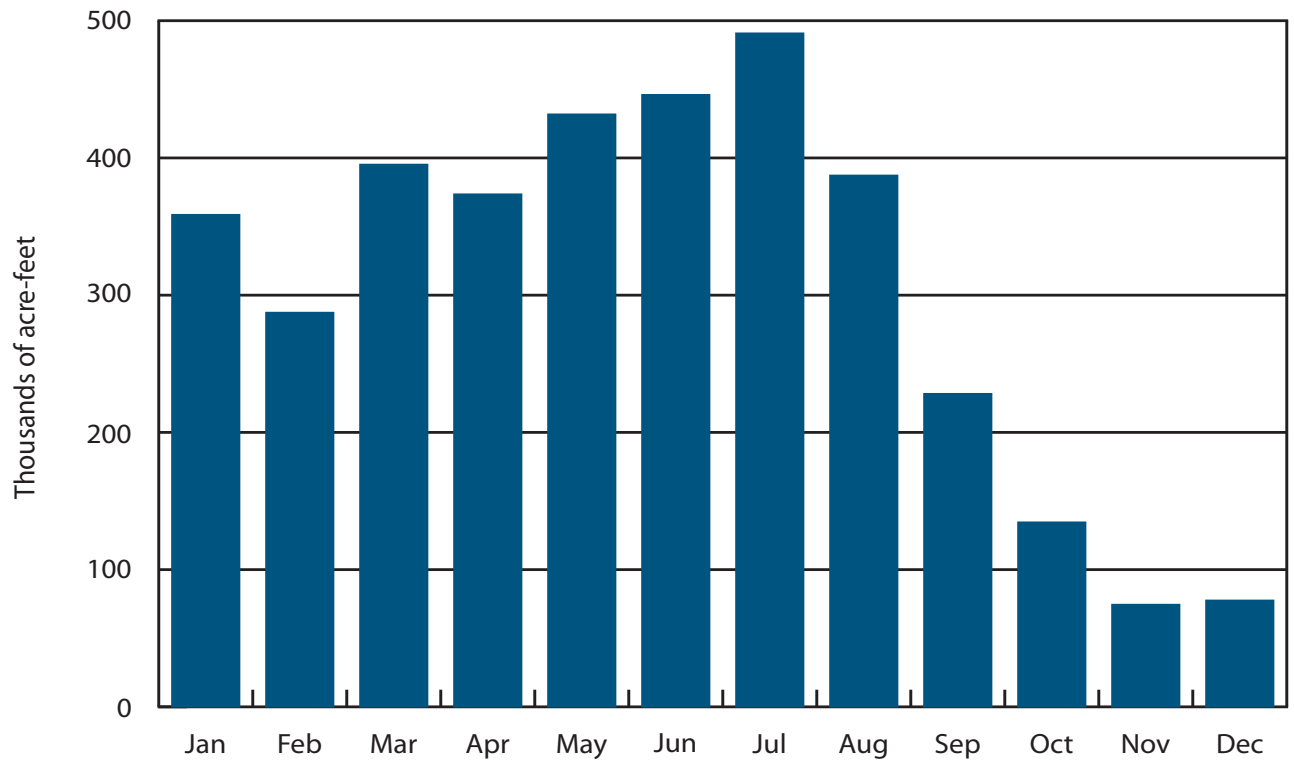


Figure 8-8 Water Pumped at Dos Amigos Pumping Plant, 2007 Calendar Year

For more information, see the water supply information website at http://cdec.water.ca.gov/water_supply.html.

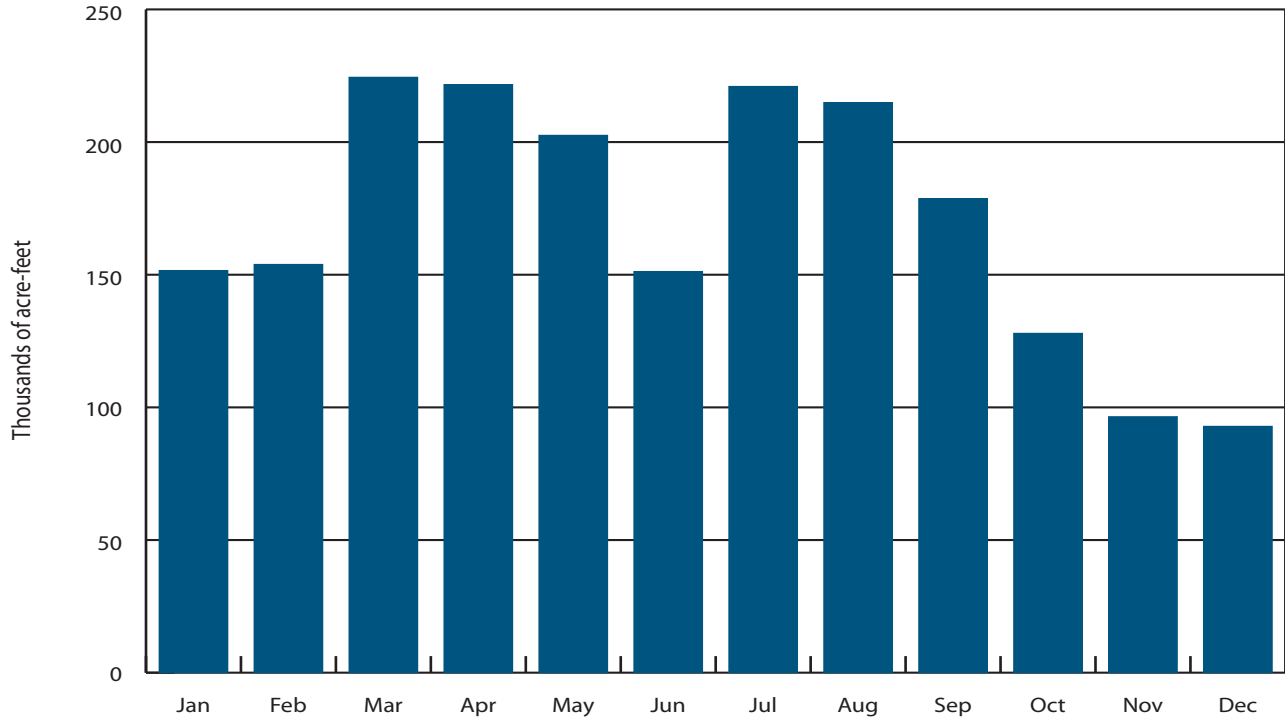


Figure 8-9 Water Pumped at Edmonston Pumping Plant, 2007 Calendar Year



Chapter 9

Water Contracts and Deliveries

Oroville Lake and Dam.

Significant Events in 2007

The draft environmental impact report (EIR) for the Monterey Amendments was released for public review and comment in October 2007.

In 2007, the Sacramento Valley 40-30-30 Index classified the water year in the Sacramento Valley as “dry,” and the San Joaquin Valley 60-20-20 Index classified that region’s water year as “critical.” The Department of Water Resources (DWR) was able to approve 60 percent of all State Water Project (SWP) water contractors Table A requests, amounting to 2,466,224 af. The total Table A water delivered to all SWP water contractors in calendar year 2007 was 1,986,455 af.

On December 4, 2007, DWR signed an 18-year agreement with Yuba County Water Agency (YCWA) for the purchase of water for the Environmental Water Account and for dry year water supplies to 22 SWP and Central Valley Project (CVP) contractors. DWR purchased a total of 480,000 af of water from YCWA for delivery at the rate of 60,000 af annually from 2008–2015 to help offset Delta export pumping reductions to benefit at-risk fish species and improve water supply reliability. In December 2007, DWR signed agreements with several of the contractors for dry year supplies from YCWA, and was in final negotiations for the remaining agreements.

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

The long-term water supply contracts between the Department of Water Resources (DWR) and 29 public agencies and local water districts provide for water service from the State Water Project (SWP) and are the basis for the SWP's construction and on-going operations. The State provides SWP financing, capital construction, improvements, and all operations and maintenance of SWP facilities and the agencies have contractually agreed to repay all associated costs.

The contracts also set forth the maximum amount of water a contractor may request each year from the SWP and these are written within the contracts in a list format known as Table A. "Table A" or "Table A water" represents a portion or all of the annual Table A requested by the SWP water contractors and approved for delivery by DWR, based on hydrologic conditions, current reservoir storage, and combined requests from the SWP water contractors. Under certain conditions DWR is not able to deliver the quantity of water requested by contractors. In these years, a lesser amount is allocated and delivered according to the long-term water supply contracts by prorating the amount in proportion to each SWP water contractor's maximum Table A amount. Table A amounts may also be used as a factor to allocate other available water supplies to each contractor. Approved Table A amounts may also be referred to in this chapter as "approved amounts," "approved water," or "allocated water". Long-term water supply contracts can be found at <http://www.water.ca.gov/swpao/wsc.cfm>.

The long-term water supply contracts are amended as needed. During 2007, eleven amendments were executed; however, eight will not become effective until 2010. All newly executed amendments are further described in this chapter.

DWR also enters into agreements with SWP water contractors, corporations, and other water agencies, which may be amended

periodically, to convey SWP and non-SWP water through the California Aqueduct and to approve the construction, operation, and maintenance of turnouts along SWP facilities. These agreements are listed in this chapter.

The State Water Project Analysis Office (SWPAO) developed a numbering system for contracts, amendments, and agreements executed by DWR. These numbers, referred to as SWPAO numbers, are designated in Chapter 9 text as "SWPAO #XXXXX" and are located in parentheses after each contract, amendment, or agreement description. These numbers can be used as an identifier for anyone who contacts DWR staff for more detailed information on a particular document.

Amendments to Long-Term SWP Water Supply Contracts

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

1. revision of annual Table A amounts in the water supply contracts;
2. allocation of costs and benefits for the enlargement or extension of the East Branch and extension of the Coastal Branch of the California Aqueduct;
3. purchase of excess capacity in the California Aqueduct;

SWP Long-Term Water Supply Contracts

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

The Metropolitan 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 Table A amount was transferred to Metropolitan through an amendment to the district's long-term contract with DWR. Long-term contracts with Hacienda Water District and Devil's Den Water District were also terminated when those districts transferred their Table A amounts, 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 periodically to incorporate mutually agreed upon 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 Table A amounts). That amount was designed to increase gradually until the maximum amount of annual Table A was reached. The total combined maximum annual Table A amount for all water contracting agencies was initially 4,230,000 af, 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 1990s, the current combined maximum annual Table A amount totals 4,172,786 af, and the contracts are in effect for the longest of the following periods: (1) the project repayment period, which extends to 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.

4. provisions to allow contractors, under certain conditions, to carry over undelivered SWP Table A water from one year for delivery in the next year; and
5. implementation of Monterey Agreement principles.

2007 Amendments to Long-Term Water Supply Contracts

The following water supply contract amendments were executed or became effective during 2007 for changes to Table A amounts.

One-Year Reduction of Table A Amounts: County of Butte

DWR executed Amendment No. 19 to the water supply contract between County of Butte (Butte) and DWR on January 19, 2007. The amendment provides for a reduction of Butte's Table A amounts to 1,200 af for 2007 only. (SWPAO #06014)

Amendments to Adjust Table A Amounts

San Geronio Pass Water Agency. DWR executed Amendment No. 17 to the water supply contract between San Geronio Pass Water Agency (San Geronio) and DWR on April 27, 2007. The amendment provides for a permanent increase effective January 1, 2007, of 1,150 af and permanent decreases of 5,300 af for 2008; 3,300 af for 2009; and 1,300 af for 2010 of San Geronio's Table A amounts. This had the effect of decelerating the growth of San Geronio's Table A amounts. (SWPAO #07002)

DWR executed Amendment No. 18 to the water supply contract between San Geronio and DWR on December 26, 2007. The amendment provides for a permanent increase effective January 1, 2008 of 5,300 af and permanent increases of 3,300 af for 2009, and 1,300 af for 2010 of San Geronio's Table A amounts. This had the long-term effect of restoring San Geronio's Table A deliveries to their previous amounts prior to Amendment 17 being executed. (SWPAO #07028)

Permanent Transfers of Table A Amounts

Permanent transfers of Table A amounts occur in pairs; one SWP contractor's Table A amounts decrease by a designated amount, and another SWP contractor's Table A amounts increase by the same amount. The following such permanent transfers occurred in 2007.

From Tulare Lake Basin Water Storage District to Coachella Valley Water District and Desert Water Agency

Tulare Lake Basin Water Storage District. DWR executed Amendment No. 34 to the water supply contract between Tulare Lake Basin Water Storage District (Tulare) and DWR on May 9, 2007. The amendment provides for a permanent transfer of 5,250 af to decrease Tulare's Table A amounts effective January 1, 2010. (SWPAO #07014)

Coachella Valley Water District. DWR executed Amendment No. 20 to the water supply contract between Coachella Valley Water District (Coachella) and DWR on May 9, 2007. The amendment provides for a permanent transfer of 5,250 af to increase Coachella's Table A amounts effective January 1, 2010. (SWPAO #07015)

Tulare Lake Basin Water Storage District. DWR executed Amendment No. 33 to the water supply contract between Tulare and DWR on May 9, 2007. The amendment provides for a permanent transfer of 1,750 af to decrease Tulare's Table A amounts effective January 1, 2010. (SWPAO #07012)

Desert Water Agency. DWR executed Amendment No. 19 to the water supply contract between Desert Water Agency (Desert) and DWR on May 9, 2007. The amendment provides for a permanent transfer of 1,750 af to increase Desert's Table A amounts effective January 1, 2010. (SWPAO #07013)

From Kern County Water Agency to Coachella Valley Water District and Desert Water Agency

Kern County Water Agency. DWR executed Amendment No. 38 to the water supply contract between Kern County Water Agency (Kern) and DWR on September 26, 2007. The amendment provides for a permanent transfer of 12,000 af to decrease Kern's Table A amounts effective January 1, 2010. (SWPAO #07019)

Coachella Valley Water District. DWR executed Amendment No. 21 to the water supply contract between Coachella and DWR on September 26, 2007. The amendment provides for a permanent transfer of 12,000 af to increase Coachella's Table A amounts effective January 1, 2010. (SWPAO #07020)

Kern County Water Agency. DWR executed Amendment No. 37 to the water supply contract between Kern and DWR on September 26, 2007. The amendment provides for a permanent transfer of 4,000 af to decrease Kern's Table A amounts effective January 1, 2010. (SWPAO #07017)

Desert Water Agency. DWR executed Amendment No. 20 to the water supply contract between Desert and DWR on September 26, 2007. The amendment provides for a permanent transfer of 4,000 af to increase Desert's Table A amounts effective January 1, 2010. (SWPAO #07018)

Monterey Amendments

The Monterey Amendments increase the reliability of existing water supplies, and increase water management flexibility, providing more tools for local water agencies to maximize use of existing facilities.

The Monterey Amendments include changes in allocation of Table A water, the transfer of Table A amounts and land, financial restructuring, and increased operational flexibility. The Monterey Amendments are discussed in detail in Chapter 1, Summary of Significant Events, of Bulletin 132-95, available online at http://www.water.ca.gov/swpao/docs/bulletin/95/chapters_frameset95.html.

Plumas County Flood Control and Water Conservation District (Plumas) and Empire-West Side Irrigation District (Empire) remain the only long-term SWP water contractors who have not signed the Monterey Amendments.

In accordance with the terms of the May 5, 2003, Monterey Settlement Agreement, the SWP continues to operate pursuant to the Monterey Amendments, while the new environmental impact report (EIR) is being prepared. The draft EIR was released in October 2007 and is available online at http://www.water.ca.gov/environmentalservices/monterey_plus.cfm. The final EIR is expected to be released in early 2010. The settlement agreement is discussed in detail in Chapter 9, Water Contracts and Deliveries, of Bulletin 132-04 (available online at <http://www.water.ca.gov/swpao/docs/bulletin/04/Bulletin132-04.pdf>).

Miscellaneous Agreements with Long-Term SWP Water Contractors

2007 Water Conveyance and Exchange Agreements

Water conveyance and exchange agreements that were executed or pending execution with long-term SWP water contractors during 2007 are described below.

Castaic Lake Water Agency

An agreement pending execution among DWR, Castaic Lake Water Agency (Castaic Lake), and Kern provides for the long-term annual conveyance of up to 11,000 af of nonproject Kern River water from Buena Vista Water Storage District (Buena Vista), a member unit of Kern, to Castaic Lake. The Kern River water will be provided to Castaic Lake either by a change in the point of delivery (POD) of a portion of Kern's annual Table A water in exchange for a like amount of Buena Vista's water or by direct pump-in to the California Aqueduct and conveyance under Article 55 of Castaic's long-term water supply contract. A total of 11,000 af was delivered under this agreement during 2007. (SWPAO #07008)

County of Butte

A letter agreement dated December 17, 2007 between DWR and County of Butte (Butte) provides for a one-time approval of an advance delivery of 255 af of Butte's 2008 Table A allocation to meet Butte's 2007 water supply needs. Butte County received 236 af under this agreement, which DWR will deduct from Butte's 2008 Table A water allocation. (SWPAO #07032)

Crestline-Lake Arrowhead Water Agency

A long-term POD agreement pending execution among DWR, Crestline-Lake Arrowhead Water Agency (Crestline), and San Bernardino Valley Municipal Water District (San Bernardino) will provide for an emergency water supply totaling 7,600 af to Lake Arrowhead Water Community Services District effective January 1, 2007 through December 31, 2020, or until all water has been delivered pursuant to this agreement. A total of 710 af was delivered to Crestline in 2007. (SWPAO #07025)

Dudley Ridge Water District

An agreement pending execution among DWR, Dudley Ridge Water District (Dudley Ridge), and Kern will provide for the transfer of up to 1,000 af of Dudley Ridge's 2007 Table A water to Kern on behalf of a landowner who farms in both the Dudley Ridge and Kern service areas. During 2007, 1,000 af was delivered under this agreement. (SWPAO #07034)

Empire-West Side Irrigation District

A contract dated April 30, 2007, between DWR and Empire provides for the delivery of unscheduled water to Empire in 2007 at times when SWP water is not needed for fulfilling Table A deliveries or for meeting project operational commitments. During 2007, 1,172 af of unscheduled water was delivered to Empire. (SWPAO #07009)

Kern County Water Agency

A letter agreement executed on April 26, 2007, between DWR and Kern provides for the transfer and future return of up to 50,000 af of Westlands Water District (Westlands) Central Valley Project (CVP) water to Kern. The Bureau of Reclamation (Reclamation) provided Westlands' 2006–2007 CVP water in O'Neill Forebay, and DWR conveyed the water, under Article 55 of Kern's long-term water supply contract, to Semitropic Water Storage District (Semitropic), a member unit of Kern. Water will be returned to Westlands either by pumping recovered groundwater into the California Aqueduct and delivery of a like amount by DWR to CVP in O'Neill Forebay, or by delivery of Kern's Table A water in a like amount to CVP in O'Neill Forebay. During 2007, 8,867 af was delivered to Kern pursuant to this agreement. (SWPAO #06013)

A letter agreement, pending execution between DWR and Kern, will provide for the delivery of up to 1,000 af of the City of Tracy's (Tracy) 2006–2007 CVP water to Kern for Semitropic to use as in lieu or for direct recharge of the local groundwater basin. In exchange, the agreement states that 100 af will be returned to Tracy in 2007 and a total of 800 af in future years. In 2007, 1,000 af of Tracy's CVP water was delivered to Semitropic and 100 af was returned to Tracy. (SWPAO #07011)

A letter agreement, pending execution between DWR and Kern, will provide for the delivery of up to 53,300 af of 2007 CVP water to Kern from Kern-Tulare Water District (Kern-Tulare) and Rag Gulch Water District (Rag Gulch), both Cross Valley Canal (CVC) contractors, in exchange for a like amount of Kern's Table A water. The CVP water will be delivered pursuant to Article 55 of Kern's long-term water supply contract. The agreement would be effective from March 1, 2007, through February 29, 2008. During 2007, 15,429 af of 2007 CVP water was delivered to Kern. (SWPAO #07016)

A change in POD agreement is pending execution among DWR, Kern, and Westlands for up to 6,214 af of Kern's 2007 Table A water. Kern's water will be delivered to the Kings County portion of Westlands' service area, which is within the SWP place of use. This agreement will allow for conveyance of nonproject water to Westlands from Nickel Family, LLC, by exchanging that water for a portion of Kern's 2007 Table A water. The agreement would be effective from July 15, 2007, through December 31, 2008. A total of 6,214 af was delivered to Westlands during 2007. (SWPAO #07023)

A change in POD agreement is pending execution among DWR, Kern, and Westlands for up to 10,000 af of Kern's 2007 Table A. Kern's water will be delivered to the Kings County portion of Westlands' service area, which is within the SWP place of use. This agreement will allow Westlands to acquire water stored in the Kern Water Bank (KWB) by exchanging that water for a portion of Kern's 2007 Table A water. The agreement would be effective from July 15, 2007, until all water has been returned pursuant to the agreement. During 2007, 10,000 af was delivered to Westlands. (SWPAO #07026)

A letter agreement, pending execution between DWR and Kern, will provide for the delivery of up to 10,000 af of Kern's 2007 Table A water in O'Neill Forebay for use at the Kern National Wildlife Refuge on behalf of Reclamation. This action will facilitate the return of 11,111 af of Kern-Tulare's (a CVP contractor) Friant-Kern water acquired by Reclamation. This agreement would be effective from January 1, 2007, through December 31, 2007. A total of 10,000 af was made available to Reclamation during 2007. (SWPAO #07033)

County of Kings

A change in POD agreement, pending execution among DWR, County of Kings (Kings), and Westlands, provides for Kings'

approved SWP water supplies to be delivered to specified Westlands turnouts in the California Aqueduct. This agreement defines the Westlands turnouts to be used during the term of the agreement, January 1, 2007, through December 31, 2035. Kings requested the water for use on Westlands' agricultural lands within Kings' service area, and during 2007 DWR delivered 300 af of Kings' 2007 Table A water and 286 af of Article 21 water. (SWPAO #07010)

Littlerock Creek Irrigation District

A letter agreement executed on December 31, 2007, among DWR, Littlerock Creek Irrigation District (Littlerock) and Antelope Valley-East Kern Water Agency (AVEK) will provide for the exchange of up to 1,380 af of Littlerock's 2007 Table A water with AVEK. AVEK will return an equal amount of its allocation of Table A water by December 31, 2017. DWR delivered 1,380 af of Littlerock's 2007 Table A water to AVEK's service area. (SWPAO #07031)

Palmdale Water District

An agreement pending execution among DWR, Kern, West Kern Water District (West Kern) a member unit of Kern, and Palmdale Water District (Palmdale) will provide for the delivery of 5,000 af of West Kern's portion of Kern's 2007 Table A water to Palmdale, effective September 1, 2007. By December 31, 2017, Palmdale will provide for the return of 10,000 af of Palmdale's Table A water to Kern. This 2-for-1 exchange was necessary in order for Palmdale to acquire an additional water supply for 2007. Kern provided 4,926 af for DWR delivery during 2007. (SWPAO #07029)

Tulare Lake Basin Water Storage District

A letter agreement dated May 4, 2007 between DWR and Tulare approved the transfer of up to 5,000 af of Tulare's 2007 Table A water to Westlands. The transfer was made on behalf of two landowners, Hansen Ranches for up to 4,000 af, and Newton

Farms for up to 1,000 af, both of which farm in Tulare's and Westlands' service areas. DWR petitioned the State Water Resources Control Board (SWRCB) for a temporary change in place of use and received approval on May 7, 2007. During 2007, 4,340 af of Tulare's Table A water was delivered to Westlands. (SWPAO #07003)

A letter agreement dated April 27, 2007, between DWR and Tulare approved the transfer of up to 6,000 af of Tulare's 2007 Table A water to Westlands on behalf of Westlake Farms Inc., which farms in both Tulare's and Westlands' service areas. During 2007, 1,805 af was delivered to Westlands for use on lands within the SWP place of use, Kings County portion of Westlands' service area. (SWPAO #07004)

A letter dated January 25, 2007, from DWR approved a temporary change in the delivery of Tulare's SWP water supplies through Dudley Ridge's turnout and for subsequent delivery into Tulare's service area effective December 19, 2006, through December 31, 2007. This approval facilitates the use of two adjacent turnouts during capacity restrictions in Tulare's turnout. During 2007, DWR delivered 454 af of Tulare's Article 21 water and 305 af of Article 56(c) water through Dudley Ridge's Turnout 2. (SWPAO #07006)

Oak Flat Water District

A letter agreement, pending execution between DWR and Oak Flat Water District (Oak Flat), provides for a one-time approval of an advance delivery of Oak Flat's 2008 Table A allocation to meet Oak Flat's 2007 water supply needs. Oak Flat received 10 af in 2007 and DWR will deduct 10 af from Oak Flat's 2008 Table A water allocation. (SWPAO #07036)

Santa Clara Valley Water District

A letter agreement dated August 16, 2007 approved the conveyance of up to 3,100 af

of Brown's Valley Irrigation District non-Project water under Article 55 of Santa Clara's Water Supply Contract. During 2007, 3,100 af was delivered under this agreement. (SWPAO #07021)

Water Conveyance and Exchange Agreements Prior to 2007

Water delivered during 2007 pursuant to agreements with SWP water contractors that were executed prior to 2007, is described below.

Castaic Lake Water Agency

By a letter dated June 2, 1994, DWR recognized the long-term agreement "Wheeling of SWP Water and other Allocated Water to Castaic Lake Water Agency" between Castaic Lake and Metropolitan Water District of Southern California (Metropolitan) for the conveyance of Castaic Lake's SWP water supplies through Metropolitan's Foothill Feeder. Metropolitan will convey Castaic Lake's water to the Rio Vista Water Treatment Plant in Castaic Lake's service area. During 2007, DWR delivered to Metropolitan's turnout facility 20,336 af of Castaic Lake's approved SWP water supplies (790 af of Article 56 water, and 19,546 af of Table A water). (SWPAO #94001)

County of Kings

A long-term change in POD agreement, executed March 10, 2006, among DWR, Kings, and Tulare will provide for the delivery of up to 200 af of Kings' annual Table A water and other SWP water supplies to Westlands' service area. The water is conveyed to GWF Energy, LLC, for use within the SWP place of use, Kings County service area. During 2007, 2 af was delivered to Westlands turnouts. (SWPAO #02031)

A change in POD agreement, executed March 24, 2004, among DWR, Kings, and Westlands provides for the delivery of up to 5,000 af of Kings' annual Table A water

through Westlands turnouts for use at Lemoore Naval Air Station. The agreement is effective from January 1, 2004, through December 31, 2035. During 2007, DWR delivered 2,531 af of Kings' Table A water to Westlands turnouts. (SWPAO #04005)

Dudley Ridge Water District

A long-term letter agreement dated November 19, 2003, among DWR, Dudley Ridge, and San Gabriel Valley Municipal Water District (San Gabriel) provides for delivery to San Gabriel of up to 11,458 af of Dudley Ridge's 2003 Table A amounts. San Gabriel will return its Table A water to Dudley Ridge during the term of the agreement through December 31, 2013. During 2007, San Gabriel returned 5,857 af of its Table A water to Dudley Ridge. (SWPAO #03055)

A long-term letter agreement dated March 13, 2005, among DWR, Dudley Ridge, and Kern provides for delivery to Kern of up to 12,000 af of Dudley Ridge's 2005 Table A water. Kern will return a portion of its Table A water, equal to two-thirds (66.7 percent) of Dudley Ridge's water delivered to Kern in 2005, during the term of the agreement through December 31, 2018. Kern returned 2,000 af of its Table A water to Dudley Ridge in 2007. (SWPAO #05015)

Kern County Water Agency

A POD agreement executed on June 8, 2000, between DWR and Kern provides approval for the delivery to Western Hills Water District (Western Hills) a portion of Kern's annual Table A water. In exchange, Kern will take a like amount of banked local water from the Pioneer Groundwater Bank. SWRCB approved Western Hills' service area to be included within the authorized SWP place of use on April 21, 2000. During 2007, 1,031 af of Kern's Table A water was delivered to Western Hills. (SWPAO #01001)

A long-term letter agreement dated July 19, 2006 provides for the delivery of up to 25,000 af of Westlands' CVP water to Kern for storage in Semitropic effective November 1, 2005, through April 15, 2006. Kern will provide return water in future years through December 31, 2035, or when all stored water has been returned to Westlands. By a letter dated October 11, 2007, from DWR, and with SWRCB approval, Kern provided 4,000 af of Westlands' water to the Fresno County portion of Westlands' service area during 2007. (SWPAO #05020)

Mojave Water Agency

A change in POD agreement executed November 13, 1997, among AVEK, Mojave Water Agency (Mojave), and DWR, and effective through December 31, 2019, allows for delivery of up to 2,250 af of Mojave's annual Table A amount to AVEK. Mojave does not have conveyance facilities to provide service to a solar energy generating station located within its service area. AVEK does have conveyance capability and has agreed to provide water service on Mojave's behalf. During 2007, DWR delivered 1,176 af of Mojave's SWP water supplies through AVEK's turnout, of which 1,140 af was 2007 Table A and 36 af was 2006 Article 56(c). (SWPAO #97003)

Napa County Flood Control and Water Conservation District

A change in POD agreement executed December 26, 2001, among DWR, Napa County Flood Control and Water Conservation District (Napa), and Solano County Water Agency (Solano) approved the delivery of up to 628 af of Napa's annual Table A water to the City of Vallejo Water Treatment Plant in Solano's service area of the North Bay Aqueduct (NBA). This water is further conveyed to the City of American Canyon, a member agency of Napa. During 2007, 180 af of Napa's water was delivered to Solano—175 af was Table A and 5 af was 2006 Article 56(c). (SWPAO #00029)

San Bernardino Valley Municipal Water District

San Bernardino and Metropolitan entered into Attachment 2 *Coordinated Use Agreement for Conveyance Facilities and State Water Project Water Supplies* on

May 14, 2001. By a letter dated February 27, 2002, DWR acknowledged the agreement and the coordinated use of local facilities currently existing within San Bernardino's jurisdictional boundaries. The coordinated use provides for delivery of San Bernardino's SWP water to Metropolitan's facilities within San Bernardino's service area. This action is permitted under Article 10 of the long-term water supply contract. During 2007, 30,000 af of San Bernardino's Table A water was delivered to Metropolitan. (SWPAO #02035)

Santa Barbara County Flood Control and Water Conservation District

A long-term letter agreement dated September 13, 2002, among DWR, Santa Barbara County Flood Control and Water Conservation District (Santa Barbara), and Dudley Ridge approved the exchange of up to 745 af of Santa Barbara's 2002 Table A water delivered to Dudley Ridge during 2002. Dudley Ridge will provide its future water supplies by December 31, 2012, to return water to Santa Barbara. During 2004, Dudley Ridge provided 225 af of its Table A water to Santa Barbara, and during 2007 the agreement was completed with a final return delivery of 520 af. (SWPAO #02013)

Solano County Water Agency

A settlement agreement was executed May 19, 2003, among DWR, Solano, and the cities of Fairfield, Vacaville, and Benicia. Concurrently, a conveyance agreement was executed between DWR and Solano. Together, these agreements approved the delivery of up to 31,620 af annually of settlement water to Solano for delivery to the three cities to help meet their current and future municipal and industrial water needs

through the NBA. During 2007, 10,568 af of settlement water was delivered to the three cities via the NBA. (SWPAO #03017)

Turnout Agreements

Kern County Water Agency

On July 2, 2007, DWR executed an agreement with Kern and Tejon-Castac Water District (Tejon-Castac) for operation and maintenance of the Wheeler Ridge-Maricopa Turnout No. 12 located at Milepost 285.01 of the California Aqueduct. The agreement transfers all interests, rights, and responsibilities of the turnout from Wheeler Ridge-Maricopa Water Storage District (Wheeler Ridge-Maricopa) to Tejon-Castac. The turnout has a maximum design capacity of 65 cubic feet per second (cfs).

Kern County Water Agency

On August 29, 2007, DWR executed an agreement with Kern and Semitropic for construction, operation, and maintenance of the Semitropic No. 3 Turnout, a new turn-in/turnout facility located at Milepost 206.99 of the California Aqueduct. In addition to water supply, the facility will increase the rate at which water that is stored in the Semitropic Groundwater Bank can be recovered by the water agencies that have placed the water into storage. The design capacity of the facility is 620 cfs.

Plumas County Flood Control and Water Conservation District

On December 19, 2007, DWR executed an agreement with Plumas for operation of the Grizzly Ranch Turnout to deliver SWP water to the Grizzly Ranch Community Services District. The turnout is located on Grizzly Creek, approximately 4.7 miles downstream from the dam at Lake Davis (an SWP facility) with a design capacity of 1 cfs.

Agreements and Activities Related to the Monterey Amendments

Turn-Back Water Pool Program

Pursuant to Article 56(d) of the Monterey Amendments, the twelfth year of the Turn-Back Water Pool Program was initiated by Notice to State Water Project Contractors No. 07-02, dated February 9, 2007. All SWP water contractors who signed the Monterey Amendments were permitted to participate in the program. The program allowed SWP water contractors to offer a portion of their approved 2007 Table A water for sale in a turn-back pool for use by interested SWP water contractors. Based on Table A supply and demand, turn-back pool water was allocated among the purchasing contractors. In 2007, 16,380 af was purchased under the Turn-Back Water Pool Program.

Initial transactions for Pool A and Pool B of the Turn-Back Water Pool Program occurred in February and March 2007, respectively. The program was then extended to June 1 to allow for changes in the percentages of Table A allocations between April 1 and June 1. Only SWP water contractors who were already committed to purchase water through Pool B were allowed to continue with the program until June. Turn-back pool water sold for \$12.74 per af (50 percent of the Delta Water Rate) through Pool A, and for \$6.37 per af (25 percent of the Delta Water Rate) through Pool B. All money collected through the Turn-Back Water Pool Program was paid to the selling SWP water contractors. The 2007 Turn-Back Water Pool Program closed on June 1, 2007. Notices to State Water Project Contractors describing the Turn-Back Water Pool Program are available online at <http://www.water.ca.gov/swpao/notices.cfm>.

Table 9-1 lists SWP water contractors who participated in Pool A and Pool B of the Turn-Back Water Pool Program in 2007.

Table 9-1 2007 Turn-Back Water Pool Program (af)

Contractor	Sold	Purchased
Pool A		
San Gabriel	7,280	
San Luis Obispo	100	
Ventura	9,000	
Alameda County		197
Alameda-Zone 7		378
Coachella		568
Desert		234
Dudley Ridge		269
Kern		4,683
Kings		43
Metropolitan		8,962
Oak Flat		27
Palmdale		100
Santa Clara		469
Tulare		450
Total	16,380	16,380
Pool B		
Total	0	0

Storage of Water Outside Service Area

Pursuant to Article 56(c) of the Monterey Amendments, SWP water contractors have agreements with DWR to deliver SWP water outside their service areas for storage and later use within their service areas. The following agreements include provisions for the conveyance and points of delivery of such water.

Alameda County Flood Control and Water Conservation District, Zone 7

A long-term change in POD agreement pending among DWR, Alameda County Flood Control and Water Conservation District, Zone 7 (Alameda-Zone 7), and Kern, provides for the delivery of a portion of Alameda-Zone 7's approved SWP water supplies for storage in Semitropic, and for the return of such water by future exchange of a like amount of Kern's Table A water. All

return water is to be delivered to Alameda-Zone 7 by December 31, 2035. During 2007, a total of 717 af of Alameda-Zone 7's water supply was delivered to Semitropic of which 250 af was 2006 Article 56(c) and 467 af was Article 21. No water was recovered in 2007 under this agreement. (SWPAO #04017)

A long-term change in POD agreement pending among DWR, Alameda-Zone 7, and Kern will provide for delivery of a portion of Alameda-Zone 7's approved SWP water supplies for storage in Cawelo Water District, a member unit of Kern. Alameda-Zone 7 would recover one-half of its stored water in future years by the return of Cawelo's portion of Kern's Table A water or by direct pumping from the groundwater bank into the California Aqueduct. All return water is to be delivered to Alameda-Zone 7 by December 31, 2035. During 2007, no water was delivered or recovered under this agreement. (SWPAO #06010)

Alameda County Water District

A POD agreement dated October 28, 1996, among DWR, Alameda County Water District (Alameda County), and Kern provides for the conveyance of a portion of Alameda County's 1996 Table A water to Semitropic. Kern's Table A water will be exchanged for recovery of Alameda County's stored water supplies or by direct pump-in to the California Aqueduct in future years through December 31, 2035. During 2007, 5,000 af was recovered by Alameda County through exchange of Kern's Table A from Semitropic under this agreement. (SWPAO #96018)

A change in POD agreement pending execution among DWR, Alameda County, and Kern, will provide for the delivery of a portion of Alameda County's 2007 approved SWP water supplies for storage in, and later recovery from, Semitropic. DWR delivered a total of 1,029 af of Alameda County's 2007 SWP water supplies— 451 af was Article 21 water and 578 af was Article 56(c). No water

was recovered from storage in 2007 under this agreement. (SWPAO #07005)

Castaic Lake Water Agency

A long-term change in POD agreement, executed September 25, 2006, among DWR, Castaic Lake, and Kern, provides for the delivery of a portion of Castaic Lake's approved 2005 and future SWP water supplies for storage in, and later recovery from, Rosedale-Rio Bravo Water Storage District (Rosedale-Rio), a member unit of Kern. During 2007, DWR delivered 8,200 af of Castaic Lake's approved 2007 Table A water to Kern for subsequent delivery to Rosedale-Rio. (SWPAO #05016)

Dudley Ridge Water District

A letter agreement dated October 22, 1997, among DWR, Dudley Ridge, and Kern allowed for the transfer and future return of Dudley Ridge's 1997 SWP water supplies to Kern for storage in the KWB, within Kern's service area, on an acre-foot for acre-foot basis. During 2007, Kern returned 462 af to Dudley Ridge to complete the agreement. (SWPAO #97021)

A letter agreement dated February 26, 1998 among DWR, Dudley Ridge, and Kern allowed for the transfer and future return of Dudley Ridge's 1998 SWP water supplies to Kern for storage in the KWB within Kern's service area on an acre-foot for acre-foot basis. During 2007, Kern returned 5,278 af to Dudley Ridge to complete the agreement. (SWPAO #98003)

A letter agreement, executed October 2, 2006, among DWR, Dudley Ridge, and San Gabriel provided for delivery of a portion of Dudley Ridge's 2005 and 2006 approved SWP water supplies to San Gabriel's service area for groundwater recharge. In future years, through December 31, 2016, San Gabriel will return a like amount of its Table A water to Dudley Ridge. During 2007, 119 af of San

Gabriel's 2007 Table A water was returned to Dudley Ridge. (SWPAO #05017)

A change in POD agreement pending execution among DWR, Dudley Ridge, and Kern, will provide for the delivery of a portion of Dudley Ridge's 2007 approved SWP water supplies for storage in and later recovery from the KWB. DWR delivered 2,161 af of Dudley Ridge's SWP water supplies allocated as Article 21 water during 2007. No water was recovered from storage in 2007 under this agreement. (SWPAO #07001)

Metropolitan Water District of Southern California

A long-term agreement executed on August 21, 1995, among DWR, Metropolitan, and Kern provides for the delivery of a portion of Metropolitan's SWP water supplies for storage in and later recovery from Semitropic. The agreement is effective until November 4, 2035. Recovery of Metropolitan's water is either by direct pump-in to the California Aqueduct or by exchange of Kern's SWP allocated water. During 2007, no water was stored under this agreement; however, 93,986 af was recovered for delivery to Metropolitan's service area. (SWPAO #95010)

A long-term POD agreement, executed March 18, 2004, among DWR, Metropolitan, and Kern, provides for the delivery of a portion of Metropolitan's future SWP water supplies for storage in and later recovery from groundwater basins within Arvin-Edison Water Storage District (Arvin-Edison). A letter agreement dated December 29, 1997, among DWR, Kern, Metropolitan, and Arvin-Edison, along with subsequent extensions to that agreement, provided approval for Metropolitan's water to be delivered for storage to Arvin-Edison. This 2004 agreement recognizes water delivered for storage, in multiple prior years starting in 1997, and for the future return of that

water. The return water is to be delivered to Metropolitan from Arvin-Edison by pump-in or by exchange of Metropolitan's water for a like amount of Kern's Table A water or other water supplies. During 2007, 1,881 af of Metropolitan's Article 21 water was delivered to Arvin-Edison for storage pursuant to SWPAO agreement #01013. A total of 22,532 af was recovered for delivery to Metropolitan; 7,586 af was recovered to complete a prior year agreement, SWPAO #99009, and 16,639 af was recovered under SWPAO #01013. (SWPAO #99009 and #01013)

A long-term POD agreement executed August 30, 2004, among DWR, Metropolitan, and Kern, provides for the delivery of a portion of Metropolitan's approved SWP supplies for storage in and later recovery from the groundwater basin underlying Kern Delta Water District (Kern Delta), a member unit of Kern. During 2007, no water was delivered or recovered from storage in Kern Delta. (SWPAO #03019)

A POD agreement is pending execution among DWR, Metropolitan, and Mojave to provide for the delivery of up to 75,000 af of Metropolitan's 2003, 2004, and 2005 approved SWP water supplies for storage within the Mojave service area. The water is to be returned to Metropolitan by exchange of Mojave's Table A water by January 15, 2010. During 2007, 26,000 af was returned to Metropolitan. (SWPAO #03057)

Santa Clara Valley Water District

A POD agreement dated September 19, 1996, among DWR, Santa Clara Valley Water District (Santa Clara), and Kern provides for the conveyance of a portion of Santa Clara's 1996 Table A water to Semitropic. Kern's Table A water will be exchanged for recovery of Santa Clara's stored water supplies or by direct pump-in to the California Aqueduct in future years through December 31, 2035. During 2007, 10,500 af was recovered by

Santa Clara through exchange of Kern's Table A from Semitropic to complete this agreement. (SWPAO #96012)

A POD agreement dated November 10, 1997, among DWR, Santa Clara, and Kern will provide for the conveyance of a portion of Santa Clara's 1997 Table A water to Semitropic. Kern's Table A water will be exchanged for recovery of Santa Clara's stored water supplies or by direct pump-in to the California Aqueduct in future years through December 31, 2035. During 2007, 9,500 af was recovered by Santa Clara through exchange of Kern's Table A from Semitropic under this agreement. (SWPAO #97020)

A POD agreement, pending execution among DWR, Santa Clara, and Kern, will provide for the delivery of a portion of Santa Clara's approved 2007 SWP water supplies for storage in and later recovery from Semitropic. During 2007, DWR delivered a total of 2,342 af of Article 21 and 1,350 af of 2006 Article 56(c) to Semitropic. (SWPAO #06011)

A letter agreement pending execution among DWR, Santa Clara, and Kern will provide for the conveyance of a portion of Santa Clara's CVP water to Semitropic pursuant to Article 55 of Santa Clara's long-term water supply contract. Kern's Table A water will be exchanged for recovery of Santa Clara's stored CVP supplies in future years through December 31, 2035. This agreement acknowledges DWR delivery of CVP water in 2005 and 2006. During 2007, no water was recovered by Santa Clara through exchange of Kern's Table A from Semitropic under this agreement. (SWPAO #06012)

Article 21 Water Program

Pursuant to the Monterey Amendments, Article 21 water replaces unscheduled, surplus, wet weather, and Article 12(d) water. The Article 21 Water Program allows

an SWP water contractor to take delivery of water over the approved and scheduled Table A amounts for the current year. Article 21 water is available for delivery on a short-term basis as determined by DWR when water is still available after operational requirements for SWP water deliveries, water quality, and Delta requirements are met.

Conditions for the Article 21 Water Program for 2007 are described in the February 8, 2007, Notice to State Water Project Contractors No. 07-01, available online at <http://www.water.ca.gov/swpao/notices.cfm>. Fourteen participants signed the notice, which indicated their acceptance of the criteria, procedures, and charges for the program. They collectively received 308,801 af of Article 21 water (Table 9-2).

During the Article 21 Water Program period, unscheduled water was also made available to Empire pursuant to its long-term water supply contract. Empire received 1,172 af of unscheduled water in 2007 for agricultural purposes.

Table 9-2 2007 Article 21 Water Deliveries (af)

Contractor	Amount
Alameda County	550
Alameda-Zone 7	912
Dudley Ridge	8,953
Kern	99,861
Kings	474
Metropolitan	166,517
Napa	3,597
Oak Flat	41
Palmdale	843
San Luis Obispo	24
Santa Barbara	1,070
Santa Clara	4,840
Solano	8,217
Tulare	12,902
<i>Subtotal</i>	<i>308,801</i>
Empire ^a	1,172
Total	309,973

^aUnscheduled agricultural water.

Flexible Storage Program

Pursuant to Article 54 of the Monterey Amendments, the flexible storage program provides SWP water contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris the option to withdraw water in excess of approved deliveries. The program objective is to provide additional flexibility and water management benefits to local participating agencies.

Available “flexible storage” is approximately 50 percent of active storage, providing for 160,000 af at Castaic Lake and 65,000 af at Lake Perris. Participating SWP water contractors participating in the Castaic Lake flexible storage program include Metropolitan, Ventura County Watershed Protection District (Ventura), and Castaic

Lake. Each can withdraw a maximum of 153,940 af, 1,377 af, and 4,683 af, respectively. At Lake Perris, since 2004, Metropolitan, Coachella, and Desert have participated in the repayment of the capital costs; but through agreement, Metropolitan is the only SWP water contractor that can withdraw water, and it may withdraw up to 65,000 af. Any participating SWP water contractor is given 5 years to replace the water with Table A amounts, purchased water, exchange water, or local water.

Metropolitan participated in the flexible storage program in 2007. In 2007, it borrowed 99,367 af from Castaic Lake and replaced 84,017 af, leaving a negative balance of 15,350 af. They had a zero balance in Lake Perris at the end of 2003. In 2007, it borrowed 15,837 af, leaving a balance of zero.

Extended Carryover Program

Pursuant to Article 56 of the Monterey Amendments, SWP water contractors can elect to store project water outside of their service areas and carry it over to the following year for use within their service areas. Qualified contractors can request Table A water be carried over for delivery in the following year to the extent that such deliveries do not adversely affect current or future project operations. Factors that influence how much extended carryover water can be delivered include operational constraints of project facilities, filling of SWP conservation storage facilities, flood control releases, and water quality restrictions. If storage requests exceed the available storage capacity, the amount available is allocated among the SWP water contractors requesting storage in proportion to their annual Table A water for that year. Fifteen SWP water contractors took delivery of 93,942 af of approved 2006 Table A water carried over into 2007, as extended carryover.

Kern River Intertie

DWR may accept floodwaters into the California Aqueduct under the “Agreement Among the State of California, Kern County Water Agency, and the Kern River Interests for Diversions of Floodwaters Through the Kern River-California Aqueduct Intertie,” dated November 18, 1975.

The intertie was authorized by the U.S. Army Corps of Engineers (Corps) as a Small Flood Control Project under the Flood Control Act of 1948, and construction was completed by the Corps in 1977.

Floodwaters from the Kern River, and other water that flows into the Kern River downstream from Lake Isabella, which are determined to be in excess of the needs of the Kern River Interests (Buena Vista Water Storage District, North Kern Water Storage District, Tulare Lake Basin Water Storage District, and Hacienda Water District) are diverted into the California Aqueduct under this agreement to alleviate flooding in Kern and Tulare counties. No flood flows were introduced into the California Aqueduct during 2007.

Environmental Water Account

The Environmental Water Account (EWA) is a cooperatively managed program intended to provide beneficial environmental changes to protect the fish of the Bay-Delta Estuary through increased operational flexibility of the SWP and CVP Delta export pumps without uncompensated water supply impacts on the SWP and CVP contractors. Three management agencies: the National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service (USFWS), and the Department of Fish and Game (DFG); and two project agencies: Reclamation and DWR, are responsible for implementing the EWA.

The EWA provides fish protection by curtailing project water exports from the Sacramento-San Joaquin Delta in the winter and spring and replacing it at a later date, usually in the summer of the same calendar year. The EWA acquires water from willing sellers to replace Delta exports foregone during pumping curtailments and repays that water to the SWP and CVP to assure no interruptions in scheduled deliveries. EWA assets consist of “operational assets,” which are acquired through changes in operations as defined in the August 28, 2000, CALFED record of decision (ROD); “purchased assets,” water purchased from willing water sellers; “source shifting,” which involves deferral of scheduled delivery of water to willing participants who are compensated for the risk involved; and other non-water assets, including 500 cfs of dedicated pumping capacity at Banks Pumping Plant from July 1 through September 30.

In 2007, the EWA's seventh operational year, Delta exports were periodically curtailed at the SWP and the CVP export facilities between January and June. These actions resulted in EWA export reductions of about 408,050 af by the SWP (January—96,598 af; February—68,300 af; March—75,200 af; April—21,900 af; May—73,401 af; and June—72,651 af) and 93,466 af by the CVP (May—39,393 af and June—54,073 af).

During water year 2007, DWR and Reclamation obtained 451,472 af of assets for the EWA, which included upstream of Delta water purchases of 113,538 af from Yuba County Water Agency (Yuba) and Merced Irrigation District (MID) after carriage and conveyance losses, south of Delta water purchases of 125,000 af from Kern, and 212,933 af from Operational Assets (see explanation in “Operational Assets” later in the chapter). The upstream of Delta water purchases consisted of a Reclamation purchase of 25,000 af from MID and DWR purchases of 125,000 af of water from Yuba. The 125,000 af of Yuba assets resulted from

two DWR purchases of water from Yuba: 62,000 af in 2006 that could not be delivered until 2007 due to excess conditions in the Delta in 2006, and 63,000 af purchased in 2007.

All EWA asset acquisitions in 2007 were covered by the EWA environmental impact statement (EIS)/(EIR) in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Source shifting to defer water deliveries was not required because the water level of San Luis Reservoir did not require such action. The EWA had no carryover debt at the beginning of January 2007. EWA's debt increased to 50,042 af by the end of December 2007.

The EWA Operating Principles Agreement between DWR, Reclamation, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), and the Department of Fish and Game (DFG) expired on December 31, 2007, marking the end of the multi-agency operations of the EWA. Congressional authorization and limited federal funding of the EWA will continue into 2008.

Technical Services for Evaluation of the Environmental Water Account

Department of Fish and Game

DWR and DFG executed Amendment No. 1 to Interagency Agreement No. 4600004351 (SWPAO #06702) on May 29, 2007, to extend the contract term by 2 years from June 30, 2007, to June 30, 2009, and to increase the maximum amount payable by DWR for DFG's services to the EWA for fiscal year (FY) 2008 and FY 2009 by \$298,820 from \$281,089 to \$579,909. Under this amendment, DFG will continue to provide technical services to DWR for development and refinement of the EWA, planning and management, and to conduct evaluations of the effectiveness of the EWA in protecting Delta fisheries and

maintaining water supply reliability for SWP and CVP water users.

Purchased Assets

The following SWP water contractors and other willing sellers participated in the EWA program in 2007. The purchased asset water amounts described herein represent the total amounts of water acquired for the EWA from various sources. These amounts have not been adjusted to reflect Delta carriage and conveyance losses.

Kern County Water Agency

DWR and Kern completed their third and final year of the multiyear agreement in 2007 (SWPAO #05705) for support of the EWA by exchanging 125,000 af of previously stored water in the KWB for the same amount of Kern's Table A water.

DWR and Kern executed Amendment No. 1 to *Agreement for the Transfer of Water from Kern County Water Agency to the Department of Water Resources of the State of California on Behalf of the Environmental Water Account for the Years 2005 through 2007* (SWPAO #05705-A1) on December 31, 2007 to extend the transfer of water to DWR for support of the EWA through December 31, 2008.

Merced Irrigation District

Reclamation purchased 25,000 af of water for the EWA in 2007 that was transferred in October and November to provide added instream fishery benefits. The transfer was charged a 10 percent conveyance loss.

Metropolitan Water District of Southern California

DWR and Metropolitan completed their third and final year of the multiyear agreement in 2007 (SWPAO #05701) for delivery of up to 100,000 af of Metropolitan Exchange Water to DWR for EWA's use in 2005. An equal amount of EWA Exchange Water will

be returned in years in which DWR's final allocation of SWP water to State Water Contractors is greater than 60 percent of Table A amounts. DWR could not return the 50,000 af of Metropolitan Exchange Water by the end of the contract term due to wet year hydrology conditions.

DWR and Metropolitan executed Amendment No. 1 to *Agreement between the Department of Water Resources of the State of California and Metropolitan Water District of Southern California for an Equal Exchange of Water in Support of the Environmental Water Account Program* under the California Bay-Delta Authority (SWPAO #05701-A1) on December 31, 2007, to extend the term of the agreement through December 31, 2008. This allowed DWR another year to return the 50,000 af of water that was previously delivered for support of the EWA.

DWR and Metropolitan completed their second and final year of the multiyear agreement in 2007 (SWPAO #06703 executed on July 25, 2006) for deferred water deliveries and repayment of up to 100,000 af per year that would provide additional water to the EWA, subject to compensation of services, in order to protect the San Luis Reservoir from being drawn down to the point where water quality issues would affect SWP and CVP contractors. Due to hydrologic conditions, there was no need for deferred water deliveries in 2007. An amendment to this contract was not executed.

Yuba County Water Agency

DWR and Yuba executed the *Agreement for the Temporary Transfer of Water from Yuba County Water Agency to the Department of Water Resources* (SWPAO #07701) on May 16, 2007 for the transfer of up to 125,000 af from storage in New Bullards Bar Reservoir and groundwater substitution for support of the EWA as the second pilot year transfer under the water purchase agreement of the pending Yuba River Accord. DWR had

purchased 62,000 af of water from Yuba in 2006, but the water could not be delivered in 2006 due to unfavorable Delta transfer conditions. This agreement allowed Yuba to provide DWR a credit for payment of 62,000 af toward the cost of future water sales since no water was delivered to the EWA in 2006. DWR initially purchased an additional 60,000 af from Yuba for the EWA in 2007.

DWR and Yuba later executed Amendment No. 1 to *Agreement for the Temporary Transfer of Water from Yuba County Water Agency to the Department of Water Resources* (SWPAO #07701-A1) on December 5, 2007, for the additional 3,000 af. As a result of favorable Delta transfer conditions in 2007, Yuba was able to release 125,000 af for EWA purposes. Of the 125,000 af released by Yuba, all but 11,400 af was available for export in 2007 and the remaining 11,400 af was stored in Lake Oroville for transfer when Delta conditions allow.

Operational Assets

In 2007, the EWA used its operational flexibility to export 212,933 af of excess flows in the Delta using available capacity at Banks Pumping Plant to reduce the EWA debt in San Luis Reservoir. DWR pumped 26,667 af in January while Reclamation did not pump any water to reduce the EWA debt, making the combined projects' pumping total for reducing the EWA debt equal to 26,667 af. In 2007, the EWA did not realize any gain from its allocated share of the SWP water gain from the Central Valley Project Improvement Act (CVPIA) Section 3406 (b)(2) fish actions release.

Lower Yuba River Accord

The Yuba Accord includes three separate but related agreements, all of which had to be in place for the Yuba Accord to become effective: a fisheries agreement among Yuba, DFG, and other entities; a conjunctive use agreement between Yuba and water districts

in Yuba County; and a water purchase agreement between Yuba and DWR. The Lower Yuba River Fisheries Agreement finalized on October 11, 2007, states that it will become effective when (1) DWR and Yuba execute their water purchase agreement; (2) Yuba executes conjunctive use agreements with its member units; and (3) Yuba executes an agreement or memorandum of understanding with Pacific Gas & Electric Company (PG&E) to make the necessary amendments to the 1966 Yuba/PG&E Power Purchase Contract for the implementation of the fisheries agreement. All of the necessary Yuba Accord agreements were executed.

DWR and Yuba executed the *Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources* (Tier 1 Agreement) (SWPAO #08800) on December 4, 2007, for the purchase of 60,000 af of water per year for 8 years from Yuba to the EWA, for a total of \$30.9 million. The agreement is effective through December 31, 2025. Due to Yuba's Federal Energy Regulatory Commission (FERC) relicensing, quantities and price of water for the remaining 10 years of the contract will be negotiated after 8 years.

DWR and Reclamation drafted but did not execute the *Agreement between the United States Department of the Interior, Bureau of Reclamation, and the State of California Department of Water Resources for Sharing of Water Purchased from the Yuba County Water Agency for the Lower Yuba River Accord* (Tier 2 Agreement) for a 50-50 percent split in sharing Component 2, 3, and 4 water between the SWP and federal CVP contractors. As a consequence of Reclamation's inability to execute the agreement during certain Delta-related litigation, DWR replaced Reclamation in the water purchase agreements by contracting directly with the federal participants and assuring the 50-50 split in Component 2, 3, and 4 water.

DWR executed the first three Tier 3 Agreements with Metropolitan, Kern, and the San Luis & Delta-Mendota Water Authority (San Luis & Delta-Mendota) titled *Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the Participating State Water Project Contractors Under the Dry Year Water Purchase Program and Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the San Luis & Delta-Mendota Water Authority Under the Dry Year Water Purchase Program* (SWPAO #s 08801 through 08803) on December 21, 2007, for the purchase of Component 2, 3, and 4 water from Yuba.

Miscellaneous Agreements with Other Agencies

In addition to negotiating agreements with SWP water contractors to provide for specified water deliveries, DWR also entered into several agreements with other agencies for water conveyance, or exchange, between January 1, 2007, and December 31, 2007.

Water Conveyance Agreements—CVP Water

DWR regularly enters into agreements to convey CVP water for contractors receiving water from Reclamation through the Cross Valley Canal (CVC), a water conveyance facility that connects with the California Aqueduct, Milepost 238.04, in Kern County. Corporations or other water agencies receive CVP water through agreements between DWR and Reclamation, including the U.S. Department of Veterans Affairs, U.S. Fish and Wildlife Service (USFWS), and Musco Family Olive Company. Occasionally, DWR also enters into agreements with Reclamation to convey CVP or SWP water from the Delta to O'Neill Forebay through CVP or SWP facilities. Some of these agreements allow Reclamation to make up for curtailed water exports from C.W. "Bill" Jones (Jones)

Pumping Plant associated with improving conditions for fish in the Delta. Other agreements allow the replacement of water exports foregone during maintenance and repair of Jones and Banks pumping plants and CVP and SWP conveyance facilities between the Delta and O'Neill Forebay.

Cross Valley Canal

Through long-term three party contracts with Reclamation and DWR, eight CVP water contractors began to receive CVP water via the California Aqueduct to the CVC. The following eight CVP water contractors are defined as CVC Contractors: County of Fresno (Fresno), County of Tulare (Tulare), Hills Valley Irrigation District (Hills Valley), Kern-Tulare Water District (Kern-Tulare), Lower Tule River Irrigation District (Lower Tule), Pixley Irrigation District (Pixley), Rag Gulch Water District (Rag Gulch), and the Tri-Valley Water District (Tri-Valley). Fresno, Tulare, Lower Tule, and Pixley executed contracts in 1975. Hill's Valley, Kern-Tulare, Rag Gulch, and Tri-Valley executed contracts in 1976. All eight original contracts terminated on December 31, 1995. In 1995, amendments were executed that extended the termination date to February 29, 1996 for all contracts. Interim Renewal (IR) contracts have been executed during the ensuing years to extend the termination date as follows:

- March 1, 1996 through February 28, 1998 (IR1);
- March 1, 1998 through February 28, 2000 (IR2);
- March 1, 2000 through November 30, 2000 (IR3);
- December 1, 2000 through February 28, 2001 (IR4);
- March 1, 2001 through February 28, 2002 (IR5);
- March 1, 2002 through February 28, 2003 (IR 6);
- March 1, 2003 through February 29, 2004 (IR 7);
- March 1, 2004 through February 28, 2005 (IR 8);
- March 1, 2005 through February 28, 2006 (IR 9);
- March 1, 2006 through February 28, 2007 (IR 10); and
- March 1, 2007 through February 29, 2008 (IR 11).

During the period July 2007 through October 2007, DWR delivered a total of 6,398 af of 2007-2008 CVP water to the CVC contractors as follows: Fresno 1,500 af, Hills Valley 1,673 af, Tri-Valley 571 af, and Tulare 2,654 af.

During 2007, CVC contractors executed the following change in POD agreements of CVP water with DWR. All the listed deliveries were made using the DWR portion of the San Luis Canal.

- Lower Tule to Westlands for up to 22,500 af; DWR delivered 1,551 af through Reaches 4-7 (SWPAO #07308);
- Lower Tule to Del Puerto Water District (Del Puerto), for up to 10,500 af, DWR delivered 10,500 af to Reach 3 (SWPAO #07310);
- Lower Tule to San Luis Water District, for up to 3,500 af, DWR delivered 3,500 af to Reach 3 (SWPAO #07315);
- Pixley to Westlands, for up to 22,500 af, DWR delivered 5,051 af to Reaches 4-7 (SWPAO #07309);
- Pixley to Del Puerto, for up to 10,500 af, DWR delivered 10,500 af to Reach 3 (SWPAO #07311);
- Kern-Tulare to Westlands, for up to 10,000 af, DWR delivered 8,419 af to Reaches 4-7 (SWPAO #07316);
- Rag Gulch to Westlands, for up to 5,000 af, DWR delivered 2,802 af to Reaches 4-7 (SWPAO #07317).

Byron Bethany Irrigation District–Musco Family Olive Company

A pending agreement among Byron-Bethany Irrigation District (Byron-Bethany), DWR, and Reclamation provides for the conveyance of up to 800 af of Byron-Bethany's CVP water to Reach 2A of the California Aqueduct for use by Musco Family Olive Company. A total of 354 af was delivered in 2007 under this pending agreement (SWPAO #04300). Construction of a permanent turnout is currently being pursued. Note: On August 12, 2004, Plain View Water District became part of Byron-Bethany. Starting with SWPAO #04300, Byron-Bethany will execute conveyance agreements for CVP water to be used by Musco Family Olive Company.

U.S. Department of Veterans Affairs

A pending letter agreement among the U.S. Department of Veterans Affairs, DWR, and Reclamation provides for the conveyance of up to 850 af of CVP-approved water to Reach 2B of the California Aqueduct to the U.S. Department of Veterans Affairs' San Joaquin Valley National Cemetery. A total of 113 af was delivered to the National Cemetery from Reach 2B of the California Aqueduct in 2007 under this pending agreement. (SWPAO #03312)

U.S. Fish and Wildlife Service Cooperative Agreement

Reclamation initiated a cooperative agreement with DWR to deliver CVP water to the Kern National Wildlife Refuge for USFWS. Under the terms of this cooperative agreement, dated September 28, 2004, up to 30,500 af of CVP water would be delivered from the end of Reach 7, to the Buena Vista Water Storage District (Buena Vista) Turnout BV-1B, Reach 10A of the California Aqueduct, from May 1, 2002, to May 31, 2012. DWR conveyed 7,526 af of CVP water to Kern National Wildlife Refuge in 2007. (SWPAO #03317)

Water Deliveries

Table A Deliveries

Each year, by October 1, the SWP water contractors submit initial requests for Table A deliveries allocated to them for use in the subsequent calendar year. Initial Table A allocation amounts for the coming year are made by DWR in December. They are based on operations studies that assume 90 percent exceedence of historical water supply (where exceedence refers to the possibility that water supply in the coming year will be exceeded by the historical water supply), current reservoir storage, and total requests by the SWP water contractors. Forecasts for the year are updated as hydrologic conditions change. Table A amounts are increased or decreased depending on both actual and projected hydrologic conditions, though decreases are rare as the 90 percent exceedence criteria is fairly conservative.

On October 1, 2006, SWP water contractors submitted initial requests for 2007 totaling 4.13 maf.

DWR approved deliveries of 2.47 maf on November 30, 2006, resulting in initial Table A amounts of 60 percent of most SWP water contractor requests.

Notices to State Water Project Contractors informing them of increases or decreases in Table A amounts are online at <http://www.water.ca.gov/swpao/notices.cfm>.

2007 SWP Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering Table A water to SWP water contractors, the SWP:

- conveys water to other public and local 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 2007, 4,061,696 af was delivered to 27 SWP water contractors and 26 other agencies, categorized as follows:

- 1,986,455 af of Table A water;
- 309,973 af of Article 21 water;
- 94,762 af of 2006 carryover water;
- 2,581 af of SWP water for recreation and fish and wildlife;
- 1,258,278 af of nonproject water delivered to satisfy settlement agreements and agreements with SWP water contractors for local water supplies; and
- 114,492 af delivered to satisfy agreements between the SWP and CVP.

Figure 9-1 shows amounts of water delivered to various locations during 2007.

Specific information about water deliveries made to SWP water contractors and other agencies during 2007, and historical deliveries from 1962 through 2007, are presented in the following three sections, each with a corresponding table, located at the end of the chapter:

- Water Delivered to Long-Term Water Supply Contractors in 2007, by Service Area (Table 9-3);
- Water Delivered in 2007, by Month (Table 9-4); and
- Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2007 (Table 9-5).

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply

contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

2007 Water Deliveries to Long-Term SWP Water Contractors

Table 9-3 shows amounts of water delivered in 2007, by service area. The following information is arranged by column number.

Table A Water Delivered

Columns 1 through 5 show a detailed breakdown of Table A water delivered for SWP water contractors in 2007.

Turn-Back Pool Water

Column 4 shows 16,380 af of Turn-Back Pool water was delivered to SWP water contractors in 2007.

2006 Carryover Table A Water Delivered During 2007

Column 6 shows a total of 94,762 af was carried over from 2006 for delivery in 2007.

The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose the water by December 31 of each year. The SWP water contractors' long-term contracts and amendments state the criteria for carrying over Table A water from one year to the next, under Articles 12(e), 14(b), and 56(c).

Total Table A Water Delivered

Column 7 shows all Table A water delivered in 2007—a total of 2,081,217 af.

Article 21 and Unscheduled Water

Column 8 shows 309,973 af of 2007 Article 21 water was delivered to SWP water contractors (which includes 308,801 af of



Figure 9-1 Water Delivered in 2007 and Delivery Locations of Long-Term Water Supply Contractors and Feather River Area Districts with Water Rights Agreements with DWR

Article 21 and 1,172 af of unscheduled water to Empire). SWP water contractors who have not signed the Monterey Amendments receive unscheduled water.

Other SWP Water

Column 9 shows 125,772 af of other SWP water. Other SWP water includes flexible withdraw water from Castaic Lake and Lake Perris, and settlement water.

Total SWP Water Delivered

Column 10 shows 2,516,962 af of total SWP water was delivered in 2007. This includes total Table A water, 2006 Table A carryover water, Article 21 water, and Other SWP water.

Non-SWP Water Deliveries to Long-Term SWP Contractors

Columns 11 and 12 include deliveries of non-SWP water to long-term water contractors. Column 11 shows 179,951 af of water bank recovery water. Column 12 shows 77,042 of other non-SWP water. Non-SWP water is local and permit water that an SWP water contractor has a water right to, or water purchased from, exchanged with, or transferred from non-SWP agencies. In 2007, non-SWP water deliveries totaled 256,993 af.

Total Deliveries

Column 13 shows total amounts of water delivered to SWP water contractors. In 2007, the SWP delivered 2,773,955 af to 29 long-term contractors.

Water Delivered in 2007 by Month

During 2007, the SWP provided water service to 53 agencies, including 29 SWP water contractors. Those agencies and the amounts of water delivered to them by month are listed in Table 9-4 and are summarized below as SWP water and non-SWP water.

SWP Water

SWP water, as defined in the long-term water supply contracts, includes Article 21 water, carryover Table A water, current year Table A amounts, transfer and exchange of Table A water, and Turn-Back Pools A and B. Detailed information concerning those conveyances is found under the "Miscellaneous Agreements with Long-Term SWP Water Contractors" section in this chapter.

2007 Non-SWP Water

In 2007, DWR used SWP facilities to convey water for various agencies according to the terms of water rights settlement agreements and water transfer and exchange agreements. Detailed information concerning those conveyances is found under the "Miscellaneous Agreements with Other Agencies" section in this chapter.

Water Rights Water

Water in this category is transported through SWP facilities to long-term SWP water contractors and other agencies according to terms of various settlement agreements. Some water simply passes through SWP transportation facilities; some portion is stored in SWP reservoirs for release later. In 2007, 1,258,278 af in this category was delivered to the Feather River, Delta, South Bay, North Bay, and Southern California areas, as summarized below.

Feather River Area. Nine non-SWP agencies in the Feather River area received 1,192,276 af:

- Last Chance Creek Water District, 12,304 af;
- Thermalito Irrigation District, 1,781 af;
- South Feather Water and Power Agency, formerly Oroville-Wyandotte Irrigation District, 5,595 af;
- Western Canal Water District, 329,924 af;
- Joint Water District Board, 821,094 af;
- Oswald Water District, 490 af;

- Tudor Mutual Water Company, 2,270 af;
- Garden Highway Mutual Water Company, 14,208 af; and
- Plumas Mutual Water Company, 4,610 af.

Delta. In the Delta, 25,714 af of Byron-Bethany Irrigation District water was delivered pursuant to the May 28, 2003, *Agreement Between the Department of Water Resources of the State of California and the Byron-Bethany Irrigation District Regarding the Diversion of Water from the Delta*.

North Bay Area. In the North Bay area, 11,801 af of Vallejo permit water and 10,568 af of water pursuant to the May 19, 2003, *Settlement Agreement among DWR, Solano County Water Agency, and the Cities of Fairfield, Vacaville, and Benicia*, was delivered.

South Bay Area. In the South Bay area, a total of 17,794 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct (SBA) SWP water contractors hold water rights to runoff from the Lake del Valle watershed.

Southern California. In Southern California, 125 af of local runoff from the Houston Creek watershed was stored and delivered to Crestline under water rights held by DWR on Houston Creek. The authorized place of use is limited to Crestline.

Annual Table A Water and Water Delivered Since 1962

Information about annual Table A water and water conveyed for the past 45 years is contained in Table 9-5. The following discussion of conveyed Table A water is arranged according to column numbers.

Annual Table A Water

Columns 1 through 7 of Table 9-5 show the amount of SWP water contractors' annual Table A water by area for years 1962 through

2007 as specified in the Table A schedules of the long-term water supply contracts.

In some instances, Table A schedules—projections of each contractor's need for water to 2035—have been amended to meet the needs of individual contractors. The amounts of annual Table A water each SWP water contractor may request for years 1962 through 2035 can be found in Table B-4 in Appendix B.

Water Delivered

Columns 8 through 16 show water delivered or conveyed, including initial fill water and operational losses and storage changes.

Table A Water. Column 8 shows amounts of Table A water delivered each year from 1962 through 2007. In 2007, a total of 2,081,217 af of Table A water was delivered.

Article 21 and Unscheduled Water. Column 9 shows amounts of Article 21 water, as defined under SWP deliveries, and unscheduled water delivered from 1962 through 2007. Article 21 and unscheduled water is water in excess of that required to meet all demands for the year's Table A water and water to be stored in SWP reservoirs. In 2007, a total of 309,973 af of Article 21 and unscheduled water was delivered.

Other Water. Column 10 includes amounts of water classified as other water delivered in 2007, including non-SWP water conveyed through SWP facilities and regulated delivery of local supply. In 2007, a total of 449,935 af 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. Column 11 also includes Delta diversions. In 2007, a total of 1,217,990 af in this category was delivered to agencies in the Feather River area, including 25,714 af delivered to Byron-Bethany in the Delta.

Recreation Water. Column 12 shows water conveyed for recreational use or to improve habitat or water quality for fish and wildlife. In 2007, 2,581 af of SWP water was conveyed for this purpose.

Initial Fill Water. The quantities listed in Column 14 represent the amounts used to initially fill the aqueducts and reservoirs south of the Delta to maximum operating capacities. Initial filling began with the SBA in 1962, and was completed in 1979, when Lake Perris reached its maximum operating capacity of 127,000 af. In 1996 and 1997, the Coastal Aqueduct was initially filled.

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. Negative values are indicated for years when withdrawals and evaporation from reservoirs south of the Delta exceed the amounts of water added to the reservoirs.

Table 9-3 Water Delivered to Long-Term Contractors in 2007, by Service Area (Acre-Feet)

SWP Contractor	Table A Water Delivered										Non-SWP			Total Water Delivered (13)			
	Table A not Transferred, Exchanged, or Stored (1)					Table A Transferred or Exchanged (2)					Total Table A (7)	Article 21 (8)	Other SWP (9)		Total SWP Water (10)	Water Bank Recovery (11)	Other Non-SWP (12)
	Table A not Transferred, Exchanged, or Stored (1)	Table A Transferred or Exchanged (2)	Table A Stored (3)	Turnback Pools (4)	Total Table A (5)	2006 Carryover (6)	Total Table A (7)										
Feather River																	
County of Butte	956				956		956			956							956
Plumas County FC&WCD					0		0			0							0
City of Yuba City	2,327				2,327		2,327			2,327							2,327
North Bay																	
Napa County FC&WCD	6,362				6,362	998	7,360		3,597	10,957							10,957
Solano County WA	14,892				14,892	1,822	16,714		8,217	35,499		11,801					47,300
South Bay																	
Alameda County FC&WCD-Zone 7	32,972			378	33,350	2,895	36,245		912	37,157							51,353
Alameda County WD	16,541			197	16,738	2,103	18,841		550	19,391		5,000					30,989
Santa Clara Valley WD	38,812			469	39,281	8,161	47,442		4,840	52,282		20,000					75,382
San Joaquin Valley																	
Castaic Lake WA (SJV)	4,424				4,424	1,647	6,071			6,071							6,071
County of Kings	4,924			43	4,967	305	5,272		474	5,746							5,746
Dudley Ridge Water District	26,937	6,976		269	34,182	2,000	36,182		8,953	45,135							45,135
Empire-West Side ID	397				397	515	912		1,172	2,084							2,084
Kern County WA	337,443	18,214		4,683	360,340	19,645	379,985		99,861	479,846		5,740					510,882
Oak Flat Water District	3,430			27	3,457	69	3,526		41	3,567							3,567
Tulare Lake Basin WSD	51,127	6,145		450	57,722	16,459	74,181		12,902	87,083							87,083
Central Coastal																	
San Luis Obispo County FC&WCD	3,752				3,752		3,752		24	3,776							3,776
Santa Barbara County FC&WCD	24,760	520			25,280	1,390	26,670		1,070	27,740							27,740
Southern California																	
Antelope Valley-East Kern WA	74,039	1,800			75,839	4,364	80,203			80,203							80,203
Castaic Lake WA	32,350		8,200		40,550	2,569	43,119			43,119				11,000			54,119
Coachella Valley WD	72,660			568	73,228		73,228			73,228							73,228
Crestline-Lake Arrowhead Water Agency	1,768				1,768		1,768			1,768				125			1,893
Desert Water Agency	30,000			234	30,234		30,234			30,234							30,234
Littlerock Creek ID	0				0		0			0							-
Metropolitan Water District of SC	1,047,046			8,962	1,056,008	28,098	1,084,106		166,517	1,365,827							1,515,038
Mojave Water Agency	19,372				19,372	737	20,109			20,109							20,109
Palmdale Water District	12,780			100	12,880	985	13,865		843	14,708							19,634
San Bernardino Valley MWD	26,406	30,710			57,116		57,116			57,116							57,116
San Gabriel Valley MWD	4,024				4,024		4,024			4,024							4,024
San Geronimo Pass WA	4,009				4,009		4,009			4,009							4,009
Ventura County WPD	3,000				3,000		3,000			3,000							3,000
Total	1,897,510	64,365	8,200	16,380	1,986,455	94,762	2,081,217	309,973	125,772	2,516,962	179,951	77,042	11,000	125	11,801	3,000	2,773,955

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
FEATHER RIVER AREA													
<i>SWP Agencies</i>													
City of Yuba City	0	0	0	0	0	117	1,125	1,077	8	0	0	0	2,327
Table A	9	137	82	221	93	21	137	6	6	3	4	1	720
County of Butte	0	0	0	0	0	0	78	109	49	0	0	0	236
Table A	9	137	82	221	93	138	1,340	1,192	63	3	4	1	3,283
Unauthorized													
Agency Total													
Plumas County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	0	0	0	0	0	0
Recreation/Fish and Wildlife (SWP)													
Recreation/Fish and Wildlife	2	0	0	1	4	0	0	1	0	0	0	0	9
<i>Non-SWP Agencies</i>													
Garden Highway Mutual Water Company													
Regulated delivery of local supply	0	0	0	991	1,438	1,807	3,238	1,488	2,247	2,561	438	0	14,208
Joint Water Districts Board													
Regulated delivery of local supply	48,113	0	0	45,090	125,760	120,633	127,340	109,460	45,020	44,688	86,100	68,890	821,094
Last Chance Creek Water District													
Regulated delivery of local supply	0	112	0	42	3,328	3,084	2,505	2,225	692	232	44	40	12,304
Oswald Water District													
Regulated delivery of local supply	0	0	0	0	1	174	154	96	65	0	0	0	490
Plumas Mutual Water Company													
Regulated delivery of local supply	0	0	56	740	124	1,826	746	482	636	0	0	0	4,610
South Feather Water and Power Agency													
Regulated delivery of local supply	161	164	18	0	655	893	962	990	924	440	298	90	5,595
Thermalito Irrigation District													
Regulated delivery of local supply	118	42	126	112	197	204	221	262	234	154	111	0	1,781
Tudor Mutual Water Company													
Regulated delivery of local supply	0	0	42	513	656	346	219	414	80	0	0	0	2,270
Western Canal Water District													
Regulated delivery of local supply	5,868	0	0	10,415	63,041	58,333	64,671	29,823	9,336	26,450	44,305	17,682	329,924
SWP													
SWP	11	137	82	222	97	138	1,340	1,193	63	4	4	1	3,292
Non-SWP													
Non-SWP	54,260	318	242	57,903	195,200	187,300	200,056	145,240	59,234	74,525	131,296	86,702	1,192,276
Feather River Area Total	54,271	455	324	58,125	195,297	187,438	201,396	146,433	59,297	74,529	131,300	86,703	1,195,568

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
NORTH BAY AREA													
<i>SWP Agencies</i>													
Napa County Flood Control and Water Conservation District													
Table A	0	2	5	100	123	1,171	681	685	755	609	1,168	888	6,187
Table A POD through Solano*	0	3	6	5	22	60	31	23	8	10	5	2	175
Article 56(c) carryover	993	0	0	0	0	0	0	0	0	0	0	0	993
Article 56(c) carryover POD through Solano*	5	0	0	0	0	0	0	0	0	0	0	0	5
Article 21	0	882	577	866	1,141	0	0	0	0	0	0	131	3,597
Vallejo Permit from Solano	0	0	0	0	0	0	213	223	64	0	0	0	500
Agency Total (*excluded from total)	993	884	582	966	1,264	1,171	894	908	819	609	1,168	1,019	11,277
Solano County Water Agency													
Table A	50	90	54	60	180	5,427	5,113	3,918	0	0	0	0	14,892
Table A POD for Napa	0	3	6	5	22	60	31	23	8	10	5	2	175
Article 56(c) carryover	1,822	0	0	0	0	0	0	0	0	0	0	0	1,822
Article 56(c) carryover POD for Napa	5	0	0	0	0	0	0	0	0	0	0	0	5
Article 21	422	1,427	1,038	563	4,536	0	0	0	0	0	0	231	8,217
Settlement	0	0	0	1,286	0	0	0	0	3,427	2,202	2,654	999	10,568
Vallejo Permit	0	100	99	197	100	100	1,682	2,720	2,533	1,738	1,473	559	11,301
Vallejo Permit to Napa*	0	0	0	0	0	0	213	223	64	0	0	0	500
Agency Total (*excluded from total)	2,299	1,620	1,197	2,111	4,838	5,587	6,826	6,661	5,968	3,950	4,132	1,791	46,980
SWP	3,292	2,404	1,680	2,880	6,002	6,658	5,825	4,626	4,190	2,821	3,827	2,251	46,456
Non-SWP	0	100	99	197	100	100	1,895	2,943	2,597	1,738	1,473	559	11,801
North Bay Area Total	3,292	2,504	1,779	3,077	6,102	6,758	7,720	7,569	6,787	4,559	5,300	2,810	58,257
SOUTH BAY AREA													
<i>SWP Agencies</i>													
Alameda County Flood Control and Water Conservation District, Zone 7													
Table A	0	28	89	208	3,977	3,707	5,872	5,303	4,548	3,127	3,514	2,599	32,972
Pool A	0	0	0	0	0	0	378	0	0	0	0	0	378
Article 56(c) carryover	2,645	0	0	0	0	0	0	0	0	0	0	0	2,645
Article 56(c) carryover to Semitropic*	250	0	0	0	0	0	0	0	0	0	0	0	250
Article 21	0	338	107	0	0	0	0	0	0	0	0	0	445
Article 21 to Semitropic*	0	467	0	0	0	0	0	0	0	0	0	0	467

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
Local	123	2,058	3,002	3,668	1,085	697	57	200	172	134	0	0	11,196
Transfer from Byron-Bethany Irrigation District	0	0	0	0	0	0	0	1,000	1,000	1,000	0	0	3,000
Agency Total (*excluded from total)	2,768	2,424	3,198	3,876	5,062	4,404	6,307	6,503	5,720	4,261	3,514	2,599	50,636
Alameda County Water District													
Table A	0	0	0	0	1,826	721	3,655	3,468	2,023	2,057	2,172	619	16,541
Pool A	0	0	0	0	0	197	0	0	0	0	0	0	197
Article 56(c) carryover	1,525	0	0	0	0	0	0	0	0	0	0	0	1,525
Article 56(c) carryover to Semitropic*	578	0	0	0	0	0	0	0	0	0	0	0	578
Article 21	0	0	99	0	0	0	0	0	0	0	0	0	99
Article 21 to Semitropic*	0	451	0	0	0	0	0	0	0	0	0	0	451
Semitropic Recovery	0	0	0	0	0	0	0	0	1,043	1,057	1,694	1,206	5,000
Local	0	0	468	3,270	1,167	1,693	0	0	0	0	0	0	6,598
Agency Total (*excluded from total)	1,525	0	567	3,270	2,993	2,611	3,655	3,468	3,066	3,114	3,866	1,825	29,960
Santa Clara Valley Water District													
Table A	0	0	5,688	3,164	0	0	7,475	8,558	4,270	3,646	3,489	2,522	38,812
Pool A	0	0	0	0	0	0	469	0	0	0	0	0	469
Article 56(c) carryover	6,811	0	0	0	0	0	0	0	0	0	0	0	6,811
Article 56(c) carryover to Semitropic*	1,350	0	0	0	0	0	0	0	0	0	0	0	1,350
Article 21	0	874	1,624	0	0	0	0	0	0	0	0	0	2,498
Article 21 to Semitropic*	0	2,342	0	0	0	0	0	0	0	0	0	0	2,342
Semitropic Recovery	0	0	0	0	5,454	4,719	0	0	3,000	0	3,000	3,827	20,000
Transfer from Browns Valley Irrigation District	0	0	0	0	0	0	0	0	0	3,100	0	0	3,100
Agency Total (*excluded from total)	6,811	874	7,312	3,164	5,454	4,719	7,944	8,558	7,270	6,746	6,489	6,349	71,690
Non-SWP Agencies													
Byron-Bethany Irrigation District													
Regulated delivery of local supply	848	279	2,223	4,003	4,356	4,152	4,213	2,945	1,849	560	162	124	25,714
Recreation/Fish and Wildlife (SWP)													
Lake del Valle	3	2	0	8	18	23	21	22	16	13	8	4	138
SWP	10,984	1,242	7,607	3,380	11,275	9,367	17,870	17,351	14,900	9,900	13,877	10,777	128,530
Non-SWP	971	2,337	5,693	10,941	6,608	6,542	4,270	4,145	3,021	4,794	162	124	49,608
South Bay Area Total	11,955	3,579	13,300	14,321	17,883	15,909	22,140	21,496	17,921	14,694	14,039	10,901	178,138

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
SAN JOAQUIN VALLEY AREA													
<i>SWP Agencies</i>													
Castaic Lake Water Agency													
Table A	0	871	282	2,849	422	0	0	0	0	0	0	0	4,424
Table A to Rosedale-Rio*	0	0	0	0	0	4,100	4,100	0	0	0	0	0	8,200
Article 56(c) carryover	1,647	0	0	0	0	0	0	0	0	0	0	0	1,647
Agency Total (*excluded from total)	1,647	871	282	2,849	422	0	0	0	0	0	0	0	6,071
<i>County of Kings</i>													
Table A	0	0	138	63	0	0	1,679	211	0	0	0	0	2,091
Table A POD through WWD*	1	0	94	406	444	213	411	439	330	253	156	86	2,833
Pool A	0	0	0	0	0	0	31	6	0	0	0	6	43
Article 12(e) carryover	305	0	0	0	0	0	0	0	0	0	0	0	305
Article 21	0	117	71	0	0	0	0	0	0	0	0	0	188
Article 21 through WWD*	102	112	72	0	0	0	0	0	0	0	0	0	286
Agency Total (*excluded from total)	305	117	209	63	0	0	1,710	217	0	0	0	6	2,627
<i>Dudley Ridge Water District</i>													
Table A	94	303	0	486	2,697	4,869	7,677	6,060	2,363	2,065	276	47	26,937
Table A Transfer to KCWA*	0	0	0	0	0	0	1,000	0	0	0	0	0	1,000
Table A Exchange from KCWA	0	0	0	0	0	2,000	0	0	0	0	0	0	2,000
Table A Exchange from SGVMWD	0	0	0	0	0	2,000	2,000	1,976	0	0	0	0	5,976
Table A Exchange to Santa Barbara County FCWCD*	0	0	0	0	0	0	0	0	520	0	0	0	520
Pool A	0	0	0	0	0	0	0	0	269	0	0	0	269
Article 56(c) carryover POD for Tulare	305	0	0	0	0	0	0	0	0	0	0	0	305
Article 56(c) carryover Transfer to KCWA*	2,000	0	0	0	0	0	0	0	0	0	0	0	2,000
Article 21	5,257	963	572	0	0	0	0	0	0	0	0	0	6,792
Article 21 POD for Tulare	454	0	0	0	0	0	0	0	0	0	0	0	454
Article 21 to Kern Water Bank*	1,284	506	371	0	0	0	0	0	0	0	0	0	2,161
Kern Water Bank Recovery	0	0	495	1,700	1,900	395	0	0	1,250	0	0	0	5,740
Agency Total (*excluded from total)	6,110	1,266	1,067	2,186	4,597	9,264	9,677	8,036	3,882	2,065	276	47	48,473
<i>Empire-West Side Irrigation District</i>													
Table A	0	0	1	0	64	27	0	305	0	0	0	0	397
Article 12(e) carryover	515	0	0	0	0	0	0	0	0	0	0	0	515
Article 21 unscheduled	1,047	71	54	0	0	0	0	0	0	0	0	0	1,172
Agency Total	1,562	71	55	0	64	27	0	305	0	0	0	0	2,084

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
Kern County Water Agency													
Table A	0	3,843	37,392	16,361	50,555	97,376	85,385	35,708	9,792	0	0	0	336,412
Table A Transfer from Dudley Ridge	0	0	0	0	0	0	1,000	0	0	0	0	0	1,000
Table A Transfer to Westlands Water District*	0	0	0	0	0	0	4,000	12,214	0	0	0	0	16,214
Table A Exchange to Dudley Ridge*	0	0	0	0	0	2,000	0	0	0	0	0	0	2,000
Table A Exchange for Castaic Lake WA*	0	0	0	0	0	0	2,000	2,000	2,000	2,000	2,000	1,000	11,000
Table A Exchange for City of Tracy*	0	0	0	0	0	0	0	0	100	0	0	0	100
Table A Exchange for Kern National Wildlife Refuge	0	0	0	0	0	0	0	0	2,000	4,104	2,974	922	10,000
Table A Exchange for Palmdale Water District*	0	0	0	0	0	0	0	0	1,359	1,710	1,335	522	4,926
Table A POD to Western Hills Water District*	23	26	62	99	149	188	173	145	30	76	38	22	1,031
Table A for EWA	0	0	0	0	36,220	0	40,000	30,000	18,780	0	0	0	125,000
Pool A	0	0	0	0	0	0	0	4,683	0	0	0	0	4,683
Article 56(c) carryover	19,645	0	0	0	0	0	0	0	0	0	0	0	19,645
Article 56(c) Transfer from Dudley Ridge	2,000	0	0	0	0	0	0	0	0	0	0	0	2,000
Article 21	62,985	20,871	16,005	0	0	0	0	0	0	0	0	0	99,861
Article 21 POD from Dudley Ridge	1,284	506	371	0	0	0	0	0	0	0	0	0	2,161
Transfer from Kern-Tulare Water District	0	0	0	0	0	0	5,947	5,634	0	0	0	0	11,581
Transfer from Rag Gulch Water District	0	0	0	0	0	0	1,976	1,872	0	0	0	0	3,848
<i>Deliveries to Water Banks</i>													
ACF&WCD, Zone 7 Article 56(c) to Semitropic	250	0	0	0	0	0	0	0	0	0	0	0	250
ACF&WCD, Zone 7 Article 21 to Semitropic	0	467	0	0	0	0	0	0	0	0	0	0	467
ACWD Article 56(c) to Semitropic	578	0	0	0	0	0	0	0	0	0	0	0	578
ACWD Article 21 to Semitropic	0	451	0	0	0	0	0	0	0	0	0	0	451
CLWA Table A to Rosedale-Rio	0	0	0	0	0	4,100	4,100	0	0	0	0	0	8,200
MWDSC Article 21 to Arvin-Edison	745	1,136	0	0	0	0	0	0	0	0	0	0	1,881
SCWWD Article 56(c) to Semitropic	1,350	0	0	0	0	0	0	0	0	0	0	0	1,350
SCWWD Article 21 to Semitropic	0	2,342	0	0	0	0	0	0	0	0	0	0	2,342
City of Tracy to Semitropic	0	1,000	0	0	0	0	0	0	0	0	0	0	1,000

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	2007 Total Deliveries												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
Westlands Water District to Semitropic	0	8,867	0	0	0	0	0	0	0	0	0	0	8,867
Water Bank Delivery Subtotal	2,923	14,263	0	0	0	4,100	4,100	0	0	0	0	0	25,386
Agency Total (*excluded from total)	88,837	39,483	53,768	16,361	50,555	101,476	98,408	47,897	9,792	0	0	0	506,577
Oak Flat Water District													
Table A	0	0	574	443	505	524	548	559	182	66	19	0	3,420
Unauthorized Table A	0	0	0	0	0	0	0	0	0	0	3	7	10
Pool A	0	0	0	0	0	0	27	0	0	0	0	0	27
Article 56(c) carryover	69	0	0	0	0	0	0	0	0	0	0	0	69
Article 21	0	13	28	0	0	0	0	0	0	0	0	0	41
Agency Total	69	13	602	443	505	524	575	559	182	66	22	7	3,567
Tulare Lake Basin Water Storage District													
Table A	0	0	3,535	3,792	10,462	13,388	7,226	11,142	0	0	151	1,431	51,127
Transfer Table A to Westlands Water District*	0	0	0	0	2,500	1,300	1,605	0	0	740	0	0	6,145
Pool A	0	0	0	0	0	0	431	18	0	0	0	1	450
Article 56(c) carryover	16,154	0	0	0	0	0	0	0	0	0	0	0	16,154
Article 56(c) POD through Dudley Ridge*	305	0	0	0	0	0	0	0	0	0	0	0	305
Article 21	8,410	2,481	1,557	0	0	0	0	0	0	0	0	0	12,448
Article 21 POD through Dudley Ridge*	454	0	0	0	0	0	0	0	0	0	0	0	454
Agency Total (* excluded from total)	24,564	2,481	5,092	3,792	10,462	13,388	7,657	11,160	0	0	151	1,432	80,179
Recreation/Fish and Wildlife (SWP)													
Department of Fish & Game, O'Neill	68	46	47	36	27	42	48	64	14	0	15	15	422
Parks and Recreation, O'Neill	3	0	3	0	2	1	3	0	1	1	1	0	15
Agency Total	71	46	50	36	29	43	51	64	15	1	16	15	437
Non-SWP Agencies													
Western Hills Water District													
Table A POD from KCWA	23	26	62	99	149	188	173	145	30	76	38	22	1,031
EWA Program													
SWP Gain*	0	0	0	0	0	0	18,620	26,460	15,680	5,710	16,787	0	83,257
Table A from KCWA*	0	0	0	0	36,220	0	40,000	30,000	18,780	0	0	0	125,000
CVP Water Annual Contractors													
Plain View WD/Musco Olive Company	29	31	35	29	32	33	4	10	26	62	36	27	354
U.S. Dept. of Veterans Affairs, S.J.V. National Cemetery	1	2	3	7	14	13	12	16	10	13	11	11	113

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	2007												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Deliveries
Agency Total	30	33	38	36	46	46	16	26	36	75	47	38	467
Cross Valley Canal Contractors													
County of Tulare	0	0	0	0	0	0	741	1,913	0	0	0	0	2,654
Fresno County Public Works	0	0	0	0	0	0	437	1,063	0	0	0	0	1,500
Hills Valley Irrigation District	0	0	0	0	0	0	475	1,198	0	0	0	0	1,673
Kern-Tulare Water District:													
Transfer to KCWA*	0	0	0	0	0	0	5,947	5,634	0	0	0	0	11,581
POD through Westlands Water District*	0	0	0	0	0	0	0	3,835	4,584	0	0	0	8,419
Lower Tule River Irrigation District:													
POD through Del Puerto Water District*	0	0	0	0	0	0	3,011	4,914	2,575	0	0	0	10,500
POD through San Luis Water District*	0	0	0	0	0	0	1,102	1,798	600	0	0	0	3,500
POD through Westlands Water District*	0	0	0	0	0	0	418	682	451	0	0	0	1,551
Pixley Irrigation District:													
POD through Del Puerto Water District*	0	0	0	0	0	0	3,012	4,914	2,574	0	0	0	10,500
POD through Westlands Water District*	0	0	0	0	0	0	1,406	2,294	1,351	0	0	0	5,051
Rag Gulch Water District:													
Transfer to KCWA*	0	0	0	0	0	0	1,976	1,872	0	0	0	0	3,848
POD through Westlands Water District*	0	0	0	0	0	0	0	1,300	1,502	0	0	0	2,802
Tri-Valley Water District	0	0	0	0	0	0	171	400	0	0	0	0	571
Agency Total	0	0	0	0	0	0	1,824	4,574	0	0	0	0	6,398
U.S. Bureau of Reclamation													
Del Puerto Water District:													
POD from Lower Tule River Irrigation District	0	0	0	0	0	0	3,011	4,914	2,575	0	0	0	10,500
POD from Pixley Irrigation District	0	0	0	0	0	0	3,012	4,914	2,574	0	0	0	10,500
Del Puerto Water District:													
POD from Lower Tule River Irrigation District	0	0	0	0	0	0	1,102	1,798	600	0	0	0	3,500
Westlands Water District:													
Table A POD from County of Kings	1	0	94	406	444	213	411	439	330	253	156	86	2,833
Table A Transfer from KCWA	0	0	0	0	0	0	4,000	12,214	0	0	0	0	16,214

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
Table A Transfer from Tulare Lake Basin WSD	0	0	0	0	2,500	1,300	1,605	0	0	740	0	0	6,145
Article 21 POD from County of Kings	102	112	72	0	0	0	0	0	0	0	0	0	286
General Conveyance to KCWA*	0	8,867	0	0	0	0	0	0	0	0	0	0	8,867
POD for City of Tracy	0	0	0	0	0	0	0	0	100	0	0	0	100
POD from Kern-Tulare Water District	0	0	0	0	0	0	0	3,835	4,584	0	0	0	8,419
POD from Lower Tule River Irrigation District	0	0	0	0	0	0	418	682	451	0	0	0	1,551
POD from Pixley Irrigation District	0	0	0	0	0	0	1,406	2,294	1,351	0	0	0	5,051
POD from Rag Gulch Water District	0	0	0	0	0	0	0	1,300	1,502	0	0	0	2,802
Kern National Wildlife Refuge	1,020	806	0	305	500	200	0	2,050	1,470	0	0	1,175	7,526
Table A Exchange from KCWA	0	0	0	0	0	0	0	0	2,000	4,104	2,974	922	10,000
Recreation	0	3	0	3	1	2	1	1	1	1	0	0	13
Fish and Wildlife	55	37	40	30	21	36	37	53	9	0	13	12	343
Agency Total (*excluded from total)	1,178	958	206	744	3,466	1,751	15,003	34,494	17,547	5,098	3,143	2,195	85,783
SWP	123,291	34,619	61,353	26,235	69,727	126,423	116,344	73,530	14,231	3,201	659	1,615	651,228
Non-SWP	1,105	10,746	78	374	568	284	18,750	33,947	17,253	4,180	3,034	2,147	92,466
San Joaquin Valley Area Total	124,396	45,365	61,431	26,609	70,295	126,707	135,094	107,477	31,484	7,381	3,693	3,762	743,694
CENTRAL COASTAL AREA													
<i>SWP Agencies</i>													
San Luis Obispo County Flood Control and Water Conservation District													
Table A	288	334	373	303	520	330	352	292	373	261	137	189	3,752
Pool A sale*	0	100	0	0	0	0	0	0	0	0	0	0	100
Article 21	24	0	0	0	0	0	0	0	0	0	0	0	24
Agency Total	312	334	373	303	520	330	352	292	373	261	137	189	3,776
Santa Barbara County Flood Control and Water Conservation District													
Table A	0	740	1,509	2,380	3,225	3,483	3,358	3,056	2,325	2,232	824	1,628	24,760
Table A Exchange from Dudley Ridge	0	0	0	0	0	0	0	0	520	0	0	0	520
Article 56(c) carryover	1,390	0	0	0	0	0	0	0	0	0	0	0	1,390
Article 21	0	417	653	0	0	0	0	0	0	0	0	0	1,070
Agency Total	1,390	1,157	2,162	2,380	3,225	3,483	3,358	3,056	2,845	2,232	824	1,628	27,740

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007 Total Deliveries
SWP	1,702	1,491	2,535	2,683	3,745	3,813	3,710	3,348	3,218	2,493	961	1,817	31,516
Non-SWP	0	0	0	0	0	0	0	0	0	0	0	0	0
Central Coastal Area Total	1,702	1,491	2,535	2,683	3,745	3,813	3,710	3,348	3,218	2,493	961	1,817	31,516
SOUTHERN CALIFORNIA AREA													
<i>SWP Agencies</i>													
Antelope Valley-East Kern Water Agency													
Table A	0	3,701	6,113	6,819	8,202	9,979	11,431	11,107	8,541	5,034	2,897	215	74,039
Table A POD from Mojave Water Agency	0	39	73	75	160	151	194	140	133	107	50	18	1,140
Table A Exchange from Littlerock Creek Irrigation District	0	0	0	0	0	0	0	0	0	0	0	1,380	1,380
Table A Exchange to Palmdale Water District*	0	0	0	0	210	210	0	0	0	0	0	0	420
Article 56(c) carryover	4,364	0	0	0	0	0	0	0	0	0	0	0	4,364
Article 56(c) carryover POD from Mojave Water Agency	36	0	0	0	0	0	0	0	0	0	0	0	36
Agency Total	4,400	3,740	6,186	6,894	8,362	10,130	11,625	11,247	8,674	5,141	2,947	1,613	80,959
<i>Castaic Lake Water Agency</i>													
Table A	0	1,595	2,870	3,007	4,862	5,149	3,770	3,619	2,979	1,970	1,291	1,238	32,350
Article 56(c) carryover	2,569	0	0	0	0	0	0	0	0	0	0	0	2,569
General Conveyance	0	0	0	0	0	0	2,000	2,000	2,000	2,000	2,000	1,000	11,000
Agency Total	2,569	1,595	2,870	3,007	4,862	5,149	5,770	5,619	4,979	3,970	3,291	2,238	45,919
<i>Coachella Valley Water District</i>													
Table A	0	922	0	0	0	0	5,133	13,321	13,321	13,321	13,321	13,321	72,660
Pool A	0	0	568	0	0	0	0	0	0	0	0	0	568
Agency Total	0	922	568	0	0	0	5,133	13,321	13,321	13,321	13,321	13,321	73,228
<i>Crestline-Lake Arrowhead Water Agency</i>													
Table A	130	0	71	103	165	226	225	198	218	164	164	104	1,768
Table A Transfer from San Bernardino Valley MWD	0	0	0	0	33	48	110	145	102	116	102	54	710
Local	0	83	40	0	0	0	0	0	0	0	0	2	125
Agency Total	130	83	111	103	198	274	335	343	320	280	266	160	2,603
<i>Desert Water Agency</i>													
Table A	0	380	0	0	0	0	2,120	5,500	5,500	5,500	5,500	5,500	30,000
Pool A	0	0	234	0	0	0	0	0	0	0	0	0	234
Agency Total	0	380	234	0	0	0	2,120	5,500	5,500	5,500	5,500	5,500	30,234

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	2007												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Deliveries
Littlerock Creek Irrigation District													
Table A Exchange to AVEK*	0	0	0	0	0	0	0	0	0	0	0	1,380	1,380
Metropolitan Water District of Southern California													
Table A	0	0	18,610	155,645	166,016	166,452	176,046	137,826	85,730	73,175	59,101	8,445	1,047,046
Table A Flexible Storage Payback	0	0	0	99,854	0	0	0	0	0	0	0	0	99,854
Table A Transfer from San Bernardino Valley MWD	0	20,000	10,000	0	0	0	0	0	0	0	0	0	30,000
Pool A	0	0	8,962	0	0	0	0	0	0	0	0	0	8,962
Article 56(c) carryover	28,098	0	0	0	0	0	0	0	0	0	0	0	28,098
Article 21	85,636	47,790	31,210	0	0	0	0	0	0	0	0	0	164,636
Article 21 to Kern Water Bank*	745	1,136	0	0	0	0	0	0	0	0	0	0	1,881
Recovery from Arvin-Edison Water Bank	0	0	2,540	1,254	598	485	500	701	1,531	5,092	5,893	5,631	24,225
Recovery from Kern-Delta Water Bank	0	0	0	0	0	0	0	0	2,500	1,250	1,250	0	5,000
Recovery from Mojave Water Bank	0	0	0	0	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250	26,000
Recovery from Semitropic Bank	0	0	0	0	0	0	0	0	13,047	20,016	29,946	30,977	93,986
Flexible Withdrawal from Castaic Lake	0	28,352	55,665	0	0	0	0	0	0	0	0	15,350	99,367
Flexible Withdrawal from Lake Perris	0	0	15,837	0	0	0	0	0	0	0	0	0	15,837
Agency Total (*excluded from total)	113,734	96,142	142,824	156,899	169,864	170,187	179,796	141,777	106,058	102,783	99,440	63,653	1,543,157
Mojave Water Agency													
Table A	0	167	3,190	1,107	896	800	651	688	3,831	2,642	1,603	2,657	18,232
Table A POD through AVEK*	0	39	73	75	160	151	194	140	133	107	50	18	1,140
Article 56(c) extended carryover	701	0	0	0	0	0	0	0	0	0	0	0	701
Article 56(c) carryover POD through AVEK*	36	0	0	0	0	0	0	0	0	0	0	0	36
Agency Total (*excluded from total)	701	167	3,190	1,107	896	800	651	688	3,831	2,642	1,603	2,657	18,933
Palmdale Water District													
Table A	0	256	896	1,642	1,676	2,236	2,583	2,756	735	0	0	0	12,780
Table A Exchange from AVEK	0	0	0	0	210	210	0	0	0	0	0	0	420
Pool A	0	0	0	0	0	0	100	0	0	0	0	0	100
Article 56(c) carryover	985	0	0	0	0	0	0	0	0	0	0	0	985
Article 21	0	504	339	0	0	0	0	0	0	0	0	0	843
General Conveyance	0	0	0	0	0	0	0	0	1,359	1,710	1,335	522	4,926
Agency Total	985	760	1,235	1,642	1,886	2,446	2,683	2,756	2,094	1,710	1,335	522	20,054

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	2007
													Total Deliveries
San Bernardino Valley Municipal Water District													
Table A	916	963	2,029	1,689	2,706	1,575	2,543	2,682	2,875	2,785	2,849	2,794	26,406
Table A Transfer to CLAWA *	0	0	0	0	33	48	110	145	102	116	102	54	710
Table A Transfer to MWDSC*	0	20,000	10,000	0	0	0	0	0	0	0	0	0	30,000
Article 56(c) carryover													
Agency Total (*excluded from total)	916	963	2,029	1,689	2,706	1,575	2,543	2,682	2,875	2,785	2,849	2,794	26,406
San Gabriel Valley Municipal Water District													
Table A	0	2	0	0	907	2,925	190	0	0	0	0	0	4,024
Table A Exchange to Dudley Ridge*	0	0	0	0	0	2,000	2,000	1,976	0	0	0	0	5,976
Pool A sale*	0	7,280	0	0	0	0	0	0	0	0	0	0	7,280
Agency Total (*excluded from total)	0	2	0	0	907	2,925	190	0	0	0	0	0	4,024
San Geronio Pass Water Agency													
Table A	792	584	743	447	626	123	0	0	0	91	603	0	4,009
Ventura County Watershed Protection District													
Table A	0	0	0	124	124	124	124	124	124	124	2,012	120	3,000
Pool A sale*	0	9,000	0	0	0	0	0	0	0	0	0	0	9,000
Agency Total (*excluded from total)	0	0	0	124	124	124	124	124	124	124	2,012	120	3,000
Recreation/Fish and Wildlife (SWP)													
Castaic Lagoon	12	10	10	21	23	26	20	22	19	20	2	11	196
Castaic Lake	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Perris	141	141	141	141	141	141	141	141	141	141	141	141	1,692
Pyramid Lake	0	0	0	0	1	1	1	1	0	0	0	2	6
Silverwood Lake	3	1	6	10	13	12	16	16	12	10	3	1	103
Agency Total	156	152	157	172	178	180	178	180	172	171	146	155	1,997
SWP													
SWP	124,383	105,407	160,107	172,084	190,609	193,913	209,148	182,237	144,589	134,808	129,978	91,209	1,838,472
Non-SWP	0	83	40	0	0	0	2,000	2,000	3,359	3,710	3,335	1,524	16,051
Southern California Area Total	124,383	105,490	160,147	172,084	190,609	193,913	211,148	184,237	147,948	138,518	133,313	92,733	1,854,523
SWP WATER													
<i>SWP Long Term Water Supply Contracts</i>													
Table A	2,303	14,986	84,479	201,598	261,604	325,462	340,086	259,025	151,049	119,318	101,347	44,453	1,905,710
Transfer Table A	0	20,000	10,000	0	2,533	1,348	6,715	12,359	102	856	102	54	54,069
Exchange Table A	0	0	0	0	210	4,210	2,000	1,976	520	0	0	1,380	10,296
Pool A	0	0	9,764	0	0	197	1,436	4,707	269	0	0	7	16,380
Article 12(e) carryover	820	0	0	0	0	0	0	0	0	0	0	0	820

Table 9-4 Total Amounts of Water Delivered in 2007, by Month (Acre-Feet)

Contracting Agency and Type of Service	2007												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total Deliveries
Article 56(C) carryover	93,942	0	0	0	0	0	0	0	0	0	0	0	93,942
Article 21	166,366	81,762	54,377	1,429	5,677	0	0	0	0	0	0	362	309,973
Water Bank Recovery	0	0	3,035	2,954	11,202	8,849	3,750	3,951	25,621	30,665	45,033	44,891	179,951
Flexible Storage Withdrawal	0	28,352	71,502	0	0	0	0	0	0	0	0	15,350	115,204
Agency Total	263,431	145,100	233,157	205,981	281,226	340,066	353,987	282,018	177,561	150,839	146,482	106,497	2,686,345
Other Water Supply Contracts													
Solano Settlement	0	0	0	1,286	0	0	0	0	3,427	2,202	2,654	999	10,568
Recreation/Fish and Wildlife	232	200	207	217	229	246	250	267	203	186	170	174	2,581
SWP Total	263,663	145,300	233,364	207,484	281,455	340,312	354,237	282,285	181,191	153,227	149,306	107,670	2,699,494
NON-SWP WATER													
Non-SWP Water Supply Contracts													
Local	55,231	2,738	5,975	68,844	201,808	193,842	204,326	148,385	61,255	75,219	131,458	86,828	1,235,909
Vallejo Permit	0	100	99	197	100	100	1,895	2,943	2,597	1,738	1,473	559	11,801
Subtotal	55,231	2,838	6,074	69,041	201,908	193,942	206,221	151,328	63,852	76,957	132,931	87,387	1,247,710
CVP/Reclamation													
Water transfer to SWP contractor	0	0	0	0	0	0	7,923	8,506	1,000	4,100	0	0	21,529
Annual Contract	30	33	38	36	46	46	16	26	36	75	47	38	467
Conveyance	0	9,867	0	0	0	0	2,000	2,000	3,459	3,710	3,335	1,522	25,893
Cross Valley Canal Contractors	0	0	0	0	0	0	10,773	24,311	13,637	0	0	0	48,721
Kern National Wildlife Refuge	1,020	806	0	305	500	200	0	2,050	3,470	4,104	2,974	2,097	17,526
Recreation/Fish and Wildlife	55	40	40	33	22	38	38	54	10	1	13	12	356
Subtotal	1,105	10,746	78	374	568	284	20,750	36,947	21,612	11,990	6,369	3,669	114,492
Non-SWP Total	56,336	13,584	6,152	69,415	202,476	194,226	226,971	188,275	85,464	88,947	139,300	91,056	1,362,202
Grand Total	319,999	158,884	239,516	276,899	483,931	534,538	581,208	470,560	266,655	242,174	288,606	198,726	4,061,696

Table 9-5 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962-2007 (Acre-Feet)^e

Year	Annual Table Amounts According to Long-Term Water Supply Contracts							Water Conveyed							Total (16)	
								Deliveries								
	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)	Table A Water (8)	Article 21, Surplus, and Unscheduled Water ^a (9)	Other Water ^b (10)	Feather River Diversions ^c (11)	Wildlife/Recreation Water (12)	Subtotal (13)	Initial Fill Water (14)		Losses and Storage Changes ^d (15)
1962	0	0	0	0	0	0	0	0	0	18,289	0	0	18,289	9	272	18,570
1963	0	0	0	0	0	0	0	0	0	22,456	0	0	22,456	71	185	22,712
1964	0	0	0	0	0	0	0	0	0	32,507	0	0	32,507	171	152	32,830
1965	0	0	0	0	0	0	0	0	0	44,105	0	0	44,105	93	729	44,927
1966	0	0	0	0	0	0	0	0	0	67,928	0	0	67,928	0	1,746	69,674
1967	0	0	11,538	0	0	0	11,538	11,354	0	53,605	0	0	64,959	8,328	4,212	77,499
1968	550	0	109,900	77,350	0	3,700	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	163,075	0	5,000	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	202,000	0	5,700	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	251,800	0	6,700	375,590	357,340	296,019	44,119	778,362	8	1,475,948	7,853	5,812	1,489,513
1972	970	0	118,300	413,066	0	209,423	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	383,652	0	481,100	986,252	692,888	296,416	42,511	800,743	1,155	1,833,713	204,638	53,798	2,092,149
1974	1,230	0	122,400	460,650	0	597,920	1,182,200	874,075	417,676	46,224	911,613	2,118	2,251,708	237,554	10,657	2,499,917
1975	1,610	0	124,500	545,809	0	714,950	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	543,417	0	836,480	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	581,400	0	954,901	1,667,321	573,896	0	389,065	581,994	1,111	1,546,066	0	(131,151)	1,414,915
1978	1,850	0	130,700	635,900	0	1,049,584	1,818,034	1,312,365	16,914	121,225	786,517	1,691	2,238,712	64,443	717,370	3,020,525
1979	2,130	0	132,700	702,685	0	1,190,573	2,028,088	1,404,292	648,389	187,630	882,549	1,766	3,124,626	12,302	(83,430)	3,053,498
1980	1,810	500	134,800	758,100	1,946	1,317,614	2,214,770	1,511,491	404,557	46,459	875,045	2,131	2,839,683	0	(26,606)	2,813,077
1981	1,940	650	137,000	818,000	2,813	1,432,065	2,392,468	1,889,125	908,428	279,161	838,557	4,688	3,919,959	0	(802,263)	3,117,696
1982	1,970	800	139,200	876,500	5,626	1,550,449	2,574,545	1,738,056	215,873	154,882	776,330	4,646	2,889,787	0	480,752	3,370,539
1983	2,000	950	141,400	867,118	8,439	1,681,257	2,701,164	1,184,119	13,019	181,453	602,905	7,849	1,989,345	0	(90,997)	1,898,348
1984	3,630	1,100	143,600	979,211	12,698	1,744,098	2,884,337	1,587,593	262,917	381,024	832,332	7,040	3,070,906	0	(140,182)	2,930,724
1985	3,760	1,250	145,800	1,019,049	21,138	1,864,849	3,055,846	1,912,765	307,672	404,842	870,008	4,033	3,499,320	0	92,885	3,592,205
1986	4,190	1,400	148,100	1,091,946	28,210	1,983,890	3,257,736	2,007,906	36,620	193,606	791,737	3,865	3,033,734	0	284,380	3,318,114
1987	4,620	1,550	150,300	1,188,500	35,204	2,103,941	3,484,115	2,113,915	114,907	377,592	831,947	7,672	3,446,033	0	(390,413)	3,055,620
1988	5,060	15,471	152,500	1,246,100	43,722	2,225,482	3,688,335	2,276,373	0	507,076	794,834	4,889	3,683,172	0	(92,850)	3,590,322
1989	5,500	24,615	156,700	1,290,400	56,342	2,424,633	3,958,190	2,853,747	0	474,559	830,500	8,135	4,166,941	0	447,917	4,614,858
1990	6,040	28,190	160,900	1,313,450	70,486	2,500,600	4,079,666	2,582,151	90	424,697	875,099	9,262	3,891,299	0	(528,869)	3,362,430
1991	11,880	29,590	166,400	1,338,011	70,486	2,510,200	4,126,567	549,113	3,521	551,051	565,395	4,879	1,673,959	0	167,435	1,841,394

Table 9-5 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962-2007 (Acre-Feet)^c (continued)

Year	Annual Table Amounts According to Long-Term Water Supply Contracts							Water Conveyed							Total (16)	
	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)	Deliveries								
								Table A Water (8)	Article 21, Surplus, and Unscheduled Water ^a (9)	Other Water ^b (10)	Feather River Diversions ^c (11)	Wildlife/Recreation Water (12)	Subtotal (13)	Initial Fill Water (14)		Losses and Storage Changes ^d (15)
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	41,38816	1,410,799	1,156	144,789	613,978	2,605	2,233,982	0	(63,541)	2,109,786
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	41,46966	2,313,236	0	254,854	822,589	2,609	3,395,287	0	726,123	4,119,411
1994	12,000	37,215	182,000	1,342,300	70,486	2,510,200	41,54201	1,749,351	112,625	236,739	874,018	8,200	2,980,933	0	(295,405)	2,685,528
1995	12,050	44,030	184,000	1,342,300	70,486	2,510,200	41,163066	1,967,093	64,330	78,425	860,077	2,575	2,972,500	0	69,536	3,042,036
1996	12,100	48,225	186,000	1,301,630	70,486	2,492,900	41,111,341	2,514,825	28,647	251,391	934,997	3,907	3,733,767	86	491,550	4,225,402
1997	12,150	49,315	188,000	1,297,300	45,201	2,492,900	4,084,866	2,226,083	21,432	322,000	993,211	4,146	3,601,172	527	(11,806)	3,589,893
1998	12,200	50,420	188,000	1,272,300	45,201	2,517,900	4,086,021	1,726,519	20,288	134,682	872,738	2,108	2,756,335	0	(132,491)	2,623,844
1999	12,250	51,500	188,000	1,272,300	70,486	2,519,900	4,114,436	2,738,903	158,070	85,312	1,108,672	4,324	4,095,281	0	(189,525)	3,905,756
2000	14,000	55,945	210,000	1,205,300	70,486	2,565,900	4,121,631	3,199,906	308,785	332,654	1,085,886	4,030	4,931,261	0	(20,103)	4,911,158
2001	14,670	66,561	220,000	1,185,519	70,486	2,566,900	4,124,136	1,534,263	43,435	477,835	1,078,656	2,929	3,137,118	0	159,983	3,297,101
2002	14,730	67,396	220,000	1,195,219	70,486	2,557,200	4,125,031	2,564,587	37,165	307,162	1,132,938	3,694	4,045,816	0	80,709	4,126,525
2003	14,790	68,231	220,400	1,194,819	70,486	2,558,200	4,126,926	2,890,215	59,828	251,447	1,008,093	2,846	4,212,429	0	459,377	4,671,806
2004	13,100	69,056	222,619	1,182,700	70,486	2,569,100	4,127,061	2,594,999	218,496	385,088	1,174,672	2,865	4,376,120	0	108,840	4,484,960
2005	10,800	69,481	222,619	1,170,000	70,486	2,582,300	4,125,686	2,826,210	731,083	96,932	1,074,706	1,506	4,730,437	0	529,347	5,259,784
2006	11,124	69,856	222,619	1,170,000	70,486	2,582,800	4,126,885	2,971,851	621,339	119,403	1,112,551	1,936	4,827,080	0	(119,981)	4,707,099
2007	11,520	70,231	222,619	1,170,000	70,486	2,584,450	4,129,306	2,081,217	309,973	449,935	1,217,990	2,581	4,061,696	0	(524,851)	3,536,845
Total	269,824	990,158	6,457,514	37,733,476	1,434,316	70,026,359	116,911,647	68,684,705	8,633,601	9,292,048	35,239,354	141,410	117,929,422	1,834,310	1,244,122	121,007,854

^a Values include amounts of deliveries to short-term contractors (Mustang Water District, 1970-1972; Tracy Golf and Country Club 1974, 1979, and 1980; 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 water 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 Delta; (3) storable local inflows to SWP reservoirs; (4) side inflow to San Luis Canal; and (5) inflow into California Aqueduct from Kern River Interlie.

^e Note: values presented in this table reflect changes to historical delivery data as a result of an audit performed by DWR. These data supersede values presented in previous Bulletin 132 editions.



Chapter 10

Power Resources

Sunset in the Sacramento-San Joaquin Delta.

Significant Events in 2007

During 2007, the California Independent System Operator (CAISO) continued work on proposals for a major redesign of its markets through the Market Redesign and Technology Upgrade (MRTU) tariff.

In January 2005, the Department of Water Resources (DWR) submitted its application for a new license for the Oroville Facilities with the Federal Energy Regulatory Commission (FERC). On February 1, 2007, FERC issued an annual license pending completion of the relicensing process. Environmental documentation and negotiations with stakeholders were ongoing in 2007.

Information for this chapter was provided by the State Water Project Analysis Office, the SWP Power and Risk Office, and the Executive Division.

Long-term State Water Project (SWP) water contractors depend on the SWP to provide economical sources of power to deliver affordable water. Consequently, the Department of Water Resources (DWR) developed and administers a comprehensive power resources program. Key elements of the program include the strategic timing of generation and pumping schedules, purchase of power resources and transmission services, short-term sales of surplus power, and studies of power resources for future needs.

Power Resources Program

The goals of the SWP power resources program are to:

- obtain reliable, environmentally sensitive, and competitively priced power resources and transmission services sufficient to operate the SWP;
- develop and manage power resources to minimize the cost of water deliveries to SWP water contractors;
- meet responsibilities and criteria of the Western Electricity Coordinating Council (WECC); and
- conform to regulations of the Federal Energy Regulatory Commission (FERC).

To achieve these goals, DWR constructed its own power facilities and enters into long-term contracts and short-term arrangements with other electric utilities and with the California Independent System Operator (CAISO) for transmission access and for power purchases and sales. DWR's generators and pumps also provide spinning and nonspinning reserves to the CAISO ancillary services markets. In addition, DWR's power resources program takes advantage of SWP water storage and conveyance capacities to control pump loads and generation in a cost-effective manner.

Major Electric Utility Industry Developments

During 2007, CAISO continued refining the Market Redesign and Technology Upgrade (MRTU) tariff. At the same time, CAISO developed a post-MRTU initiatives road map to further reform the California electricity market.

In the area of renewable resources, the California Public Utilities Commission (CPUC), California Energy Commission, CAISO, and publicly owned utilities supervised the Renewable Energy Transmission Initiative to help identify transmission projects needed to accommodate renewable energy goals. These goals are primarily the result of California's Renewables Portfolio Standard, which requires electric corporations to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010.

DWR Participation in Electric Utility Industry Activities

DWR continued to participate in CAISO's stakeholder processes to help ensure that MRTU tariff, CAISO Business Practice Manuals, and MRTU functional simulations are compatible with operations of wholesale market participants, including the SWP. DWR's participation in CAISO stakeholder

processes focused on the following primary elements:

- modeling, scheduling, and settling DWR's hydroelectric power facilities and power transactions;
- forecasting CAISO Locational Marginal Prices and participating in CAISO Congestion Revenue Rights allocation and auction processes;
- allocating Residual Unit Commitment costs;
- setting Start-up Cost and Minimum Load Cost bid caps;
- accommodating Use-Limited Resources for the CAISO market participation;
- mitigating energy bids for Exceptionally Dispatched resources;
- allocating CAISO Grid Management Charges to market participants; and
- initiating new market refinements, including Demand Response and Convergence Bidding.

DWR also participated in additional electric utility stakeholder processes and FERC proceedings to help ensure that various market requirements and cost allocation mechanisms were appropriately structured. Major processes and litigations in which DWR participated include the following (with FERC docket number given in parenthesis if applicable):

- San Diego Gas & Electric Company (SDG&E) 3rd transmission owner tariff filing to increase its wholesale Transmission Revenue Requirement (ER07-284);
- CAISO request for conceptual approval of a financing mechanism and rate treatment for facilities that interconnect Location Constrained Resources (EL07-33);
- Nevada Hydro Company filing for inclusion of its pump-storage cost into

CAISO transmission access charge (ER06-278);

- Pacific Gas & Electric Company (PG&E) 10th transmission owner tariff filing and existing transmission contracts rate filing (ER07-1213, ER07-267);
- PacifiCorp transmission agreement filing under which PacifiCorp leases to PG&E a 500 KV transmission line over a four-year window (ER07-882);
- PG&E filing to increase existing transmission contract rates under the Comprehensive Agreement with DWR (ER08-267);
- Southern California Edison (SCE) petition for declaratory order for incentive rate treatment (EL07-62);
- PG&E filing to FERC to continue revenue sharing on non-tariff products and services (ER07-91);
- CAISO filing of Transmission Rights and Transmission Curtailments that affect SWP scheduling priorities (ER06-615, ER07-613);
- CAISO Tariff Amendment 60 filing to allocate minimum load costs that are incurred in solving Inter-Zonal Congestions (EL04-103, ER04-835);
- CAISO filing to allocate ancillary service costs (ER06-615-006, ER06-615-012);
- DWR filing in recognition of DWR as a wholesale entity by California Air Resources Board for greenhouse gas emission reporting;
- California Energy Commission process for designating transmission corridors in California;
- CAISO filing to allocate Electric Reliability Organization cost to market participants (ER07-805-002, ER07-1304); and
- CAISO filing to exempt SWP Participating Load from underscheduling penalties (ER06-615-013).

DWR also participated in litigation before the Ninth Circuit Court and the D.C. Circuit Court on various electric utility matters when a

successful resolution was not reached before FERC. Litigation included:

- FERC No. 04-73161: treatment of certain PG&E interconnection facilities that connect generating plants to the transmission grid as transmission facilities and allocation of the related cost to ratepayers on a “rolled-in” systemwide basis;
- FERC No. 06-1179: treatment of certain transmission facilities that are included in the contracts between the transmission owners and the Cities of Anaheim and Riverside but that are not controlled by CAISO and allocation of the associated cost to CAISO ratepayers; and
- FERC No. 07-1222: application of Must Offer Obligations to Use-limited Resources including DWR’s hydroelectric power generators and pumps.

Bulk Electric System Reliability Standards

Background

The Energy Policy Act of 2005 gave FERC legal jurisdiction over the reliability of the Bulk Electric System in the United States. The North American Electric Reliability Corporation (NERC) was chosen by FERC as the Electric Reliability Organization (ERO) and is now empowered to oversee development of reliability standards and to assess the adequacy of the owners and users of the Bulk Electric System to operate in a reliable manner. Compliance with NERC reliability standards is mandatory. Noncompliance with any NERC reliability standard requirement can result in significant financial penalties and/or sanctions.

NERC has delegated enforcement of its reliability standard requirements to eight regional entities. In DWR’s region, the Western Electricity Coordinating Council (WECC) is the entity assessing and enforcing compliance with the reliability standards.

The standards developed by NERC fall under these categories:

- BAL—Resource and Demand Balancing;
- COM—Communications;
- CIP—Critical Infrastructure Protection;
- EOP—Emergency Preparedness and Operations;
- FAC—Facilities Design, Connections, and Maintenance;
- INT—Interchange Scheduling and Coordination;
- IRO—Interconnection Reliability Operations and Coordination;
- MOD—Modeling, Data, and Analysis;
- NUC—Nuclear;
- PER—Personnel Performance, Training, and Qualifications;
- PRC—Protection and Control;
- TOP—Transmission Operations;
- TPL—Transmission Planning; and
- VAR—Voltage and Reactive.

NERC Reliability Compliance—Program Goals

DWR is committed to providing an effective reliability compliance program. In addition, DWR strives to achieve a culture of compliance that supports its key business objectives of safety and reliability.

DWR established its compliance program to ensure strict compliance with NERC’s mandatory reliability standards. These standards include specific impacts on operations, maintenance, physical security, and cyber security. The compliance program may perform program audits and reviews to ensure successful and ongoing compliance. Audits and reviews are done by the Governance side of the compliance program and include only staff that are independent of any responsibility for meeting the reliability standards. Consultants or contractors can be used for providing the objectivity that is required.

Compliance program attributes include:

- senior management involvement and support in fostering a culture of compliance as well as having a continuous role in participating, evaluating, and authorizing the program;
- DWR participation in industry groups that develop, review, approve, and implement reliability standards, North American Energy Standards Board (NAESB) business practice standards, and WECC regional criteria and guidelines;
- identification of employees, designated as Business Owners and Subject Matter Experts, who have responsibility, authority, and accountability for compliance with the reliability standards;
- employee training as required to adhere to the requirements of the reliability standards and to foster support and awareness of the compliance program and employee responsibilities;
- encouraging internal communication along with an easy mechanism to alert program staff to any issues that have caused, or are likely to cause, DWR to be potentially noncompliant with the standards; and
- responsiveness in addressing, correcting, or mitigating issues identified during the development and implementation of the compliance program.

DWR's Responsibility

All owners, operators, and users of the Bulk Electric System must formally register with NERC and fully comply with all applicable reliability standards and associated requirements. DWR is currently registered with NERC for 4 of 15 functional areas as follows:

- Transmission Owner (TO);
- Load Serving Entity (LSE);
- Generation Owner (GO); and
- Generation Operator (GOP).

DWR organizations that are responsible for the registered functional areas reside within the following offices:

- Plant Asset Management Office;
- State Water Project Operations Control Office;
- Power Planning and Contract Management Office;
- Field Division Offices; and
- Operations Support Office.

All management and staff in these organizations are required to support DWR's compliance efforts.

DWR has initiated the work required to meet the compliance requirements of the reliability standards. The first self-certification is due in January 2008 involving operations, maintenance and engineering functions. This process requires DWR to certify that it is currently in compliance with the requirements of each standard or provide a violation report supported by a mitigation plan to resolve outstanding items. Violations may lead to financial penalties or reduced operating flexibility.

Oroville Facilities Relicensing

On January 26, 2005, DWR submitted an application to FERC requesting a new license for the Oroville Facilities (FERC Project Number 2100). The existing 50-year term hydropower license expired January 31, 2007, and, until the new license is issued, FERC is issuing annual licenses.

In September 2005, FERC accepted DWR's application for a new license; and in March 2006, DWR concluded settlement negotiations with a wide array of interests. The final Settlement Agreement was filed the same month.

On May 18, 2007, FERC issued the final environmental impact statement (EIS) for the Oroville facilities. On July 6, 2007,

DWR submitted the combined biological assessment and essential fish habitat assessment to the National Marine Fisheries Service (NOAA Fisheries). These assessments evaluated the effects of the proposed project on the federally listed anadromous fish species and their designated critical habitats protected under the federal Endangered Species Act (ESA).

Negotiations among DWR, PG&E, and various stakeholders on the *Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead: FERC Project Nos. 1962, 2100, 2105, and 2107* (HEA) were concluded in November 2007, and the parties signed the habitat expansion agreement. However, negotiations with Native American tribes continued, as well as negotiations between DWR and Butte County to address socioeconomic issues, and negotiations between DWR and Feather River Service Area water users to address water temperature contractual issues. Discussions continued with appropriate parties regarding the development of a historic properties management plan and an associated programmatic agreement. DWR circulated the draft environmental impact report (EIR) in 2007 and received numerous comments from agencies and stakeholders. It continued with preparation of the final EIR and responses to comments.

The HEA is available at <http://www.sac-basin-hea.com>.

During 2007, primary achievements included:

- completion of the reconnaissance study for potential facilities modification(s) for fish habitat temperature needs;
- FERC's issuance of a Notice of Authorization for Continued Project Operation while the relicensing process continues;
- filing of responses to comments submitted by interveners on the draft EIS;

- completion of the final biological opinion by the U.S. Fish and Wildlife Service (USFWS) on wildlife and non-anadromous fish species;
- completion of the National Environmental Policy Act (NEPA) final EIS by FERC containing evaluations on DWR's proposal and alternatives for licensing the Oroville facilities;
- withdrawing and resubmitting the application for Section 401 water quality certification with the State Water Resources Control Board (SWRCB), thereby reinitiating the one-year clock for SWRCB to take action;
- issuance of a notice of completion and availability of the draft EIR and notice of public meeting for relicensing of the Oroville facilities;
- submission of the revised biological assessment for federally listed anadromous fishes;
- conducting of a public meeting on the draft EIR for the Oroville facilities relicensing;
- submission of comments to FERC on the final EIS for the Oroville facilities relicensing; and
- submission to FERC of the approved copy of the HEA.

As an interim settlement activity, DWR agreed to provide \$3 million to the Feather River Recreation and Park District to fund recreation improvements at Riverbend Park in Oroville through calendar year 2007. An additional \$2.2 million was added via a contract amendment with approval of the original signatories to the interim settlement agreement for Riverbend Park improvements. These funds count towards the total committed as part of the Supplemental Benefits Fund created by the Oroville Facilities Relicensing Settlement Agreement.

The following is a partial list of SWP facilities that will be subject to the new license terms and conditions:

- Oroville Dam and Reservoir;
- Hyatt Pumping-Generating Plant;
- Thermalito Pumping-Generating Plant;
- Thermalito Diversion Dam Powerplant;
- Thermalito Diversion Dam;
- Fish Barrier Dam;
- Feather River Fish Hatchery;
- Thermalito Power Canal;
- Thermalito Forebay; and
- Thermalito Afterbay.

Existing SWP Power Facilities

Figure 10-1 shows the names, locations, and nameplate capacities of DWR's primary power facilities.

Hydroelectric

Economic hydroelectric generation provides the largest share of SWP power resources. The combined Hyatt Pumping-Generating Plant and Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt hours (kWh) of energy in a median water year, while the 3 megawatts (MW) from Thermalito Diversion Dam Powerplant adds another 24 million kWh per year.

Generation at California Aqueduct recovery plants—Alamo, Devil Canyon, Gianelli, Mojave Siphon, and Warne—varies with the amount of water conveyed. These five plants generate about one-sixth of the total energy used by the SWP.

Coal

Since July 1983, under the "Participation Agreement Reid Gardner Unit No. 4" between DWR and Nevada Power Company (NPC), DWR has received energy from Reid Gardner Powerplant, a coal-fired facility in Nevada. Reid Gardner Powerplant consists of

four units. DWR owns 67.8 percent of Unit 4, and NPC owns the remainder of Unit 4 as well as all of Units 1, 2, and 3. Under the agreement, DWR receives up to 235 MW from Unit 4, subject to NPC's limited right to interrupt DWR's energy deliveries. Whenever NPC interrupts DWR's scheduled energy, DWR receives payment based on NPC's combustion turbine costs.

In 2007, NPC entered into a consent decree with the U.S. Environmental Protection Agency and the State of Nevada to settle disputes related to opacity and emission reporting requirements at the Reid Gardner Powerplant. As a result of the consent decree, NPC installed pollution control equipment, paid penalties, and agreed to comply with various reporting requirements. The Reid Gardner agreement expires in 2013 and will not be renewed.

Future SWP Power Facilities

To meet future SWP power requirements, DWR evaluates new power and transmission resources. Factors considered include:

- anticipated power requirements for pumping;
- 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.

In addition, DWR is considering several potential power resources at existing plants, including a second unit at Alamo Powerplant and a third unit at Warne Powerplant.

Contractual Resource Arrangements

Through joint developments, exchanges, and purchases, DWR obtains a significant amount of capacity and energy for SWP operations



Figure 10-1 Names, Locations, and Nameplate Capacities of Primary Power Facilities

from other utilities throughout California, the Northwest, and the Southwest. Under these agreements, DWR can sell, buy, or exchange energy on an hourly to multiyear basis, as needed.

Joint Developments

In 1966, DWR entered into a contract with the Los Angeles Department of Water and Power (LADWP) for joint development of the West Branch of the California Aqueduct. LADWP constructed and operates Castaic Powerplant, which is connected to the LADWP transmission system at the Sylmar Substation. DWR receives capacity and energy at the Sylmar Substation based on weekly water schedules through the West Branch.

Gianelli Pumping-Generating Plant is a joint project between DWR and the U.S. Bureau of Reclamation (Reclamation). DWR's share of the facility is 222 MW, and Reclamation's share is 202 MW.

Purchases

DWR obtains a significant amount of energy through long-term and short-term purchase agreements.

Long-Term Purchase Agreements. The output of the 165 MW hydroelectric Pine Flat Powerplant, owned and operated by Kings River Conservation District, supplies the SWP with about 400 million kWh of energy in median water years. DWR also contracts for the energy output of five hydroelectric plants totaling 30 MW owned and operated by Metropolitan Water District of Southern California (Metropolitan).

Short-Term Purchase Agreements. DWR also purchases energy from member utilities and energy marketers of the Western Systems Power Pool, which changed its name to WSPP in May 2007. In addition to the standard WSPP transactions, DWR can also purchase surplus energy from Metropolitan's

Colorado River Aqueduct system according to the terms of the 1988 Coordination Agreement between DWR and Metropolitan. This agreement also provides for monthly surplus firm and economy energy sales from DWR to Metropolitan and energy exchanges between DWR and Metropolitan.

Energy Exchanges

Under an energy exchange agreement with Sacramento Municipal Utility District (SMUD), DWR provides SMUD with energy during peak periods from May through September. In return, SMUD provides DWR with energy during off-peak periods from January through March and from September through December.

Load Management

DWR operates its pumps through an extensive computerized network. This control system allows DWR to minimize the cost of power it purchases by maximizing pumping during off-peak periods when power costs are lower—usually at night—and selling power to other utilities and energy marketers during on-peak periods when power costs are higher. By taking advantage of this scheduling flexibility, whenever not restricted by operating requirements, SWP pump load and generation are optimized to reduce the net cost of power needed for SWP water deliveries.

Sales or Exchanges of Excess Power

When generation from SWP power resources exceeds requirements, DWR sells or exchanges the excess power through contracts with utilities and marketers.

Demand Response

Through the demand reserves contract administered by the California Energy Resource Scheduling Division of DWR, DWR reduces demand on the CAISO electric grid by dropping SWP pump load when called upon.

Contractual Transmission Agreements

Although able to acquire transmission independently, DWR depends on other sources for transmission services. PG&E, CAISO, and SCE are the primary providers of transmission service between SWP power resources and pumping loads and also with interconnected utilities for power purchases, sales, and exchanges.

Under the Comprehensive Agreement with PG&E, DWR receives 1,300 MW of firm transmission service over the PG&E transmission system to serve SWP pump loads and power resources in Northern and Central California.

In Southern California, DWR receives transmission service for SWP loads and resources through CAISO. Additionally, DWR has interconnection and wholesale distribution service agreements with SCE for service over SCE's distribution facilities from the CAISO interchange points to SWP loads and resources.

Under the Participation Agreement with NPC, DWR receives 235 MW of firm transmission service over NPC's transmission system between Reid Gardner Unit 4 and the El Dorado Substation. Under the Firm Transmission Service Agreement between SCE and DWR, DWR receives 235 MW of firm transmission service over SCE's transmission system between the El Dorado Substation and the Vincent Substation.

SWP Power Operation in 2007

Tables 10-1 through 10-4, at the end of this chapter, present historical information about SWP power operation for calendar year 2007, including energy consumed, generated, exchanged, purchased, and sold.

Energy Consumed

In 2007, energy used at the 28 SWP pumping and generating plants totaled 9.77 million megawatt hours (MWh). According to the terms and conditions of various water conveyance contracts and exchange agreements, some water belonging to the Central Valley Project (CVP) is pumped through Banks and Dos Amigos Pumping Plants and Gianelli Pumping-Generating Plant. Reclamation furnishes additional energy for this purpose.

Table 10-1 shows the amount of energy used each month at SWP pumping and power generating plants to operate the SWP in 2007, excluding transmission losses.

Energy Generated

Table 10-2 shows the amounts of energy generated at SWP facilities in 2007, as well as energy purchased for SWP operations.

Hydroelectric and Coal

The Hyatt-Thermalito power complex in Oroville generated 2.08 million MWh of energy in 2007.

Energy generated at SWP aqueduct recovery plants—Gianelli, Alamo, Devil Canyon, Mojave Siphon, and Warne—totaled 1.99 million MWh.

The SWP share of energy generated at the coal-fired Reid Gardner Unit 4 in Nevada totaled 1.52 million MWh.

Contractual Resource Arrangements

SWP power operations rely on contractual arrangements as well as SWP facilities. These contractual arrangements include joint development projects, energy exchanges, and energy purchases.

Joint Developments

Through the West Branch Cooperative Development Agreement with LADWP, DWR receives energy based on the amount of water scheduled through the West Branch. In 2007, LADWP provided 850,513 MWh for DWR's share of energy generated at Castaic Powerplant.

DWR's share of Gianelli Pumping-Generating Plant used 183,589 MWh and generated 245,677 MWh of energy.

Energy Exchanges

As detailed previously in this chapter, DWR exchanged energy with SMUD in 2007 under the terms of an existing energy exchange agreement.

Purchases and Costs

Table 10-3 shows amounts of power, transmission, and other services purchased in 2007 and the costs of purchases, by area. Amounts shown include short-term and long-term purchases. It also reflects the restructuring of the electric industry through transactions with CAISO and through new charges (grid management and ancillary services charges).

DWR purchased 4.97 million MWh of energy at a cost of \$263.67 million. Other SWP power costs, including transmission, operation, maintenance, and CAISO ancillary services totaled \$135.73 million. This amount includes \$4.94 million for debt service and \$5.54 million for operations and maintenance costs at Pine Flat Powerplant. It also includes \$1.78 million for transmission at Reid Gardner Unit 4 and \$62.24 million for costs associated with operations and maintenance, fuel, insurance, and property taxes at Reid Gardner Unit 4.

Long-Term Purchase Agreements. According to the terms of the Kings River Conservation District contract, DWR receives the total

output of the 165 MW Pine Flat Powerplant. In 2007, the power plant provided 194,813 MWh of energy to the SWP at a total cost of \$1.56 million.

Under the Metropolitan Small Hydro contract, DWR purchased 145,142 MWh of energy in 2007 from five small hydroelectric power plants on the Metropolitan system at a cost of \$8.24 million.

Short-Term Purchase Agreements. Existing resources and long-term power and transmission contracts ensure that the SWP has enough power to meet long-term needs. When SWP power requirements exceed resources during daily operations, short-term purchases make up the difference. In 2007, the SWP purchased short-term energy from 24 marketers, in addition to 12 public electric utilities.

Sales of Excess Power

DWR sold 2.26 million MWh of energy to 20 utilities and 22 power marketers for total revenues of \$138.89 million in 2007. DWR also received \$40.43 million in revenues for capacity, exchanges, and other energy-related services, including \$24.35 million for transactions made through CAISO. See Table 10-4 for information about energy and other services sold and revenue received, including those sold to CAISO.

Forecasting Power Operations

DWR bases its forecast of power operations primarily on the amount of energy necessary to deliver approved Table A water requested by water contractors.

Each year, after reviewing the water contractors' water delivery requests and the construction schedule for future facilities, DWR forecasts the associated energy consumption and generation through 2035.

Short-term power requirements, based on 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. The forecast also includes losses in reservoirs and aqueducts, recreation water, and water to replace storage in reservoirs south of the Delta.

Actual SWP power requirements may vary significantly from the forecast amounts. 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 in the amount of water available for delivery and for generation. If full deliveries could not be made, less power would be used. Power requirements could also decrease during a wet year because of the availability of local water in the San Joaquin Valley or Southern California.

Conversely, power requirements could exceed the amount originally forecast 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 unexpectedly dry year, then more power would be used.

Table 10-1 Energy Used at Pumping Plants and Power Plants in 2007, by Month (Millions of Kilowatt-Hours)

Pumping Plants and Power Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Hyatt-Thermalito Pumping-Generating Plant (pumpback and station service)	0.160	0.133	10.251	0.000	0.215	0.254	0.622	0.056	1.089	0.036	0.082	0.113	13.011
North Bay Interim Pumping Plant	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cordelia Pumping Plant	1.018	0.848	0.633	0.976	1.262	1.284	1.518	1.531	1.435	0.977	1.123	0.917	13.522
Barker Slough Pumping Plant	0.606	0.459	0.338	0.583	1.279	1.575	2.024	1.894	1.621	0.916	1.078	0.533	12.906
South Bay Pumping Plant	8.913	2.626	12.274	13.601	14.222	6.263	15.101	15.529	10.599	9.514	10.943	8.723	128.307
Del Valle Pumping Plant	0.022	0.018	0.266	0.532	0.317	0.031	0.029	0.015	0.015	0.020	0.024	0.028	1.315
Banks Pumping Plant	60.131	39.773	52.278	34.646	8.850	6.750	104.821	103.012	80.729	54.379	46.585	58.065	650.018
Gianelli Pumping-Generating Plant (SWP share)	19.401	21.137	12.943	7.369	(0.900)	0.043	15.257	15.509	16.089	11.379	28.609	36.752	183.589
Dos Amigos Pumping Plant (SWP share)	37.972	21.328	39.200	35.448	40.547	36.783	47.055	38.108	26.875	17.943	8.243	9.668	359.171
Buena Vista Pumping Plant	37.742	38.435	55.781	56.087	54.694	43.648	59.308	56.725	45.597	31.891	23.184	22.974	526.067
Teerink Pumping Plant	41.165	42.149	62.048	61.379	57.760	44.153	62.367	60.265	49.517	35.951	26.932	26.326	570.011
Chrisman Pumping Plant	91.511	92.906	136.198	133.557	123.613	94.215	134.756	131.168	109.300	78.911	59.362	57.285	1,242.781
Edmonston Pumping Plant	340.582	345.909	505.413	496.345	454.970	339.852	493.218	480.418	399.236	287.508	217.717	209.843	4,571.011
Alamo Powerplant (station service)	0.099	0.073	0.068	0.063	0.048	0.002	0.000	0.009	0.010	0.003	0.002	0.019	0.395
Pearlblossom Pumping Plant	63.923	29.333	60.019	59.372	63.657	61.572	74.323	63.494	54.397	46.553	44.289	26.701	647.634
Pine Flat Powerplant (station service)	0.092	0.122	0.000	0.038	0.000	0.000	0.000	0.024	0.205	0.278	0.293	0.289	1.340
Mojave Siphon Powerplant (station service)	0.007	0.046	0.001	0.000	0.002	0.001	0.000	0.000	0.014	0.001	0.000	0.012	0.085
Devil Canyon Powerplant (station service)	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.002	0.000	0.002	0.000	0.002	0.008
Oso Pumping Plant	12.947	27.448	33.041	31.744	24.890	11.699	24.049	27.041	22.290	13.382	6.858	13.656	249.043
Warne Powerplant (station service)	0.134	0.000	0.000	0.006	0.014	0.230	0.009	0.000	0.000	0.002	0.135	0.241	0.770
Las Perillas Pumping Plant	0.367	0.306	0.620	1.020	1.435	1.726	1.842	1.527	0.910	0.500	0.155	0.177	10.585
Badger Hill Pumping Plant	0.941	0.778	1.623	2.666	3.698	4.343	4.617	3.773	2.318	1.303	0.381	0.437	26.878
Devil's Den Pumping Plant	1.174	1.038	1.761	1.857	2.619	2.634	2.544	2.327	2.242	1.739	0.700	1.280	21.915
Bluestone Pumping Plant	1.105	0.982	1.672	1.761	2.499	2.509	2.410	2.195	2.102	1.637	0.659	1.205	20.735
Polonio Pass Pumping Plant	1.205	1.065	1.780	1.861	2.629	2.656	2.565	2.352	2.249	1.741	0.702	1.290	22.094
Greenspot Pumping Plant	0.813	0.645	0.639	0.489	1.068	0.611	0.597	0.627	0.826	0.706	1.020	0.881	8.923
Crafton Hills Pumping Plant	0.995	0.790	0.772	0.529	0.833	0.534	0.602	0.587	0.484	0.591	1.001	1.060	8.778
Cherry Valley Pumping Plant	0.160	0.125	0.028	0.019	0.026	0.016	0.019	0.020	0.016	0.013	0.025	0.016	0.482
<i>Subtotal</i>	723.183	668.472	989.647	941.945	860.248	663.383	1,049.656	1,008.205	830.167	597.874	480.100	478.493	9,291.374
High Voltage Transmission Line Losses and Deviation	58.389	55.351	43.853	21.112	(8.774)	34.663	47.061	3.587	26.214	64.354	48.795	87.335	481.940
Total Energy Required for SWP	781.572	723.823	1,033.500	963.057	851.474	698.047	1,096.716	1,011.792	856.381	662.227	528.895	565.828	9,773.314

Table 10-2 Energy Generated and Purchased in 2007, by Month (Millions of Kilowatt-Hours)

Sources of Energy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
SWP Energy Sources													
Hyatt-Thermalito Powerplant	111,781	102,259	139,294	162,555	172,931	253,083	336,030	270,962	176,156	122,616	144,290	84,887	2,076,844
Gianelli Pumping-Generating Plant (SWP share)	18,569	17,424	40,947	44,526	62,426	46,814	11,314	2,662	0.000	0.000	0.000	0.995	245,677
Alamo Powerplant	0.000	0.000	0.185	0.200	2,717	9,371	10,114	8,036	7,624	7,050	7,213	4,813	57,323
Mojave Siphon Powerplant	7,210	3,842	6,422	6,462	6,921	7,067	8,503	6,929	5,972	5,044	4,882	2,650	71,904
Devil Canyon Powerplant	117,755	60,100	102,426	103,000	113,184	117,293	125,639	114,673	91,800	83,671	78,614	44,427	1,152,582
Reid Gardner Unit 4	147,722	147,548	154,575	1,748	115,573	125,890	118,151	160,207	141,025	120,730	128,760	153,319	1,515,248
Warne Powerplant	26,753	50,691	56,100	53,393	50,504	24,925	45,971	47,294	46,410	29,127	0.209	26,405	457,782
<i>Subtotal</i>	<i>429,790</i>	<i>381,864</i>	<i>499,949</i>	<i>371,884</i>	<i>524,256</i>	<i>584,443</i>	<i>655,722</i>	<i>610,763</i>	<i>468,987</i>	<i>368,238</i>	<i>363,968</i>	<i>317,496</i>	<i>5,577,360</i>
Energy Sources from Long-Term Agreements													
Castaic Powerplant	34,989	97,978	120,091	91,323	86,474	43,261	87,496	94,199	75,968	46,683	25,914	46,137	850,513
Metropolitan Small Hydro Generation	10,379	5,613	10,138	11,761	13,663	14,433	11,800	14,453	15,826	15,339	13,587	8,150	145,142
Pine Flat Powerplant (Kings River Conservation Dist.)	0.079	2,648	6,020	5,746	34,554	72,079	62,070	11,614	0.000	0.000	0.000	0.000	194,810
Power Exchange Delivered to Other Entities	0.000	0.000	0.000	0.000	(31,000)	(30,000)	(31,000)	(31,000)	(30,000)	0.000	0.000	0.000	(153,000)
Power Exchange Received from Other Entities	43,400	39,200	43,225	0.000	0.000	0.000	0.000	0.000	24,000	43,400	42,175	43,400	278,800
Power Exchange Delivered to SCE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Power Exchange Received from SCE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Energy to Metropolitan for CRA ^a Pumping	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Energy from Metropolitan for CRA ^a	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Power System Imbalances	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Purchases													
Purchases (Firm and Power Contractors)	464,689	435,010	470,096	551,960	410,169	339,012	513,965	490,207	483,033	394,751	370,176	402,817	5,325,887
<i>Subtotal</i>	<i>553,536</i>	<i>580,449</i>	<i>649,570</i>	<i>660,790</i>	<i>513,860</i>	<i>438,785</i>	<i>644,331</i>	<i>579,473</i>	<i>568,827</i>	<i>500,173</i>	<i>451,852</i>	<i>500,504</i>	<i>6,642,152</i>
Total Resources	983,326	962,313	1,149,519	1,032,674	1,038,116	1,023,228	1,300,053	1,190,236	1,037,814	868,411	815,820	818,000	12,219,512
Less Energy Sales	(201,754)	(238,490)	(116,019)	(69,617)	(186,642)	(325,181)	(203,337)	(178,444)	(181,433)	(206,184)	(286,925)	(252,172)	(2,446,198)
Total Energy Provided to the SWP	781,572	723,823	1,033,500	963,057	851,474	698,047	1,096,716	1,011,792	856,381	662,227	528,895	565,828	9,773,314

^a Contractual Resource Arrangement.

Table 10-3 Power, Transmission, and Related Purchases in 2007, by Service Area

Purchase Category	Power (MWh)	Power Cost (Dollars)	Total Cost (Dollars)
Power Purchases			
Northern California Area	206,691	2,214,420.79	2,214,420.79
Southern California Area	896,745	48,101,944.83	48,101,944.83
Energy Marketers	3,866,052	213,351,277.91	213,351,277.91
<i>Subtotal</i>	<i>4,969,488</i>	<i>263,667,643.53</i>	<i>263,667,643.53</i>
Transmission and Other Purchases			135,727,354.22
Miscellaneous Fees			919.60
<i>Subtotal</i>			<i>135,728,273.82</i>
Total	4,969,488	263,667,643.53	399,395,917.35

Table 10-4 Energy Sold in 2007 and Revenue from Sales, by Service Area

Region	Energy Sold (MWh)	Revenue from Energy Sales (Dollars)	Revenue from Exchanges, Capacity, and Other Energy-Related Services (Dollars)	Total Power Sales (Dollars)
Pacific Northwest Area	190	12,912.00		12,912.00
Northern California Area	82,301	5,486,416.00	36,225,490.00	41,711,906.00
Southern California Area	595,306	36,614,485.00	2,617,450.00	39,231,935.00
Southeast Area	198,452	15,588,655.00	1,582,069.00	17,170,724.00
Energy Marketers	1,388,053	81,187,700.00		81,187,700.00
Total	2,264,302	138,890,168.00	40,425,009.00	179,315,177.00



Chapter 11

Facilities Maintenance

Thermalito Afterbay Outlet on the Feather River.

Significant Events in 2007

Flowing water in the Gorman Creek Improvement Channel broke out pieces of the concrete channel lining, exposing and scouring the soil behind the lining upstream of the inlet to Gorman Creek Siphon. Approximately 1,000 feet was repaired from Station 115+75 to the Gorman Creek Siphon due to the initial break.

Three 20-foot sections of the Peace Valley Pipeline were completely encased in reinforced concrete to strengthen the pipeline's structural integrity. The resulting cross section of the work is the 144-inch diameter pipe encased in a 17' x 17' block of concrete.

A Director's Safety Review Board was convened in January 2007 for the dams in the Delta Field Division, and a Director's Safety Review Board for Upper Feather River Dams was held in November 2007. The Safety Review Board found all facilities safe for continued operation.

A construction application for enlargement of Patterson Dam's Reservoir was filed with Division of Safety of Dams in May 2007.

Information for this chapter was provided by the Division of Operations and Maintenance, the Division of Safety of Dams, and the State Water Project Analysis Office.

The Department of Water Resources (DWR), through the Division of Operations and Maintenance (O&M), monitors all State Water Project (SWP) facilities to ensure safety and reliability. DWR is required, by federal and State law, to contract periodically with independent consultants to review the safety of SWP dams and power facilities.

Inspecting and Maintaining Project Dams

DWR conducts several types of inspections of SWP facilities to ensure that each dam is safe for continued operation. O&M staff collect and evaluate data about the performance of each facility. Engineers from the Division of Safety of Dams (DSOD) review instrumentation data and inspect jurisdictional SWP dams, either semi-annually or annually. They evaluate proposed modifications to existing dams, as well as the design and construction of new jurisdictional dams. The Federal Energy Regulatory Commission (FERC) inspects all licensed SWP facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock, or power plant. In addition, under FERC and California Water Code (CWC) requirements, consulting engineers and geologists are retained to evaluate SWP dam facilities every 5 years.

DWR contracts periodically with independent consultants to review the safety of SWP dams and power facilities, except Pearblossom Spill Basin. The four dams in the San Luis Field Division (Sisk, O'Neill, Los Banos Detention, and Little Panoche Detention) are used jointly with the Bureau of Reclamation (Reclamation), and are not under DSOD jurisdiction. Pearblossom Spill Basin Dam was originally designed to be used during misoperation at the Pearblossom Pumping Plant; the spill basin was never fully completed and has never been used.

Routine Inspections

During 2007, DSOD, along with O&M staff, inspected Frenchman, Antelope, and Grizzly Valley dams in the Upper Feather River area; Oroville, Bidwell Bar, Parish Camp Saddle Dam, and Thermalito Afterbay dams in the Oroville Field Division; Clifton Court Forebay, Bethany, Patterson, and Del Valle dams in the Delta Field Division; and Pyramid, Castaic, Cedar Springs, Devil Canyon Powerplant Second Afterbay, Perris, and Crafton Hills dams in the Southern Field Division.

Joint-Use Facility Inspection

Every 6 years, Reclamation conducts a Comprehensive Facility Review (CFR) of the four joint-use facility dams in the San Luis Field Division. The next CFR is scheduled to be conducted from February to March of 2009. Periodic Facility Reviews (PFRs) are also conducted by Reclamation every 6 years using an alternate schedule spaced in between the CFR schedule. PFRs were conducted for the joint-use facilities in May and June of 2006. No PFRs were conducted in 2007.

Independent Reviews

California Water Code Reviews

To comply with the CWC and the California Code of Regulations, DWR is required to retain a consulting board to review: (1) the adequacy of the design of any dam or reservoir DWR proposes to construct and (2) the safety of the completed construction, including the terms and conditions for the Certificate of Approval.

These provisions require DWR to retain a board of three consultants to meet at least once every 5 years to review the operational performance of DWR-owned dams and more frequently when consulting on new dams. The board of consultants independently reviews and assesses safety conditions of SWP dams.

Consultants are selected based on their knowledge of geotechnical, structural, and civil engineering, including their experience in evaluating dam performance. Their independent assessments include the review of dam performance during earthquakes, evaluation of instrumentation data, inspection of each dam, and evaluation of studies performed by DWR. The consultants then prepare reports on each dam, approving dams as safe for continued operation and making recommendations. Based on these recommendations, DWR prepares action plans.

A Director's Safety Review Board was convened in January 2007 for the dams in the Delta Field Division, and a Director's Safety Review Board for Upper Feather River Dams was held in November 2007. The Safety Review Board found all facilities safe for continued operation.

Review boards for Crafton Hills Dam and Castaic Dam will be held in early 2008.

FERC Reviews

These reviews and the FERC Part 12D safety inspections, which may be conducted by one or more consultants, are scheduled every 5 years. As a supplement to the FERC Part 12D safety inspection, FERC's Dam Safety Performance Monitoring Program requires that a Potential Failure Mode Analysis (PFMA) be performed for FERC-licensed dams. The PFMA involves document review and site visits to develop a comprehensive list of potential failure modes at each dam. From this review process, three

documents are generated: the FERC Part 12D safety inspection report; PFMA report; and Supporting Technical Information Document (STID), which summarizes the project elements and details that do not change significantly over time.

Arroyo Pasajero Program

The Arroyo Pasajero and its tributaries drain approximately 530 square miles of the Diablo Range of the coastal mountains west of the California Aqueduct in Fresno County. Its downstream juncture with the San Luis Canal segment of the California Aqueduct, between Highway 198 and Avenal Cutoff Road, poses a particularly difficult operational and maintenance problem for the SWP. Reclamation designed and constructed the San Luis Canal segment of the California Aqueduct, while DWR operates and maintains it, with all costs shared 45 percent and 55 percent, respectively.

During periods of heavy rainfall, high flows in the Arroyo Pasajero and its tributaries transport heavy sediment loads eroded from the Arroyo Pasajero watershed. Over a vast amount of time, sediment transported by arroyo floods formed a 450-square-mile alluvial fan extending from its apex at the eastern margin of Pleasant Valley (Anticline Ridge) to the San Joaquin Valley trough. The California Aqueduct traverses the arroyo's alluvial fan and forms a barrier to arroyo flood flows. Flood control facilities, designed to accommodate Arroyo Pasajero floodwater, include the West Side Detention Basin (designed to store floodwater and sediment west of the California Aqueduct), an evacuation culvert to release floodwater east of the California Aqueduct, and drain inlets to release floodwater into the California Aqueduct.

Since the floods of 1969, when nearly all of the detention basin's planned 50-year sediment storage capacity was filled by deposition, DWR and Reclamation have

worked to mitigate the effects of heavy flooding and the diminished storage capacity of the detention basin. In 1980, asbestos was discovered in the Metropolitan Water District of Southern California's water supply and traced to runoff from the Arroyo Pasajero and other Diablo Range streams. This discovery, in conjunction with the high cost of removing sediment from the California Aqueduct, led DWR to adjust operating procedures to minimize runoff entering the California Aqueduct. The volume of runoff and sediment transported by the Arroyo Pasajero is roughly 400 percent greater than was originally estimated during the detention basin design in the mid-1960s.

DWR and DWR/Reclamation Alternative Long-term Solution

Construction to restore the storage capacity of the West Side Detention Basin started in August 2004, and many of the improvements were completed by the summer of 2005. These improvements restored the storage capacity to the detention basin and added control over releases of floodwater into the California Aqueduct and onto private farmland. The intended 50-year level of protection is achieved by raising levees, adding a control structure equipped with a rubber dam, installing flood gates, and acquiring flood easements.

One project component yet to be implemented, is to armor the railroad embankment to reduce damages when it is overtopped by floodwater. This component has not been implemented due to difficulties in negotiating the improvements with the owners of the railroad. As of 2007, this was still an ongoing issue. In 2007, DWR continued to work with local landowners and the courts on efforts to settle litigation that involved the acquisition of necessary easements and fee property interest for the project.

Related Activities

DWR, with the support of the State Water Contractors, continued during 2006 to provide funds and staff support to a Coordinated Resource Management Plan group, called the Stewards of the Arroyo Pasajero Watershed. This group was not active in 2007 and therefore, DWR's participation came to an end.

Planning for a restoration project similar to the West Side Detention Basin restoration project began in 2006 for the Cantua Creek Stream Group detention basins and continued in 2007. The project goal is to improve aqueduct flood protection and water quality.

A draft reconnaissance study for the Cantua Creek Stream Group Improvement Project identified actions such as raising embankments, making modifications to structures, and acquiring flood easements to provide a 50-year level of protection for the California Aqueduct at the Cantua Creek Stream Group. Improving water quality in the aqueduct was a significant goal of the study, since currently, several of the existing drain inlets are not gated and sediment-laden floodwater flows directly into the aqueduct with little detention. It has been widely understood that increasing flood storage and detention of this floodwater prior to releasing it into the aqueduct would provide a significant benefit to water quality in the aqueduct. As of 2007, DWR plans to continue work on the study to prepare feasibility-level designs and estimate costs.

During 2007, DWR initiated efforts to obtain alternative funding sources for projects associated with the Arroyo Pasajero Program. Inquiries were made to FloodSAFE about potentially using Proposition 84 and 1E funds on the Reclamation/DWR joint-use facilities. In addition, an effort was made to obtain funding via Assembly Bill 669 for construction of a bridge at State Highway Route 269 and the Arroyo Pasajero crossing.

Repairs and Modifications

DWR continually monitors all SWP facilities and performs repairs and modifications as necessary to ensure safe, reliable water delivery.

Table 11-1 presents information, arranged chronologically, about significant scheduled and unscheduled outages at SWP pumping and power plants in 2007. The table includes information about incidents resulting in outages exceeding 14 days.

Table 11-1 Outages for Maintenance and Repair of Facilities in 2007, by Month

Month	Facility	Units Taken Out of Service
January	Banks Pumping Plant	Unit 6 from January 29 to April 9 for annual maintenance
	Banks Pumping Plant	Unit 7 from January 8 to February 5 for annual maintenance
	South Bay Pumping Plant	Unit 6 from January 8 to March 23 to inspect bearings and impeller, realign pump, and repair cooling water line
	Dos Amigos Pumping Plant	Unit 1 from January 8 to February 20 for biennial maintenance
	Las Perillas Pumping Plant	Unit 2 from January 31 to April 4 to refurbish motor
	Badger Hill Pumping Plant	Unit 2 from January 31 to April 12 to refurbish motor
	Pearblossom Pumping Plant	Unit 3 from January 6 to September 25 to replace failed rotor windings and rebuild pump
February	Gianelli Pumping-Generating Plant	Units 7 and 8 from February 26 to June 6 for biennial maintenance, to perform weld repair on scroll case and draft tube, and work on headgate
	Devil's Den Pumping Plant	Unit 1 from February 10 to March 2 to investigate phase current imbalance
	Teerink Pumping Plant	Unit 5 from February 26 to May 23 to rewind motor and recoat discharge line
March	Pearblossom Pumping Plant	Unit 8 from March 26 to October 22 to repair shaft and replace pump seal
	Reid Gardner Powerplant	Unit 4 from March 30 to April 29 for annual maintenance and to upgrade boiler
April	Banks Pumping Plant	Unit 4 from April 2 to April 18 for annual maintenance
	Banks Pumping Plant	Unit 5 from April 23 to June 15 for annual maintenance
	Dos Amigos Pumping Plant	Unit 3 from April 16 to May 22 for biennial maintenance
	Teerink Pumping Plant	Unit 9 from April 23 to August 9 to rewind motor and recoat discharge line
May	Thermalito Diversion Dam Powerplant	Unit 1 from May 9 to May 29 to investigate governor problems
	Thermalito Diversion Dam Powerplant	Unit 1 from May 31 to July 26 to replace governor power supply and make other governor repairs
June	Chrisman Pumping Plant	Units 1 through 3 from May 7 to May 21 to modify transformer KYA relays
	Banks Pumping Plant	Unit 8 from June 3 to July 12 to replace upstream o-ring seal
	South Bay Pumping Plant	Unit 1 from June 26 to July 11 to adjust automatic voltage regulator and motor synchronization timer
	Dos Amigos Pumping Plant	Unit 4 from June 4 to June 26 to repack discharge line coupling and recoat stay vanes
July	Banks Pumping Plant	Unit 11 from July 16 to September 10 for annual maintenance and to repair discharge valve upstream seat
	Polonio Pass Pumping Plant	Unit 3 from July 16 to September 13 replace motor bearings
	Edmonston Pumping Plant	Unit 7 from July 9 to expected completion date in 2008 to refurbish motor and pump
August	Teerink Pumping Plant	Unit 1 from August 20 to December 20 to rewind motor, replace 13.8 kV bus, and work on transformer KYA
	Teerink Pumping Plant	Unit 7 from August 13 to September 25 to recoat discharge line
	Mojave Siphon Powerplant	Unit 2 from August 6 to August 30 for annual maintenance
September	Banks Pumping Plant	Unit 3 from September 10 to September 28 to repair motor
	Banks Pumping Plant	Unit 6 from September 27 to October 26 to replace failed o-ring
	Banks Pumping Plant	Unit 10 from September 24 to October 26 for annual maintenance
	South Bay Pumping Plant	Units 1 through 4 from September 30 to October 15 for pipeline encasement
	Gianelli Pumping-Generating Plant	Units 5 and 6 from September 19 to expected completion date in 2008 for annual maintenance, to weld repair scroll case and draft tube, repair AVR, and work in switchyard
	Dos Amigos Pumping Plant	Unit 2 from September 10 to November 20 for biennial maintenance

Table 11-1 Outages for Maintenance and Repair of Facilities in 2007, by Month *(continued)*

Month	Facility	Units Taken Out of Service
	Polonio Pass Pumping Plant	Unit 1 from September 16 to expected completion date in 2008 to send motor to vendor for testing and to rebuild discharge valve
	Buena Vista Pumping Plant	Unit 6 from September 4 to November 1 to overhaul and realign motor and pump
	Mojave Siphon Powerplant	Unit 3 from September 10 to September 27 for annual maintenance
	Oso Pumping Plant	Unit 5 from September 13 to expected completion date in 2008 to repair broken amortisseur bar
	Pine Flat Powerplant	Unit 2 from September 17 to expected completion date in 2008 for annual maintenance and to recoat penstock
October	Banks Pumping Plant	Unit 9 from October 24 to November 29 for annual maintenance
	Barker Slough Pumping Plant	Unit 4 from October 7 to October 24 to repair unit breaker
	Gianelli Pumping-Generating Plant	Unit 4 from October 15 to November 17 to repair leaks in oil-cooling coils for lower motor guide bearing
	Devil Canyon Powerplant	Unit 4 from October 15 to November 8 for annual maintenance
	Oso Pumping Plant	Unit 3 from October 25 to November 30 to replace raw water header piping
	William Warne Powerplant	Unit 2 from October 1 to November 30 for annual maintenance, to clean cooling water sump, and to work on Peace Valley Pipeline encasement
November	Hyatt Powerplant	Unit 4 from November 25 to expected completion date in 2008 to adjust wicket gates, work on governor, and repair coating
	Banks Pumping Plant	Unit 1 from November 14 to December 17 to repair discharge valve
	Buena Vista Pumping Plant	Units 1 through 6 from November 5 to November 30 to replace 13.2kV bus and work on transformer KYA
	Teerink Pumping Plant	Units 2 through 5 from November 5 to December 2 to replace 13.8kV bus and work on transformer KYA
	Edmonston Pumping Plant	Unit 3 from November 5 to December 28 to rewedge stator and inspect rotor
	Edmonston Pumping Plant	Unit 6 from November 25 to December 17 to modify lower pump oil tub
	Oso Pumping Plant	Units 1 and 2 from November 5 to November 30 to replace raw water header piping
	William Warne Powerplant	Unit 1 from November 1 to November 30 to work on Peace Valley Pipeline encasement
December	Gianelli Pumping-Generating Plant	Unit 2 from December 12 to December 28 to install larger sump pumps and drain flooded turbine pit
	Badger Hill Pumping Plant	Unit 5 from December 4 to expected completion date in 2008 to refurbish motor
	Buena Vista Pumping Plant	Units 7 through 10 from December 4 through December 21 to replace 13.2kV bus
	Teerink Pumping Plant	Unit 7 from December 3 to December 24 to replace 13.8kV bus
	Teerink Pumping Plant	Units 6, 8 and 9 from December 3 to December 21 to replace 13.8kV bus
	Mojave Siphon Powerplant	Unit 1 from December 3 to December 19 for annual maintenance



Chapter 12

Engineering, Construction, and Real Estate

Levee project on the San Joaquin River near Lathrop.

Significant Events in 2007

The Department of Water Resources (DWR) prepared conceptual-level cost estimates for isolated conveyance options and existing Delta channel improvements. DWR used a 15,000 cubic feet per second diversion from the Sacramento River near Hood to the State and federal export locations at Clifton Court Forebay. The options were primarily based on the concepts outlined in *Descriptions of Potential Bay Delta Conservation Plan Conservation Strategy Options*, May 2007.

Engineering, construction and real estate work to enhance, expand, repair, and protect the State Water Project and other facilities within the State continued. Other significant projects included South Bay Aqueduct Enlargement, expansion of South Bay Pumping Plant, Tehachapi East Afterbay construction, East Branch Enlargement, Edmonston Pumping Plant refurbishment, Hyatt Powerplant Pump-Turbine refurbishment, and the East Branch Extension Phase I Improvements and Phase II projects.

Construction was completed in December 2007 on a fish containment system at the outlet structure of Grizzly Valley Dam (Lake Davis) to prevent all life stages of northern pike from escaping from Lake Davis.

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

Initial construction of the State Water Project (SWP) facilities began in 1957 with the relocation of the Western Pacific Railroad facilities and Highway 70 near the City of Oroville to accommodate the SWP Oroville Facilities. Oroville Dam was constructed between 1961 and 1967. Construction of the South Bay Aqueduct (SBA) facilities was started in 1960, and the first SWP water was delivered through the SBA in 1965 to serve Alameda and Santa Clara counties.

In 1963, work began on the California Aqueduct, and by 1968, the State Water Project (SWP) was delivering water to long-term contractors in the San Joaquin Valley to the foot of the Tehachapi Mountains. By 1973, with the completion of Edmonston Pumping Plant at the foot of the Tehachapi Mountains and other East Branch conveyance facilities, the SWP was delivering water to Lake Perris at the southernmost point in Los Angeles County.

In 1974, SWP water was delivered to Los Angeles County through the West Branch Facilities. SWP water was delivered to Napa County in 1968, through the first phase facilities of the North Bay Aqueduct, and to Solano County in 1988 by the second phase facilities. The first SWP water delivery through the Coastal Branch (Phase I) was made in 1968 to Kings and Kern counties.

Prior to the completion of the initial facilities in 1973, work began on the Upper Feather River facilities to supply local water, recreation, and fish enhancement. Power plants, additional pumping units, and turbine-generators that had been deferred from the initial construction of the SWP were built to ensure water quality and fish enhancement in the Delta.

From the 1980s through 2005, design and construction activities shifted to repairing concrete lining failures or potential failures of the canal system and concrete pipeline sections; replacing equipment components of existing facilities; enlarging or extending aqueduct reaches; adding pumps and motors

to existing facilities; constructing the Devil Canyon Second Afterbay; constructing Phase II of the Coastal Branch to deliver water to San Luis Obispo and Santa Barbara counties in August 1997; and extending the SWP through the East Branch Extension to the San Geronio Pass service area in San Bernardino and Riverside counties. The East Branch Extension Phase I became operational in 2003.

Design Activities

In 2007, work to enhance, expand, repair, and protect water delivery in the SWP continued. Engineering activities supported more efficient water deliveries within the confines of legal constraints, environmental restraints, and power availability. Significant projects included South Bay Aqueduct Enlargement, South Bay Pumping Plant expansion, Tehachapi East Afterbay construction, East Branch enlargement, and feasibility studies for the East Branch Extension Phase I Improvements and Phase II projects. In addition, public scoping meetings were held for the East Branch Extension Phase II project in April 2007 and the Phase I Improvements project in December 2007. Table 12-1 (at the end of the chapter) provides a list of completed and ongoing design work that was undertaken in 2007.

The Department of Water Resources (DWR) designed projects for development into construction contracts. Division of Engineering (DOE) staff worked with the Division of Operations and Maintenance,

Bay-Delta Office, Division of Flood Management, Division of Environmental Services, Office of the Chief Counsel, Department of Fish and Game, Department of Boating and Waterways, California Department of Transportation, SWP water contractors, California water districts, Sacramento River, San Joaquin River, and Delta levee maintenance districts, CALFED, U.S. Army Corps of Engineers, Bureau of Reclamation, Federal Energy Regulatory Commission, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and other entities concerned with water resources activities. DOE staff prepared preliminary designs and estimates, and conducted special studies of dams, canal embankments, and other SWP facilities.

In 2007, DWR prepared conceptual-level cost estimates for isolated conveyance options and existing Delta channel improvements. DWR used a 15,000 cubic feet per second (cfs) diversion from the Sacramento River near Hood to the State and federal export locations at Clifton Court Forebay. The options were primarily based on the concepts outlined in *Descriptions of Potential Bay Delta Conservation Plan Conservation Strategy Options*, May 2007.

The basis of each option (alignment and location of the intake and outlet) was derived from the Bay Delta Conservation Plan with some deviation of alignment depending on the local geological and foundation conditions for the construction of the canal embankment and relocation of existing facilities such as roads. Conveyance components included intake facilities (e.g., trashracks, flood control gates, fish screens, etc.), canals, siphons, culverts, bridges, and forebays. Delta channel improvements included intake facilities, canals, pumping plants, channel dredging, setback levees, and river barriers.

The cost estimates were conceptual and did not include environmental analysis or mitigation.

Other studies, reports, and activities continued from previous reporting periods, or initiated in 2007, include the following:

- stability analysis for Oroville, Parish Camp Saddle, Bidwell Canyon Saddle, and Thermalito dams;
- geologic faulting and seismicity studies of SWP and flood control facilities;
- Banks Pumping Plant cut slope evaluation;
- Dos Amigos Pumping Plant trash rake system replacement;
- Frank's Tract Pilot Project—conceptual design;
- South Delta Improvement Project, permanent operable barriers—final design;
- fish screens at Sherman and Twitchell islands—preliminary design;
- Delta smelt refugium at Skinner Fish Facility—final design;
- South Bay Aqueduct reliability study;
- South Bay Aqueduct enlargement and improvement activities;
- Gianelli Pumping-Generating Plant power transformer second containment basin;
- Gianelli Pumping-Generating Plant replacement of eight 156-inch butterfly valves;
- canal lining repair, Milepost 56.4 to 164.9;
- flood control improvements, Weir No. 2 Rehabilitation, Lower Butte Creek, Sutter Bypass;
- concrete encasement of Coastal Aqueduct pipeline for Highway 46 widening;
- Devil's Den Pumping Plant trashrack/traveling screen modification;
- evaluation of the hydrology and capacity of the cross-drainage facilities, Buena Vista and Teerink pumping plants;

- Warne Powerplant penstock cooling water transient study;
- Castaic, Pyramid, and Perris dams—emergency release facilities;
- Castaic Dam and Perris Dam breach inundation study;
- Pearblossom Disposal Area assessment study, Phase II;
- Hesperia Master Drainage Plan for Antelope Wash and adjacent area;
- East Branch Enlargement, Phase II preliminary design and environmental impact reports;
- East Branch Extension, Phase I Improvements and Phase II prefeasibility studies;
- Santa Ana Pipeline repair;
- Peace Valley Pipeline repair;
- North Bay Aqueduct alternate intake study; and
- Perris outlet tower study.

In 2007, DOE staff completed the following studies and activities:

- Byron Road Bridge deck deterioration study and analysis;
- Sites Reservoir inundation study;
- Castaic Dam high intake tower and access bridge analysis;
- Thermalito Forebay Dam, piezometer P 66 artesian pressure study;
- South Feather Water and Power Agency's Miners Ranch Canal—erosion sites repair study;
- Miner's Ranch erosion repair study;
- San Joaquin River Restoration Program—appraisal level design;
- feasibility of using low-pressure carbon dioxide (CO₂) system at Chrisman Pumping Plant;
- feasibility study for furnishing spare parts for the Baldwin-Lima-Hamilton pumps at Edmonston Pumping Plant;
- feasibility study for replacing the east/west elevators at Edmonston Pumping Plant;

- feasibility study to replace the heating ventilation and air conditioning system at Gianelli Pumping-Generating Plant;
- feasibility study to replace the fire alarm system at San Luis and Coalinga Operations and Maintenance Centers; and
- Vista del Lago Visitors Center—erosion repair.

Construction Activities

DOE worked on 71 construction contracts in 2007. Projects included turbine and pump replacement, pipeline repair, trashrack upgrade at fish hatcheries, and recreational and maintenance facilities improvements at dam and reservoir sites. Table 12-2 (at the end of the chapter) shows contract title, specification number, date the contractor received the Notice to Begin Work, the expected or actual acceptance date (physical completion date is discussed in narratives below), and the actual or estimated contract cost (including change orders for added work). Resolution of contract claims may extend the actual contract closeout beyond the completion or acceptance date.

Upper Feather River Division

Grizzly Valley Dam

A fish containment system at the Grizzly Valley Dam outlet structure was constructed to prevent northern pike from exiting Lake Davis and entering Big Grizzly Creek (Specification No. 06-11). Construction began in June 2006 and was completed in November 2007. Contract administrative items are expected to continue throughout 2008.

Oroville Division

Hyatt Powerplant

Refurbishment of turbine Units 1, 3, and 5 began in February 1999 (Specification No. 98-22) and ended in 2006. The contractor continued working on its final

contract submittals, including operations and maintenance manuals, throughout 2007.

Refurbishment of pump-turbine Units 2, 4, and 6, started in November 2001 (Specification No. 01-11), continued throughout 2007. Completion is expected in 2008.

Delta Facilities

Middle River, Old River, and Grant Line Canal

Work on a multiyear (2004 through 2006) contract (Specification No. 03-07) to install and remove seasonal temporary rock barriers in designated South Delta waterways (Middle River, Old River, and Grant Line Canal) was completed in December 2006 and accepted in June 2007.

The temporary barriers were installed to enhance water levels and circulation in the South Delta for local agricultural diversion, to assist fish migration, and to gather hydraulic data for the design of future permanent barriers. Changed or added work per contract change order included:

- emergency relocation of flood supplies;
- urgent repairs to a divider wall at the Skinner Fish Facility;
- temporary agricultural pumping;
- removal and replacement of the Roaring River Slough flapgate and flashboard riser;
- removal and replacement of flashboards at Montezuma Slough;
- repairs to Sherman Island fish screens;
- construction of the Vernalis water quality station;
- pumps and equipment for the Travis Surge Tank sediment removal;
- pumps at C-Line Ditch;
- testing of air pockets, nozzles, and valves at Brushy Creek;
- geologic trenching at Patterson;

- pondweed abatement at Clifton Court Forebay;
- vegetation removal at California Aqueduct Milepost 10.75;
- piles for the South Delta (Franks Tract, Delta-Mendota Canal, Grantline Canal);
- hyacinth removal in Tom Paine Slough;
- dredging of Bethany Reservoir and Middle River;
- demolition of a building and a cap well at Grizzly Slough;
- new pumps at Skinner Fish Facility;
- an environmental impact report and an action plan for the South Delta Improvements Program;
- removal of frames at Morrow Island and Horseshoe Bend;
- high density, electrical resistivity survey;
- aquatic herbicide application at Clifton Court Forebay;
- trashrake gripper for Skinner Fish Facility; and
- barge crane for Montezuma Slough.

On January 30, 2007, DWR issued the Notice to Begin Work for the new temporary barriers contract (Specification No. 06-26) for work from 2007 through 2009. Contract work continued throughout the year, including the following work added by construction orders:

- weed harvesting and mapping at Clifton Court Forebay;
- removal and replacement of flashboards at Montezuma Slough; and
- Delta smelt refugium at the Skinner Fish Facility.

Suisun March Facilities

Roaring River Slough

An emergency contract (Specification No. 06-02) began in January 2006 to restore approximately 1,700 feet of levee along the north side of Roaring River Slough (Station 370+20 to 417+20) on Grizzly Island

to ensure water quality and protect Grizzly Island from future flooding. The contractor completed the work in May 2006, and DWR accepted the project in December 2007.

North Bay Aqueduct Napa Turnout Reservoir

Replacement of the Napa Turnout Reservoir began in April 2007 and continued throughout the year. The contract (Specification No. 07-01) includes replacing the existing tank with two, 5-million gallon steel covered tanks and installing piping and appurtenances. Construction is expected to continue throughout 2008.

South Bay Aqueduct South Bay Aqueduct Enlargement and Improvement

The South Bay Aqueduct Enlargement and Improvement projects will restore the first 16.38 miles of the South Bay Aqueduct to the 300 cfs design flow and increase the design capacity by up to 130 cfs. This work will enlarge the South Bay Pumping Plant to accommodate four additional 45 cfs units, construct a third discharge line, construct Dyer Reservoir (425 af of active storage), enlarge the canal and Patterson Reservoir, and modify associated structures.

Dyer Reservoir

Contract work to construct a drainage diversion at Dyer Reservoir (Specification No. 06-24) began in September 2006 and is anticipated to be complete in October 2008. DWR extended the contract to allow a temporary bridge to remain in place due to environmental restrictions. The extension is expected to continue throughout much of 2008.

South Bay Pumping Plant

A contract (Specification No. 04-05) to furnish 45 cfs pump and motor units for Units No. 10 through 13 and one spare pump

and motor for the pumping plant began in November 2004 and continued throughout 2007. Completion is expected in mid-2010.

A contract (Specification No. 04-20) to furnish valves, actuators, and hydraulic power units began in May 2005 and continued throughout the year. Repairs to the butterfly valves are expected to extend the contract into mid-2010.

A contract (Specification No. 05-10) to furnish switchyard equipment began in September 2005 and is expected to be completed in mid-2010. Added work per contract change order will furnish equipment for the Banks Switchyard expansion to accommodate the new 69 kV transmission line from Banks Pumping Plant to South Bay Pumping Plant.

A contract (Specification No. 05-05) to furnish 5-kilovolt (kV) switchgear began in October 2005. The contract submittal and measuring process continued throughout 2007. Contract completion is expected in mid-2010.

The contract (Specification No. 06-04) to construct the initial facilities for the South Bay Pumping Plant enlargement began in August 2006. Construction continued throughout 2007 and is expected to be completed in late 2008. Work to repair a leak in the South Bay Aqueduct at Milepost 32.4 was added via change order.

A contract (Specification No. 07-02) to furnish power transformers began in April 2007 and is expected to be completed in mid-2010.

The contract (Specification No. 07-18) to complete the pumping plant facilities began in December 2007. Completion is expected in mid-2010.

South Bay Pumping Plant Discharge Line and Brushy Creek Pipeline No. 3

A contract (Specification No. 06-09) to construct a South Bay Pumping Plant discharge line and the Brushy Creek Pipeline No. 3 began in December 2006. Work continued throughout the year. Completion is expected in fall 2008

San Luis Division

Gianelli Pumping-Generating Plant and Dos Amigos Pumping Plant

A contract (Specification No. 04-08) to refurbish the existing CO₂ fire suppression system for Motor-Generator Units No. 1 through 8 and the oil purifier room at Gianelli, and Motor Units No. 1 through 6 and the oil purifier room at Dos Amigos began in July 2004. The original work was essentially complete in November 2007, but added work via contract change order continued the rest of the year. The added work includes:

- replacing and refurbishing fire extinguishers at the San Luis Field Division;
- installing an escape platform at Dos Amigos and safety platforms at Gianelli;
- repairing the CO₂ systems at Edmonston, Chrisman, and Teerink pumping plants;
- replacing the fire alarm systems at San Luis Operations and Maintenance Center and at Coalinga Operations and Maintenance Center; and
- inspecting and repairing the fire sprinkler system at the San Luis Operations and Maintenance Center warehouse.

Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Coalinga Operations and Maintenance Subcenter, Check Sites and Flowmeter Sites

A contract (Specification No. 06-10) to replace standby engine generators began in August 2006. Work continued throughout

2007. With the added change order work listed below (and additional change order work expected in early 2008) contract completion is expected in early 2011. The added work includes:

- furnishing and installing engine generators for the Delta Operations and Maintenance Center and for Banks Pumping Plant; and
- furnishing and installing a backup generator for University of California, Davis.

San Luis Canal

Work on a contract (Specification No. 04-03) to restore the West Side Detention Basin began in August 2004 and was completed in September 2007. Acceptance is expected in mid 2008. Restoration work included:

- earthwork;
- concrete and steel reinforcement;
- gravel road surfacing and chip sealing;
- erosion protection;
- construction of a concrete weir with inflatable rubber dam, control system, and appurtenances; and
- rehabilitation of the existing drain inlets.

Work added by change orders included:

- repairing Milepost 166R and Milepost 122R canal embankments;
- sealing and paving roads at California Aqueduct Reaches 6 and 7;
- cleaning the toe drain at O'Neill Dam;
- installing security bars at the San Luis Field Division guard building; and
- installing gates at various locations in San Joaquin Field Division.

Due to subsidence that caused buckling and cracking in the canal lining, a contract (Specification No. 07-20) to remove and replace damaged portions of the concrete lining along the California Aqueduct between

Mileposts 56.40 and 164.90 began in November 2007. Completion is expected in 2009 due to pending change order work.

South San Joaquin Division

Buena Vista Pumping Plant

A contract (Specification No. 07-05) to design, manufacture, test, and deliver spare coils (17,000 horsepower [hp] and 8,500 hp) and materials began in June 2007 and is expected to be complete in May 2009.

Lost Hills Operations and Maintenance Center

Contract work (Specification No. 07-06) began in August 2007 to connect existing water and sewer lines to the Lost Hills Utility District lines and was essentially completed in November 2007. DWR acceptance is pending completion of all administrative items.

Teerink Pumping Plant

Recoating of Discharge Lines 1 through 7 interiors began in January 2007 (Specification No. 06-25). Completion is expected in mid-2008.

Tehachapi Division

Edmonston Pumping Plant

A contract (Specification No. 02-10) to replace pump Units W2, W4, W6, and W8 began in June 2003 and continued throughout 2007, with completion scheduled for March 2011. Work consists of:

- designing, fabricating, and testing a four-stage pump model and a single-stage pump model, and furnishing a pump model test program report;
- designing, manufacturing, delivering, storing, and installing four pumps to replace existing pumps;
- furnishing spare parts, auxiliary equipment, tools, and templates;

- modifying existing pump foundations, if required, for the new pumps;
- applying coatings; and
- providing liaison services.

A contract (Specification No. 04-09) to furnish spare impellers and diffusers began in July 2004 and was completed in March 2007. Acceptance by DWR is not expected until 2008 due to outstanding submittals. Work consists of the manufacture and delivery of:

- two complete sets of pump impellers and two additional impellers;
- one complete set of diffusers;
- two complete sets of stationary and rotating wearing rings;
- one complete set of upper and lower wear plates;
- one complete set of interstage bushings; and templates.

Mojave Division

Cedar Springs Dam Maintenance Station

DWR awarded a contract (Specification No. 07-25) in December 2007 to construct a 14,400-square foot civil maintenance and mobile equipment building to replace the outdated Cedar Springs Dam Maintenance Subcenter. Work is expected to begin in January 2008 and be completed in mid-2010.

Horsethief Creek Bridge

A contract (Specification No. 07-12) to build a new one-lane railroad flat car bridge over Horsethief Creek began in September 2007. The bridge will replace partially blocked culverts, provide a larger area for Horsethief Creek storm water to pass under the Mojave Siphon Maintenance Road, improve access from Mojave Siphon Powerplant to Check 66, and protect the nearby Mojave Siphon pipelines. Completion is expected in early 2008.

Mojave Siphon Powerplant

A contract (Specification No. 07-09) to furnish, install, and encase approximately 60 feet of 10 foot diameter steel pipe from the existing tee on Barrel Number 3 to the abandoned prestressed concrete cylinder pipe (Barrel Number 4) began in August 2007. The work also includes construction of a blowoff to allow drainage of the bypass line for maintenance activities. Completion is expected in May 2008.

Tehachapi East Afterbay

The Tehachapi East Afterbay project is located near the bifurcation of the East and West Branches of the California Aqueduct in southern Kern County to provide additional storage to the existing Tehachapi Afterbay (which is located in the Tehachapi Division). The principal features of the Tehachapi East Afterbay project include an inlet channel, isolation weir, reservoir, flow barrier, spoil embankment, outlet channel, bypass, drainage culvert, control building, improvements to the existing canal, and site work.

The contract (Specification No. 04-18) to furnish roller gates began in February 2005, was completed in January 2006, and was accepted in August 2007. Work included furnishing two roller gates with hydraulic actuators and one hydraulic power unit, metalwork, coatings, and electrical work.

The afterbay completion contract (Specification No. 05-03) began in May 2005 but was terminated for default in November 2005. The remaining work was divided among three contracts, two of which remained open in 2007, as follows.

- The completion Phase II contract (Specification No. 05-16) began in January 2006, and included the bypass facilities, control building, flow barrier, removal of Cofferdam No. 2, and miscellaneous roadwork. Work was

completed in June 2006 and accepted in April 2007.

- The completion Phase III contract (Specification No. 06-14), which began in August 2006, included the outlet channel completion, aqueduct plug, Cofferdam No. 1 removal, and site work. Work was completed in March 2007 and accepted in August 2007.

Santa Ana Division

East Branch Extension Phase I

Construction of the East Branch Extension Phase I began with the issuance of a Notice to Begin Work on February 26, 1999, for pipeline Reaches 1 and 2. Phase I of the project is being constructed to convey 8,650 af of SWP water annually to the San Gorgonio Pass Water Agency service area, with provisions to provide San Bernardino deliveries to the Yucaipa Valley. Located in San Bernardino and Riverside counties, the project facilities will consist of existing pipelines, three new pipeline reaches, three new pump stations, and a new reservoir. The official groundbreaking ceremony took place in Yucaipa on August 23, 1999.

Below are brief descriptions of the remaining construction contracts.

Pump Stations. Work began in November 1999 on the contract (Specification No. 99-17) to design, manufacture, shop test, and deliver three 4,500 gallons per minute (gpm) and one 9,000 gpm vertical turbine pumps for Greenspot Pump Station; two 4,500 gpm and one 9,000 gpm vertical turbine pumps for Crafton Hills Pump Station; and two 3,600 gpm vertical turbine pumps for Cherry Valley Pump Station. The contract calls for electric motors, variable frequency drives (VFDs), appurtenant equipment, and associated training programs. Completion of this contract was scheduled for December 2003, but was extended to September 2008 due to a change order

for additional pump units and related components for Greenspot and Crafton Hills pump stations. As of December 2007, the added units were complete except for erecting engineer services, which are expected to occur in 2009 during completion of Specification 06-21.

The contract (Specification No. 01-05) to furnish and install the control and communications systems for Greenspot, Crafton Hills, and Cherry Valley pump stations began in October 2001 and was completed in May 2004. Acceptance is expected in August 2008.

Work on a contract (Specification No. 06-21) to install spare units at Greenspot, Crafton Hills, and Cherry Valley pump stations, and to replace the existing control valves and unit discharge isolation valves for Greenspot Pump Station Units No. 1 through 4 began in October 2006. Work continued throughout 2007 and is expected to be completed in late 2009. The work includes:

- furnishing and installing a pump, motor, variable VFD, programmable logic controller (PLC) cubicle, and motor control center unit breaker assembly at Cherry Valley Pump Station;
- furnishing and installing switchgear at Greenspot and Crafton Hills pump stations;
- installing PLCs, valves, piping, tubing, fittings, hangers, supports, and appurtenances at all three pump stations;
- installing DWR-furnished pumps and motors at Greenspot and Crafton Hills pump stations;
- installing a DWR-furnished VFD at Greenspot Pump Station;
- removing existing valves, piping, and appurtenances; and
- manufacturing and delivering tools and spare parts to all three pump stations.

Valves. Three separate contracts (Specification Nos. 99-20, 99-22, and 99-23) were awarded to furnish East Branch Extension valves. Work began on all three contracts in 1999 and was essentially complete for Specification Nos. 99-20 and 99-23 in July 2001 and June 2001, respectively, and in December 2000 for Specification No. 99-22. Several corrective issues continued to be addressed throughout 2007. Project acceptance is expected in 2008.

Lake Perris State Recreation Area

Repairs to the marina at Lake Perris State Recreation Area began in May 2006 (Specification No. 06-05) and were completed in September 2006. DWR accepted the project in February 2007.

A contract (Specification No. 06-28) to modify the existing Americans with Disabilities Act (ADA) fishing dock began in February 2007. Work included new concrete footings, installing 600 feet of ADA access ramp, building and installing a 50 foot dock section, and relocating two ramps and three platforms. Added work by change order included inspection and repair of an aerator and a new anchor system for the dock pedestals and columns. All work was completed in October 2007 and is expected to be accepted in March 2008.

Santa Ana Pipeline

Phase IV of the excavation, inspection, and repair of the Santa Ana Pipeline began in November 2007 (Specification No. 07-23). Completion is expected in 2010.

West Branch

Gorman Creek Improvement Channel

An emergency contract (Specification No. 07-03) began in January 2007 to remove and replace 1,000 feet of damaged concrete liner near Station 115, improve the liner foundation, inspect and patch approximately 11,000 feet of open channel, and remove

concrete and silt from Hungry Valley Siphon. The repairs, which were required to ensure scheduled West Branch water deliveries, were completed in February 2007. However, after flow resumed, inspections found that 11,000 feet of the channel upstream of Station 115 were in need of urgent repair. The additional repairs began in September and continued throughout 2007. Completion is expected in mid-2008.

Lower Quail Canal

A contract (Specification No. 06-23) to control seepage on the Lower Quail Canal began January 2007, was completed in March 2007, and was accepted in July 2007. Work included:

- placing a seepage control blanket;
- installing drainage piping within the seepage control blanket; and
- placing compacted embankment.

Oso Pumping Plant

Work began in December 2007 to construct a 14,400 square foot civil maintenance and mobile equipment building at Oso Pumping Plant (Specification No. 07-22). Work is expected to be completed in late 2009.

Peace Valley Pipeline

A contract (Specification No. 07-21) to excavate, inspect, and encase pipe section numbers 774, 808, and 825 of the Peace Valley Pipeline began in October 2007 and was completed in December 2007. Acceptance is expected in early 2008.

Construction Activities in Multiple Divisions

Banks Pumping Plant and Gianelli Pumping-Generating Plant

A contract (Specification No. 02-12) began in May 2003 to design, manufacture, deliver, and install automatic digital voltage regulators for Banks Pumping Plant, Units 1

through 7 and Gianelli Pumping-Generating Plant, Units 1 through 8 and completed in March 2006. Contract acceptance is expected in mid-2008; however it may be delayed until completion of all contractor submittals.

Banks Pumping Plant, Dos Amigos Pumping Plant, and Coalinga Operations and Maintenance Subcenter

A contract (Specification No. 06-03) to replace and recoat roofs at Banks Pumping Plant, Dos Amigos Pumping Plant, and Coalinga Operations and Maintenance Subcenter began in March 2006 and was completed in October 2006. The contract included added work to remove and replace roofing at the Sacramento Maintenance Facility. Acceptance is expected in early 2008.

Banks Pumping Plant, Skinner Fish Facility, and Roaring River Intake Structure

Contract (Specification No. 06-12) work began in August 2006 to design, manufacture, test, deliver, and install cathodic protection at Banks Pumping Plant, Skinner Fish Facility, and the Roaring River intake structure. Added work included installation of a cathodic protection system at the Travis Surge Tank; installation of insulating unions and magnesium anodes at seven liquid propane gas tanks in Delta Field Division; installation of one union at the mobile equipment repair building; installation of magnesium anodes at six riser locations in Delta Field Division; and improvement of the cathodic protection system at the trashrack structure at the Skinner Fish Facility. Work was completed in December 2007. Acceptance is expected in early 2008.

Banks Pumping Plant and Teerink Pumping Plant

A contract (Specification No. 06-27) to furnish spare coils and materials for Banks

Pumping Plant and Teerink Pumping Plant began in February 2007. Completion is expected in 2008.

California Aqueduct

In July 2005, work began on a contract (Specification No. 05-07) to monitor, test, and repair copper communications cable and voice and data equipment along 440 miles of the California Aqueduct. DWR terminated the contract for convenience in October 2007.

Oroville, Delta, and San Luis Field Divisions

In September 2007, work began on a contract (Specification No. 07-16) to seal and pave roads and parking areas in Oroville, Delta, and San Luis Field Divisions. Final inspections were held in December 2007, and completion is expected in 2008.

Oroville and Southern Field Divisions

Work began in September 2005 to seal and pave roads in the Oroville and Southern Field Divisions (Specification No. 05-11). Work was completed in April 2007; acceptance is expected in early 2008. The following work was added by change order:

- flood damage repair—Oroville Wildlife Area (Oroville Field Division);
- excavation, paving, guardrail and drainage work, and miscellaneous work (Oroville Field Division);
- erosion repair—Angeles Tunnel north adit access road (Southern Field Division);
- removal of roadway and culverts, relocation of utilities, regrading of flood channel—downstream of Devil Canyon Powerplant (Southern Field Division);
- road repair—Lower Quail Lake Canal and Oso Canal (Southern Field Division);
- installation and repair of irrigation system—Perris Lake State Recreation Area (Southern Field Division);
- installation of monitoring wells—Peace Valley Pipeline (Southern Field Division);

- modular office trailer—Pearblossom Operations and Maintenance Center (Southern Field Division); and
- roadway and culvert repair—Old Ferry Road (Delta Field Division).

San Luis and Southern Field Divisions

In August 2004, work began on a contract (Specification No. 04-10) to seal and pave roads in the San Luis and Southern Field Divisions. The contract was completed in August 2005; however, acceptance is not expected until early 2008. Added work included:

- emergency repairs due to storm damage: Osito adit channel, Piru Creek embankment, Devil Canyon Powerplant access road, Smokey Bear Road, and the Angeles Tunnel south adit access road (Southern Field Division);
- installation of anode beds and repairs to cathodic protection test stations (Southern Field Division);
- providing a temporary office and a soils/concrete laboratory building—Tehachapi East Afterbay (Southern Field Division); and
- sealing and paving roads—fog seal, asphalt dikes, fill, drain inlets (Southern Field Division).

A contract (Specification No. 06-15) to seal and pave roads in San Luis and Southern Field Divisions began in July 2006, and was completed in February 2007. Acceptance is expected in early 2008. Added work included:

- road resurfacing – McCabe Road (San Luis Field Division);
- installation of drainage and headwalls, regarding, and paving – vicinity of Ritter Siphon (Southern Field Division); and
- placement of a dumpster pad and preparing parking lot for paving – Vista Del Lago Visitors Center (Southern Field Division).

Southern Field Division

In September 2007, work began on a contract to seal and pave roads and parking areas at the Southern Field Division (Specification No. 07-17). Completion is expected in early 2008.

Warne Powerplant and Devil Canyon Powerplant

A contract (Specification No. 01-13) to furnish spare coils for Warne Powerplant and for Devil Canyon Powerplant began in October 2001 and completed in February 2006. Acceptance is expected in mid-2008. Change order work included:

- furnishing and delivering a set of serge rings with support and insulation blocks;
- substitution of stator bars in lieu of stator coils; and
- furnishing and delivering an additional set of stator windings.

Miscellaneous Construction Activities

The following non-SWP construction activities are categorized as miscellaneous.

Demonstration Aeration Facility

A contract (Specification No. 05-06) to install a demonstration aeration facility on Dock 20 at Rough and Ready Island in the Port of Stockton began in December 2005 and continued through 2007. Work includes installing:

- two 30-inch diameter steel U tube casings and two 20-inch diameter U tubes;
- 24-inch steel piping and 30-inch high-density polyethylene diffuser piping;
- two vertical turbine pump-motor units;
- four fish screens with two air burst systems; and
- electrical items including a PLC, water flow meter, instrumentation, and distribution panel and meter.

Added work includes:

- decommissioning an existing meteorological tower and installing a new tower;
- modifications to the initial design;
- additional coatings;
- providing and installing a liquid oxygen storage tank and distribution system;
- removing and replacing asphalt and concrete; and
- purchasing a storage container.

Detention Basin Excavation and Stockpile

A contract (Specification No. 07-19) to excavate a detention basin and stockpile and seed the excavated material in the City of Woodland began in September 2007 and was completed in December 2007. Acceptance is expected in late 2007.

Emergency Flood Response

The following two emergency contracts were awarded to respond to flooding at the listed locations.

Sacramento-San Joaquin Delta and Suisun Marsh.

The work for this contract (Specification No. 06-01) began in January 2006, was completed in May 2007, and was accepted in August 2007. Work included placing rip-rap, rock, sand, and fill; relocating flood response supplies; and restoring levees.

San Joaquin River. Contract (Specification No. 06-20) work began in April 2006, was completed in December 2006, and was accepted in July 2007. Work included levee repairs and construction of filter berms.

Emergency Levee Erosion Repairs

The contracts listed below provided emergency levee erosion repairs and included most or all of the following work:

- fencing;

- removal of trees, brush, and debris;
- levee repairs;
- placement of in-stream woody material; and
- planting, seeding, and irrigation.

Cache Slough Miles 16.5L and 21.8R, Steamboat Slough Mile 16.2R, and Sacramento River Miles 20.8L, 26.5L, and 32.5R.

Specification No. 06-17 began in July 2006 and continued throughout 2007. Completion is expected in May 2008.

Sacramento River Mile 85.6R and Bear River Miles 2.4L and 10.1R. Specification No. 06-16 began in June 2006 and continued throughout 2007. Completion is expected in mid-2008.

Sacramento River Miles 56.8R and 69.9R. Specification No. 06-18 began in July 2006 and continued through 2007. Project completion is expected in mid-2008.

Sacramento River Miles 130.8R, 141.4R, 145.9L, 154.5R, and 164.0R. Specification No. 06-19 began in July 2006 and continued throughout 2007. Added work at two additional sites (Sacramento River Miles 99.5R and 182.0R) will likely extend completion to mid-2008.

Phase II Bear River Mile 1.2L and Sacramento River Miles 99.5R and 182.0R. Specification No. 07-10 began in July 2007, and was complete, except for the plant establishment period, by December 2007. Completion is expected in mid-2009.

Phase II Sutter Slough Miles 24.8L and 25.4R and Sacramento River Miles 70.7R, 71.7R, and 73.0R. Specification No. 07-13 began in August 2007 and completion is expected in mid-2009.

Levee Setback

A contract (Specification No. 06-13) to construct a levee setback at Cache Creek North Levee Miles 0.8, 1.1, and 2.4

began in June 2006, was completed in September 2006, and was accepted in July 2007. Work included:

- removing trees, clearing, and grubbing;
- constructing the levee setback;
- paving roads;
- excavating a notch in the existing levee;
- constructing a new road and new levee ramps; and
- fabricating and installing a gate, providing a diesel generator, relocating an irrigation line, and shaping two levee notches.

Restore Habitat and Public Access

Phase I (Specification No. 06-22) of the San Joaquin River restoration at Jensen River Ranch began in November 2006 and was completed in March 2007. The work included:

- removal of selected irrigation lines, structures, and trees;
- site work and earthwork; and
- installing a storm drain bypass and an irrigation system.

Phase II (Specification No. 07-11) of the restoration began in August 2007 and was completed in December 2007. Acceptance is expected in 2008. Work included:

- selective demolition;
- site work;
- construction of a potable waterline, an oxbow embankment, a storm drain bypass tie-in, corrugated metal pipe culverts, fencing, and gates; and
- plantings and drip irrigation.

Rock Conveyor System

The design, fabrication, transport, assembly, and demonstration of a rock conveyor system at the Port of Stockton began in November 2007 (Specification No. 07-24).

Completion is expected in mid-2008. After completion, the conveyor system will be covered, transported to the Port of Stockton, and stored for future use.

Sediment Removal

Work began in July 2006 on a contract (Specification No. 06-08) to excavate and dispose of sediment material from the Yolo Bypass. The work was completed in October 2006 and accepted in June 2007.

In August 2007, removal of approximately 1.8 million cubic yards of sediment from Tisdale Bypass began (Specification No. 07-14). The work was complete in December 2007. Acceptance is expected in early 2008.

Real Estate Branch Activities

DWR has spent a net total of \$251.5 million to acquire rights-of-way, recreation, and mitigation land for the SWP from its inception to December 31, 2007. DWR conducted the following real estate activities from January 1 through December 31, 2007:

- acquired four parcels (129.99 acres in permanent easement and 12.08 acres in temporary easement) for \$495,703 for the South Bay Aqueduct Improvement Project and the Cache Creek North Levee Repair;
- renewed eleven leases and added one new lease on SWP properties;
- managed leasing activities of SWP non-operating properties, which produced an income of \$350,891;
- processed 22 encroachment permit applications and issued 18;
- collected fees of \$149,247 for review and inspection costs related to encroachment permit applications;
- received eight encroachment reviews where applicant had prior property rights;
- coordinated review of 24 tentative tract map developments within 1 mile of the California Aqueduct;
- completed 14 appraisals covering 28 parcels and 5 rental rate appraisals on 9 parcels;
- completed one cost estimate covering 250 parcels for the Delta Habitat Conservation and Conveyance Project;
- completed one right-of-entry for the Horse Thief Creek Remediation Project;
- completed three Agreements for Compensation and one Agreement for Transfer of Control for the South Bay Aqueduct Project.

In addition, DWR obtained 28 temporary permits, including:

- one for the New Hope Tract Phase II Mitigation Project;
- one for the Brushy Creek Pipeline;
- one for the water quality monitoring program;
- one for the Temporary Barriers Project;
- seven for East Branch Extension, Phase II;
- two for South Delta Improvements Program, Permanent Barriers; and
- two for Crafton Hills Reservoir.

Table 12-1 Design Activities, January 1, 2007, through December 31, 2007, by Division

Division and Facility	Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
Delta Field Division			
South Bay Aqueduct Enlargement (subcomponents below)			
South Bay Pumping Plant	Furnish power transformers (rebid)	December 2003	February 2007
	Furnish and install SCADA equipment	February 2004	October 2007
	Furnish valves, actuators, and hydraulic power unit	July 2003	November 2009
	Furnish 45 cfs pumps and motors	March 2003	February 2007
	Construct a 69kV transmission and switchyard	October 2006	May 2008
	Plant completion	January 2005	October 2007
	Plant discharge line and Brushy Creek Pipeline No. 3	May 2003	October 2006
Surge Tank No. 3	Construct new surge tank	July 2004	July 2009
Canal	Canal modification	July 2003	July 2008
Dyer Reservoir	Construct a new 425 af reservoir	September 2003	June 2008
Banks Pumping Plant	Hillside improvement	October 2006	November 2008
Patterson Reservoir	Raise embankment and refurbish liner	January 2006	May 2008
Permanent barriers—South Delta Improvements Program	New operable barriers—4 sites	September 2003	August 2009
Fish screens at Sherman and Twitchell Islands	New fish screens at existing siphons—10 sites	September 2007	March 2008
Skinner Fish Facility	Delta smelt refugium culture facility	September 2007	January 2008
Port of Stockton	Rock conveyor system	July 2007	March 2008
Oroville Field Division			
Hyatt Powerplant	Pump—turbine refurbishment, Units 2, 4, and 6	March 2000	September 2007
San Joaquin Field Division			
Edmonston Pumping Plant	Furnish spare impellers and diffusers, Units E1, E3, E5, E7, E9, E11, and E13	March 2004	January 2007
Edmonston Pumping Plant	Pump replacement, Units W2, W4, W6, and W8	August 2001	March 2011
Edmonston, Teerink, Chrisman, Buena Vista	Replace septic tanks and sewer piping	August 2007	September 2009
Lost Hills Operations and Maintenance Center	Domestic and fire water supply	January 2005	December 2007
Teerink Pumping Plant	Recoat discharge lines interior	December 2005	June 2009
San Luis Field Division			
Canal liner repair	Remove and replace damaged concrete liner	May 2007	August 2007
Dos Amigos Pumping Plant	Replace trashracks and trashrake	August 2007	September 2010
Gianelli Pumping-Generating Plant	Evaluation of existing heating ventilation and air conditioning system	August 2007	March 2008
	Replacement of eight 156-inch butterfly valves	August 2008	June 2012
East Branch Extension—Phase I Improvements	Project planning and engineering feasibility studies for the Crafton Hills Reservoir enlargement	December 2006	June 2008
East Branch Extension—Phase II	Project planning and engineering feasibility studies	March 2007	September 2009

Table 12-1 Design Activities, January 1, 2007, through December 31, 2007, by Division

Division and Facility	Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
Perris Dam	Dam remediation	January 2007	September 2010
Perris Dam	Tower retrofit	February 2008	February 2009
Perris Dam	Emergency outlet extension	January 2007	July 2010
Southern Field Division			
Lower Quail Canal	Seepage control blanket	May 2006	January 2007
Vista del Lago Visitor's Center	Erosion repair and water line replacement	July 2007	March 2009
Oso Pumping Plant and Cedar Springs Dam Maintenance Station	Civil maintenance and mobile equipment buildings	May 2005	March 2007
Multiple Divisions			
Sacramento River Mile 85.6R and Bear River Miles 2.4L and 10.1R	Emergency levee erosion repair	June 2006	February 2008
Sacramento River Miles 56.8R and 69.9R	Emergency levee erosion repair	July 2006	February 2008
Sacramento River Miles 130.8R, 141.4R, 145.9L, 154.5R, and 164.0R	Emergency levee erosion repair	July 2006	February 2008

Table 12-2 Construction Activities, January 1, 2007, through December 31, 2007, by Division

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (NTBW ^a)	Acceptance Date (Expected or Actual)	Contract Costs (In Thousands of Dollars)
Upper Feather River Division				
Grizzly Valley Dam and Reservoir	Lake Davis fish containment (06-11)	June 2006	March 2008	1,590
Oroville Division				
Hyatt Powerplant	Refurbish pump-turbine Units 1, 3, and 5 (98-22)	February 1999	February 2008	10,089
	Refurbish pump-turbine Units 2, 4, and 6 (01-11)	November 2001	February 2008	15,966
Delta Facilities				
Middle River, Old River, and Grant Line Canal	Temporary rock barriers multiyear contract (2004–2006) (03-07)	November 2003	June 2007	17,656
	Temporary rock barriers multiyear contract (2007–2009) (06-26)	January 2007	February 2010	9,327
Suisun Marsh Facilities				
Roaring River Slough, Station 370+20 and 417+20	Emergency levee restoration (06-02)	January 2006	December 2007	2,100
North Bay Aqueduct				
Napa Turnout Reservoir	Reservoir replacement (07-01)	April 2007	May 2009	11,080
South Bay Aqueduct				
Dyer Reservoir	Drainage diversion (06-24)	September 2006	June 2008	762
South Bay Pumping Plant	Furnish 45 cfs pump and motor units and one spare pump motor (04-05)	November 2004	March 2009	7,170
	Furnish valves, actuators, and hydraulic power units (04-20)	May 2005	March 2009	2,178
	Furnish switchyard equipment (05-10)	September 2005	March 2009	1,471
	Furnish 5 kV switchgear (05-05)	October 2005	March 2009	2,996
	Construct initial pumping plant facilities (06-04)	August 2006	February 2008	14,004
	Furnish power transformers (07-02)	March 2007	November 2009	5,070
	Complete pumping plant (07-18)	December 2007	June 2009	9,833
	Discharge line and Brushy Creek Pipeline No. 3 (06-09)	December 2006	August 2008	27,191
San Luis Division				
Gianelli Pumping-Generating Plant and Dos Amigos Pumping Plant	Refurbish CO ₂ system (04-08)	July 2004	June 2008	1,696
Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Coalinga Operations and Maintenance Subcenter, Check Sites, and Flowmeter Sites	Replace standby engine generators (06-10)	August 2006	January 2010	2,525
San Luis Canal	Restore West Side Detention Basin (04-03)	August 2004	July 2008	7,276
	Canal lining repair, Milepost 56.40 to 164.90 (07-20)	November 2007	September 2008	3,296
South San Joaquin Division				
Buena Vista Pumping Plant	Furnish spare coils and materials (07-05)	June 2007	July 2009	4,800
Lost Hills Operations and Maintenance Center	Water and sewer service connection (07-06)	August 2007	February 2008	339

Table 12-2 Construction Activities, January 1, 2007, through December 31, 2007, by Division

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (NTBW ^a)	Acceptance Date (Expected or Actual)	Contract Costs (In Thousands of Dollars)
Teerink Pumping Plant	Recoat discharge lines interior (06-25)	January 2007	June 2008	5,830
Tehachapi Division				
Edmonston Pumping Plant	Replace pumps, Units W2, W4, W6, and W8 (02-11)	June 2003	March 2011	32,900
	Impeller replacement (04-09)	July 2004	March 2007	4,300
Mojave Division				
Cedar Springs Dam Maintenance Station	Construct civil maintenance and mobile equipment building (07-25)	July 2007	March 2009	2,781
Horsethief Creek Bridge	Construct bridge (07-12)	September 2007	March 2008	1,737
Mojave Siphon Powerplant	Penstock bypass connection line (07-09)	August 2007	March 2008	1,535
Tehachapi East Afterbay	Furnish roller gates (04-18)	February 2005	August 2007	640
	Complete Afterbay Phase II (05-16)	January 2006	April 2007	15,814
	Complete Afterbay Phase III (06-14)	August 2006	August 2007	10,871
Santa Ana Division				
East Branch Extension Phase I				
Greenspot, Crafton Hills, and Cherry Valley Pump Stations	Furnish pumps, motors, and variable frequency drives (99-17)	November 1999	March 2008	4,748
	Furnish and install supervisory control and communications systems (01-05)	October 2001	August 2008	4,449
	Furnish and install additional units (06-21)	October 2006	September 2008	4,272
Valve facilities, various locations				
	Furnish ANSI ball valves (99-20)	October 1999	May 2008	1,074
	Furnish AWWA butterfly valves (99-22)	October 1999	May 2008	733
	Furnish ANSI butterfly valves (99-23)	November 1999	May 2008	1,213
Lake Perris State Recreation Area	Repair marina (06-05)	May 2006	February 2007	331
	ADA fish dock modifications (06-28)	February 2007	February 2008	886
Santa Ana Pipeline	Excavate, inspect, and repair, Phase IV (07-23)	November 2007	January 2008	975
West Branch				
Gorman Creek Improvement Channel	Emergency repair (07-03)	January 2007	March 2008	3,000
Lower Quail Canal	Seepage control blanket (06-23)	January 2007	July 2007	657
Oso Pumping Plant	Construct civil maintenance and mobile equipment building (07-22)	December 2007	March 2009	2,811
Peace Valley Pipeline	Excavate, inspect, and repair (07-21)	October 2007	March 2008	1,130
Multiple Divisions				
Banks Pumping Plant and Gianelli Pumping-Generating Plant	Design, manufacture, deliver, and install digital voltage regulators (02-12)	May 2003	January 2008	2,082
Banks Pumping Plant, Dos Amigos Pumping Plant, and Coalinga Operations & Maintenance Subcenter	Replace and recoat roofs (06-03)	March 2006	February 2008	1,732
Banks Pumping Plant, Skinner Fish Facility, and Roaring River Intake Structure	Rehabilitation of cathodic protection anodes (06-12)	June 2006	February 2008	314
Banks Pumping Plant and Teerink Pumping Plant	Furnish spare coils and materials (06-27)	February 2007	July 2008	1,680

Table 12-2 Construction Activities, January 1, 2007, through December 31, 2007, by Division

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (NTBW ^a)	Acceptance Date (Expected or Actual)	Contract Costs (In Thousands of Dollars)
California Aqueduct	Monitor, test, and repair copper communications equipment (05-07)	July 2005	Terminated for convenience October 2007	526
Oroville, Delta, and San Luis Field Divisions	Seal and pave roads and parking areas—2007 (07-16)	September 2007	February 2008	3,039
Oroville and Southern Field Divisions	Seal and pave roads (05-11)	September 2005	February 2008	6,556
San Luis and Southern Field Divisions	Seal and pave roads—2004 (04-10)	August 2004	January 2008	6,473
Southern Field Division	Seal and pave roads—2006 (06-15)	July 2006	January 2008	3,927
	Seal and pave roads and parking areas—2007 (07-17)	September 2007	February 2008	2,085
Warne and Devil Canyon Poweplants	Furnish spare coils and materials (01-13)	October 2001	February 2008	1,787
Miscellaneous Activities				
Bear River Mile 1.2L and Sacramento River Miles 99.5R and 182.0R	Emergency levee erosion repair—Phase II (07-10)	July 2007	November 2008	5,500
City of Woodland	Detention basin excavation and stockpile—State emergency erosion repair project (07-19)	September 2007	November 2007	298
Port of Stockton, Rough and Ready Island Dock 20	Install demonstration aeration facility (05-06)	December 2005	March 2008	4,066
Port of Stockton	Rock conveyor system (07-24)	November 2007	May 2008	911
Cache Creek Levee Mile 0.8, 1.1, and 2.4	North levee setback (06-13)	June 2006	July 2007	673
Cache Slough Miles 16.5L and 21.8R, Steamboat Slough Mile 16.2R, Sacramento River Miles 20.8L, 26.5L, and 32.5R	Emergency levee erosion repair (06-17)	July 2006	February 2008	45,168
Jensen River Ranch	San Joaquin River Restoration, Phase I (06-22)	November 2006	February 2008	1,412
	San Joaquin River Restoration, Phase II (07-11)	August 2007	December 2007	527
Sacramento River Mile 85.6R and Bear River Miles 2.4L and 10.1R	Emergency levee erosion repair (06-16)	June 2006	August 2008	19,223
Sacramento River Miles 56.8R and 69.9R	Emergency levee erosion repair (06-18)	July 2006	August 2008	8,875
Sacramento River Miles 130.8R, 141.4R, 145.9L, 154.5R, and 164.0R	Emergency levee erosion repair (06-19)	July 2006	August 2008	42,269
Sacramento-San Joaquin Delta, and Suisun Marsh	Emergency flood response (06-01)	January 2006	August 2007	2,685
San Joaquin River	Emergency flood response (06-20)	April 2006	July 2007	3,681
Sutter Slough Miles 24.8L and 25.4R and Sacramento River Miles 70.7R, 71.7R, and 73.0R	Emergency levee erosion repair (07-13)	July 2007	November 2008	4,942
Tisdale Bypass	Sediment removal (07-14)	August 2007	February 2008	7,523
Yolo Bypass	Sediment removal (06-08)	July 2006	June 2007	5,949

^a Notice to Begin Work



Chapter 13 Recreation

Lime Saddle, Lake Oroville State Recreation Area.

Significant Events in 2007

The Department of Fish and Game (DFG) continued its fish planting activities at 11 of the 12 State Water Project (SWP) facilities. A total of 574,030 salmonids were planted: 417,330 trout and 156,700 salmon. Lake Oroville was planted with 133,758 coho, while Lake del Valle was planted with 10,000 Chinook and 12,932 much-desired kokanee. Additionally, Lake Perris was planted with 300 trophy-sized rainbow trout to attract more anglers.

SWP facilities supported an estimated 4.7 million recreation days of use, about the same as in 2006 and 2005.

This was the third year that the Department of Water Resources (DWR) and partner agencies scheduled Catch A Special Thrill (C.A.S.T.) events at SWP recreation lakes. Four of the SWP lakes hosted these events (Lake Oroville, Lake del Valle, Castaic Lake, and Lake Perris). More than 300 volunteers, many of them DWR employees, helped make these events a great day for 140 disabled and disadvantaged children.

Information for this chapter was provided by the Division of Integrated Regional Water Management, Public Affairs Office, Division of Environmental Services, and the State Water Project Analysis Office.

The State Water Project (SWP) is a multipurpose project that provides recreational benefits to millions of Californians. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP offers extensive and varied recreational opportunities—tours, sightseeing, fishing, hunting, picnicking, camping, boating, water skiing, bicycling, hiking, and swimming. Under the Davis-Dolwig Act (DDA), these recreational opportunities, as well as fish and wildlife enhancements, are not allocable as water and power costs to the SWP water contractors. They are financed by Department of Water Resources' (DWR) existing authorities under the Burns-Porter Act as well appropriations from the Legislature specifically for these purposes.

Recreation Areas

The SWP has 37 developed recreation areas, or sites, throughout California, including 18 developed fishing access sites. Figure 13-1 shows the name and location of each area.

Recreation Use

In 2007, SWP facilities supported an estimated 4.7 million recreation days of use (Table 13-1), about the same as in 2006 and 2005. A recreation day is defined as one individual user visiting a recreation site along the SWP within all or part of a one-day period. Recreation usage increased significantly at Lake del Valle, Silverwood Lake, and Castaic Lake in 2007. Usage decreased at Lake Perris, where the lake level was lowered because of seismic safety risks in the foundation of Perris Dam. Recreation use at the fishing access sites and along the California Aqueduct Bikeway nearly equaled that of 2006.

Most SWP recreation use is concentrated at the major reservoirs, with 33 percent occurring at the lakes in the Oroville Field Division, and 44 percent of the total SWP recreational use in 2007 occurring at the four major reservoirs in Southern California: Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris. Since the SWP began delivering water in 1962, approximately

195 million recreation days have been recorded at SWP recreational facilities. In addition to recreation use, visitation at DWR's three SWP educational visitors centers totaled:

- Lake Oroville Visitors Center, 76,600 recreation days;
- Romero Overlook Visitors Center, San Luis Reservoir, 107,200 recreation days; and
- Vista del Lago Visitors Center, Pyramid Lake, 117,000 recreation days.

Overall, recreation usage of 4.7 million recreation days at the 16 SWP reservoirs listed in Table 13-1 contributed significantly to the 69.0 million (during calendar year 2007) day-use visitors at the 278 units of the California State Park System in fiscal year (FY) 2007–2008.

Facilities

Planning

During 2007, the following improvements to SWP facilities were planned:

Lake del Valle State Recreation Area

- East Bay Regional Parks is making plans to install a new 300,000-gallon steel bolted water storage tank on the west side of the lake.



Figure 13-1 Names and Locations of SWP Recreation Areas

Table 13-1 Recreation Days Estimated^a in 2007, by Field Division and Facility

Field Division and Facility	Number of Recreation Days (rounded)
Oroville Field Division	
Frenchman Lake	65,600e
Antelope Lake	17,200e
Lake Davis	20,800e
Lake Oroville and Thermalito Forebay	1,030,500
Thermalito Afterbay and Oroville Wildlife Area	350,500
Feather River Fish Hatchery	155,700
Lake Oroville Visitors Center	76,600
<i>Subtotal</i>	<i>1,716,900</i>
Delta Field Division	
Lake del Valle	314,600
Bethany Reservoir	24,900e
Fishing Access Sites:	
Niels Hansen	100e
California Aqueduct:	
Walk-in fishing	600e
Bikeway	100e
White Slough Wildlife Area	11,300e
<i>Subtotal</i>	<i>351,600</i>
San Luis Field Division	
San Luis Reservoir SRA, includes San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	471,600
Romero Overlook Visitors Center	107,200
California Aqueduct:	
Walk-in fishing	12,000e
Wildlife Areas	11,000e
<i>Subtotal</i>	<i>601,800</i>
San Joaquin Field Division	
Fishing Access Sites:	
Kettleman City	1,000e
Lost Hills	1,000e
Buttonwillow	1,000e
California Aqueduct:	
Walk-in fishing	9,500e
<i>Subtotal</i>	<i>12,500</i>
Southern Field Division	
Silverwood Lake	436,700
Lake Perris	678,900
Pyramid Lake	118,400
Vista del Lago Visitors Center	117,000
Castaic Lake	658,400
Fishing Access Sites:	
Quail Lake	1,300e
77th Street East	100e
Longview Road	100e
California Aqueduct:	
Walk-in fishing	1,300e
Bikeway	500e
<i>Subtotal</i>	<i>2,012,700</i>
Total for Recreational Centers	4,394,700
Total for Visitors Centers	300,800
Grand Total	4,737,100

^a These values are provided by numerous sources and vary in their degree of accuracy. Recreation days are based on counts except where marked "e," which are based on partial data.

- The California Department of Boating and Waterways is planning to install an American with Disabilities Act (ADA) compliant dock on the west side of the lake in 2008.

San Luis Reservoir State Recreation Area

Six new vaulted toilets and upgrade of existing four wind-warning light systems are planned for 2008 (DWR).

New Facilities

During 2007, new facilities were completed at the following sites:

Lake del Valle State Recreation Area

East Bay Regional Parks installed a 300,000-gallon steel bolted water storage tank on the east side of the lake.

San Luis Reservoir State Recreation Area

DWR built five new ADA-compliant restroom facilities. These were installed at the Basalt and San Luis Creek areas along the ADA walkway. A new boat dock was also installed at Los Banos Creek.

Silverwood Lake State Recreation Area

DBW funded the installation of a new boat dock at the marina launch ramp. Construction was completed in 2007.

Improvements to Facilities

During 2007, improvements were made at the following facility:

Silverwood Lake State Recreation Area

DBW provided funding for improvements to the Chamise and Sycamore Landing boat-in day use facilities. Construction will be completed in 2008.

Oroville Recreation Plan

The Oroville Facilities, including Lake Oroville State Recreation Area, Oroville Wildlife Area, and adjacent DWR facilities are operated in conformance with the 1993 Amended Recreation Plan that was approved by the Federal Energy Regulatory Commission (FERC) in their 1994 Order 2100-054. In 2006, and consistent with their respective Davis-Dolwig Act (DDA) roles and responsibilities, DWR and its Settlement Agreement (SA) signatories submitted a new, collaboratively developed Settlement Agreement Recreation Management Plan (SARMP, March 2006) for FERC approval. This approval is expected sometime in 2011 or later, pending a new FERC license.

Additional need-based recreation improvements identified and proposed in the SARMP are anticipated to be constructed when FERC issues new license terms and conditions. The new terms and conditions are expected to be consistent with the proposed SARMP. In the meantime, DWR and its DDA collaborating partners, the Department of Parks and Recreation (DPR), the Department of Boating and Waterways (DBW), and the Department of Fish and Game (DFG), will continue to operate Oroville Facilities recreational installations consistent with the existing FERC license.

Fish Planting

In 2007, DFG continued fish planting at SWP facilities, including all major SWP reservoirs. A total of 574,030 salmonids were planted, of which 417,330 were trout and 156,700 were salmon. Lake Oroville was planted with 133,758 coho, while Lake del Valle was planted with 10,000 Chinook and 12,932 much-desired kokanee, neither of which had been planted in 2006. Also new this year, DFG planted 300 trophy-sized rainbow trout in Lake Perris to attract more anglers. See Table 13-2.

SWP Deliveries for Recreation

DWR has an agreement with DPR to provide onshore recreation water at several SWP facilities in an amount prorated to the yearly SWP Table A allocation. These deliveries are made pursuant to the DDA at no cost to DPR and while stipulating reimbursement from the State to DWR for these water supply deliveries, as allocated under DWR's joint SWP cost allocation. Per the 2007 60 percent SWP Table A allocation, maximum diversion amounts under the onshore recreation agreement were allocated at 60 percent, or a total of 4,068 af as follows: 1,650 af at San Luis Reservoir; 240 af at Lake del Valle; 1,398 af at Castaic Lake/Lagoon; 750 af at Lake Perris; and 30 af at Bethany Reservoir.

Actual deliveries under the agreement totaled 1,045 af as follows: 15 af at San Luis Reservoir; 138 af at Lake Del Valle; 196 af at Castaic Lake; 696 af at Lake Perris; and 0 af at Bethany Reservoir. In addition, 103 af was delivered to DPR at Silverwood Lake and 6 af to the U.S. Forest Service at Pyramid Lake. Further detail on these deliveries is provided in Table 9-4 of Chapter 9, Water Contracts and Deliveries.

Recreation Financing

Prior to 2001, DWR reported capital costs allocated to fish and wildlife enhancement and recreation in Appendix D to Bulletin 132, *Costs of Recreation and Fish and Wildlife Enhancement*. This report is no longer mandated by the Legislature, and these capital costs, starting with FY 2000-2001, are reported in this bulletin.

The approach to financing recreation and fish and wildlife enhancement in connection with the SWP is provided in the DDA (California Water Code Sections 11900-11925, 1961); the Burns-Porter Act (CWC Section 12937, 1959); and CWC Sections as early as 1953

Table 13-2 Fish Planted by Department of Fish and Game in 2007 (Thousands)

Location and Size	Eagle Lake Trout	Brook Trout	Rainbow Trout	Coho Salmon	Chinook Salmon	Kokanee Salmon	Total For Lake
Antelope Lake Catchables	5.3	7.5	12.7				25.5
Lake Davis Catchables	31.2						31.2
Frenchman Reservoir Fingerlings			88.0				126.4
	38.4						
Lake Oroville Catchables				133.8			133.8
Thermalito Forebay Catchables	1.5		22.6				24.1
Lake del Valle Fingerlings					10.0	12.9	51.5
	6.4		22.1				
Los Banos Reservoir Catchables	11.3		7.2				18.5
Pyramid Lake Catchables			30.5				30.5
Castaic Lake Catchables			20.8				20.8
Castaic Lagoon Catchables			55.1				55.1
Silverwood Lake Catchables	6.2		11.6				17.8
Lake Perris Catchables	3.8		34.9				39.0
			0.3				
California Aqueduct	- - - - -	- - - - -	- - - - -	No Fish Planted	- - - - -	- - - - -	- - - - -
Total	104.1	7.5	305.8	133.8	10.0	12.9	574.0

(12581, 12582, 233, 345, 346), which declare recreation at the SWP to be a benefit to all the people of California and a cost that is to be borne by them. While this intent is cited in the DDA, no specific appropriation or funding source was defined. Consequently, Assembly Bill (AB) 12 in 1966, Senate Bill (SB) 1268 in 1970, and the Environmental Water Act, AB 1441 and AB 1442 in 1989, were all enacted to provide the statutorily required State funding for this SWP purpose.

As noted above, the Legislature has appropriated monies to meet State obligations to fund fish and wildlife enhancements and recreation at the SWP intermittently in the past. AB 12 appropriated \$5 million per year to DWR from tidelands oil and gas revenues, which totaled \$90 million through the early 1980s when these revenues were exhausted; SB 1268 appropriated \$55 million to DPR and \$5 million to DFG specifically for their responsibilities under the DDA at SWP facilities. Finally, AB 1442 appropriated a total of \$172 million to reimburse DWR for SWP Recreation and Fish and Wildlife Enhancement (R&FWE) costs incurred over the roughly previous dozen years as an offset to DWR's outstanding California Water Fund repayment, and an additional \$30 million for SWP R&FWE through 1994.

While no other appropriations to DWR for SWP R&FWE have been made by the Legislature, DWR has used its authority under the Burns-Porter Act to carry out and fund all SWP project purposes, including R&FWE, with State Water Resources Development System revenues.

Capital Cost Allocations

Table 13-3 shows capital costs allocated to R&FWE and overall costs of lands acquired for recreation development through calendar year 2007. Total capital costs increased by \$15,406,313 since Bulletin 132-07 due to an increase of \$1,491,198

in 2007, and \$13,915,115 in years prior to 2007 due to historical adjustments. Reporting adjustments are for actual capitalized planning costs for facilities not yet constructed. These costs are budgeted by DWR from funds available for financing project construction costs. Specific (i.e., 100 percent) R&FWE costs not reported in this table are budgeted and funded by several other State departments with statutorily defined roles and responsibilities in the DDA, and these costs are financed by appropriations to these departments from a variety of funds.

Accrued Interest Charges

Table 13-4 details accrued interest charges included in the costs shown in Table 13-3, and reimbursements through December 2007. These interest accruals are calculated through December 31, 2007, on the portion of annual disbursements financed by the California Water Resources Development Bond Fund, and based on the weighted average interest costs of Burns-Porter and water system revenue bonds sold to date. The reimbursements were included in DWR's budget as appropriations from the General Fund and are used by DWR to pay for operations, maintenance, power, and replacement costs associated with operating the SWP for R&FWE.

For a more detailed discussion of these legislative provisions, and DWR's procedures for reporting and tabulating recreation and enhancement costs, please see the last published Appendix D (to Bulletins 132-98, 132-99, 132-00, and 132-01). This report can be found online at <http://www.swpao.water.ca.gov/publications/index.cfm>.

Table 13-3 Recreation and Enhancement Costs of the State Water Project

Facility	Joint Costs Allocated to Recreation and Enhancement						
	1952–2006	2007	Subtotal	Interest	Total	132-07 Costs	Increase/ Decrease
Frenchman Dam and Lake (78.5%)							
California Water Resources Development Bond Fund	102,997	0	102,997	2,097	105,094	105,094	0
All Other Funds	2,719,775	0	2,719,775	0	2,719,775	2,717,730	2,045
Antelope Dam and Lake (100%)							
California Water Resources Development Bond Fund	1,033,261	0	1,033,261	113,788	1,147,049	1,147,049	0
All Other Funds	4,625,717	0	4,625,717	0	4,625,717	4,625,718	0
Grizzly Valley Dam and Lake Davis (99.0%)							
California Water Resources Development Bond Fund	4,003,092	0	4,003,092	486,754	4,489,846	4,489,846	0
All Other Funds	4,390,357	190,132	4,580,489	0	4,580,489	4,390,356	190,133
Other Feather River Projects^a							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	746,131	0	746,131	0	746,131	0	746,131
Delta Facilities^a							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	12,907,550	54,511	12,962,061	0	12,962,061	0	12,962,061
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir (3.4%)							
California Water Resources Development Bond Fund	988,910	0	988,910	169,085	1,157,995	1,157,995	0
All Other Funds	3,504,115	891	3,505,007	0	3,505,007	3,504,390	617
California Aqueduct Delta to Dos Amigos P.P. (3.4%)							
California Water Resources Development Bond Fund	4,467,667	0	4,467,667	897,406	5,365,073	5,365,073	0
All Other Funds	4,660,748	24,434	4,685,183	0	4,685,183	4,662,760	22,423
Oroville Division (2.9%)							
California Water Resources Development Bond Fund	5,725,216	0	5,725,216	1,790,491	7,515,707	7,515,707	0
All Other Funds	5,597,267	186,500	5,783,767	0	5,783,767	5,021,397	762,370
Del Valle Dam and Lake del Valle (48.0%)							
California Water Resources Development Bond Fund	10,546,762	0	10,546,762	6,813,560	17,360,322	17,360,322	0
All Other Funds	4,194,521	3,648	4,198,169	0	4,198,169	4,194,879	3,290
California Aqueduct Dos Amigos P.P. to Termini (5.7%)							
California Water Resources Development Bond Fund	48,382,162	0	48,382,162	75,353,773	123,735,935	123,735,935	0
All Other Funds	86,457,021	784,790	87,241,811	0	87,241,811	86,478,513	763,298
<i>Subtotal</i>	<i>205,053,271</i>	<i>1,244,905</i>	<i>206,298,176</i>	<i>85,626,954</i>	<i>291,925,130</i>	<i>276,472,762</i>	<i>15,452,368</i>
Specific Costs of Acquiring Land for Recreation Development							
Frenchman Dam and Lake							
California Water Resources Development Bond Fund	3,379	0	3,379	160	3,539	3,539	0
All Other Funds	49,950	0	49,950	0	49,950	49,950	0
Grizzly Valley Dam and Lake Davis							
California Water Resources Development Bond Fund	204,475	0	204,475	17,573	222,048	222,048	0
All Other Funds	554,246	0	554,246	0	554,246	554,246	0
Abbey Bridge Dam and Reservoir							
California Water Resources Development Bond Fund	9	0	9	0	9	9	0
All Other Funds	9,921	0	9,921	0	9,921	9,921	0
Antelope Dam and Lake							
California Water Resources Development Bond Fund	3,167	0	3,167	0	3,167	0	3,167
All Other Funds	201,137	0	201,137	0	201,137	0	201,137
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir							
California Water Resources Development Bond Fund	395,284	0	395,284	33,467	428,751	428,751	0
All Other Funds	867,243	0	867,243	0	867,243	867,243	0
California Aqueduct Delta to Dos Amigos P.P.							
California Water Resources Development Bond Fund	422,681	0	422,681	158,456	581,137	619,542	(38,405)
All Other Funds	(91,879)	0	(91,879)	0	(91,879)	(137,600)	45,721
Oroville Division							
California Water Resources Development Bond Fund	7,809,509	0	7,809,509	3,673,041	11,482,550	11,482,550	0
All Other Funds	3,408,487	246,293	3,654,780	0	3,654,780	3,921,246	(266,466)
Del Valle Dam and Lake del Valle							
California Water Resources Development Bond Fund	519,425	0	519,425	448,292	967,717	967,717	0
All Other Funds	(32,202)	0	(32,202)	0	(32,202)	(32,202)	0
California Aqueduct Dos Amigos P.P. to Termini							
California Water Resources Development Bond Fund	478,971	0	478,971	915,217	1,394,188	1,394,188	0
All Other Funds	419,088	0	419,088	0	419,088	410,296	8,792
Castaic Dam and Lake							
California Water Resources Development Bond Fund	1,954,297	0	1,954,297	3,856,203	5,810,500	5,810,500	0
All Other Funds	951,352	0	951,352	0	951,352	951,352	0
Cedar Springs Dam and Silverwood Lake							
California Water Resources Development Bond Fund	424,966	0	424,966	817,173	1,242,139	1,242,139	0
All Other Funds	370,164	0	370,164	0	370,164	370,164	0
Perris Dam and Lake Perris							
California Water Resources Development Bond Fund	1,022,313	0	1,022,313	2,033,799	3,056,112	3,056,112	0
All Other Funds	4,939,976	0	4,939,976	0	4,939,976	4,939,976	0
<i>Subtotal</i>	<i>24,885,959</i>	<i>246,293</i>	<i>25,132,252</i>	<i>11,953,381</i>	<i>37,085,633</i>	<i>37,131,687</i>	<i>(46,054)</i>
Total Recreation and Enhancement Costs							
California Water Resources Development Bond Fund	88,488,543	0	88,488,543	97,580,335	186,068,878	186,104,116	(35,238)
All Other Funds	141,450,687	1,491,198	142,941,885	0	142,941,885	127,500,333	15,441,551
Total	229,939,230	1,491,198	231,430,428	97,580,335	329,010,763	313,604,449	15,406,313

^a Actual capitalized planning costs for facilities not yet constructed.

Table 13-4 Calculation of Interest Accruals on California Water Resources Development Bond Fund Disbursements (in dollars at 4.608% per annum)

Facility	1952-2006						2007						2008 Beginning of Year Balance to be Reimbursed					
	Disbursements			Reimbursements			Disbursements			Reimbursements			Disbursements			Reimbursements		
	WRD Bond Funds	All Other Funds	Interest Accrual	WRD Bond Funds	All Other Funds	Interest Accrual	WRD Bond Funds	All Other Funds	Interest Accrual	WRD Bond Funds	All Other Funds	Interest Accrual	WRD Bond Funds	All Other Funds	Interest Accrual	WRD Bond Funds	All Other Funds	Interest Accrual
Frenchman Dam and Lake	102,997	2,719,775	2,097	104,900	2,719,468	2,097	0	0	0	0	0	0	102,997	2,719,775	104,900	2,719,468	2,097	
Antelope Dam and Lake	1,033,261	4,625,717	1,137,888	1,140,322	4,478,932	1,137,888	0	0	0	0	0	0	1,033,261	4,625,717	1,140,322	4,478,932	1,137,888	
Grizzly Valley Dam and Lake Davis	4,003,092	4,390,357	486,754	4,444,594	2,568,667	486,754	0	190,132	0	0	0	0	4,003,092	4,580,489	4,444,594	2,568,667	486,754	
Other Feather River Projects ^a	0	746,131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delta Facilities ^a	0	7,055,939	0	0	0	0	0	54,276	0	0	0	0	0	7,110,215	0	0	0	0
Oroville Division	5,725,216	5,597,267	1,790,491	7,324,529	4,570,269	1,790,491	0	186,500	0	0	0	0	5,725,216	5,783,767	7,324,529	4,570,269	1,790,491	
DelValle Dam and Lake del Valle	10,546,762	4,194,521	6,813,560	16,463,934	3,130,016	6,813,560	0	3,648	0	0	0	0	10,546,762	4,198,169	16,463,934	3,130,016	6,813,560	
California Aqueduct Delta to Dos Amigos P.P. and Los Banos Reservoir	4,467,667	4,660,748	897,406	5,267,351	4,092,435	897,406	0	24,434	0	0	0	0	4,467,667	4,685,183	5,267,351	4,092,435	897,406	
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	988,910	3,504,115	169,085	1,938,244	2,725,578	169,085	0	891	0	0	0	0	988,910	3,505,007	1,938,244	2,725,578	169,085	
California Aqueduct Dos Amigos P.P. to Termini	48,382,162	86,457,021	75,353,773	113,035,518	49,410,851	75,353,773	0	784,790	0	0	0	0	48,382,162	87,241,811	113,035,518	49,410,851	75,353,773	
Subtotal	75,250,067	129,803,204	85,626,954	149,719,392	73,696,216	85,626,954	0	1,244,905	0	0	0	0	75,250,067	131,048,109	149,719,392	73,696,216	85,626,954	
	Specific Costs of Acquiring Land for Recreation Development																	
Frenchman Dam and Lake	3,379	49,950	160	3,520	49,947	160	0	0	0	0	0	0	3,379	49,950	3,520	49,947	160	
Grizzly Valley Dam and Lake Davis	204,475	554,246	17,573	220,423	554,244	17,573	0	0	0	0	0	0	204,475	554,246	220,423	554,244	17,573	
Abbey Bridge Dam and Reservoir ^a	9	9,921	0	9	9,921	0	0	0	0	0	0	0	9	9,921	9	9,921	0	
Antelope Dam and Lake	3,167	201,137	0	0	0	0	0	0	0	0	0	0	3,167	201,137	0	0	0	
Oroville Division	7,809,509	3,408,487	3,673,041	11,028,039	649,733	3,673,041	0	246,293	0	0	0	0	7,809,509	3,654,780	11,028,039	649,733	3,673,041	
DelValle Dam and Lake del Valle	519,425	(32,202)	448,292	917,078	(32,200)	448,292	0	0	0	0	0	0	519,425	(32,202)	917,078	(32,200)	448,292	
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	395,284	867,243	33,467	425,700	415,610	33,467	0	0	0	0	0	0	395,284	867,243	425,700	415,610	33,467	
California Aqueduct Delta to Dos Amigos P.P.	422,681	(91,879)	1,584,556	603,887	(137,494)	1,584,556	0	0	0	0	0	0	422,681	(91,879)	603,887	(137,494)	1,584,556	
California Aqueduct Dos Amigos P.P. to Termini	478,971	419,088	915,217	1,271,912	398,349	915,217	0	0	0	0	0	0	478,971	419,088	1,271,912	398,349	915,217	
Castaic Dam and Lake	1,954,297	951,352	3,856,203	5,291,258	951,070	3,856,203	0	0	0	0	0	0	1,954,297	951,352	5,291,258	951,070	3,856,203	
Cedar Springs Dam and Silverwood Lake	424,966	370,164	817,173	1,132,207	370,137	817,173	0	0	0	0	0	0	424,966	370,164	1,132,207	370,137	817,173	
Perris Dam and Lake Perris	1,022,313	4,939,976	2,033,799	2,780,487	4,867,247	2,033,799	0	0	0	0	0	0	1,022,313	4,939,976	2,780,487	4,867,247	2,033,799	
Subtotal	13,238,476	11,647,483	11,953,381	23,674,520	8,096,564	11,953,381	0	246,293	0	0	0	0	13,238,476	11,893,776	23,674,520	8,096,564	11,953,381	
Total	88,488,543	141,450,687	97,580,335	173,393,912	81,792,780	97,580,335	0	1,491,198	0	0	0	0	88,488,543	142,941,885	173,393,912	81,792,780	97,580,335	

^a Actual capitalized planning costs for facilities not yet constructed.



Chapter 14

Financial Analysis

The confluence of the Sacramento (top) and American rivers in Sacramento, California.

Information for this chapter was provided by the State Water Project Analysis Office in conjunction with the Division of Fiscal Services.

This chapter presents both a summary and a detailed explanation of State Water Project (SWP) current financial analysis, capital costs and requirements, revenues and expenses, and bond activities for years 2008 through 2015.

The Department of Water Resources (DWR) performs 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; and debt service payments for bonds expended for construction. The results of the current financial analysis, dated December 31, 2007, are presented in Tables 14-1 and 14-2, located at the end of this chapter.

Future contingencies may change the financial analysis, some of which include:

- alterations in schedules of currently planned construction for future facilities;
- changes in economic conditions, including changes in interest rates and in SWP water contractor Table A amounts 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;
- increases in capital costs related to additional conservation facilities; and
- outcome of lawsuits now pending before the courts.

Capital Requirements and Financing

In conducting the current analysis, DWR projected that future construction costs through the year 2015 plus reimbursement of \$314 million interim financing for prior expenditures will total \$2.07 billion. Special capital requirements for revenue bond financing of these construction costs are projected at \$227 million for a total capital requirement of \$2.30 billion. This projection includes construction and financing costs for the following significant SWP facilities planned for completion by 2015:

- South Delta facilities;
- Phase II enlargement of the East Branch of the California Aqueduct;
- Phase I improvements to the East Branch Extension;
- Phase II of the East Branch Extension;
- enlargement of the South Bay Aqueduct; and
- a new intake at Clifton Court Forebay.

Most of these capital requirements will be financed from the projected sale of \$2.26 billion of revenue bonds. The remaining \$36 million will be financed from capital resources revenues and the transfer of excess revenues not needed for operation costs or debt service.

The analysis of capital requirements and financing presented in Table 14-1 does not include the costs and financing of all facilities

needed to develop the remaining yield necessary to meet the total 4.2 million af contractual commitment to long-term SWP water contractors. Table 14-1 also does not include the costs of associated work essential for realizing full benefits from the SWP, but financed and constructed by local interests or State agencies other than DWR. Those facilities include on-shore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures for various SWP purposes is detailed in Table 14-3.

Capital Requirements

Lines 1 through 20 in Table 14-1 show actual and projected SWP capital requirements through 2015. Estimates of future capital expenditures include allowances for construction cost escalation of 5 percent per year from 2008 through 2015. Right-of-way costs are escalated at 4 percent per year from 2008 through 2015. 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 16) and special capital requirements under revenue bond financing (Line 17). DWR will decide whether 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, consists of the estimated costs for improvements and the historical costs for Phase II. Phase II, which became operational in May 1988, connected with the Phase I facilities, which were completed in 1968 (Phase I costs

are included in the initial project facilities discussed in Line 1). Phase II included costs for pipelines, pumping plants, and a small reservoir necessary to divert water from the western Delta to Napa and Solano counties for urban use. The improvements consist of replacing the existing tank with two 5-million gallon tanks. Construction began in 2007 and is anticipated to be completed in March 2010.

Line 3, Delta and Suisun Marsh Facilities, shows historical costs in Column 1 that include planning for general Delta facilities and 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 four permanent barriers in the Delta.

Line 4, Final Four Units at Banks Pumping Plant, includes costs of the final four 1,067 cubic feet per second (cfs) units, which became operational in spring 1992.

Line 5, Coastal Branch Aqueduct, includes all costs for the planning, design, and construction of Phase II of the Coastal Branch of the California Aqueduct. Phase II construction began in October 1993 and was completed in 1997. Water deliveries from Phase II facilities began in July 1997.

Line 6, West Branch Aqueduct, shows costs for all facilities on the West Branch except Warne Powerplant. Those costs are included in Line 11.

Line 7, East Branch Enlargement, includes expenditures for Phases I and II of the East Branch Enlargement. Phase I included the enlargement share of power plant costs at Mojave Siphon and Devil Canyon. (The remaining power plant costs are included

Table 14-3 Allocation of Capital Expenditures (Thousands of Dollars)

Facilities and Construction Divisions	Expenditures Incurred Through 2007	Future Expenditures	Total	Preliminary Allocation Among Project Purposes			
				Water Supply and Power Generation	Flood Control ^a	Recreation and Fish and Wildlife Enhancement	Other ^b
Project Construction Expenditures							
Upper Feather Division	20,301	61	20,362	1,529	0	18,834	0
Oroville Division	623,257	30,297	653,554	558,773	71,783	22,998	0
Delta Facilities Division	411,948	34,095	446,043	430,925	0	15,118	0
North Bay Aqueduct	98,815	369,437	468,252	468,252	0	0	0
South Bay Aqueduct	178,344	110,731	289,075	265,644	8,195	15,236	0
California Aqueduct							
North San Joaquin Division	270,381	18,159	288,540	280,168	0	8,371	0
San Luis Division	269,719	5,528	275,247	262,727	0	12,520	0
South San Joaquin Division	310,607	9,929	320,536	302,703	0	17,833	0
Tehachapi Division	335,288	28,832	364,120	343,403	0	20,717	0
Mojave Division	292,799	37,575	330,374	290,108	0	40,266	0
Santa Ana Division	334,643	222,566	557,209	511,777	0	45,432	0
West Branch	511,259	34,074	545,333	511,569	0	33,764	0
Coastal Branch	492,800	11,838	504,638	504,638	0	0	0
<i>Subtotal, California Aqueduct</i>	<i>2,817,496</i>	<i>368,500</i>	<i>3,185,996</i>	<i>3,007,092</i>	<i>0</i>	<i>178,904</i>	<i>0</i>
Other Project Facilities							
Small Hydroelectric Power							
Generating Facilities	97,689	0	97,689	97,689	0	0	0
Off-Aqueduct Power							
Generating Facilities	474,246	43,220	517,466	517,466	0	0	0
East Branch Enlargement	453,459	399,780	853,239	853,239	0	0	0
East Branch Extension	120,645	255,024	375,669	375,669	0	0	0
Coastal Power Allocation	30,708	0	30,708	30,708	0	0	0
Agricultural Drainage Facilities	72,486	26,896	99,382	0	0	0	99,382
Planning and Preoperations	151,904	34,154	186,058	186,058	0	0	0
Unassigned/Miscellaneous	17,588	87,817	105,405	0	0	0	105,405
<i>Subtotal, Project Construction Expenditures</i>	<i>5,568,887</i>	<i>1,760,012</i>	<i>7,328,899</i>	<i>6,793,044</i>	<i>79,978</i>	<i>251,090</i>	<i>204,787</i>
Other Capital Requirements							
Davis-Grunsky Act Program	130,000	0	130,000	0	0	0	130,000
Total Capital Expenditures	5,698,887	1,760,012	7,458,899	6,793,044	79,978	251,090	334,787

^aReflects DWR's allocation to this purpose, irrespective of federal payments.

^bIncludes costs currently unassigned to purpose, planning costs of deleted features of project facilities, initial costs of inventoried items, and costs assigned to the Davis-Grunsky Act Program.

in Line 11.) East Branch Enlargement costs for Phase I, by facility, are presented in Table 14-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement. Construction of Unit 2 was deferred.

Work on the Environmental Impact Report (EIR), mapping, and preliminary design for Phase II of the enlargement began in March 2007. Construction is currently projected to be completed in 2017. Project costs include raising the canal embankment and concrete lining, constructing additional siphon barrels, adding bays to check structures, constructing Unit 2 at Alamo Powerplant, and adding two pump/motor units and a discharge line at Pearblossom Pumping Plant.

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, the reconstruction of the San Bernardino Tunnel Intake, and the construction of the Tehachapi East Afterbay. Costs for power plant construction at Alamo, Mojave Siphon, and Devil Canyon are not included in this line.

Line 9, East Branch Extension, shows expenditures for Phases I and II of the extension of the East Branch of the California Aqueduct. The East Branch Extension extends the California Aqueduct east from the Devil Canyon Powerplant to a terminus at Noble Creek near Beaumont in Riverside County. The extension provides water service to the San Geronio Pass Water Agency and the San Bernardino Valley Municipal Water District. Construction of Phase I began in February 1999 and was completed in 2003. Phase I improvements

include enlargement of the Crafton Hills Reservoir and construction of the Yucaipa Connector Pipeline. Construction of this phase is to be completed by mid-2011. Phase II will increase the pumping capacity to 100 percent of design capacity. Construction is anticipated to begin in 2010. All costs in Line 9 will be allocated to and repaid by the two participating contractors.

Line 10, South Bay Aqueduct Improvements and Enlargement, shows expenditures for providing additional capacity required to meet increases in water demands for the service area of Alameda County Flood Control and Water Conservation District, Zone 7, and increasing the existing capacity of the South Bay Aqueduct to its original design capacity. Construction includes creating a third discharge line, creating a 500 af Dyer Reservoir, modifying the canal, and enlarging the South Bay Pumping Plant. Construction began in 2006 and is scheduled to be completed in 2012.

Line 11, Power Generation and Transmission Facilities, does not include the East Branch Enlargement share of costs for Alamo, Mojave Siphon, and Devil Canyon powerplants shown in Line 7 of Table 14-1. The capital costs for facilities included in Line 11 are shown in Table 14-5.

Line 12, Additional Conservation Facilities, shows projected costs to plan and study additional conservation facilities. Specific planning activities and projected spending amounts for 2008 through 2015 are shown in Table 14-6. Expenditures for these items are being reviewed. Construction costs of additional conservation facilities are not included in the financial analysis.

Line 12 does not include CALFED program costs. CALFED expenditures for preliminary planning and environmental impact report preparation are currently financed by appropriations from the General Fund. DWR assumes that future costs of the CALFED

Table 14-4 East Branch Enlargement Capital Costs by Facility

Facility	Amount (Millions of Dollars)
Aqueduct and Siphons	128.1
Pearblossom Pumping Plant	70.1
Alamo Powerplant	5.0
Mojave Siphon Powerplant	47.3
Devil Canyon Powerplant and Second Afterbay	202.9
Total	453.4

Table 14-5 Estimated Capital Costs for Power Generation and Transmission Facilities

Facility	Amount (Millions of Dollars)
Power Plants	
Reid Gardner, Unit 4	340.0
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
Warne	84.5
Alamo	44.9
Mojave Siphon	38.7
Thermalito Diversion Dam	14.1
<i>Subtotal</i>	<i>729.5</i>
Transmission Lines	
Midway–Wheeler Ridge	10.7
Geysers–Lakeville	6.9
<i>Subtotal</i>	<i>17.6</i>
Total	747.1

Table 14-6 Estimated Future Costs for Planning Additional Conservation Facilities

Activity	Amount (Millions of Dollars)
SWP Future Water Supply	28.3
Other Planning Costs	5.8
Total	34.1

program will continue to be financed from the General Fund.

Line 13, Agricultural Drainage Facilities, includes projected costs of the Agricultural Drainage Program. The activities in this program are monitoring, evaluating, reducing, and treating drainage, as well as investigating treatment and reuse of drainage water.

DWR assumes that future costs of the drainage program will be financed by revenue transfers (Line 36).

Line 14, 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 California Aqueduct units described in the preceding paragraphs.

Line 15, Subtotal Project Construction Expenditures, is the total of Lines 1 through 14.

Line 16, 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, 2007, DWR had disbursed \$130 million (including \$8.5 million for administration) in grants and loans to local agencies throughout the State.

Line 17, 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 14-7.

Line 18, Total Capital Requirements, is the total of Lines 15, 16, and 17.

Line 19, Power Facilities Capital Requirements, shows the total capital requirements for power facilities included in Line 18.

Line 20, Water Facilities Capital Requirements, shows the total capital requirements for water facilities included in Line 18.

Capital Financing

The SWP was constructed using three general types of financing: Burns-Porter Act, revenue bonds, and capital resources. Lines 21 through 37 of Table 14-1 present specific information about these financing sources.

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 (California Water Code Sections 12930–12944), approved by voters in November 1960. The Burns-Porter Act authorized an issuance of \$1.75 billion of general obligation State bonds, which are repaid by revenues received according to the water supply contracts. Of that authorization, \$130 million was reserved specifically for the Davis-Grunsky Act Program.

Proceeds from the sale of general obligation bonds were deposited in the California Water Resources Development Bond Fund—Bond Proceeds Account, from which monies were expended only for the construction of SWP facilities and for the Davis-Grunsky Act Program. Approximately 28 percent of the

Table 14-7 Application of Revenue Bond Proceeds (Millions of Dollars)

Bond Series ^a	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs ^b		
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	237.9	239.5
Power Facilities Series H	22.2	0.0	0.0	0.0	184.5	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	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	8.6	9.0
Water System Facilities Series F	0.0	0.0	0.0	0.0	160.0	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	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	537.8	537.8
Water System Facilities Series M	166.3	0.0	9.9	0.0	13.8	23.7	190.0
Water System Facilities Series N	137.4	0.0	6.0	0.0	8.6	14.6	152.0
Water System Facilities Series O	156.5	0.0	8.4	0.0	170.1	178.5	335.0
Water System Facilities Series P	141.6	0.0	5.2	0.0	13.2	18.4	160.0
Water System Facilities Series Q	135.0	0.0	8.0	0.0	123.6	131.6	266.6
Water System Facilities Series R	0.0	0.0	0.0	0.0	20.7	20.7	20.7
Water System Facilities Series S	78.2	0.0	5.8	0.0	116.2	122.0	200.2
Water System Facilities Series T	0.0	0.0	0.0	0.0	135.7	135.7	135.7
Water System Facilities Series U	98.7	0.0	5.3	0.0	103.2	108.5	207.2
Water System Facilities Series V	0.0	0.0	0.0	0.0	20.6	20.6	20.6
Water System Facilities Series W	41.0	0.0	1.3	0.0	218.7	220.0	261.0
Water System Facilities Series X	0.0	0.0	0.0	0.0	160.2	160.2	160.2
Water System Facilities Series Y	0.0	0.0	0.0	0.0	329.9	329.9	329.9
Water System Facilities Series Z	0.0	0.0	0.0	0.0	170.7	170.7	170.7
Water System Facilities Series AA	0.0	0.0	0.0	0.0	108.7	108.7	108.7
Water System Facilities Series AB	92.2	0.0	3.9	0.0	93.6	97.5	189.7
Water System Facilities Series AC	13.7	0.0	0.6	0.0	257.7	258.3	272.0
Water System Facilities Series AD	12.4	0.0	0.9	0.0	99.1	100.0	112.4
<i>Subtotal</i>	<i>2,680.4</i>	<i>2.6</i>	<i>255.0</i>	<i>14.8</i>	<i>4,043.6</i>	<i>4,316.0</i>	<i>6,996.4^c</i>
Future East Branch Enlargement Bonds	399.8	0.0	19.7	0.0	25.1	44.8	444.6
Future East Branch Extension Bonds	249.2	0.0	12.2	0.0	15.5	27.7	276.9
Future So. Bay Aq. Enlargement Bonds	166.7	0.0	8.1	0.0	10.4	18.5	185.2
Future Water System Facilities Bonds	1,222.4	0.0	59.7	0.0	76.0	135.7	1,358.1
Total	4,718.5	2.6	354.7	14.8	4,170.6	4,542.7	9,261.2

^a Actual bond issue for all except future East Branch Enlargement, future East Branch Extension, future South Bay Aqueduct Improvements and Enlargement, and future Water System Facilities bonds.

^b Bond financing and refunding costs include funds applied to debt service reserve requirements.

^c Includes \$3,581.9 million of refunded principal, leaving a net principal obligation of \$3,414.5 million.

expenditures through 2007 for construction and the Davis-Grunsky Act Program were financed with general obligation bonds.

Monies deposited in the California Water Fund were appropriated for purposes outlined in the Burns-Porter Act. Such deposits were derived from a portion of the State tideland oil revenues, in accordance with a continuing authorization. The California Water Fund was used to finance \$508 million, or approximately 8 percent, of the construction expenditures through 2007.

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). DWR's authority to issue revenue bonds was confirmed by a decision of the California Supreme Court in 1963 (*Warne v. Harkness*, 60 Cal. 2d 579).

Proceeds from the sale of revenue bonds are deposited in the Central Valley Water Project Construction Fund, from which money is expended only for purposes specified in the resolution authorizing each bond sale. Those purposes, in addition to paying construction, planning, and right-of-way costs, may include funding the Debt Service Reserve Account, paying interest on bonds, and paying water system operating expenses during a specified period.

As of December 31, 2007, DWR had sold \$7.0 billion of revenue bonds. That amount includes \$3.6 billion of refunded bonds, leaving a total principal obligation of \$3.4 billion.

Capital Resources

Capital resources financing is derived from payments and appropriations (including a portion of the State 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 interest on general obligation bonds and costs of constructing SWP facilities.

According to DWR'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, East Branch Extension bonds, South Bay Aqueduct Enlargement bonds, water system facilities bonds, initial project facilities bonds, bond proceeds from the Davis-Grunsky Act Program, California Water Fund monies, and capital resources revenues.

Line 21, Power Revenue Bonds through Series H, includes the proceeds applied from power revenue bonds for Oroville, Devil Canyon, Castaic, Warne, Reid Gardner, Bottle Rock, Alamo, South Geysers, and small hydro projects.

No future power revenue bond sales are projected for this financial analysis.

Line 22, East Branch Enlargement, Current Bonds, shows that \$474 million of Water System Revenue Bond proceeds has been applied to the East Branch Enlargement project through December 31, 2007. Of this total amount, \$417 million was used for construction expenditures and \$57 million for bond discounts, interest costs, and debt service reserves.

Line 23, East Branch Enlargement, Future Bonds, shows DWR's estimate of \$445 million of bonds required to

complete construction of the East Branch Enlargement Phase II.

Line 24, East Branch Extension, Current Bonds, shows that \$140 million of Water System Revenue Bond proceeds had been spent through December 31, 2007.

Line 25, East Branch Extension, Future Bonds, shows DWR's estimate of \$277 million of additional bonds required to complete construction of the East Branch Extension and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 26, South Bay Aqueduct Enlargement, Current Bonds, shows that \$17 million of Water System Revenue Bond proceeds had been spent through December 31, 2007.

Line 27, South Bay Aqueduct Enlargement, Future Bonds, shows DWR's estimate of \$185 million of bonds required to complete construction of the South Bay Aqueduct Enlargement and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 28, Water System Facilities, Current Bonds, shows that through December 31, 2007, \$1.5 billion of proceeds from Water System Revenue Bonds, Series A through Series AD, was applied to SWP projects other than the East Branch Enlargement, the East Branch Extension, and the South Bay Aqueduct Enlargement. Of this total, \$1.3 billion was used to pay for construction expenditures and \$0.2 billion was used to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 29, Water System Facilities, Future Bonds, shows that \$1.4 billion of future water revenue bonds is needed to provide \$1.2 billion for construction of SWP water system facilities and \$0.2 billion for bond discounts, interest costs, and debt service reserve requirements.

Line 30, Subtotal, Water Revenue Bonds, is the total of Lines 22 through 29.

Line 31, Initial Project Facilities Bond Proceeds, shows the amount of general obligation bonds sold to provide financing costs for initial 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 billion—\$1.750 billion 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 32, 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.

Line 33, Application of California Water Fund Monies, shows the amount of SWP costs financed under the Burns-Porter Act. The act 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, 2007, was used to finance a total of \$508 million of SWP costs.

Line 34, Interim Financing, shows the net annual amounts of funds flowing into and out of the Water Revenue Commercial Paper Notes program. This program was established in March 1993 to provide an ongoing source of interim financing for water system projects prior to permanent financing from the sale of long-term revenue bonds. DWR has authority to issue up to \$94.4 million of Water Revenue Commercial Paper Notes. A positive number indicates money borrowed from the program to finance construction costs. A negative number indicates money repaid to the program. The financial analysis assumes that all funds borrowed from the program will be repaid before the end of the analysis period.

Line 35, Application of Capital Resources Revenues to Construction, presents the Capital Resources Revenues applied for capital expenditures.

Line 36, Revenue Transfers Applied, shows monies assumed to be transferred to the California Water Fund, according to provisions of the Burns-Porter Act, and

subsequently reappropriated to construction (see Line 40 of Table 14-2). Projected amounts for 2008 through 2015 include funds to finance expenditures for agricultural drainage facilities, as indicated in Line 13 of Table 14-1, and expenditures for additional conservation facilities, as indicated in Line 12.

Line 37, Subtotal, Other Capital Financing, is the total of Lines 31 through 36.

Line 38, Total Financing of Capital Requirements, totals Lines 21, 30, and 37.

Annual Revenues and Expenditures

After financial analysis of SWP operations, DWR concluded that projected payments by contractors and other revenues will be adequate to pay annual operations, maintenance, power, and replacement costs and meet all repayment obligations on funds used to finance SWP construction and other authorized costs during the period 2008 through 2015. Data on annual revenues and expenditures are presented in Table 14-2. A detailed discussion of each line item follows.

Project Revenues

Project revenues consist primarily of SWP contractor payments required under their individual long-term water supply contracts. Those revenues are deposited in two funds: the Central Valley Water Project Revenue Fund, where all revenues pledged to revenue bonds are placed, and the California Water Resources Development Bond Fund-Systems Revenue Account, where all other SWP operating revenues are placed. Use of those funds is limited to paying operating costs and debt service; except that revenues in excess of those costs may be deposited to a reserve for future SWP construction, since the California Water Fund has been repaid (see Line 39).

Line 1, Capital Resources Revenues, includes the following:

- 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 (LADWP) for Castaic power development;
- advances from contractors for construction of requested work;
- 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 and have been appropriated by the California Legislature from the State tideland oil revenues. There have been no appropriations since 1985, and no appropriations are indicated in the financial analysis for the period 2008–2015. Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see Line 39).

Lines 2 through 12, 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 12.

Operations, maintenance, power, and replacement (OMP&R) 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 certain securities issued and loans obtained to finance SWP facilities.

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 contracts were 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 14-8).

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, South Bay Aqueduct, or water system facilities defined in the Water Revenue Bond Amendment.

Table 14-9 lists 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 DWR's determination of 2009 water charges to be billed on July 1, 2008. However, information about significant differences between the sum of future charges included in Lines 2 through 12 of Table 14-2 and the substantiation of 2009 charges included in Appendix B are as follows.

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 2007. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-2008 charges in Appendix B represent charges as they should have been, according to currently known conditions. Pre-2008 charges included in Table 14-2 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 14-2 for 2008 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-2008 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch Enlargement share of the Series A through Series AD bonds. Charges in Table 14-2 apply to Series A through Series AD bonds and also include amounts of the debt service and cover for assumed future bonds.
- The water revenue bond surcharge in Appendix B applies only to the Series B through Series AD bonds. Surcharge values included in Table 14-2 apply to Series B through Series AD bonds and to assumed future issues required to finance SWP construction costs included in Table 14-1.

Line 13, Subtotal, Water Contractor Payments, is the total of Lines 2 through 12.

Line 14, 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. If not needed to meet annual bond service, the cover is credited to the contractors in the following year. The annual charges for the following cost components include an amount for bond cover:

- minimum OMP&R component of the Transportation Charge for Off-Aqueduct Power Facilities;
- Water System Revenue Bond Surcharge;
- capital cost component of the Transportation Charge for East Branch Enlargement Facilities;
- capital cost component of the Transportation Charge for Coastal Branch Extension Facilities;
- capital cost component of the Transportation Charge for East Branch Extension Facilities;
- capital cost component of the Transportation Charge for Tehachapi Afterbay; and
- capital cost component of the Transportation Charge for South Bay Aqueduct Enlargement.

Line 15, Rate Management Adjustments, shows the projected amount of revenue reductions allocated to contractors after repayment of the California Water Fund (see Line 39). Under provisions of the Monterey Amendment, the reduction amount allocated to agricultural contractors is deposited into a trust fund to stabilize payments in water-short years. The urban contractor allocation is applied as a direct reduction in charges.

Table 14-8 Revenue Bond Proceeds Affecting Project Interest Rate (Millions of Dollars)

Project	Proceeds Included in Project Interest Rate				Total Principal Amount of Bonds	Percentage of Total Amount Included in Calculating Project Interest Rate [4] / [5]
	Applied to Construction Costs	Less Portion of Proceeds Derived from Interest Earnings Prior to Delivery of Bonds	Plus Bond Financing and Refunding Costs	Subtotal, Proceeds Included in Calculating Project Interest Rate [1] - [2] + [3]		
	[1]	[2]	[3]	[4]		
Devil Canyon-Castaic Project Revenue Bonds	125.3	1.5	1.4	125.2	139.2	90
Pyramid Project Revenue Bonds (Series A)	71.2	0.5	1.1	71.8	95.8	75
Alamo Project Bond Anticipation Note	16.8	0.1	0.3	17.0	24.4	70
Small Hydro Project I Revenue Bonds (Series D)	25.4	0.2	1.5	26.7	37.5	71
Alamo Project Revenue Bonds (Series F)	38.9	0.3	0.7	39.3	50.0	79
Power Facilities Revenue Bonds (Series H)						
Pyramid Project	5.0	0.0	0.1	5.1	5.1	100
Alamo Project	1.7	0.0	0.0	1.7	1.7	100
Small Hydro Project I	25.2 ^a	0.2	0.4	25.4	35.6	71
Water System Revenue Bonds (Series J)						
Pyramid Project	0.0	0.0	75.9 ^b	75.9	99.2 ^b	77
Alamo Project	0.0	0.0	45.6 ^b	45.6	57.1 ^b	80
Small Hydro Project I	0.0	0.0	27.8 ^b	27.8	38.8 ^b	72
Water System Revenue Bonds (Series L)						
Small Hydro Project I	0.0	0.0	1.5 ^b	1.5	2.1 ^b	71
Water System Revenue Bonds (Series Q)						
Pyramid Project	0.0	0.0	3.0 ^b	3.0	3.9 ^b	77
Alamo Project	0.0	0.0	4.8 ^b	4.8	6.0 ^b	80
Water System Revenue Bonds (Series S)						
Pyramid Project	0.0	0.0	8.0 ^b	8.0	10.4 ^b	77
Alamo Project	0.0	0.0	7.6 ^b	7.6	9.5 ^b	80
Water System Revenue Bonds (Series U)						
Pyramid Project	0.0	0.0	2.4 ^b	2.4	3.2 ^b	75
Alamo Project	0.0	0.0	3.2 ^b	3.2	4.0 ^b	80
Water System Revenue Bonds (Series W)						
Pyramid Project	0.0	0.0	27.7 ^b	27.7	36.0 ^b	77
Alamo Project	0.0	0.0	11.8 ^b	11.8	14.7 ^b	80
Small Hydro Project (construction)	3.4	0.0	0.0	3.4	3.7	92
Small Hydro Project (refunding)	0.0	0.0	16.3 ^b	16.3	22.7 ^b	72
Water System Revenue Bonds (Series X)						
Pyramid Project	0.0	0.0	8.5 ^b	8.5	11.0 ^b	77
Alamo Project (Series H refunding)	0.0	0.0	0.3 ^b	0.3	0.3 ^b	100
Alamo Project (Series F refunding)	0.0	0.0	3.9 ^b	3.9	4.9 ^b	79
Small Hydro Project	0.0	0.0	4.6 ^b	4.6	6.4 ^b	72
Water System Revenue Bonds (Series AC)						
Pyramid Project	0.0	0.0	3.8 ^b	3.8	5.0 ^b	76
Alamo Project	0.0	0.0	2.8 ^b	2.8	3.6 ^b	80
Small Hydro Project	0.0	0.0	1.2 ^b	1.2	1.6 ^b	72
Water System Revenue Bonds (Series AD)						
Pyramid Project	0.0	0.0	3.2 ^b	3.2	4.2 ^b	76
Alamo Project	0.0	0.0	2.6 ^b	2.6	3.3 ^b	80
Small Hydro Project	0.0	0.0	0.7 ^b	0.7	1.0 ^b	72

^a Amount consists of 71 percent of proceeds deposited in escrow 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.

Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale

Bond Sales	Date of Sale	Dollar-Years ^a (Thousands)	Interest Cost (Thousands)	Issue Interest Rate ^b (Percent)	Project Interest Rate ^c (Percent)
\$ 50,000,000 Bond Anticipation Notes	11/21/63	26,944	531	1.971	1.971
\$100,000,000 Series A Water Bonds	2/18/64	3,402,000	119,750	3.520	3.508
\$ 50,000,000 Series B Water Bonds	5/05/64	1,726,000	60,986	3.533	3.516
\$100,000,000 Series C Water Bonds	10/07/64	3,452,000	123,764	3.585	3.544
\$100,000,000 Series D Water Bonds	2/16/65	3,497,900	122,403	3.499	3.531
\$100,000,000 Series E Water Bonds	11/23/65	3,497,900	130,029	3.717	3.573
\$100,000,000 Series F Water Bonds	6/08/66	3,497,900	137,359	3.927	3.638
\$100,000,000 Series G Water Bonds	11/22/66	3,497,900	143,788	4.111	3.711
\$100,000,000 Series H Water Bonds	3/21/67	3,497,900	129,261	3.695	3.709
\$100,000,000 Series J Water Bonds	7/18/67	3,497,900	143,199	4.094	3.754
\$100,000,000 Series K Water Bonds	11/14/67	3,497,900	163,887	4.685	3.853
\$150,000,000 Revenue Bonds, Oroville Division, Series A	4/03/68	5,228,700	270,289	5.169	
\$100,000,000 Series L Water Bonds	7/11/68	3,497,900	166,918	4.772	3.941
\$100,000,000 Series M Water Bonds	10/22/68	3,497,900	169,989	4.860	4.021
\$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/01/69	3,423,460	195,902	5.722	
\$ 46,761,000 Cumulative 1970 General Fund Borrowing, repaid 7/10/70	—	4,938	346	7.007	
\$200,000,000 Series N and P Bond Anticipation Notes	6/16/70	200,000	11,660	5.830	4.030
\$100,000,000 Series N Water Bonds	2/02/71	3,447,900	190,292	5.519	4.148
\$100,000,000 Series Q Bond Anticipation Notes	3/10/71	100,000	2,349	2.349	4.143
\$100,000,000 Series P Water Bonds	4/21/71	3,397,900	193,377	5.691	4.255
\$150,000,000 Series Q and R Water Bonds	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	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	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	12/1/81	24,266	2,305	9.499	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	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	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	

Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale

Bond Sales	Date of Sale	Dollar-Years ^a (Thousands)	Interest Cost (Thousands)	Issue Interest Rate ^b (Percent)	Project Interest Rate ^c (Percent)
\$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	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	4.621
\$537,830,000 Series L Water System Revenue Bonds	5/19/93	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
\$ 1,400,000 Series Y Water Bonds	11/30/94	19,483	1,249	6.411	
\$190,000,000 Series M Water System Revenue Bonds	12/19/93	3,911,846	194,981	4.984	
\$152,000,000 Series N Water System Revenue Bonds	3/03/95	2,241,606	122,658	5.472	
\$335,000,000 Series O Water System Revenue Bonds	12/05/95	7,528,890	375,667	4.990	
\$160,000,000 Series P Water System Revenue Bonds	5/07/96	3,553,823	204,524	5.755	
\$266,630,000 Series Q Water System Revenue Bonds	11/05/96	5,481,815	299,846	5.470	4.620
\$20,700,000 Series R Water System Revenue Bonds	3/10/97	564,125	36,627	6.493	
\$200,205,000 Series S Water System Revenue Bonds	8/04/97	4,093,110	203,755	4.978	4.615
\$135,665,000 Series T Water System Revenue Bonds	8/04/97	1,310,620	66,942	5.108	
\$207,180,000 Series U Water System Revenue Bonds	12/01/98	4,032,075	200,758	4.979	
\$ 20,580,000 Series V Water System Revenue Bonds	12/01/98	525,100	32,819	6.250	
\$260,995,000 Series W Water System Revenue Bonds	5/01/01	3,659,312	195,822	5.351	4.613
\$160,225,000 Series X Water System Revenue Bonds	5/01/02	2,732,785	139,109	5.090	4.610
\$329,885,000 Series Y Water System Revenue Bonds	7/05/02	4,422,973	222,654	5.034	
\$170,655,000 Series Z Water System Revenue Bonds	10/02/02	1,706,132	75,696	4.437	
\$108,705,000 Series AA Water System Revenue Bonds	10/04/02	2,114,341	104,220	4.929	
\$189,625,000 Series AB Water System Revenue Bonds	3/09/04	4,344,942	173,788	4.000	
\$272,070,000 Series AC Water System Revenue Bonds	12/15/04	4,479,436	209,150	4.669	
\$112,390,000 Series AD Water System Revenue Bonds	6/14/05	1,827,449	90,461	4.950	4.608
Total		199,322,344	11,499,096		
Portion allocated to Project Interest Rate		63,912,154	2,945,036	4.608	4.608

^a A unit equivalent to one dollar of principal amount outstanding for one year.

^b The total interest cost (without regard to discounts paid or to premiums received) divided by the total dollar-years, expressed as a percent.

^c Determined by dividing cumulative interest costs by cumulative dollar-years, expressed as a percent. (Oroville Division bonds and revenue bonds for Off-Aqueduct Power Facilities, the East Branch Enlargement Facilities, East Branch Extension Facilities, Water System Facilities as defined in the Water Revenue Bond Amendment, Coastal Extension Facilities, and South Bay Enlargement Facilities are excluded from this calculation.)

Line 16, Federal Payments for Project Operating Costs, shows federal payments made in accordance with the December 31, 1961, agreement between California and the United States providing for DWR to operate and maintain the San Luis Joint-Use Facilities. According to the January 12, 1972, supplement to the agreement, the Bureau of Reclamation (Reclamation) initially paid 45 percent of operations, maintenance, and replacement (OM&R) costs for those activities. (The percentage does not apply to power costs; Reclamation and DWR each provide their own power to pump water through the joint facilities.)

The percentage paid by Reclamation is periodically reviewed by Reclamation and DWR. The most recent review of the percentage paid by Reclamation was completed in 1987 and resulted in a federal share of 44.09 percent. The amounts in Line 16 are based on the assumption that the federal share will continue at this level for calendar years 2008 through 2015.

Line 17, Appropriations for Operating Costs Allocated to Recreation, shows appropriations made under the Davis-Dolwig Act (DDA). In passing the DDA, the California Legislature declared its intent that except for funds provided according to Assembly Bill 12 (1966), DWR's 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 to be paid by annual appropriations from the General Fund. Through fiscal year 1982–1983, these appropriations totaled \$16.657 million. There have been no additional appropriations since the 1982–1983 fiscal year and none are indicated for 2008 through 2015.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and to fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see line 39).

Line 18, Davis-Grunsky Loan Repayments, shows the repayments by local agencies of \$54.2 million of loans disbursed as of December 31, 2007. Repayment on any future loans was assumed to be beyond the period covered by the financial analysis.

Line 19, Revenue Bond Proceeds, includes bond proceeds classified as special reserves according to the description of revenue bond financing in Line 17 of Table 14-1. Those proceeds, used for capitalized OMP&R costs, revenue bond debt service, and debt service reserves, are not classified as revenue but are included in this line to simplify the financial presentation.

Line 20, 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 21, Oroville-Thermalito Payments, shows payments from Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E) for power generation at the Oroville facilities. Those utilities purchased all power generation from Hyatt and Thermalito powerplants before April 1, 1983, in accordance with a power sale contract dated November 29, 1967. The 1952–2007 entry includes the amounts of final settlement of payments made according to the contract.

Line 22, Miscellaneous Revenues, includes all other operating revenues not included in Lines 2 through 21.

Line 23, Subtotal, Other Revenues, is the total of Lines 16 through 22.

Line 24, Total Operating Revenues, is the total of Lines 13, 14, 15, and 23.

Line 25, Total Operating Revenues and Capital Resources Revenues, is the total of Lines 1 and 24.

Project Expenses

Project expenses include the following:

- 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 in accordance with resolutions authorizing the issuance of such bonds.

Water contractor revenues associated with operating costs and debt service attributable to projects financed by revenue bonds are deposited in the Central Valley Water Project Revenue Fund for appropriate disbursement. All other operating revenues are deposited in the California Water Resources Development Bond Fund-Systems Revenue Account and are disbursed in accordance with the following four priorities of use, as specified in the Burns-Porter Act:

- SWP OMP&R costs;
- general obligation bond debt service;
- repayment of expenditures from the California Water Fund; and
- deposits to a reserve for future SWP construction.

Project expenses are presented in Lines 26 through 36 of Table 14-2.

Line 26, Project Operations, Maintenance, Power, and Replacement Costs, shows the OMP&R portion of the historical and projected costs presented in Table 14-10, at the end of this chapter.

Table 14-10 and Line 26 of Table 14-2 also include the amounts of the operations and maintenance costs for the federal share of joint facilities and those OMP&R costs allocated to recreation, which are intended to be offset by revenues listed in Lines 16 and 17.

Allowances for cost escalations are included in OMP&R costs through 2009. Allowances for additional long-term price escalations in the future are not included in these estimates, because changes in OMP&R costs do not substantially affect the overall results of the financial analysis. (For the most part, changes in OMP&R costs cause direct offsetting changes in operating revenues.)

Power costs make up the major item of annual operating expenses for the SWP. Assumptions about future power sources and costs are discussed in Chapter 10, Power Resources. Line 26 also includes costs associated with power transactions that result in the sale of power not required for the delivery of water.

Line 27, Deposits to Replacement Reserves, shows funds set aside as required by contract for replacing existing SWP facilities. By December 31, 2007, \$106.8 million had been spent for replacement costs; the balance of the replacement reserve as of that date was \$15.9 million.

Line 28, Deposits to Special Reserves Under Revenue Bond Financing, includes two significant components: special reserve deposits related to revenue bonds and

capital resources revenue carryover from prior years used for construction in the current year. Special reserve deposits are the net of several income and expenditure items. Income items related to revenue bonds are:

- proceeds set aside to pay bond interest during construction (capitalized interest);
- proceeds set aside for first year operating costs (capitalized operations and maintenance);
- water contractor payments or bond proceeds set aside for debt service reserves;
- water contractor payments for revenue bond cover requirements; and
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements.

The 1952–2007 column also includes advances to DWR’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 include:

- debt service cover payments returned to contractors;
- debt service reserve interest payments returned to contractors;
- surplus account funds returned to 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 28 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 29, Capital Resources Expenditures, includes the amount of capital resources revenues applied to construction that is shown in Line 35 of Table 14-1. In Table 14-2, these expenditures are funded out of withdrawals from the reserves in Line 28 and do not affect net revenues shown in Line 38.

Lines 30 and 31, Payment of Debt Service on Bonds Sold through December 31, 2007, show the total principal and interest payments, respectively, on bonds sold to date. Table 14-11, at the end of this chapter, summarizes payments on general obligation bonds (Series A through Y water bonds), power revenue bonds by project, and water system revenue bonds (Series A through AD).

Lines 32 and 33, Payments on Projected Future Water Bonds, include the projected annual debt service amounts for future water revenue bonds included on Lines 25, 27, and 29 of Table 14-1 for the East Branch Extension, South Bay Aqueduct Enlargement, and other water system facilities.

Assumptions about the service on these future bonds are that interest costs for the water revenue bonds average 4.5 percent; and that bonds are to be repaid by the end of the project repayment period (2035) or sooner, with maturities commencing in the year following the date of sale and with equal annual bond service for the principal repayment period.

Lines 34 and 35, Total Payments of Bond Debt Service, show the total of principal payments indicated on Lines 30 and 32, and the total of interest repayments indicated on Lines 31 and 33.

Line 36, Subtotal, Debt Service, is the total of Lines 34 and 35.

Line 37, Total Operating Expenses and Debt Service, is the total of Lines 26, 27, 28, 29, and 36.

Line 38, Net System Revenues, shows the annual amounts of revenues remaining after the payment of operating costs and bond debt service costs.

Line 39, California Water Fund Repayment, shows the total amount of repayments made to the California Water Fund to reimburse the fund for monies expended for construction of the State Water Resources Development System.

Repayment of the California Water Fund was completed in 1998 after reimbursements totaling \$508 million. In addition to the \$296 million of repayments shown in Line 39, \$212 million of reimbursement was credited to the SWP as offsets for recreation and fish and wildlife enhancement expenditures.

Line 40, Revenues Used for Capital Expenditures, includes the amounts required annually for financing scheduled capital expenditures. Revenues not needed for operating costs or debt services are available for financing SWP capital expenditures.

Future Costs of Water Service

Estimates of future water costs are useful to contractors for short-range and long-range planning of water needs, operations, and budgets. Unit water charges shown in Table 14-12 represent costs of water delivery by service area for calendar years 2009 and 2014. The unit rates include costs of existing and future SWP facilities accounted for in Table 14-1 and Table 14-7. The unit charges are based on the assumption that in 2009 and 2014, the SWP will be able to deliver the entire amount of water requested by each contractor. The unit water charges included in Table 14-12 are listed both as 2009 dollars and as escalated rates reflecting assumed future inflation of 5 percent per year through 2014.

Table 14-12 Estimated Unit Water Charges for 2009 and 2014, by Service Area (Dollars per Acre-Foot)

Service Area and Charge	2009	2014
	(In 2009 Dollars)	(In 2014 Dollars)
Feather River Area		
Capital; Operations, Maintenance, and Replacement (OM&R)	43	55
North Bay Area		
Capital; OM&R	207	264
Power	38	48
Total	245	312
South Bay Area		
Capital; OM&R	137	175
Power	67	86
Total	204	261
Coastal Area		
Capital; OM&R	542	692
Power	177	226
Total	719	918
San Joaquin Area		
Capital; OM&R	73	93
Power	31	40
Total	104	133
Southern California Area		
Capital; OM&R	184	235
Power	212	271
Total	396	506

Table 14-1 Capital Requirements and Financing, December 31, 2007 (Thousands of Dollars)

Line Number/Item	Calendar Year											
	1952-2007	2008	2009	2010	2011	2012	2013	2014	2015	2008-2015	1952-2015	
Capital Requirements												
1. Initial Project Facilities	2,202,316	0	0	0	0	0	0	0	0	0	0	2,202,316
2. North Bay Aqueduct	94,565	3,823	8,162	3,854	2,660	5,938	25,000	140,000	180,000	369,437		464,002
3. Delta & Suisun Marsh Facilities	259,642	14,906	8,247	2,458	1,856	1,856	1,856	1,458	1,458	34,095		293,737
4. Final 4 Units at Banks Pumping Plant	43,673	0	0	0	0	0	0	0	0	0		43,673
5. Coastal Branch Aqueduct	508,890	0	0	0	0	0	0	0	0	0		508,890
6. West Branch Aqueduct	199,624	15	0	0	0	0	0	0	0	15		199,639
7. East Branch Enlargement	453,459	6,923	14,773	34,677	60,659	67,704	71,538	71,774	71,732	399,780		853,239
8. East Branch Improvements	322,421	1,678	11,770	350	0	0	0	0	0	13,798		336,219
9. East Branch Extension	120,645	15,050	20,414	85,680	92,675	31,605	7,600	1,000	1,000	255,024		375,669
10. South Bay Aqueduct Improvements and Enlargement	71,582	46,439	43,422	20,870	0	0	0	0	0	110,731		182,313
11. Power Generation and Transmission Facilities	703,876	12,320	7,900	8,000	8,100	6,900	0	0	0	43,220		747,096
12. Additional Conservation Facilities	151,904	4,628	4,628	4,628	4,054	4,054	4,054	4,054	4,054	34,154		186,058
13. Agricultural Drainage Facilities	72,486	3,362	3,362	3,362	3,362	3,362	3,362	3,362	3,362	26,896		99,382
14. Other Costs	363,804	20,765	38,238	204,631	131,403	73,675	4,150	0	0	472,862		836,666
15. <i>Subtotal, Project Construction Expenditures</i>	<i>5,568,887</i>	<i>129,909</i>	<i>160,916</i>	<i>368,510</i>	<i>304,769</i>	<i>195,094</i>	<i>117,560</i>	<i>221,648</i>	<i>261,606</i>	<i>1,760,012</i>		<i>7,328,899</i>
16. Davis-Grunsky Act Program Costs	130,000	0	0	0	0	0	0	0	0	0		130,000
17. Special Capital Requirements Under Revenue Bond Financing	597,040	48,836	15,735	15,773	61,848	11,091	18,568	8,126	46,756	226,733		823,773
18. Total Capital Requirements	6,295,927	178,745	176,651	384,283	366,617	206,185	136,128	229,774	308,362	1,986,745		8,282,672
19. Power Facilities Capital Requirements	703,876	12,320	7,900	8,000	8,100	6,900	0	0	0	43,220		747,096
20. Water Facilities Capital Requirements	5,592,051	166,425	168,751	376,283	358,517	199,285	136,128	229,774	308,362	1,943,525		7,535,576
Financing of Capital Requirements												
Power Revenue Bond Proceeds												
21. Power Revenue Bonds through Series H	1,162,458	0	0	0	0	0	0	0	0	0		1,162,458
Water Revenue Bond Proceeds												
22. East Branch Enlargement, Current Bonds	473,606	0	0	0	0	0	0	0	0	0		473,606
23. East Branch Enlargement, Future Bonds	0	7,700	16,500	38,600	67,400	75,300	79,500	79,800	79,800	444,600		444,600
24. East Branch Extension, Current Bonds	139,520	0	0	0	0	0	0	0	0	0		139,520
25. East Branch Extension, Future Bonds	0	10,300	22,700	95,200	103,000	35,100	8,400	1,100	1,100	276,900		276,900
26. So. Bay Aqueduct Enlargement, Current Bonds	16,938	0	0	0	0	0	0	0	0	0		16,938
27. So. Bay Aqueduct Enlargement, Future Bonds	0	113,800	48,200	23,200	0	0	0	0	0	185,200		185,200
28. Water System Facilities, Current Bonds	1,455,083	0	0	0	0	0	0	0	0	0		1,455,083
29. Water System Facilities, Future Bonds	0	356,500	69,500	0	447,800	0	98,300	0	386,000	1,358,100		1,358,100
30. <i>Subtotal, Water Revenue Bonds</i>	<i>2,085,147</i>	<i>488,300</i>	<i>156,900</i>	<i>157,000</i>	<i>618,200</i>	<i>110,400</i>	<i>186,200</i>	<i>80,900</i>	<i>466,900</i>	<i>2,264,800</i>		<i>4,349,947</i>
Other Capital Financing												
31. Initial Project Facilities Bond Proceeds	1,452,452	0	0	0	0	0	0	0	0	0		1,452,452
32. Davis-Grunsky Act Program Bond Proceeds	130,000	0	0	0	0	0	0	0	0	0		130,000
33. Application of CA Water Fund Monies (Tideland Oil Revenues)	508,056	0	0	0	0	0	0	0	0	0		508,056
34. Interim Financing	314,055	(314,055)	15,251	222,783	(256,083)	91,285	(54,572)	144,374	(163,038)	(314,055)		0
35. Application of Capital Resources Revenues to Construction	566,269	0	0	0	0	0	0	0	0	0		566,269
36. Revenue Transfers Applied	77,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	36,000		113,490
37. <i>Subtotal, Other Capital Financing</i>	<i>3,048,322</i>	<i>(309,555)</i>	<i>19,751</i>	<i>227,283</i>	<i>(251,583)</i>	<i>95,785</i>	<i>(50,072)</i>	<i>148,874</i>	<i>(158,538)</i>	<i>(278,055)</i>		<i>2,770,267</i>
38. Total Financing of Capital Requirements	6,295,927	178,745	176,651	384,283	366,617	206,185	136,128	229,774	308,362	1,986,745		8,282,672

Table 14-2 State Water Project Revenues and Expenditures, December 31, 2007 (Thousands of Dollars)

Line Number/Item	Calendar Year										
	1952-2007	2008	2009	2010	2011	2012	2013	2014	2015	2008-2015	1952-2015
PROJECT REVENUES											
1. Capital resources revenues	814,701	0	0	0	0	0	0	0	0	0	814,701
Water Contractor Payments											
2. Transportation capital	3,775,363	142,788	151,884	165,415	172,801	172,906	171,548	170,458	168,682	1,316,482	5,091,845
3. Transportation minimum	2,996,879	201,418	167,975	143,614	144,361	144,056	143,956	145,123	143,553	1,234,056	4,230,935
4. Transportation variable	4,185,270	301,426	229,959	323,671	318,028	343,769	391,900	422,870	434,896	2,766,519	6,951,789
5. Off-Aqueduct power facilities	2,411,981	132,604	142,091	144,154	141,011	141,221	78,250	20,072	11,892	811,295	3,223,276
6. Delta water charge	2,222,548	108,290	128,509	128,525	128,541	128,556	128,571	128,589	128,618	1,008,199	3,230,747
7. East Branch Enlargement	682,022	43,132	45,374	46,616	50,954	56,831	63,008	70,407	78,886	455,208	1,137,230
8. East Branch Extension	59,771	7,534	9,909	11,856	19,798	28,682	33,322	33,346	33,616	178,063	237,834
9. Coastal Extension	28,934	2,935	2,931	6,174	4,090	4,093	4,383	4,966	5,026	34,598	63,532
10. South Bay Aqueduct Improvements and Enlargement	2,203	1,212	10,412	14,389	16,345	16,345	16,350	16,348	16,347	107,748	109,951
11. Tehachapi East Afterbay	931	503	500	503	500	503	499	502	497	4,007	4,938
12. Water revenue bond surcharge	478,626	56,975	76,140	82,803	59,667	118,285	114,408	123,937	127,411	759,626	1,238,252
13. Subtotal, water contractor payments	16,844,528	998,817	965,684	1,067,720	1,056,096	1,155,247	1,146,195	1,136,618	1,149,424	8,675,801	25,520,329
14. Revenue bond cover adjustments	(592,758)	(42,209)	(45,234)	(46,369)	(50,163)	(53,189)	(50,328)	(51,696)	(53,159)	(392,347)	(985,105)
15. Rate management adjustments	(287,049)	(22,283)	(22,000)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(287,103)	(574,152)
Other Revenues											
16. Federal payments for project operating costs	270,505	15,515	15,515	15,515	15,515	15,515	15,515	15,515	15,515	124,120	394,625
17. Appropriations for operating costs allocated to recreation	16,657	0	0	0	0	0	0	0	0	0	16,657
18. Davis-Grunsky loan repayments	57,526	1,230	1,360	1,389	1,252	1,283	1,132	894	887	9,427	66,953
19. Revenue bond proceeds	652,977	0	0	0	0	0	0	0	0	0	652,977
20. Interest earnings on operating revenues	571,193	2,600	1,000	1,000	1,000	1,500	1,500	2,000	2,000	12,600	583,793
21. Oroville-Thermalito payments	249,279	0	0	0	0	0	0	0	0	0	249,279
22. Miscellaneous revenues	184,264	0	0	0	0	0	0	0	0	0	184,264
23. Subtotal, other revenues	2,002,401	19,345	17,875	17,904	17,767	18,298	18,147	18,409	18,402	146,147	2,148,548
24. Total operating revenues	17,967,122	953,670	916,325	998,785	983,230	1,079,886	1,073,544	1,062,861	1,074,197	8,142,498	26,109,620
25. Total operating revenues and capital resources revenues	18,781,823	953,670	916,325	998,785	983,230	1,079,886	1,073,544	1,062,861	1,074,197	8,142,498	26,924,321
PROJECT EXPENSES											
26. Project operations, maintenance, power, and replacement costs	9,345,636	701,943	830,842	791,855	661,100	677,545	731,269	687,209	696,475	5,778,238	15,123,874
27. Deposits to replacement reserves	122,668	0	0	0	0	0	0	0	0	0	122,668
28. Deposits to special reserves	748,655	(21,939)	(223,388)	(111,228)	(7,973)	30,481	(20,711)	4,026	6,641	(344,091)	404,564
29. Capital resources expenditures	686,932	0	0	0	0	0	0	0	0	0	686,932
Payments of Debt Service											
30. Principal repayments on bonds sold through December 31, 2007 (current bonds)	2,174,865	131,475	141,339	147,005	155,434	162,364	153,940	156,265	157,070	1,204,892	3,379,757
31. Interest on bonds sold through December 31, 2007 (current bonds)	5,329,290	137,691	131,428	124,692	117,620	109,799	101,546	94,353	86,967	904,096	6,233,386
32. Future water bond principal repayments	0	0	9,629	13,360	17,485	33,100	37,425	44,238	48,624	203,861	203,861
33. Future water bond interest payments	0	0	21,975	28,601	35,064	62,097	65,575	72,270	73,920	359,502	359,502
34. Total principal	2,174,865	131,475	150,968	160,365	172,919	195,464	191,365	200,503	205,694	1,408,753	3,583,618
35. Total interest	5,329,290	137,691	153,403	153,293	152,684	171,896	167,121	166,623	160,887	1,263,598	6,592,888
36. Subtotal, debt service	7,504,155	269,166	304,371	313,658	325,603	367,360	358,486	367,126	366,581	2,672,351	10,176,506
NET REVENUES											
37. Total Operating Expenses and Debt Service	18,408,046	949,170	911,825	994,285	978,730	1,075,386	1,069,044	1,058,361	1,069,697	8,106,498	26,514,544
38. Net system revenues	373,777	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	36,000	409,777
Application of Net System Revenues											
39. California Water Fund repayment	296,287	0	0	0	0	0	0	0	0	0	296,287
40. Revenues used for capital expenditures	77,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	36,000	113,490

Table 14-10 Operations, Maintenance, Power, and Replacement Costs, by Facility, Composition, and Purpose (Thousands of Dollars)

Feature	Calendar Year										TOTAL
	1962-2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2035	
Project Facility											
Feather River facilities	840,383	34,741	40,621	36,371	29,914	29,457	30,684	29,070	28,881	624,455	1,724,577
North Bay Aqueduct	51,088	4,670	5,540	5,057	4,161	4,162	4,504	4,407	4,440	91,106	179,135
Delta facilities	576	0	0	0	0	0	0	0	0	0	576
Suisun Marsh	31,523	3,635	4,250	3,806	2,518	2,479	2,581	2,444	2,428	52,498	108,162
South Bay Aqueduct	169,426	17,806	21,142	19,325	15,853	15,856	17,259	16,927	16,952	332,973	643,519
California Aqueduct											
Delta to Edmonston	3,417,700	257,773	303,534	294,139	236,086	237,425	278,189	271,875	279,008	5,742,687	11,318,416
Edmonston to Perris	3,102,158	284,844	352,875	332,970	271,713	285,113	326,785	335,653	337,718	6,786,896	12,416,725
West Branch	(94,321)	(14,697)	(18,010)	(15,800)	(12,367)	(10,136)	(12,029)	(11,628)	(11,346)	(333,807)	(534,141)
Coastal Branch	227,237	18,244	21,738	19,958	16,364	16,422	18,045	17,826	17,879	352,871	726,584
East Branch Enlargement	50,415	5,328	7,688	6,924	5,626	5,535	5,766	5,476	5,471	104,718	202,947
Off-Aqueduct power-generating facilities	1,211,062	71,551	73,416	71,057	76,213	76,213	44,466	140	25	298	1,624,441
Recreation, planning, and CVP negotiations	4,664	683	683	683	683	683	683	683	683	13,660	23,788
Water quality monitoring	380,869	15,712	15,712	15,712	12,683	12,683	12,683	12,683	12,683	227,572	718,992
Davis-Grunsky Act Program	11,705	600	600	600	600	600	600	600	600	12,000	28,505
<i>Subtotal</i>	<i>9,404,485</i>	<i>700,890</i>	<i>829,789</i>	<i>790,802</i>	<i>660,047</i>	<i>676,492</i>	<i>730,216</i>	<i>686,156</i>	<i>695,422</i>	<i>14,007,927</i>	<i>29,182,226</i>
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	(59,848)
Total OMP&R Costs	9,344,637	700,890	829,789	790,802	660,047	676,492	730,216	686,156	695,422	14,007,927	29,122,378
Composition											
Salaries and expenses of headquarters personnel	2,679,482	126,755	165,088	192,702	89,341	92,130	101,288	85,156	81,971	1,270,250	4,884,163
Salaries and expenses of field personnel	3,814,401	154,617	210,357	245,897	114,348	118,355	130,425	111,005	106,759	2,214,881	7,221,045
Pumping power											
Used by pumping plants	2,278,203	412,488	437,153	342,741	452,006	460,627	526,825	564,180	581,457	12,101,987	18,157,667
Produced by generation plants	(469,763)	(64,798)	(56,502)	(61,872)	(72,138)	(71,110)	(73,065)	(74,602)	(75,067)	(1,585,029)	(2,603,946)
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	(59,848)
Off-Aqueduct power generating facilities requirement	1,211,062	71,551	73,416	71,057	76,213	76,213	44,466	140	25	298	1,624,441
Oroville-Thermalito insurance premiums	12,151	277	277	277	277	277	277	277	277	5,540	19,907
Less portion of costs incurred during construction	(121,051)	0	0	0	0	0	0	0	0	0	(121,051)
Total OMP&R Costs	9,344,637	700,890	829,789	790,802	660,047	676,492	730,216	686,156	695,422	14,007,927	29,122,378
Project Purpose											
Water supply and power generation	8,965,490	675,774	805,801	766,079	635,323	651,767	705,490	661,427	670,693	13,513,347	28,051,191
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	(59,848)
Recreation and fish and wildlife enhancement	166,222	12,192	11,064	11,800	11,800	11,800	11,800	11,800	11,800	236,000	496,278
Flood control	5,361	324	324	323	324	325	326	329	329	6,580	14,545
Miscellaneous purposes											
Federal share, San Luis and Delta facilities	255,707	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	240,000	591,707
Other (Davis-Grunsky, drainage, City of Los Angeles)	11,705	600	600	600	600	600	600	600	600	12,000	28,505
Total OMP&R Costs	9,344,637	700,890	829,789	790,802	660,047	676,492	730,216	686,156	695,422	14,007,927	29,122,378

Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2007 (Thousands of Dollars)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds ^a		Pyramid Project Revenue Bonds ^b		Alamo Project Revenue Bonds ^b		Small Hydro Project Revenue Bonds ^b		Water System Facilities Water System Revenue Bonds ^c		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds ^{d,e}		South Geysers Project Revenue Bonds ^b		Bottle Rock Project Revenue Bonds ^b		East Branch Enlargement Project Water System Revenue Bonds ^c		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds ^c		South Bay Enlargement Facilities Water System Revenue Bonds ^c		Tehachapi East Afterbay Facilities Water System Revenue Bonds ^c		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	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	3,333	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	11,114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,114	
1966	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,764	
1967	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,911	
1968	0	37,761	0	3,876	0	0	0	0	0	0	0	0	0	0	41,637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,637	
1969	0	47,460	0	10,448	0	0	0	0	0	0	0	0	0	0	57,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,908	
1970	0	53,290	0	13,145	0	0	0	0	0	0	0	0	0	0	66,435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,435	
1971	0	63,035	0	13,145	0	0	0	0	0	0	0	0	0	0	76,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,180	
1972	0	69,149	1,260	13,112	0	0	0	0	0	0	0	0	1,260	82,261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	82,261		
1973	1,200	69,347	1,330	13,042	0	0	0	0	0	0	0	0	2,530	82,389	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,097		
1974	3,000	69,533	1,400	12,969	0	0	0	0	0	0	0	0	4,400	82,502	0	7,708	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	0	0	0	0	0	0	0	6,475	82,259	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,475	89,967		
1976	7,000	69,657	1,555	12,811	0	0	0	0	0	0	0	0	8,555	82,468	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	90,176		
1977	10,200	69,298	1,635	12,727	0	0	0	0	0	0	0	0	11,835	82,025	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,733		
1978	12,700	69,286	5,775	12,537	0	0	0	0	0	0	0	0	18,475	81,823	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,531		
1979	13,650	68,660	11,585	12,275	0	0	0	0	0	0	0	0	25,235	80,935	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,643		
1980	16,050	67,941	3,265	11,739	0	7,900	0	0	0	0	0	0	19,315	87,580	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,288		
1981	18,050	67,078	4,885	11,444	0	7,292	0	0	0	0	0	0	22,935	85,814	0	7,708	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,834		
1982	19,250	66,130	17,920	10,968	0	7,292	0	0	0	0	0	0	37,170	84,390	0	7,708	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,445		
1983	20,520	65,111	21,110	10,147	0	7,292	0	2,449	0	3,727	0	0	41,630	88,726	900	7,708	0	35,719	0	4,777	0	6,017	0	0	0	0	0	0	0	0	42,530	142,947		
1984	21,785	64,036	10,005	9,013	640	7,292	0	4,198	0	3,727	0	0	32,430	88,266	955	7,647	0	35,719	0	5,647	0	10,315	0	0	0	0	0	0	0	0	33,385	147,594		
1985	22,555	62,892	12,700	8,628	675	7,238	0	4,198	0	3,727	0	0	35,930	86,683	1,010	7,583	9,425	27,209	0	5,647	0	10,315	0	0	0	0	0	0	0	0	46,365	137,437		
1986	23,830	61,705	11,435	7,859	715	7,377	0	4,263	0	3,537	0	0	35,980	84,741	1,070	7,515	3,805	32,882	0	5,516	1,240	10,315	0	4,021	0	0	0	0	0	0	42,095	144,990		
1987	25,495	60,452	11,715	7,188	790	7,513	265	4,329	0	3,348	0	4,952	38,265	87,782	1,135	7,442	4,860	32,605	0	5,386	1,305	10,253	0	9,651	0	0	0	0	0	0	45,565	153,119		
1988	26,770	59,120	6,685	6,664	830	7,447	280	4,314	345	3,348	710	11,037	35,620	91,930	1,205	7,366	5,065	32,295	580	5,521	1,390	10,849	995	9,875	0	0	0	0	0	44,855	157,836			
1989	28,145	57,790	33,705	5,513	875	7,378	295	4,298	365	3,328	1,148	14,373	64,533	92,680	1,275	7,284	7,820	27,557	709	5,646	1,565	11,592	1,078	10,104	0	0	0	0	0	76,980	154,863			
1990	29,385	56,436	10,385	4,301	930	7,305	320	4,279	405	3,304	1,227	19,555	42,652	95,180	1,355	7,198	6,675	29,781	761	5,596	1,678	11,491	1,134	10,048	0	0	0	0	0	54,255	159,294			
1991	30,365	55,034	12,055	3,922	980	7,227	335	4,257	430	3,276	2,129	27,569	46,294	101,285	1,435	7,107	7,170	29,302	818	5,535	1,791	11,376	1,197	16,856	0	0	0	0	0	58,705	171,461			
1992	31,745	54,193	14,135	2,985	2,395	5,308	1,260	3,086	960	2,553	5,108	28,411	55,603	96,536	1,520	7,010	8,950	27,188	1,934	4,136	4,575	7,942	2,583	22,241	0	0	0	0	0	75,165	165,053			
1993	33,390	52,670	13,755	2,237	1,525	5,688	755	3,300	445	2,640	4,577	29,965	54,447	96,500	1,610	6,907	8,820	26,953	901	4,256	3,264	8,385	3,040	21,428	0	0	0	0	0	72,082	164,429			
1994	35,075	51,231	35,225	934	1,580	5,634	780	3,274	695	2,569	5,910	38,223	79,265	101,865	1,705	6,799	77,105	26,273	1,588	4,072	3,374	8,270	4,567	20,752	0	0	0	0	0	167,604	168,031			
1995	36,280	49,703	0	0	1,635	5,570	805	3,242	745	2,536	8,064	37,879	47,529	98,930	1,810	6,684	5,420	19,230	1,695	4,004	3,521	8,133	4,979	20,499	0	0	0	0	0	64,954	157,480			
1996	37,520	48,024	0	0	2,320	5,486	1,055	3,203	3,135	2,464	10,459	58,170	54,489	117,347	1,920	6,561	49,465	18,130	3,043	3,908	3,682	7,974	4,771	23,240	0	0	0	0	0	117,370	177,160			
1997	37,215	46,365	0	0	1,695	5,274	875	3,073	585	2,283	14,375	67,910	54,745	124,905	2,035	6,432	7,515	15,255	1,825	3,696	3,861	7,741	6,300	23,702	0	1,981	0	76	0	76,281	183,788			
1998	37,295	44,736	0	0	1,770	5,237	910	3,059	625	2,258	16,754	68,585	57,354	123,875	2,155	6,295	5,045	16,144	1,935	3,637	4,030	7,508	6,760	23,966	0	1,829	0	229	0	77,279	183,483			
1999	38,220	43,132	0	0	1,845	5,141	960	3,005	680	2,229	18,701	68,085	60,406	121,592	2,285	6,160	9,310	11,659	2,081	3,549	4,240	7,318	7,518	25,033	0	1,808	65	2,931	0	85,905	180,050			
2000	39,510	41,469	0	0	1,925	5,045	1,010	2,955	610	2,197	19,536	66,901	62,591	118,567	2,420	6,040	9,870	11,194	1,950	3,448	4,470	7,096	8,974	24,652	0	1,808	915	2,928	0	91,190	175,733			
2001	40,600	39,751	0	0	2,250	4,949	1,155	2,901	780	2,272	20,944	66,418	65,729	116,291	2,565	5,912	10,365	10,757	2,045	3,344	4,720	6,855	9,425	24,187	0	2,131	950	2,889	0	95,799	172,366			
2002	41,740	37,984	0	0	2,460	4,619	1,280	2,788	950	2,192	23,918	63,128	70,348	110,681	2,720	5,773	11,185	10,011	2,225	3,075	5,265	6,323	9,817	23,098	335	2,311	1,245	3,481	0	103,140	164,753			
2003	43,590	36,159	0	0	2,500	4,429	1,315	2,672	940	2,110	23,442	60,439	71,787	105,809	2,885	5,626	2,135	9,314	2,335	2,890	5,445	5,939	9,988	18,444	245	2,310	1,105	4,277	0	95,925	154,609			
2004	45,730	34,244	0	0	2,500	4,291	1,330	2,598	970	2,059	26,396	60,952	76,926	104,144	3,055	5,470	2,210	9,228	2,425	2,758	5,610	5,634	9,883	20,820	220	2,298	2,045	5,538	0	232	139	102,374	156,261	
2005	46,985	32,242	0	0	2,727	3,992	1,461	2,406	1,327	1,963	23,064	57,886	75,564	98,489	3,240	5,305	8,825	9,127	2,759	2,563	5,959	5,237	3,669	20,105	305	2,155	2,124	5,968	0	559	197	102,445	149,705	
2006	48,275</																																	



Chapter 15

SWP Education and Information

“Science on a Sphere” was the centerpiece of an interactive California State Fair exhibit on climate change and water, cosponsored by the Department of Water Resources.

Significant Events in 2007

Public Affairs Office (PAO) news releases and media contacts helped Department of Water Resources (DWR) officials convey important messages on State Water Project (SWP) activities, including Delta pumping adjustments, water supply developments, drought impacts, and conservation efforts.

During May, DWR observed Water Awareness Month for the 20th consecutive year, helping Californians adapt to conserving water in a developing major California drought.

In December, the death of David N. Kennedy, who had served as DWR Director for 15 years prior to his retirement, saddened California's water community while inspiring many with the legacy of his leadership.

During 2007, the SWP Tours program welcomed 31 foreign tours with 292 visitors to selected SWP facilities. Tour groups came from all over the United States and 12 other countries: Armenia, Canada, China, Congo, England, Germany, India, Iran, Japan, South Korea, the Netherlands, and Uganda. The Delta Tour program for DWR employees, a component of the DWR Training Program, continued, with three Delta Tours completed. There were also several school tours of the SWP.

Information for this chapter was provided by the Public Affairs Office.

The Department of Water Resources' (DWR) Public Affairs Office (PAO) functions as an information link between DWR and the public, most often involving the news media. PAO provides information about DWR's mission, programs and activities. Written communication, websites, and publications are often used. So too, are sophisticated graphics, artwork, video, photography, exhibits, tours, visitors centers' exhibits and displays, and special events.

News Topic Highlights

Snow Surveys

DWR conducts five monthly Sierra snow surveys each year to help gauge water supply conditions. The surveys begin in December or January and are completed in the spring, usually in late April or early May. The 2007 snowpack figures at the final survey indicated a statewide Sierra snowpack just 27 percent of average, signaling a dry year for California water supply. This compared with a 136 percent snowpack the previous year.

The PAO encourages media coverage of DWR's snow surveys to promote public awareness of the importance and uncertainty of water supplies in California. News releases were issued for each of the snow surveys. Interviews were arranged for reporters seeking additional information and water management perspectives.

Drought Conditions

In June, alerting the public to drought challenges, the Governor urged Californians to increase water conservation and advocated an effort to modernize California's aging water infrastructure to improve supply reliability. DWR officials and program managers implemented conservation measures and provided technical advice and assistance to other water agencies and the public.

In July, DWR announced that it would sponsor 11 drought workshops throughout California to help urban water supply districts in their conservation campaigns.

Delta Pumping

The tiny Delta smelt, an endangered species, played a starring role in California water activities during 2007, as reflected in DWR news announcements.

After finding smelt at the Banks Pumping Plant, DWR voluntarily suspended State Water Project (SWP) pumping for 10 days, starting on May 31. "The shutdown shines a bright light on the delicate balancing act that California's aging water system strikes each day, between preserving the environment and meeting our State's thirst for water," commented DWR Director Snow. Pumping resumed gradually on June 10.

Earlier in May, DWR appealed an April 18 court order giving it 60 days to shut down SWP export pumps unless it received Department of Fish and Game (DFG) authorization to "take" protected Delta smelt and Chinook salmon. In April, May, and June, Director Snow and other water leaders repeatedly briefed the news media on the Delta pumping situation.

DWR adjusted its SWP pumping in December to comply with a December 14 decision by federal Judge Oliver Wanger to safeguard Delta smelt. While accommodating the judicial decision with substantial

cuts in pumping, DWR officials noted that fish protection and environmental concerns underscored a growing need to protect the Delta while improving water supply reliability.

Flood Protection

In October 2007, the Governor signed a package of flood legislation to strengthen flood protection in California. The flood bills will lead to development of a comprehensive Central Valley Flood Protection plan. This legislation will also change the name of the Reclamation Board to the Central California Flood Protection Board, effective in 2008. Major steps were taken toward evaluating and repairing levee sites on the Sacramento and San Joaquin rivers and in the advancement of flood safety planning.

Climate Change Activities

Throughout 2007, climate change emerged as a rising concern in California's water community. DWR played a leading role in climate change response activities.

In a January 31 speech, Director Snow outlined a plan to ensure California's water future in the face of global climate change. He detailed the Governor's proposal for investing \$5.95 billion in added water storage, improvements to the Delta ecosystem, and water conservation.

From May 16 to 18, DWR cosponsored a Climate Change Workshop with the Western Governors Association and the Western States Water Council. Climate change was a featured element in a special DWR and National Weather Service exhibit at the 2007 California State Fair. In September, DWR signed an agreement with the National Oceanic and Atmospheric Administration's (NOAA) Climate Program Office to establish a process for coordinating climate research applicable to water management.

Death of David N. Kennedy

David N. Kennedy, Director of DWR from 1983-1998, died in Sacramento on December 23, 2007. He was 71. He was the sixth DWR director, and served in that capacity longer than any previous director. Initially appointed by Governor Deukmejian, and reappointed by Governor Wilson, his leadership saw California through major floods in 1986, 1997, and 1998, as well as the longest statewide drought in modern history, from 1987 to 1992. DWR Director Snow said, "California has lost a great water leader and dedicated public servant." Kennedy's obituary was issued in a DWR news release on December 26, 2007. Articles memorializing his life and career are being prepared for publication in the *DWR NEWS/People* Winter 2008 issue.

News Events

The following are samples of significant DWR news events promoted by the PAO during 2007.

In January, DWR announced completion of levee structural repairs at 19 additional sites due to high risk in urban areas along the Sacramento and San Joaquin rivers. These are among 71 sites the U.S. Army Corps of Engineers (Corps) determined to be critically damaged. The repairs indicate the State's high priority placed on improving flood safety.

On February 26, DWR announced it would hold a series of six public workshops to discuss Flood Bond Funding. Analysts and flood managers will discuss how Proposition 1E and 84 flood bond funds will be invested. On February 27, DWR released its annual *Bond Expenditure Disaster Preparedness and Flood Prevention Plan*.

On March 1, DWR Chief Deputy Director Nancy Saracino testified before a Congressional subcommittee in support of a multiagency program to restore a

major portion of the San Joaquin River. On March 5, DWR released its *Pelagic Fish Action Plan* to address the recent years' decline of pelagic fish species in the San Joaquin-Sacramento Delta.

On March 30, DWR began helicopter surveys along 350 miles of urban levees from Lathrop to Marysville, part of a sophisticated levee evaluation program.

DWR's May 1 snow survey showed Sierra snowpack at a critically lower than average stage. Water leaders stated the dry conditions show the need for conservation now and more water storage in the future. During May, DWR observed the 20th annual Water Awareness Month, promoting the message: Use Water Wisely.

At the Association of California Water Agencies (ACWA) Spring Conference in May, the Governor gave a speech on water policy, advocating a major program to renovate the State's aging infrastructure. On May 10, DWR announced a new climate change web portal to enable viewers to track DWR's climate change related activities.

On June 25, the first California Water Plan 2009 Regional Update Workshop was held in Oakland, the first of nine regional workshops statewide.

In July, DWR announced acquisition of three emergency communication trailers for use at strategic locations during emergency responses to such events as floods, earthquakes, or tsunamis. On July 17, the Governor announced that DWR would immediately take a series of steps to improve Delta conditions, help restore its ecosystem, and protect fish.

On August 21, the Governor and U.S. Senator Dianne Feinstein met and heard presentations by top water experts working to heal the Sacramento-San Joaquin Delta, a key water source for at least

some of the water supply to an estimated 25 million Californians.

On September 17, the Governor called a special session for the Legislature to consider a comprehensive \$5.9 billion water plan he and Senator Feinstein proposed. Earlier, on September 10, Director Snow had described DWR activities to safeguard the SWP and other California water systems from invasion by quagga and zebra mussels.

On October 10, the Governor signed a package of six bills relating to improved flood protection in California. One major bill renamed the Reclamation Board as the Central Valley Flood Protection Board, effective in 2008. It also mandated development of a comprehensive Central Valley Flood Protection Plan, under board supervision.

During November, DWR announced a series of workshops to provide an overview of water conditions and to analyze the water outlook for calendar year 2008. DWR emergency officials worked with fire authorities during extensive Southern California wildfires. On November 21, DWR officials announced an initial SWP allocation for water deliveries in 2008: an amount of water equal to 25 percent of contractors' requests.

Community Relations

2007 California State Fair

For the 2007 California State Fair, DWR and NOAA cosponsored "Science on a Sphere" an exhibit that featured a global climate and weather education focus. The six-foot round, free-hanging video display globe showed science-based visuals of hurricanes, global warming, and floods. It proved to be highly popular with fair visitors.

SWP Publications

E-News

PAO continued to distribute electronic news articles on water-related issues via email. These news clippings were distributed to DWR employees under the heading of *California Water News*. The news items help keep program managers and staff aware of water issue developments, especially those relevant to DWR programs and activities.

DWR NEWS/People

DWR's quarterly magazine, *DWR NEWS/People*, drew attention to DWR programs and activities, while recognizing the team and individual achievements of DWR employees.

The Summer 2007 edition showcased two major restoration efforts in which DWR plays a leading role: restoration programs for the Salton Sea and for a 153-mile portion of the San Joaquin River.

The Fall 2007 issue featured articles tracing the history and development of two major DWR reports: *Bulletin 132*, summarizing SWP activities on an annual basis; and the *California Water Plan*, an influential report on California's water supply and demand, published at five-year intervals.

Throughout the year, the magazine published articles dealing with a variety of topics. These included an update on South Bay Aqueduct expansion, the operations of SWP contracting agencies, and DWR's efforts to safeguard the SWP from invasive quagga mussels. Veteran DWR Hydrologist Maury Roos contributed an article that vividly depicted his 50 years of dealing with California floods.

Community Outreach

SWP Visitors Centers

The SWP visitors centers have exhibits, films, and photos that tell the story of the SWP

and the importance of water to our everyday lives. Figure 15-1 shows the locations of SWP visitors centers.

School Education Program

The School Education Program's goal is to provide students and educators with a statewide perspective on water issues such as conservation, conveyance systems, and the water cycle. The PAO staff develops and promotes high-quality materials and provides them free of charge to schools, educators, and water districts. Program achievements for 2007 follow.

Public Events and Outreach

PAO provided a display of DWR's Interactive Children's Exhibits at the following:

- Jack Splash event, Oroville (March);
- Urban Creeks Council's Creek Week event held at the Sacramento Discovery Center (April);
- Castaic Lake Fishing event (May);
- Hooked On Fishing, Oroville (June); and
- DWR booths at the following events: Fred Hall (March), Redwood Acres Fair (June), California State Fair (August–September), Salmon Festival (September), Pittsburg Seafood Festival (September), and a Catch A Special Thrill (C.A.S.T.) event at Millerton Lake (October).

Outreach to Teachers and Educators

In 2007, the PAO staff was actively involved in presenting DWR's School Education Program and materials to teachers at the following events:

- the Bay Area Environmental Education Resource Fair in San Rafael (January);
- the California Regional Environmental Education Community (CREEC) Conference, Berkeley (February);
- the California Association of Bilingual Education Conference in San Jose (March); and

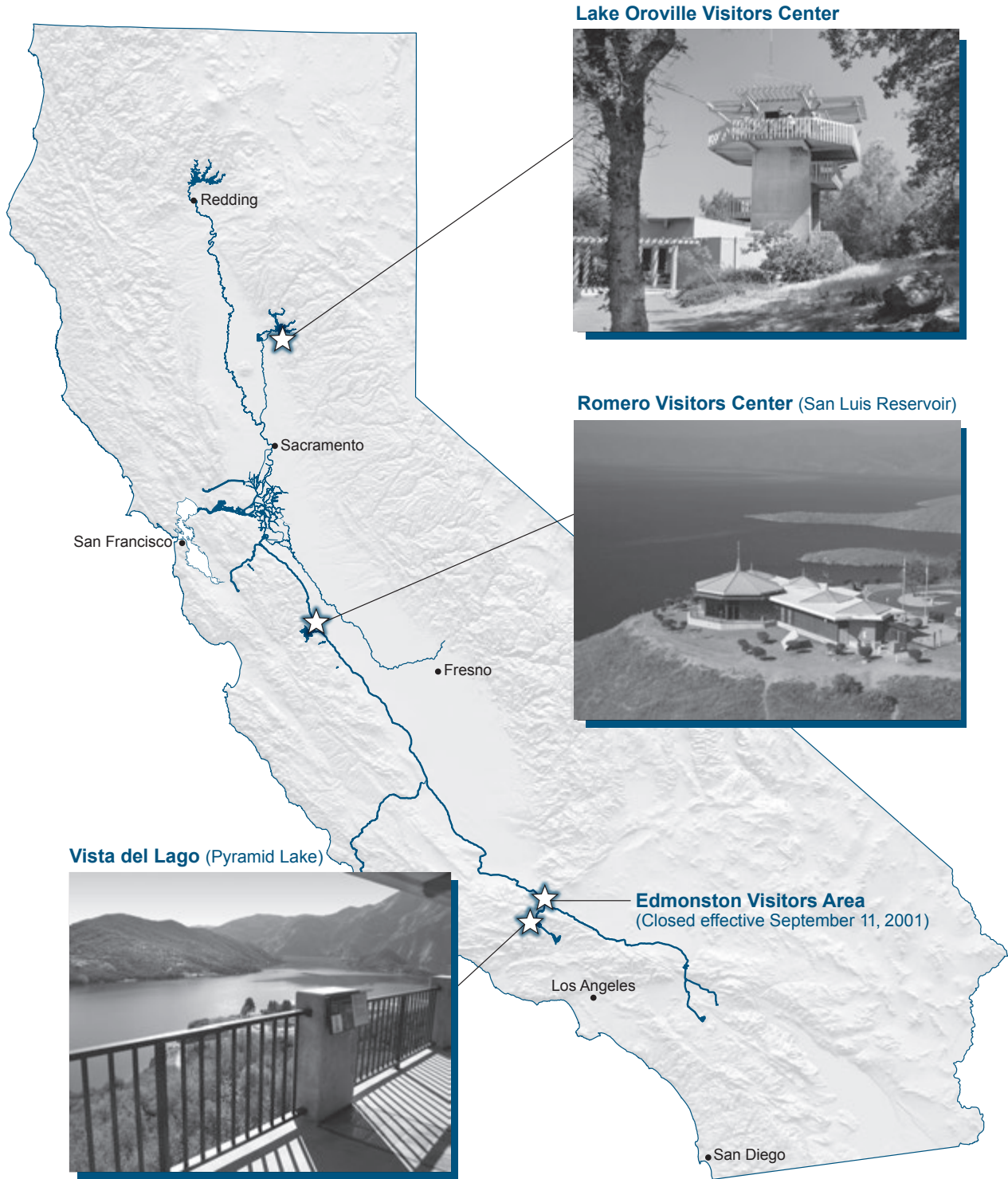


Figure 15-1 Visitors Centers on the SWP

- the California Science Teachers Association Conference, San Francisco (October).

Publications and Materials

Additional 2007 program achievements include providing curriculum materials and children's videos to California teachers and water agencies through the *Water Facts and Fun* online catalog and promotional events. In order to provide materials, the following items were purchased or reprinted:

- 20,000 *California's Amazing Delta* book covers;
- 5,000 *Water and Me* student books;
- 5,000 Hamburger activity sheets for students;
- 600 California Science Standards Related to Water;
- 10,000 Water Conservation Pledges;
- 3,300 *I Make Every Drop Count* stickers;
- 16,000 *California Water Works and Why It Does* books for students;
- 2,000 children's program DVDs;
- 500 Project WET (Water Education for Teachers) books, which were provided to teachers who participated in Project WET training workshops; and
- 2,000 black mesh water cycle bags for teachers.

Collaboration/Partnerships

Wherever possible, DWR's School Education program seeks to partner with other entities with similar interests and goals to pool resources in educating California's youth on the importance of our water resources. The following collaborative efforts occurred in 2007.

- Participated on the California Water Awareness Campaign education subcommittee, and purchased 7,500 copies of book #5: *Water Quality*, with a special emphasis on pollution and what individuals can do to protect the

cleanliness of our water supply.

- Facilitated DWR's Water Education Committee meetings, March 20–21, 2007, hosted by the San Diego County Water Authority; and September 26–27, 2007, hosted by the Sonoma County Water Agency.
- Participated on the Project WET Advisory Committee and the California Environmental Education Interagency Network (CEEIN) Committee.
- Participated on the Creek Week Planning Committee with DWR providing artwork for a poster, brochures, and a bookmark for Creek Week.

Collaborative efforts also included providing support for the following:

- the Environmentality Challenge for fifth grade students, in conjunction with the State of California and the Walt Disney Corporation;
- the California Department of Education's CREEC Network; and
- the Delta Studies Institute for teachers, cosponsored with the San Joaquin County Office of Education.

Appendix B
Data and Computations
Used to
Determine 2009 Water Charges

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Appendix B

Data and Computations

Used to

Determine 2009 Water Charges

The Department of Water Resources (DWR) annually furnishes Statements of Charges to the 29 long-term State Water Project (SWP) 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), DWR performs an annual 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 supply 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 2009. The information is based on established data about the SWP, both known and projected, as of June 30, 2008.

The computational procedures and interrelationships between tabulations in this appendix are outlined on Figure B-1 and Figure B-2. All tables referenced on Figures B-1 and B-2 follow this text.

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

- Frenchman Dam and Lake;
- Grizzly Valley Dam and Lake Davis;
- Antelope Dam and Lake;
- Oroville Dam and Lake Oroville;
- Oroville power facilities;
- Delta facilities;
- a portion of the California Aqueduct from the Delta to Dos Amigos Pumping Plant, and
- Sisk Dam, San Luis Reservoir, and Gianelli Pumping-Generating Plant

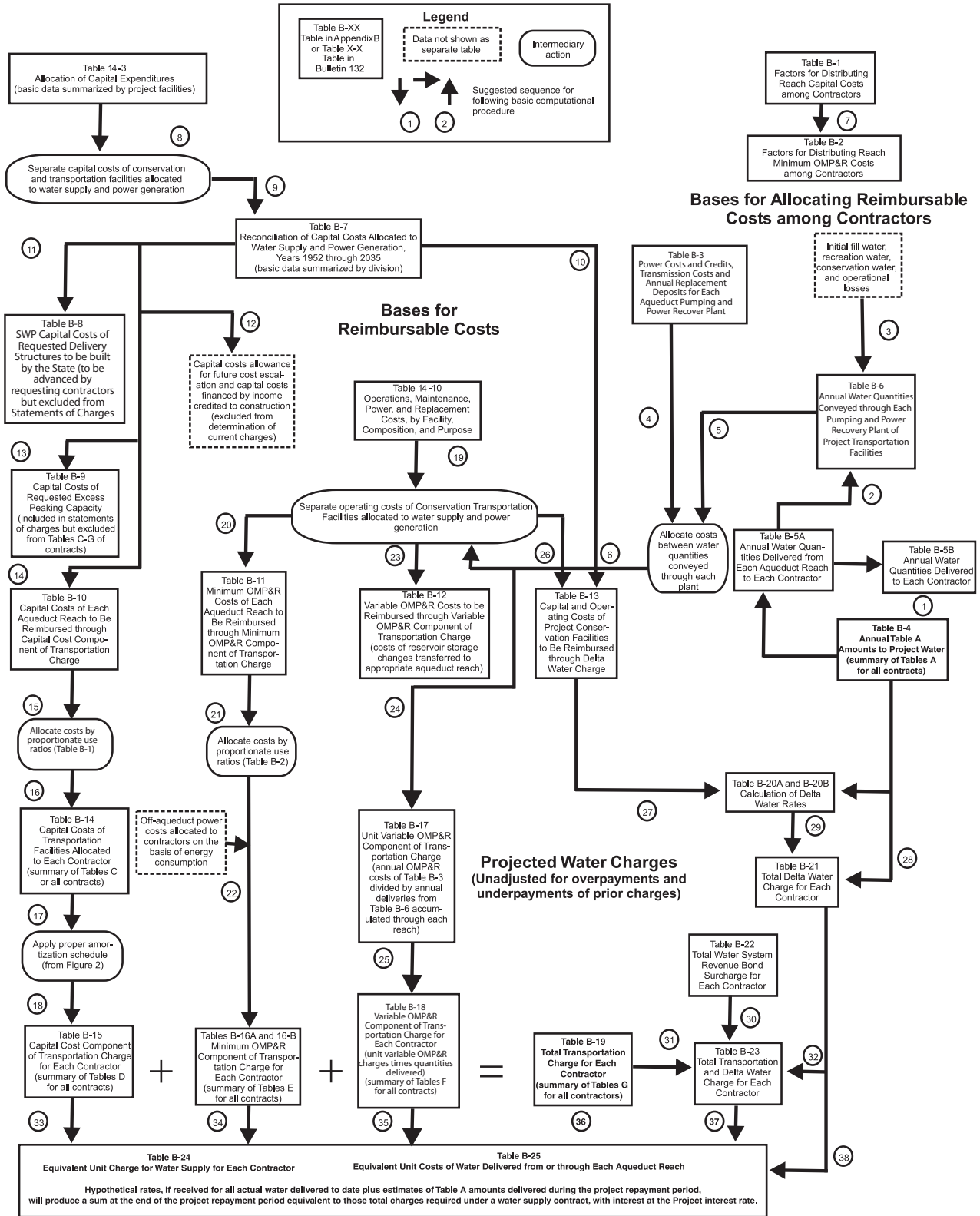


Figure B-1. Relationships of Data Used to Substantiate Statements of Charges

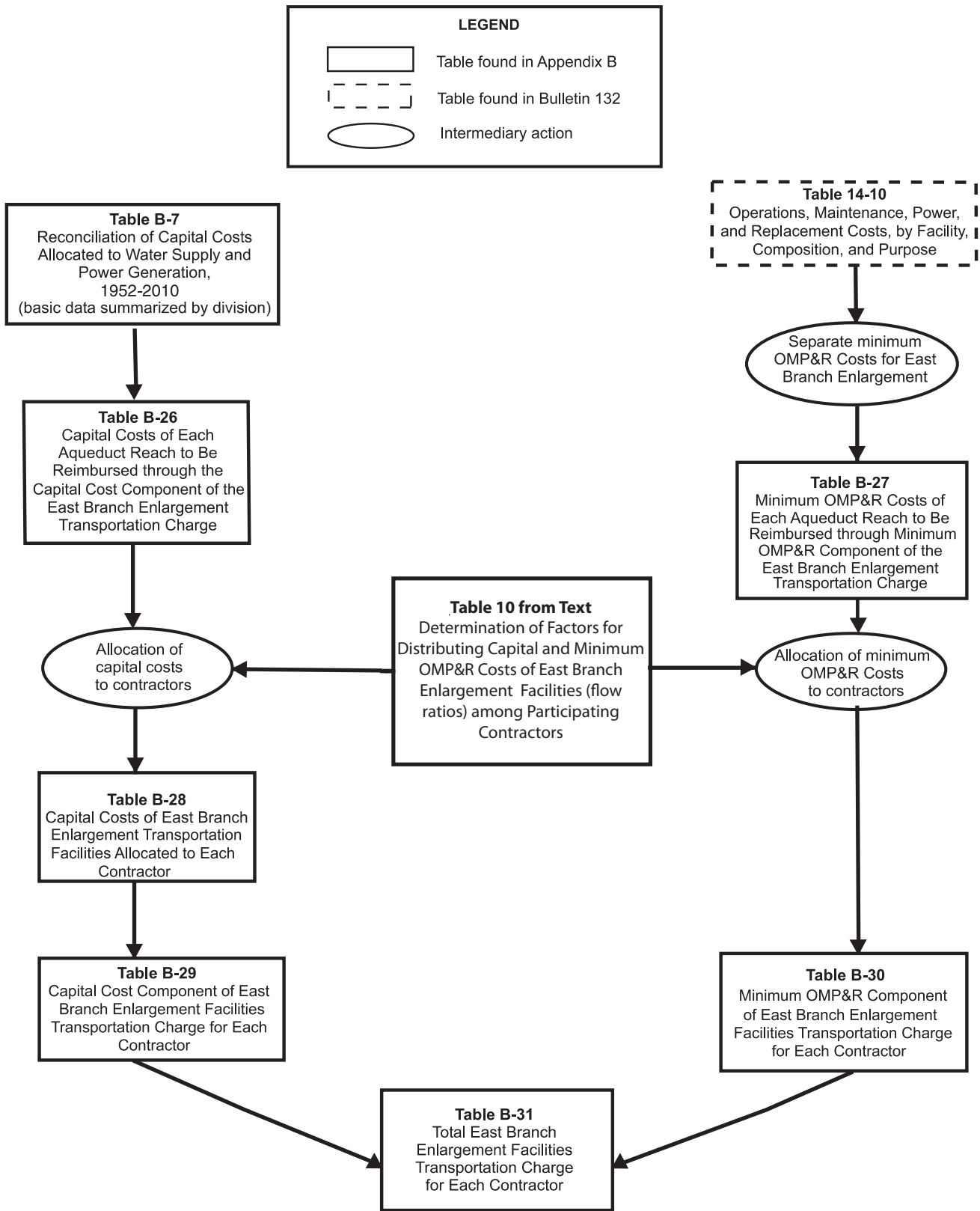


Figure B-2. Relationships of Data Used to Substantiate East Branch Enlargement Charges

Project Transportation Facilities

- Grizzly Valley Pipeline;
- North Bay Aqueduct;
- South Bay Aqueduct, including Del Valle Dam and Lake Del Valle;
- the remainder of the California Aqueduct from the Delta to Dos Amigos Pumping Plant and all facilities south, including dams and lakes in Southern California; and
- Off-Aqueduct Power Facilities (Reid Gardner Unit No. 4, Bottlerock 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 allocations for the remainder of the project repayment period, is calculated to result in repayment of all outstanding reimbursable costs of the Project Conservation Facilities, with appropriate interest, by the end of the repayment period (2035).

The Transportation Charge is for use of facilities to transport water to the vicinity of each contractor’s turnout. Generally, the annual charge represents each contractor’s proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each contractor’s allocated share of those reimbursable capital costs is amortized

for repayment to the State; and certain variations are allowed in the amortization methods. The contractors’ shares of reimbursable operating costs are repaid in the year such costs are incurred by the State.

The East Branch Enlargement Transportation Charge is paid by the seven Southern California contractors participating in the enlargement. San Bernardino Valley Municipal Water District advanced funds to pay the district’s allocated capital costs for the East Branch Enlargement. The remaining six contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each contractor also will pay an allocated share of the minimum operation, maintenance, power, and replacement costs (OMP&R) of the East Branch Enlargement.

Transportation charges for the Coastal Branch Extension, East Branch Extension, and South Bay Enlargement are being repaid by contractors in their respective service areas.

Transportation charges for the Tehachapi Afterbay are repaid by those contractors using electrical power for delivery of their Table A water downstream of the Tehachapi Afterbay.

Composition and Timing of Water Charges

As shown on Figure B-3, the Delta Water Charge and the Transportation Charge consist of the following three components:

- 1) Conservation and transportation capital cost components, which will

Delta Water Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of Conservation Facilities
2. Operations and maintenance costs for newly constructed Conservation Facilities prior to initial operations
3. Activation costs for newly constructed Conservation Facilities
4. Power costs allocated to initial filling of San Luis Reservoir
5. Capitalized O&M costs (major repair work and so forth) for Conservation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986 (Department of Water Resources-Department of Fish and Game agreement)

Minimum OMP&R Component

1. Direct O&M costs of Conservation Facilities
 - a. Headquarters and field divisions (portion)
 - b. Insurance and FERC costs (portion)
2. General O&M costs allocated to Conservation Facilities
 - a. Contractor Accounting Office (portion)
 - b. Financial and contract administration (portion)
 - c. Water rights
 - d. Power planning for SWP facilities (portion)
3. Replacement deposits for SWP control centers (portion)
4. Credits for a portion of Hyatt-Thermalito power generation
5. Power costs and credits related to pumping water to San Luis Reservoir for project operations (storage changes)
6. Value of power used and generated by Gianelli Pumping-Generating Plant
7. Program costs (portion) to offset annual fish losses resulting from pumping at Banks 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. Contractor Accounting Office (portion)
 - b. Financial and contract administration (portion)
 - c. Power planning for SWP facilities (portion)
3. Power costs and credits related to pumping water to Southern California reservoirs for project operations (storage changes)
4. Power costs for pumping water to replenish losses from Transportation Facilities
5. Other power costs
 - a. Station service at Transportation Facility power and pumping plants
 - b. Transmission service costs related to "backbone" Transportation Facilities
6. Replacement deposits for SWP control centers (portion)
7. Off-Aqueduct Power Facility costs—bond service, bond cover costs (25 percent of bond service), bond reserves, transmission costs to provide service to backbone; fuel costs taxes, and O&M-less power sales allocated to Off-Aqueduct Power Facilities
8. Program costs (portion) to offset annual fish losses resulting from pumping at Banks 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, Warne, and Castaic power generation credited at the power plant reach and charged to aqueduct pumping plants
3. Hyatt-Thermalito Diversion Dam power plant generation charged to aqueduct pumping plants (credits for this generation are reflected in the Delta Water Rate)
4. Replacement deposits for equipment at pumping plants and power plants
5. Credits from sale of excess SWP system power
6. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge.

Figure B-3. Composition of Delta Water Charge and Transportation Charge

return to the State all reimbursable capital costs;

- 2) Conservation and transportation minimum OMP&R components, which will 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 allocations, such adjustments are amortized during the remainder of the project repayment period. This appendix includes a redetermination of the Delta Water Rate for 2009.

Article 28 of the standard provisions stipulates that Transportation Charges be redetermined each year. The tables in Appendix B include the numerical data used in this redetermination. Transportation Charges for prior years through 2007 included in those tables are the redetermined amounts and do not equal the amounts actually paid by contractors.

As provided under the Water System Revenue Bond Amendment to the water supply contracts, differences between actual payments under the Transportation

capital cost component and amounts computed in this redetermination are accumulated with interest and amortized during the remaining years of the contract repayment period. All computations for adjustments are included in the attachments accompanying each contractor's Statement of Charges and are reflected in revised copies of Table C through Table G of the contract, which are also furnished to each long-term water supply contractor in the annual Statements of Charges.

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 they are treated in this appendix) are outlined below.

- 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.

- 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 on or before 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 on or before July 1 of the preceding year.
- 3) The variable OMP&R component of the Transportation Charge is paid in varying monthly amounts and is due the fifteenth day of the second month following actual water delivery. The charges are projected based on a unit charge per acre-foot established on or before 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 water delivery.

Bases for Allocating Reimbursable Costs Among Contractors

This section describes the procedures for allocating reimbursable costs of Project Transportation Facilities among contractors (see upper right portion of Figure B-1). Those costs do not include annual costs of Off-Aqueduct Power Facilities, which are explained in the section "Project Water Charges."

Capital and Minimum OMP&R Costs

Figure B-4 includes information about the repayment reaches that form the basis for allocating reimbursable costs of the Project Transportation Facilities among contractors.

Allocations of reimbursable capital costs and minimum OMP&R costs of each reach are based on the proportionate maximum use of that reach by respective contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors was first reported in Bulletin 132-70. The ratios in Bulletin 132-70 were subsequently revised for the North Bay Aqueduct, the South Bay Aqueduct, the

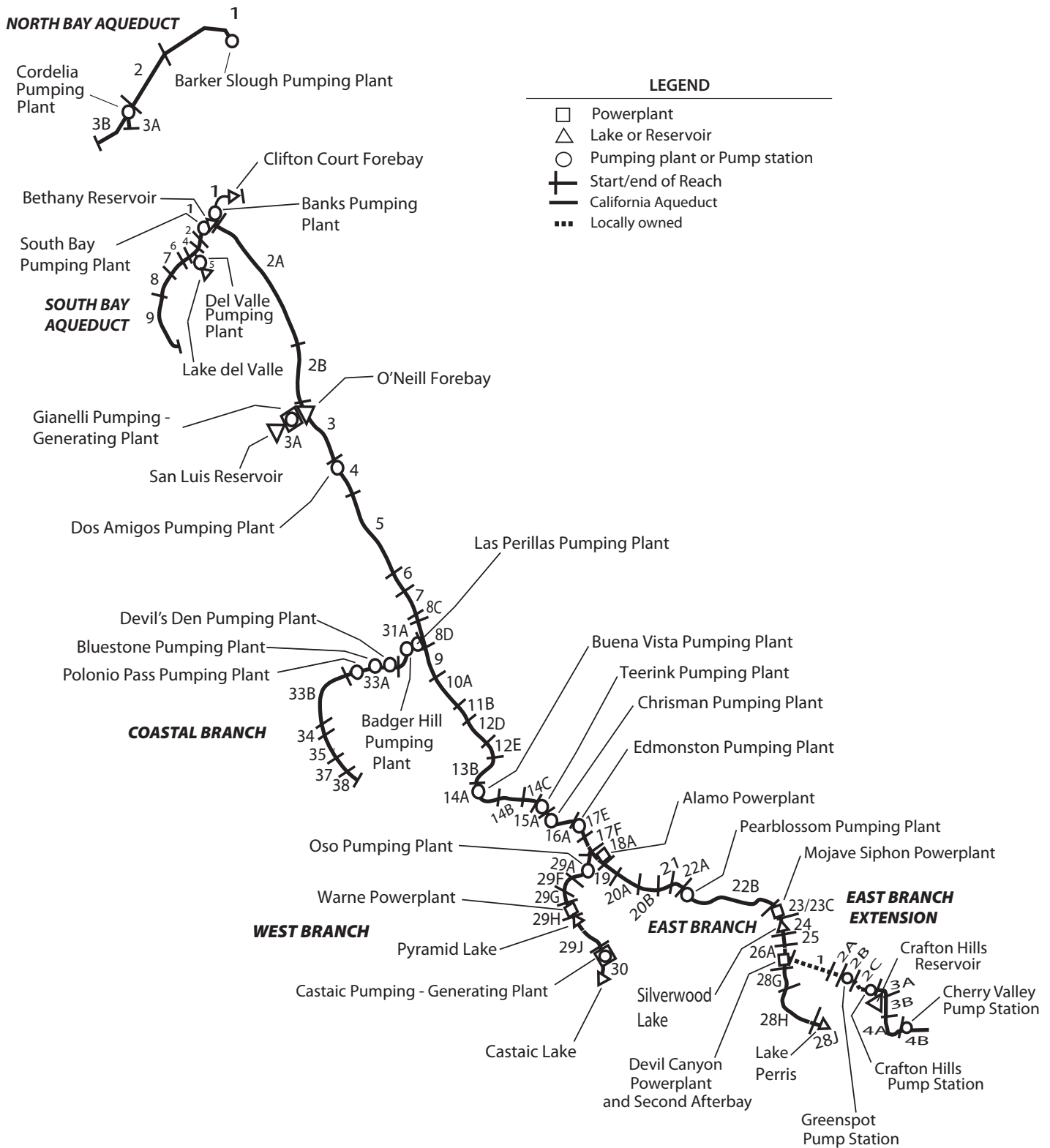


Figure B-4. Repayment Reaches and Descriptions

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 Napa Turnout 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 No.1 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 Sisk Dam, San Luis Reservoir, Gianelli 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 Teerink Pumping Plant
- 15A Teerink Pumping Plant to Chrisman Pumping Plant
- 16A Chrisman Pumping Plant to Edmonston Pumping Plant

Coastal Branch, California Aqueduct

- 31A Avenal Gap to Devil's Den Pumping Plant
- 33A Devil's Den Pumping Plant through Tank 1
- 33B Tank 1 through Chorro Valley Turnout
- 34 Chorro Valley Turnout through Lopez Turnout
- 35 Lopez Turnout through Guadalupe Turnout
- 37 Guadalupe Turnout to SPRR crossing near Casmalia
- 38 SPRR crossing near Casmalia through terminous at Tank 5 (Outlet Vault)

Tehachapi Division

- 17E Edmonston Pumping Plant to Porter Tunnel
- 17F Porter Tunnel to Junction, West Branch

Mojave Division

- 18A Junction, West Branch 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
- 23C Mojave Siphon Powerplant
- 24 Cedar Springs Dam and Silverwood Lake

Santa Ana Division

- 25 Silverwood Lake to South Portal, San Bernardino Tunnel
- 26A South Portals San Bernardino Tunnel through Devil Canyon Powerplant and Second Afterbay
- 28G Devil Canyon Powerplant and Second Afterbay to Barton Road
- 28H Barton Road to Lake Perris
- 28J Perris Dam and Lake Perris

East Branch Extension

- 1 Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road
- 2A Junction, Foothill Pipeline near Cone Camp Road to Greenspot Pump Station
- 2B Greenspot Pump Station to Morton Canyon Valve Vault
- 2C Morton Canyon Valve Vault to Crafton Hills Pump Station
- 3A Crafton Hills Pump Station to Carter Street Valve Vault
- 3B Carter Street Valve Vault to Garden Air Creek, South of San Bernardino/Riverside County Line
- 4A Garden Air Creek to Cherry Valley Pump Station
- 4B Cherry Valley Pump Station to Terminus at Noble Creek

West Branch, California Aqueduct

- 29A Junction, California Aqueduct through Oso Pumping Plant
- 29F Oso Pumping Plant through Quail Embankment
- 29G Quail Embankment through Warne Powerplant
- 29H Pyramid Dam and Lake
- 29J Pyramid Lake through Castaic Powerplant
- 30 Castaic Dam and Lake

California Aqueduct from the Delta to Castaic Lake, and the Coastal Branch.

All the revisions reported in previous bulletins regarding the derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors were last reported in Tables B-1 and B-2 of Bulletin 132-91. Under Article 53 of the Monterey Amendment, agricultural contractors may sell up to 130,000 acre-feet of aqueduct capacity to municipal and industrial contractors. The first permanent transfer occurred in 1998. Currently, 114,000 acre-feet of the allowable capacity has been transferred. Table 1 shows the permanent capacity transfers that have taken place since the Monterey Amendment was implemented in 1995.

Table B-1 presents the reach ratios currently applicable to reimbursable capital costs.

Table B-2 presents corresponding ratios for allocating 2009 and after reimbursable minimum OMP&R costs among contractors. 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 power costs, credits, and transmission costs for each aqueduct pumping and power recovery plant. These variable costs are:

- costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service costs that are independent and vary with power usage are classified as minimum OMP&R costs);
- credits for capacity and energy produced at aqueduct power recovery plants (treated as negative costs);
- payments for replacement of major plant machinery components having economic lives shorter than the project repayment period. (In 1997, DWR discontinued charging for a sinking fund for replacements. Replacement costs, for 1999 and thereafter, are to be paid on an annual basis, as the costs are incurred.); and
- beginning in 2005, a portion of transmission expenditures that will depend on and vary with water and power usage. These costs will be included as part of the variable component. Costs reflect the revised 2008 transmission rate structure from Pacific Gas and Electric.

Table B-3 excludes plant capacity and energy costs associated with surplus and unscheduled water service after

Table 1. Summary of Permanent Aqueduct Capacity Transfers

Contractor		Capacity Transfer		
Seller	Buyer	Amount (af)	Effective Year	Transfer Description
Transfers under Monterey Amendment				
Kern	Mojave	25,000	1998	Purchased capacity upstream from Reach 31A
Kern	Castaic Lake	41,000	2000	Purchased capacity upstream from Reach 16A
Kern	Palmdale	4,000	2000	Purchased capacity upstream from Reach 11B
Kern	Alameda-Zone 7	7,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	15,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	10,000	2001	Purchased capacity upstream from Reach 11B
Kern	Solano	5,756	2001	Purchased capacity upstream from Reach 11 B and Reach 31A
Kern	Napa	4,025	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Alameda-Zone 7	2,219	2004	Purchased capacity upstream from Reach 11B
<i>Subtotal under Article 53</i>		114,000		
Transfers outside of Monterey Amendment				
Tulare	Dudley Ridge	3,973	2002	Purchased capacity upstream from Reach 8D
Tulare	AVEK	3,000	2002	Purchased capacity upstream from Reach 8D
Tulare	Alameda-Zone 7	400	2003	Purchased capacity upstream from Reach 8D
Tulare	Kings	5,000	2004	Purchased capacity upstream from Reach 8D
Tulare	Coachella	9,900	2004	Purchased capacity upstream from Reach 8D
MWDSC	Coachella	88,100	2005	Purchased capacity upstream from Reach 28J
MWDSC	Desert	11,900	2005	Purchased capacity upstream from Reach 28J
Tulare	Kings	305	2006	Purchased capacity upstream from Reach 31A
<i>Subtotal outside of Article 53</i>		122,578		

May 1, 1973. Prior to that date, surplus water service was charged the same unit variable OMP&R component as allocated 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 were allocated directly to those water contractors receiving surplus and unscheduled water service. A contract amendment in 1991 again revised the rate structure to provide for payment of costs through a melded power rate. These revisions to charges for surplus and unscheduled water are effective from the date of the amendments and are not applied to past charges.

An interruptible water program was established in 1994. This program is based on individual annual contracts; costs for interruptible water actually delivered are included in Table B-3.

Water Conveyance

Tables B-4, B-5A, B-5B, and B-6 present water conveyance quantities that form the basis for allocating costs.

Table B-4 presents the schedules of annual allocations as set forth in Table A and Article 6(a) of each water supply contract.

Table B-5A shows amounts of actual and projected allocated water quantities

delivered from each aqueduct reach to each contractor. Projected deliveries for years 2008 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, and actual interruptible water deliveries in 1994 and after.

Table B-5B presents a summary of actual and projected annual allocated water quantities for each contractor. The quantities also include amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of interruptible water in 1994 and after.

Table B-6 summarizes the annual allocated water quantities conveyed or to be conveyed through each aqueduct pumping plant or power plant for each of the following functions:

- *Deliveries-Water Supply.* Water made available to contractors at down-aqueduct delivery structures, including certain hypothetical quantities to facilitate cost allocations, for those years when deliveries are made from net annual storage withdrawals. The net annual amounts of storage withdrawals are hypothetically added to the actual amounts conveyed from the Delta to the reservoirs, since deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were actually conveyed from the Delta in that year. The hypothetical increases in the deliveries made from reservoir storage withdrawals are offset by equal credits

to the minimum OMP&R costs of the respective reservoirs. Thus, the variable OMP&R components per acre-foot (Table B-17) may be applied to the total annual quantities delivered either from aqueduct reservoir storage or from the Delta.

- *Initial Fill Water.* Water required for initial filling of down-aqueduct reaches and reservoirs or for repayment of pre-consolidation water used during construction.
- *Deliveries-Recreation.* Water delivered to down-aqueduct recreation developments or used for fish and wildlife 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.

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 the exception of Banks Pumping Plant, "Reservoir Storage Changes" also includes SWP water placed into Southern California groundwater 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). At Banks Pumping Plant, groundwater 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.
- 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 previously for Transportation Facilities also applies to water delivered from storage in 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, the power and replacement costs of Banks

Table 2. Project Purpose Cost Allocation Factors (Percentages)

	Water Supply and Power Generation		All Other Purposes (Nonreimbursable)	
	Capital Costs	Minimum OMP&R Costs	Capital Costs	Minimum OMP&R Costs
PROJECT FACILITIES				
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				
Peripheral Canal Related	86.0	86.0	14.0	14.0
Remaining of Delta Facilities	96.6	96.7	3.4	3.3
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

^aPercentages 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 Hyatt and Thermalito Powerplants and switchyards.

^bPercentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.

^cPercentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

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, and actual deliveries of interruptible water in 1994 and after.

Bases for Reimbursable Costs

This section describes the methods used to derive the costs allocated by the procedures outlined in the preceding section. A diagram of the cost derivation process is shown in the upper-left quadrant of Figure B-1.

First, the capital and minimum OMP&R costs of all SWP facilities are allocated among the various project purposes according to the allocation percentages in Table 2. Those percentages may be subject to revision in the future.

The redeterminations in this appendix involve only the SWP 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, 2007; 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 DWR.

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 Metropolitan Water District of Southern California, San Gabriel Valley Municipal Water District, and AVEK, these include:

- additional costs incurred by the State for requested excess capacity;
- advances by water contractors of funds for such costs; and
- 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 Metropolitan's contract, 809 cubic feet per second of excess capacity was originally constructed in reaches of the West Branch at Metropolitan's request. That capacity was reclassified as basic capacity of SWP Transportation Facilities under Amendment 7. Metropolitan 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 Metropolitan's contract requires that additional costs for modifications to the Santa Ana Pipeline (required for enlargement of Lake Perris) will be allocated to Metropolitan and returned to the State through payments of the Transportation Charge. The additional costs to be repaid through Metropolitan'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 of the Transportation Charge and payment 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 the Delta Water Charge and the Transportation Charge 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) all of electric power transmission and station service costs up to 2004, and electric power transmission and station service costs for 2005 and after that do not vary with power usage allocable to aqueduct pumping and recovery plants;
- 4) all costs for equipment, materials, and supplies;
- 5) portions of the power and replacement costs of all up-aqueduct pumping plants and power plants that are allocable to the annual conveyance of water lost to evaporation and seepage from respective aqueduct reaches or placed into storage in respective reservoirs of the project transportation facilities (after initial fill);
- 6) credits, which offset those costs in (5) above, for deliveries drawn from

reservoir storage; and

- 7) escalation of projected operating costs at five percent per year for 2008, 2009, and 2010.

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 adjustments are made to *Table B-3* costs to derive *Table B-12* costs:

- 1) Part 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. 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.
- 2) 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.
- 3) 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. 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. The unit rate is equal to the variable OMP&R unit rate for the year the water is taken from storage.

- 4) That portion of costs attributable to pumping water to replace evaporation and seepage losses and for additions or withdrawals from storage in San Luis Reservoir is charged to the minimum OMP&R component of the Delta Water Rate.

The remaining costs are allocated to transportation water supply and repaid by the contractors.

Conservation Capital and Operating Costs

Table B-13 is a summary of actual and projected capital and operating costs of the initial Project Conservation Facilities. These costs are reimbursed through payments by contractors under the Delta Water Charge, Oroville power sales, and Gianelli Generating Plant credits. *Table B-13* also shows credits applied to the reimbursable capital costs of the Project Conservation Facilities according to negotiated settlements concerning incurred planning costs for the period from 1952 through 1978.

DWR is currently negotiating two new conservation programs to address on-going issues at the Delta, the Delta Habitat, Conveyance and Conservation Plan and a new Four Pumps Agreement. Program costs estimates were included as part of the Conservation costs. These costs and associated allocations will be adjusted

in future bills to reflect contractual agreements and agency participation.

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 allocated water service is also included for each contractor and each aqueduct reach. A diagram of all calculations may be found in the lower half of Figure B-1.

Transportation Charges

The accumulation of allocated costs of each aqueduct reach to each contractor is the basis for the Transportation Charge components.

Table B-14 summarizes each contractor's share of the capital costs of aqueduct reaches presented in Table B-10. Those amounts are determined by applying proportionate-use ratios set forth in Table B-1 to the costs in Table B-10. The resulting allocated costs are set forth in Table C of the respective water supply contracts.

Prepayments of the capital cost component, required under Metropolitan's Amendment 7, are included as negative capital costs in Table B-14 and Table C of Metropolitan's Statement of Charges. Solano, Empire-West Side Irrigation District, and Castaic Lake Water Agency

also prepaid capital costs (see Table B-14 footnotes). Table B-14 includes costs of the planned East Branch Extension to provide water service to San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency.

Both Table B-14 and Table C of the six contractors 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 capital cost components of the Transportation Charge for each contractor for each year of the project repayment period. By the year 2035, the capital cost components shown in Table B-15 will recover the costs shown in Table B-14, with interest at the Project Interest Rate of 4.608 percent per annum and based on the amortization schedules included in Table 3.

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

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 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
Kern County Water Agency	
Agricultural Use	1968 ^e
Municipal and Industrial Use	1968 ^e
Little Rock 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
Palmdale Water District	1964
Plumas County Flood Control and Water Conservation District	1970
San Bernadino Valley Municipal Water District	1963
San Gabriel Valley Municipal Water District	1963 ^d
San Geronio Pass Water Agency	1963 ^d
San Luis Obispo County Flood Control and Water Conservation District	1964 ^f
Santa Barbara County Flood Control and Water Conservation District	1964
Santa Clara Valley Water District	1963
Solano County Water Agency	1973
Tulare Lake Basin Water Storage District	1968 ^e
Ventura County Watershed Protection 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, Empire, Kern (agricultural use), Oak Flat, and Tulare, 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 allocations (Table B-4) through the project repayment period.

^f For San Luis Obispo and Santa Barbara County, all principal and interest payments for costs of the Coastal Stub were deferred until 1976.

Table 4. Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency

Year	Direct Charges
1969	46,511
1970	46,302
1971	140,074
1972	95,017
1973	72,454
1974	100,692
1975	127,456
1976	138,504
1977	120,753
1978	157,652
1979	121,231
1980	150,728
1981	75,866
1982	82,805
1983	90,007
1984	107,468
1985	159,406
1986	137,241
1987	127,073
1988	130,924
1989	128,468
1990	138,234
1991	139,527
1992	185,370
1993	219,334
1994	364,196
1995	272,341
1996	322,123
Total	3,997,767

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 Off-Aqueduct Power Facility charges, which are included separately in Table B-16B. Both Table B-16A and Table E include the operating costs payable under the Devil Canyon-Castaic contract for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant.

As part of operating agreements with DWR, Kern was billed from 1963 through 1987 for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill Pumping Plants by Berrenda Mesa Water Storage District (see Bulletin 132-71, page 7). Under those agreements, a portion of minimum OMP&R costs of Reach 31A were assigned directly to Kern, as shown in Table 4, with the remaining reach costs allocated by application of the proportionate-use ratios. DWR purchased the last unit, Unit No. 6, at Las Perillas and Badger Hill Pumping Plants in early 1997 to provide pumping capacity for deliveries to Coastal Area contractors, which began in 1997. As a result of the Monterey Amendment, the costs related to this settlement are to be allocated among all SWP contractors in proportion to their maximum Table A amounts. As costs are incurred, related charges will be included in the contractors' annual Statements of Charges as part of the minimum. It is estimated that between 2002 and 2010, the Monterey Amendment

litigation costs will be slightly less than \$16 million.

Table B16-B summarizes annual Off-Aqueduct Power Facility charges allocated to each water contractor, adjusted for prior overpayments or underpayments. 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.

Adopted October 1, 1979, the General Bond Resolution 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 summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 2007.

Table 5. Summary of 2007 Off-Aqueduct Power Facility Charges and Credits

Charges by Item	(Dollars)
Reid Gardner Powerplant	87,418,129
Bottle Rock Powerplant	14,282,125
South Geysers Powerplant	6,723,098
<i>Subtotal</i>	<i>108,423,352</i>
Credits by Item	
Power Sales	(16,581,848)
Net Total Charge	91,841,504

Table 6 shows projected Off-Aqueduct Power Facility charges and an amount equal to 25 percent of annual bond service for 2008 through 2029.

Annual Off-Aqueduct Power Facility charges are allocated among contractors in proportion to the electrical energy required to pump allocated water for the year. The initial allocation for the Statements of Charges is based on estimates of energy to pump requested allocated 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. An additional adjustment is made the following year based on actual water deliveries and actual costs for the year.

Table 6. Projected Charges for Off-Aqueduct Power Facilities

Year	Total Annual Cost (Dollars)	25% Bond Cover (Dollars)
2008	135,723,268	11,655,732
2009	142,090,852	12,910,026
2010	144,154,294	13,075,808
2011	141,010,556	12,451,292
2012	141,221,100	12,493,400
2013	78,250,003	6,428,385
2014	20,072,007	3,989,672
2015	11,892,459	2,353,762
2016	10,187,066	2,012,684
2017	9,785,391	1,932,349
2018	4,070,567	789,384
2019	4,050,878	785,446
2020	4,355,523	846,375
2021	6,714,690	1,318,208
2022	6,372,870	1,249,844
2023	4,538,351	882,941
2024	3,311,241	637,519
2025	335,289	66,588
2026	481,211	95,772
2027	813,726	162,275
2028	504,350	100,400
2029	497,350	99,000

The energy required to pump each contractor's water is calculated using the kilowatt-hour per acre-foot factors (shown in Table 7) for the pumping plants upstream from the delivery turnouts. The amounts include transmission losses.

Table 7. Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs

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
Banks	296	296
South Bay (including Del Valle)	869	1,165
Dos Amigos	138	434
Buena Vista	242	676
Teerink	295	971
Chrisman	639	1,610
Edmonston	2,236	3,846
Pearblossom	703	4,549
Greenspot	871	5,420
Crafton Hills	1,087	6,507
Cherry Valley	224	6,731
Oso	280	4,126
Las Perillas	77	511
Badger Hill	200	711
Devil's Den	705	1,416
Bluestone	705	2,121
Polonio Pass	705	2,826

^aIncludes transmission losses.

Table B-17 presents a summary of actual and projected total variable OMP&R costs for each acre-foot of water conveyed through each aqueduct pumping plant and power plant for each year of the project. Provisions for calculating the variable OMP&R component of the Transportation Charge:

- An annual charge per acre-foot of projected water deliveries to all contractors served from or through

each reach is determined so the projected variable OMP&R costs to be incurred for each reach will be returned to the State.

- The total annual variable OMP&R component for any contractor for a given reach is obtained by multiplying the unit charge associated with that reach by the quantity of water actually delivered from or through the reach to the contractor.

The data summarized in Table B-17 are derived by dividing the costs shown in Table B-3 by the quantities of water shown in Table B-6. However, certain costs included in 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 shown in Tables 8 and 9 on pages B-22 and B-23.

The unit rates shown in Table B-17 constitute the rates for the pumping plants and power plants listed. The cumulative rates constitute the total rates, cumulative from the Sacramento-San Joaquin Delta, and are applicable to deliveries from or downstream of the pumping plants and power plants. Extra peaking service costs are excluded.

Table B-18 shows the variable OMP&R components of the Transportation Charge for each contractor for each year of the

Table 8. Extra Peaking Charges for Additional Power, by Pumping Plant (Dollars)

Year	Las Perillas and Badger Hill											Total			
	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Badger Hill	Buena Vista	Teerink	Chrisman	Edmonston		Pearblossom	Oso	
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	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
1978	0	0	0	0	0	45,145	3,680	0	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	12,126	0	0	0	0	0	0	0	0	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,594	3,534	152	0	0	0	0	0	0	0	11,315
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	0	0	0	0	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	0	0	76,878
1986	0	0	0	0	1,864	863	0	291	354	766	2,683	0	0	0	6,821
1987	0	0	0	604	17,129	7,838	835	2,295	1,806	3,460	11,058	0	0	0	45,025
1988	639	39	287	894	43,475	20,082	2,213	5,792	4,367	8,272	25,886	0	0	0	111,946
1989	2,491	566	1,483	70	40,251	18,642	1,935	3,401	1,531	2,058	3,793	0	0	0	76,221
1990	45	0	18	343	19,524	9,044	0	150	145	314	643	0	0	0	30,226
1991	903	0	281	0	21	8	0	15	17	39	139	41	0	0	1,464
1992	208	117	203	0	7,070	2,502	0	182	190	435	0	0	0	0	10,907
1993	0	681	889	4,483	123,080	54,741	0	8,898	5,458	10,900	35,068	11,139	0	0	255,337
1994	0	366	393	679	6,566	2,795	454	1,083	155	357	1,121	0	132	0	14,101
1995	0	0	0	1,717	24,464	9,422	27	1,865	3,475	782	1,104	400	0	0	43,256
1996	4	0	1	1,983	10,031	4,976	0	391	432	1,015	3,404	1,160	0	0	23,397
1997	0	1,780	2,152	3,107	337,357	165,774	1,753	34,604	12,296	15,910	21,028	0	0	0	595,761
1998	0	0	0	20,966	235,693	106,251	2,354	697	848	1,836	6,426	0	0	0	375,071
1999	0	0	0	0	63,196	26,235	0	3,394	4,136	8,959	31,350	7,740	0	0	145,010
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,290	3,549	5,707	38,457	1,041,323	637,838	70,909	78,719	43,445	67,625	172,056	20,480	132	0	2,184,530

Table 9. Extra Peaking Charges for Additional Power, by Contractor (Dollars)

Year	Napa	Solano	Alameda Zone7	Alameda County	Santa Clara	Dudley Ridge	Empire	Kern	Kings	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella	Desert	Littlerock	Palmdale	San Gabriel	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	9,511	0	0	1,365	0	0	0	391	0	0	0	0	0	11,315
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	2,194	4,614	0	0	0	0	0	0	6,821
1987	0	0	229	0	599	313	84	24,141	0	95	0	18,207	545	0	0	812	0	0	45,025
1988	892	73	665	561	0	1,853	1,404	58,905	0	72	2,368	44,526	627	0	0	0	0	0	111,946
1989	3,478	1,062	96	0	0	13	403	55,085	0	239	8,278	0	1,043	0	0	1,035	5,489	0	76,221
1990	63	0	470	0	0	0	0	28,587	0	0	0	0	0	0	0	81	1,025	0	30,226
1991	1,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	0	1,464
1992	271	257	0	0	0	0	49	10,109	221	0	0	0	0	0	0	0	0	0	10,907
1993	0	1,570	6,122	0	0	0	3,757	97,812	504	0	74,577	0	0	24,983	41,156	0	4,856	0	255,337
1994	0	759	896	0	0	0	7	9,933	0	0	0	0	2,450	0	0	56	0	0	14,101
1995	0	0	2,353	0	0	10,197	0	28,085	310	0	0	0	27	0	0	0	2,284	0	43,256
1996	5	0	81	2,612	0	334	205	4,552	969	0	7,809	0	0	0	0	0	3,598	3,232	23,397
1997	0	3,932	3,999	0	0	6,190	0	546,733	0	40	0	0	0	0	0	0	34,867	0	595,761
1998	0	0	19,666	8,442	0	22,631	1	312,626	0	651	0	0	0	0	0	0	11,054	0	375,071
1999	0	0	0	0	0	0	0	76,425	0	0	6,922	0	0	0	0	0	11,576	50,087	145,010
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,893	7,653	34,577	13,644	3,521	55,250	5,974	1,620,176	3,692	2,017	102,158	123,049	9,858	24,983	41,156	2,439	74,749	53,741	2,184,530

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.

According to provisions of the Devil Canyon-Castaic contract, Table B-19 and Table G include amounts of debt service and operating cost payments due from the six contractors located down-aqueduct from Devil Canyon and Castaic Powerplants.

Delta Water Charges

Table B-20A presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 2009 according to the amended Article 22(e) and 22(g) of all 29 contracts. The Delta Water Rate was calculated at a Project Interest Rate of 4.608 percent based on Conservation Facility costs shown in Table B-13. That Delta Water Rate is used to compute projected Delta Water Charges under Article 53(i) for the contractors who have executed the Monterey Amendment. Included in Table B-20A is the Delta Water Rate for the two contractors who have

not executed the Monterey Amendment (Plumas County and Empire).

Table B-20B shows each component of the 2009 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 allocated 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 (WSRB) to the Delta Water Charge and the transportation capital cost component for each contractor. The surcharge shown in Table B-22 includes the financing costs of the WSRB surcharge, series B through AE. This surcharge is levied according to an amendment to the water supply contracts, which was signed by all long-term water supply contractors.

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.

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 allocated water now projected for delivery to the respective contractors.

These equivalent charges would provide the same principal sum at the end of the project 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 allocated water delivered to date; all surplus water delivered prior to May 1, 1973; all interruptible water deliveries in 1994 and after; and all allocated 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 allocated 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 allocated water through respective aqueduct reaches of the Project Transportation Facilities.

Those unit costs provide the basis of charges assessed for extra service (such as delivery of allocations down-aqueduct from a contractor's turnout) and for wheeling service to entities other than the long-term water supply contractors.

The cumulative unit conveyance costs indicated for reaches in Table B-25 do not necessarily equal the equivalent unit Transportation Charges to contractors

served from such reaches. The unit charges in Table B-24 account for the rate of water demand buildup and cost allocation factors of the individual contractors; however, the unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all contractors whose allocations are conveyed through a given reach. Table B-25 also includes surplus water delivered prior to May 1, 1973, and interruptible water deliveries in 1994 and after.

East Branch Enlargement Facility Charges

Table B-26 reflects DWR's projection of annual capital costs of the East Branch Enlargement Facilities for each aqueduct reach. These projections will be redetermined in future bulletins to include:

- a reallocation of costs of constructing the present east branch facilities between Alamo Powerplant and Silverwood Lake;
- a reallocation of costs of Silverwood Lake to reflect additional use as a result of East Branch Enlargement operation;
- a reallocation of costs of San Bernardino Tunnel to reflect redistribution of flow capacities necessary for the East Branch Enlargement facilities; and
- 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 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		1,200	1,506	
19		151	13	136	6		1,200	1,506	
20A	35	151	13	136	6		1,200	1,541	
20B	35	151	13	136	6		1,200	1,541	
21	35	151	13	136			1,200	1,535	
22A	35	151	13	136			1,200	1,535	
22B		151	13	136			1,200	1,500	
23B		184	67	212			1,200	1,663	
23C		184	67				1,200	1,451	
24		190	78				1,200	1,468	
25		193	83			63	1,200	1,539	
26A		193	83			63	1,200	1,539	
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	0.00398358	0.00000000	0.77871512	1.00000000	
20B	0.02271252	0.09798832	0.00843608	0.08825438	0.00398358	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	

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 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 developed by DWR in consultation with the affected contractors.

Table B-28 shows each participating contractor's share of the estimated capital costs of the East Branch Enlargement shown in Table B-26.

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. The amounts shown in Table B-30 will recover the minimum OMP&R costs shown in Table B-27.

Table B-31 shows the annual East Branch Enlargement Transportation charges for each participating contractor (the sum of the corresponding amounts included in Tables B-29 and B-30).

East Branch Extension Phase I Facility Charges

The East Branch Extension-Phase I charges recover associated costs for East Branch Extension facilities beginning at Devil Canyon Powerplant Afterbay and extending to the terminus at Noble Creek in the vicinity of Beaumont, Riverside County. These costs will be recovered from two contractors, San Bernardino and San Geronimo, according to their amended Water Supply contracts. The factors for distributing costs are shown in Table 11. Table 12 shows the debt service for 2009.

Short-Term Agreements

DWR and the long-term water supply contractors execute short-term agreements that affect the contractors' charges. DWR executed a five-year agreement in 1997 with 16 municipal and industrial contractors who agreed to pay for allocated shares of Municipal Water Quality Investigations costs. In 2002 and 2006, additional amendments were executed to extend the program. The MWQI charges under this agreement are included in the transportation minimum OMP&R components shown in Table B-16A.

Nine contractors executed a short-term agreement (1997 and 1998) to participate in the feasibility study for the American Basin conjunctive-use program. Costs of the feasibility study are included in Table B-16A.

Contractors have agreed to participate in several Delta Improvement programs which started in 2007 and possibly extend out into the future.

The first contract pertains to the Bay Delta Conservation Plan (BDCP) agreed to in the Memorandum of Agreement for Supplemental Funding for Certain Ecosystem Actions and Support for Implementation of Near-Term Water Supply, Water Quality, Ecosystem, and Levee Actions (MOA). The BDCP is comprised of two elements, fishery costs and consultation costs. These costs were added to the contractors' transportation minimum component for bill years 2007 and 2008.

The second contract pertains to the non-BDCP costs of the MOA, which elements are Delta Vision and Pelagic Organism Decline research costs. These costs were added to the contractors' conservation minimum component for bill years 2007 and 2008.

Table 11. Factors for Distributing Capital and Minimum OMP&R Costs of the East Branch Extension Facilities

Reach Number	Reach Description	San Bernardino Municipal Water District	San Gorgonio Pass Water Agency	Total
Capital				
all	Average of the contractors' participation of EBX facilities	0.458417	0.541583	1.000000
Minimum				
1	Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road	0.557330	0.442670	1.000000
2A	Junction Foothill Pipeline near Cone Camp Rd to Greenspot Pump Station	0.557330	0.442670	1.000000
2B	Greenspot Pump Station to Morton Canyon Valve Vault	0.777778	0.222222	1.000000
2C	Morton Canyon Valve Vault to Crafton Hills Pump Station	0.777778	0.222222	1.000000
3A	Crafton Hills Pump Station to Carter Street Valve Vault	0.557330	0.442670	1.000000
3B	Carter Street Valve Vault to Garden Air Creek, South of San Bernardino County Line	0.557330	0.442670	1.000000
4A	Garden Air Creek to Cherry Valley Pump Station		1.000000	1.000000
4B	Cherry Valley Pump Station to Terminus at Noble Creek		1.000000	1.000000

Table 12. East Branch Extension Facilities Debt Service for 2009

Contractor	Share of Participation (%)	Total Debt Service Charge (Dollars)
San Bernardino	45.84170	8,032,839
San Gorgonio	54.15830	9,490,157
Total	100.00000	17,522,996

Tables B-1 through B-3 Follow

TABLE B-1. Factors for Distributing Reach Capital Costs among Contractors

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
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		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
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 Pasaiero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasaiero 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	0.01202065
12E	Elk Hills Road thru Tupman Road			0.04037074	0.01597665	0.00728878	0.00184332	0.01202059
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.01733322	0.00791595	0.00200194	0.01305492
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04599268	0.01820137	0.00831952	0.00210399	0.01372049
14B	Santiago Creek thru Old River Road			0.04682530	0.01853084	0.00847388	0.00214303	0.01397505
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.01941356	0.00888679	0.00224744	0.01465600
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.02014241	0.00922722	0.00233351	0.01521742
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.02109050	0.00967107	0.00244575	0.01594937
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05340725	0.02113537	0.00969176	0.00245098	0.01598349
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112	0.02399391	0.00606795	0.00060679	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Littlerock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04608043
22B	Pearblossom Pumping Plant to West Fork Mojave River					0.02827552	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake					0.00324449	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake					0.01024605	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.					0.03544337		
29F	Oso Pumping Plant thru Quail Embankment					0.03544339		
29G	Quail Embankment thru Warne Powerplant					0.03544339		
29H	Pyramid Dam and Lake					0.02817144		
29J	Pyramid Lake thru Castaic Powerplant					0.03544338		
30	Castaic Dam and Lake					0.02927284		
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503			0.07364766		
33A	Devil's Den Pumping Plant through Tank 1	0.10101221	0.89898779					
33B	Tank 1 through Chorro Valley Turnout	0.09912818	0.90087182					
34	Chorro Valley Turnout through Lopez Turnout	0.05479573	0.94520427					
35	Lopez Turnout through Guadalupe Turnout		1.00000000					

Note: Proportionate use factors do not reflect permanent water transfer as a result of the Monterey Amendment.

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			
CA-AQ								
1	0.01707770	0.00089678	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)								
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino	San Gabriel	San Geronio	The Metropolitan	Ventura	Total
				Municipal Water District	Valley Municipal Water District	San Geronio Pass Water Agency	Water District of Southern California	County Watershed Protection District	
CA-AQ									
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	0.01189888	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 WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
NORTH BAY AQUEDUCT								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29251728	0.70748272					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.42000793	0.57998207					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			0.33980110	0.19515838	0.46504052	0.00000000	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.33978741	0.19516252	0.46505007	0.00000000	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.31610985	0.20216089	0.48172926	0.00000000	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.53312173	0.12972254	0.33715573	0.00000000	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.32478705	0.19906896	0.47614399	0.00000000	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout			0.14604872	0.25176680	0.60218448	0.00000000	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				0.00870649	0.02074717		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	0.00531803	0.00981112	0.03024584	0.02544226	0.02816849	0.00133276	0.01137611
2A	Bethany Reservoir to Orestimba Creek	0.00557057	0.01027704	0.03167950	0.02660598	0.02949522	0.00139543	0.01191224
2B	Orestimba Creek to O'Neill Forebay	0.00557667	0.01028833	0.03171597	0.02666336	0.02953453	0.00139736	0.01192791
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557562	0.01028637	0.03171043	0.02666656	0.02953095	0.00139720	0.01192641
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557450	0.01028431	0.03170463	0.02666994	0.02952719	0.00139705	0.01192482
5	Panoche Creek to Five Points	0.00557309	0.01028175	0.03169736	0.02667416	0.02952249	0.00139687	0.01192284
6	Five Points to Arroyo Pasajero	0.00557099	0.01027787	0.03168637	0.02668054	0.02951539	0.00139656	0.01191985
7	Arroyo Pasajero to Kettleman City	0.00557031	0.01027662	0.03168285	0.02668259	0.02951311	0.00139646	0.01191888
8C	Kettleman City thru Milham Avenue	0.00551445	0.01017357	0.03136136	0.02635185	0.02920164	0.00138158	0.01179354
8D	Milham Avenue thru Avenal Gap	0.00562665	0.01038055	0.03200083	0.02691146	0.02980153	0.00141001	0.01203564
9	Avenal Gap thru Twisselman Road			0.03436980	0.02785985	0.03125286	0.00153069	0.01306310
10A	Twisselman Road thru Lost Hills			0.03490578	0.02831966	0.03174218	0.00155504	0.01326985
11B	Lost Hills to 7th Standard Road			0.03824176	0.03115437	0.03478569	0.00170600	0.01455350
12D	7th Standard Road thru Elk Hills Road			0.04009312	0.03274031	0.03647572	0.00179001	0.01526741
12E	Elk Hills Road thru Tupman Road			0.04014397	0.03279589	0.03652306	0.00179253	0.01528847
13B	Tupman Road to Buena Vista Pumping Plant			0.04343323	0.03558110	0.03952321	0.00194122	0.01655295
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04552298	0.03718058	0.04143137	0.00203618	0.01735961
14B	Santiago Creek thru Old River Road			0.04617191	0.03342424	0.04202703	0.00206642	0.01761493
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04735241	0.03220394	0.04310736	0.00212063	0.01807432
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04804398	0.03267426	0.04374004	0.00215235	0.01834317
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.04964403	0.03376234	0.04520241	0.00222537	0.01896287
17E	Edmonston Pumping Plant to Porter Tunnel			0.05163545	0.03511660	0.04702307	0.00231640	0.01973513
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05173926	0.03518719	0.04711769	0.00232108	0.01977493
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13485569		0.11344457	0.00605083	0.05154915
19	Alamo Powerplant to Fairmont			0.13485222		0.11344290	0.00605098	0.05154980
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847930		0.12213523	0.00651583	0.05550703
20B	70th Street West to Palmdale			0.02276024		0.12812785	0.00683566	0.05823170
21	Palmdale to Littlerock Creek			0.02318952		0.13056387	0.00696663	0.05934507
22A	Littlerock Creek to Pearlblossom Pumping Plant			0.01181870		0.13242454	0.00706632	0.06019328
22B	Pearlblossom Pumping Plant to West Fork Mojave River					0.13400843	0.00715085	0.06091324
23	West Fork Mojave River to Silverwood Lake					0.12416451	0.00818135	0.02168414
24	Cedar Springs Dam and Silverwood Lake					0.02651510	0.01251569	0.01910229
25	Silverwood Lake to South Portal San Bernardino Tunnel					0.09751351		0.01317145
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.					0.12013473		0.01622697
28G	Devil Canyon Powerplant to Barton Road					0.30672992		0.04143095
28H	Barton Road to Lake Perris					0.32330286		0.04366951
28J	Perris Dam and Lake Perris					0.32330202		0.04366970
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.			0.00296720		0.05726734		
29F	Oso Pumping Plant thru Quail Embankment			0.00296796		0.05726649		
29G	Quail Embankment thru Warne Powerplant					0.05742327		
29H	Pyramid Dam and Lake					0.03349572		
29J	Pyramid Lake thru Castaic Powerplant					0.05740996		
30	Castaic Dam and Lake					0.03248607		
31A	Avenal Gap to Devil's Den Pumping Plant	0.10542164	0.19449108					
33A	Devil's Den Pumping Plant thru Tank 1	0.10101221	0.89898779			0.07351496		
33B	Tank 1 thru Chorro Valley Turnout	0.10101221	0.89898779					
34	Chorro Valley Turnout thru Lopez Turnout	0.05271277	0.94728723					
35	Lopez Turnout thru Guadalupe Turnout		1.00000000					

Note: Proportionate use factors reflect permanent capacity water transfer that have been signed as of February 1, 2007.

TABLE B-2. Factors for Distributing Reach Minimum OMP&R Costs Among Contractors

Reach No.	SAN JOAQUIN VALLEY AREA										
	Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	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			
CA-AQ											
1	0.00101503	0.00145926	0.02320270	0.01822142	0.00088480	0.00254117	0.02735295	0.27469072	0.00247193	0.00166749	0.02830375
2A	0.00106167	0.00152624	0.00868437	0.01903859	0.00092448	0.00286184	0.02863089	0.28700500	0.00258450	0.00174223	0.02957310
2B	0.00106383	0.00152939	0.00870009	0.01908995	0.00092696	0.00266476	0.02867562	0.28778222	0.00259040		0.02965288
3	0.00106393	0.00152954	0.00870024	0.01909529	0.00092722	0.00266425	0.02867409	0.28786344	0.00259080		0.02966116
4	0.00106401	0.00152968	0.00870041	0.01910089	0.00092749	0.00266370	0.02867248	0.28794882	0.00259124		0.02966986
5	0.00106413	0.00152986	0.00870062	0.01910789	0.00092783	0.00266303	0.02867046	0.28805544	0.00259177		0.02968073
6	0.00106431	0.00153014	0.00870096	0.01911848	0.00092835	0.00266203	0.02866740	0.28821677	0.00259258		0.02969716
7	0.00106438	0.00153022	0.00870107	0.01912188	0.00092852	0.00266169	0.02866642	0.28826851	0.00259284		0.02970244
8C	0.00105148	0.00151159	0.00859994	0.01886176	0.00091590	0.00263501	0.02834912	0.28434072	0.00255999		0.02929844
8D	0.00107370	0.00154358	0.00878005	0.01927090		0.00268862	0.02893698	0.29051094	0.00165734		0.01089124
9	0.00079826	0.00110157	0.00786471				0.03143148	0.29263291			
10A	0.00081139	0.00111953	0.00799211				0.03193731	0.28144288			
11B	0.00065052	0.00095254	0.00354792				0.03506894	0.21771722			
12D							0.03681479	0.18486151			
12E							0.03687019	0.18374304			
13B							0.01413733	0.14208658			
14A							0.00599913	0.10936622			
14B							0.00609042	0.10066378			
14C							0.00625275	0.07940837			
15A							0.00634765	0.06578229			
16A							0.00656553	0.03434119			
17E							0.00201100				
31A	0.00628695	0.00977801	0.02617705			0.05037550		0.43917148	0.00176551		

Reach No.	SOUTHERN CALIFORNIA AREA (continued)									Total
	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District		
CA-AQ										
1	0.00049056	0.01818303	0.00458550	0.02356891	0.00648711	0.00397380	0.41547239	0.00427921		1.00000000
2A	0.00051386	0.01902951	0.00480271	0.02467716	0.00679322	0.00416065	0.43517158	0.00448242		1.00000000
2B	0.00051442	0.01906116	0.00480833	0.02471121	0.00680191	0.00416639	0.43566900	0.00448735		1.00000000
3	0.00051433	0.01906070	0.00480752	0.02470855	0.00680098	0.00416594	0.43559198	0.00448650		1.00000000
4	0.00051424	0.01906023	0.00480668	0.02470576	0.00680000	0.00416546	0.43551100	0.00448561		1.00000000
5	0.00051412	0.01905962	0.00480562	0.02470229	0.00679878	0.00416487	0.43540988	0.00448450		1.00000000
6	0.00051392	0.01905870	0.00480402	0.02469702	0.00679694	0.00416399	0.43525686	0.00448280		1.00000000
7	0.00051385	0.01905842	0.00480349	0.02469533	0.00679634	0.00416372	0.43520780	0.00448226		1.00000000
8C	0.00050870	0.01884315	0.00475451	0.02443210	0.00672541	0.00411933	0.44227753	0.00443733		1.00000000
8D	0.00051904	0.01923550	0.00485156	0.02493497	0.00686329	0.00420412	0.45134389	0.00452761		1.00000000
9	0.00056296	0.01845645	0.00526337	0.02706903	0.00744835	0.00456392	0.48981993	0.00491076		1.00000000
10A	0.00057175	0.01874332	0.00534585	0.02749934	0.00756597	0.00463648	0.49755423	0.00498733		1.00000000
11B	0.00062640	0.02052979	0.00585888	0.03016888	0.00829640	0.00508658	0.54559067	0.00546394		1.00000000
12D	0.00065673	0.02152073	0.00605960	0.03165452	0.00870248	0.00533707	0.57229756	0.00572844		1.00000000
12E	0.00065758	0.02154749	0.00606732	0.03169920	0.00871431	0.00534461	0.57307663	0.00573571		1.00000000
13B	0.00071145	0.02330931	0.00656455	0.03432822	0.00943394	0.00578787	0.62040339	0.00620565		1.00000000
14A	0.00074569	0.02442760	0.00688049	0.03600736	0.00989269	0.00607098	0.65057491	0.00650421		1.00000000
14B	0.00075633	0.02477336	0.00697864	0.03654173	0.01003745	0.00616108	0.66009578	0.00659690		1.00000000
14C	0.00077566	0.02540391	0.00715715	0.03750028	0.01029837	0.00632270	0.67725661	0.00676554		1.00000000
15A	0.00078697	0.02577340	0.00726173	0.03806102	0.01045107	0.00641723	0.68730050	0.00686434		1.00000000
16A	0.00081317	0.02662897	0.00750366	0.03935225	0.01080332	0.00663493	0.71046704	0.00709292		1.00000000
17E	0.00084580	0.02769354	0.00780477	0.04096189	0.01124220	0.00690630	0.73933042	0.00737743		1.00000000
17F	0.00084750	0.02774917	0.00782046	0.04104458	0.01126486	0.00692025	0.74082077	0.00739226		1.00000000
18A	0.00220895	0.04946256	0.01657935	0.10699871	0.02936451	0.01804030	0.47144538			1.00000000
19	0.00220892	0.04946131	0.01657891	0.10700135	0.02936470	0.01804074	0.47144817			1.00000000
19C										1.00000000
20A	0.00237900	0.05324853	0.01784830	0.11522152	0.03161788	0.01942666	0.50762172			1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12097843	0.03316974	0.02038045	0.53253657			1.00000000
21	0.00254199	0.05692053		0.12319479	0.03380312	0.02077093	0.54270355			1.00000000
22A		0.05773082		0.12495766	0.03428593	0.02106816	0.55045459			1.00000000
22B		0.05842136		0.12645207	0.03469602	0.02132008	0.55703795			1.00000000
23				0.14467451	0.03969010	0.02439237	0.63721302			1.00000000
24				0.22243002	0.04339445	0.02843498	0.64760747			1.00000000
25				0.11825184	0.03722720	0.01993915	0.71389685			1.00000000
26A				0.14947726	0.03997501	0.02520426	0.64898177			1.00000000
28G				0.05126136			0.60057777			1.00000000
28H							0.63302763			1.00000000
28J							0.63302828			1.00000000
29A							0.92702291	0.01274255		1.00000000
29F							0.92702302	0.01274253		1.00000000
29G							0.92979606	0.01278067		1.00000000
29H							0.95753173	0.00897255		1.00000000
29J							0.92980918	0.01278086		1.00000000
30							0.95895422	0.00855971		1.00000000
31A		0.09301782								1.00000000
33A										1.00000000
33B										1.00000000
34										1.00000000
35										1.00000000

TABLE B-3. Power Costs and Credits, Transmission costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant (a

(in dollars)

Sheet 1 of 3

Calendar Year	NORTH BAY AQUEDUCT			SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT			
	Reach 1	Reach 3A	Reach 3B	Reach 1 (c)	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping P.	Cordelia Pumping P. Solano	Cordelia Pumping P. Napa (b)	South Bay & Del Valle Pumping P.	Banks Pumping P.	Dos Amigos Pumping P.	Buena Vista Pumping P.	Teerink Pumping P.
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	37,731	0	0	0	0
1963	0	0	0	56,414	0	0	0	0
1964	0	0	0	71,745	0	0	0	0
1965	0	0	0	138,653	0	0	0	0
1966	0	0	0	189,402	0	0	0	0
1967	0	0	0	220,327	28,554	0	0	0
1968	0	0	7,128	339,261	1,286,777	227,505	0	0
1969	0	0	8,557	274,851	817,304	119,303	0	0
1970	0	0	13,666	439,983	330,508	193,720	2,940	0
1971	0	0	10,626	413,657	559,946	205,206	134,340	7,921
1972	0	0	14,430	615,164	1,072,833	541,628	305,868	159,125
1973	0	0	14,453	477,134	880,234	469,676	469,104	472,187
1974	0	0	17,508	502,473	959,269	536,361	514,168	553,285
1975	0	0	14,801	373,706	1,315,916	536,495	607,981	664,738
1976	0	0	20,867	580,607	878,728	572,326	658,261	645,377
1977	0	0	22,640	534,087	631,578	178,904	139,856	138,714
1978	0	0	21,670	559,981	3,833,011	653,606	966,756	926,444
1979	0	0	16,240	614,117	3,394,344	994,921	805,839	788,539
1980	0	0	19,936	523,445	1,981,918	818,368	857,033	846,757
1981	0	0	23,863	639,976	1,975,220	1,640,814	1,197,553	1,189,437
1982	0	0	12,078	484,808	3,405,761	1,148,258	1,159,605	1,212,973
1983	0	0	2,339	77,394	1,264,426	140,742	276,289	264,076
1984	0	0	4,797	289,827	1,390,432	555,409	551,468	508,111
1985	0	0	10,220	456,051	2,830,593	1,283,981	1,336,378	1,378,587
1986	0	0	15,484	827,079	7,180,656	2,282,364	2,290,023	2,343,903
1987	0	0	27,223	901,077	3,924,603	1,996,638	1,851,663	1,885,638
1988	18,112	19,927	23,868	932,456	5,377,272	2,072,091	2,100,427	2,142,121
1989	30,783	45,783	26,501	1,211,118	10,887,880	3,334,006	3,427,675	3,553,496
1990	53,484	67,109	40,793	1,861,178	9,523,541	4,754,649	5,990,489	6,327,687
1991	11,254	10,442	5,983	3,463,154	3,463,154	723,518	1,263,736	1,445,729
1992	14,484	13,070	9,398	327,309	2,700,240	808,067	1,071,702	1,121,273
1993	(12,340)	(8,753)	(5,393)	(159,836)	(333,548)	(609,139)	(461,719)	(459,965)
1994	54,407	39,608	29,189	823,317	4,438,900	1,938,280	2,325,005	2,375,321
1995	20,699	20,620	11,791	253,482	4,009,296	1,076,372	924,147	887,105
1996	59,545	47,288	23,483	645,189	9,531,541	3,449,781	2,444,752	2,341,848
1997	69,837	52,935	21,955	963,877	7,625,930	3,064,281	2,847,907	2,788,387
1998	(11,058)	(9,488)	(4,554)	(124,695)	296,016	(362,362)	(316,705)	(304,065)
1999	30,114	25,288	10,024	516,703	4,988,797	2,287,161	1,553,244	1,241,104
2000	58,651	42,587	15,094	861,671	8,025,528	3,046,708	2,966,168	3,038,567
2001	360,761	250,331	214,209	4,068,696	24,175,475	9,882,002	14,868,284	15,252,650
2002	191,948	105,385	61,953	2,258,767	17,221,057	6,949,418	8,493,564	8,803,124
2003	181,608	118,767	98,077	2,567,656	21,542,492	9,051,535	10,696,186	11,139,389
2004	246,316	136,402	105,066	2,452,187	21,375,211	9,167,278	12,084,098	12,682,850
2005	279,237	144,265	146,323	2,745,626	29,060,263	12,814,765	12,402,303	12,757,307
2006	245,509	171,670	198,361	2,653,454	25,213,754	10,420,393	11,348,284	12,269,861
2007	396,347	239,684	158,846	3,903,306	21,512,733	11,109,297	16,196,141	17,629,844
2008	483,579	470,598	410,276	6,041,545	42,637,409	18,154,824	21,968,329	25,377,259
2009	395,081	463,302	492,754	5,370,298	48,465,589	20,289,196	23,195,485	26,654,702
2010	318,856	373,914	397,685	4,395,558	36,288,206	15,988,572	18,280,959	21,011,302
2011	521,874	414,700	452,511	7,027,152	45,800,983	20,241,516	24,773,972	24,588,803
2012	540,754	428,969	478,336	7,258,045	43,225,612	20,841,549	25,441,077	25,232,575
2013	590,035	470,850	537,926	7,935,760	56,492,626	23,353,797	28,704,144	28,466,198
2014	633,199	505,673	593,420	8,499,285	51,044,244	25,409,730	31,361,633	31,097,513
2015	649,348	513,314	625,018	8,622,909	57,254,849	25,903,675	32,015,732	31,748,165
2016	662,158	518,585	652,549	8,708,223	64,935,254	26,442,269	32,815,769	32,556,414
2017	660,184	511,059	662,509	8,586,420	58,516,881	26,109,608	32,437,334	32,189,632
2018	684,340	525,913	705,921	8,826,799	56,646,922	26,619,126	32,929,517	32,651,061
2019	706,766	538,973	748,398	9,038,125	67,265,511	28,368,013	35,629,238	35,393,152
2020	677,790	509,300	724,929	8,557,934	59,091,545	26,445,185	33,068,967	32,845,977
2021	678,069	508,458	727,139	8,544,337	58,088,885	26,510,898	33,204,383	32,988,204
2022	657,998	491,896	701,252	8,276,329	53,656,763	25,620,960	32,095,748	31,896,590
2023	661,566	494,839	705,852	8,323,952	57,716,975	25,799,293	32,327,069	32,125,900
2024	684,833	514,039	735,860	8,634,643	63,736,280	26,872,514	33,685,193	33,466,484
2025	681,875	511,596	732,044	8,595,134	53,197,202	26,621,674	33,314,030	33,091,435
2026	686,363	515,300	737,834	8,655,064	66,597,222	27,015,059	33,899,345	33,683,151
2027	676,423	507,099	725,014	8,522,332	59,146,482	26,484,720	33,194,990	32,982,787
2028	680,928	510,815	730,824	8,582,502	60,664,940	26,659,368	33,401,472	33,183,980
2029	672,606	503,950	720,093	8,471,390	57,624,134	26,298,999	32,955,128	32,745,061
2030	677,810	508,244	726,803	8,540,853	60,459,261	26,532,664	33,249,344	33,035,090
2031	668,912	500,902	715,327	8,422,048	53,244,282	25,561,160	31,750,199	31,512,772
2032	681,696	511,450	731,817	8,592,762	60,513,854	26,988,014	33,956,755	33,754,332
2033	714,614	538,611	774,267	9,032,275	61,550,682	27,773,195	34,601,871	34,335,435
2034	689,362	517,775	741,702	8,695,120	59,942,852	27,334,927	34,394,019	34,185,562
2035	675,841	506,617	724,262	8,514,567	58,736,304	26,530,839	33,267,053	33,079,149
TOTAL	20,012,558	15,419,661	19,901,816	267,057,580	1,843,119,892	812,845,670	998,289,568	1,006,898,130

- a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.
- b) Power costs for the period 1968 through 1987 are for an interim facility.
- c) 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, Transmission costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant

(in dollars)

Sheet 2 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 2B (EBX)	Reach 3A (EBX)
	Chrisman Pumping P.	Edmonston Pumping P.	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Devil Canyon Powerplant	Greenspot Pumping Plant	Crafton Hills Pumping P.
	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
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	348,235	1,179,787	0	81,484	0	(3,112)	0	0
1973	829,325	2,961,697	0	586,209	0	(956,197)	0	0
1974	993,796	3,522,973	0	566,546	0	(963,572)	0	0
1975	1,340,518	4,675,938	0	587,227	0	(1,125,945)	0	0
1976	1,360,502	4,740,176	0	871,540	0	(1,567,312)	0	0
1977	291,196	977,258	0	275,980	0	(1,262,960)	0	0
1978	1,728,268	6,104,186	0	1,758,473	0	(3,345,147)	0	0
1979	1,612,105	5,564,009	0	1,770,844	0	(3,381,969)	0	0
1980	1,808,192	6,269,482	0	1,769,468	0	(3,508,195)	0	0
1981	2,731,775	9,388,367	0	2,049,947	0	(3,743,153)	0	0
1982	2,557,070	9,355,533	0	1,614,895	0	(3,149,352)	0	0
1983	545,887	1,827,188	0	301,180	0	(5,905,161)	0	0
1984	1,044,264	3,507,659	0	633,223	0	(7,865,341)	0	0
1985	2,994,227	10,459,919	0	1,140,057	0	(10,664,136)	0	0
1986	5,062,706	17,643,403	(1,080,970)	2,482,042	0	(12,235,312)	0	0
1987	4,119,308	14,361,151	(1,062,392)	1,822,523	0	(10,871,342)	0	0
1988	4,724,696	16,562,202	(810,907)	2,373,442	0	(14,772,519)	0	0
1989	7,936,397	27,756,045	(822,973)	4,130,250	0	(19,098,882)	0	0
1990	14,254,357	50,152,078	(845,641)	6,810,694	0	(21,336,948)	0	0
1991	3,363,863	12,019,190	(351,262)	1,306,263	0	(5,781,948)	0	0
1992	2,503,167	8,677,102	(997,736)	1,116,809	0	(9,903,370)	0	0
1993	(1,018,142)	(3,558,718)	(84,856)	(370,935)	0	(7,956,659)	0	0
1994	5,337,101	18,723,854	(93,031)	2,529,462	0	(12,122,861)	0	0
1995	1,948,905	6,847,537	(1,297,179)	951,513	0	(10,256,635)	0	0
1996	5,156,434	18,332,558	(2,959,744)	2,725,712	(941,959)	(13,155,960)	0	0
1997	6,217,434	22,057,503	(2,876,697)	3,431,693	(1,932,337)	(13,519,660)	0	0
1998	(673,122)	(2,350,976)	(2,244,105)	(439,496)	(1,385,473)	(10,955,475)	0	0
1999	3,232,010	12,564,772	(2,811,928)	1,779,376	(2,482,354)	(14,772,635)	0	0
2000	6,993,104	25,232,758	(5,129,549)	3,969,325	(4,429,149)	(25,856,637)	0	0
2001	34,362,260	126,969,965	(3,298,048)	19,044,251	(3,649,034)	(19,498,071)	0	0
2002	19,684,736	73,074,996	(4,926,146)	10,767,871	(5,255,302)	(24,635,887)	0	0
2003	25,395,240	93,471,977	(3,431,664)	14,896,580	(6,760,773)	(28,000,328)	0	0
2004	28,967,905	106,508,267	(6,227,543)	16,646,955	(7,691,607)	(31,217,777)	75,708	66,415
2005	28,966,891	102,884,711	(6,140,331)	18,267,341	(6,778,759)	(30,592,888)	68,161	47,906
2006	26,736,475	98,356,120	(4,091,143)	18,491,176	(6,391,206)	(34,897,387)	145,736	159,676
2007	38,437,208	141,214,996	(3,065,445)	20,270,753	(6,098,250)	(29,208,525)	268,907	256,246
2008	53,648,549	191,639,646	(7,419,717)	35,040,468	(4,009,864)	(35,844,853)	544,807	675,558
2009	56,224,837	200,786,392	(5,621,200)	37,811,973	(8,263,600)	(31,442,500)	652,221	813,965
2010	44,314,996	158,472,930	(7,209,800)	29,115,481	(8,722,500)	(32,270,000)	479,438	598,335
2011	57,610,478	215,986,661	(5,676,281)	32,337,855	(6,650,250)	(32,188,175)	550,577	687,114
2012	59,118,447	221,618,381	(5,769,388)	33,900,159	(6,829,725)	(32,405,200)	550,577	687,114
2013	66,769,573	250,365,643	(5,758,155)	38,208,617	(6,846,000)	(32,831,750)	550,577	687,114
2014	72,993,328	273,745,894	(5,782,172)	41,234,910	(6,862,800)	(32,782,050)	550,577	687,114
2015	74,534,997	279,542,997	(5,871,801)	42,761,891	(7,063,725)	(33,390,200)	550,577	687,114
2016	76,460,199	286,805,981	(5,934,499)	44,100,528	(7,156,875)	(34,005,575)	550,577	687,114
2017	75,599,269	283,587,303	(5,889,990)	43,304,112	(7,174,350)	(33,978,600)	550,577	687,114
2018	76,668,889	287,555,403	(5,952,829)	44,771,198	(7,497,975)	(34,012,075)	550,577	687,114
2019	83,212,870	312,271,444	(5,999,923)	46,909,035	(7,434,300)	(34,727,425)	550,577	687,114
2020	77,178,043	289,577,862	(5,968,950)	44,257,544	(7,439,925)	(34,666,150)	550,577	687,114
2021	77,521,275	290,882,877	(5,995,458)	44,377,198	(7,505,625)	(34,811,350)	550,577	687,114
2022	74,944,559	281,215,449	(6,023,168)	42,714,305	(7,496,625)	(34,809,700)	550,577	687,114
2023	75,487,315	283,254,913	(6,038,651)	43,098,445	(7,534,575)	(34,804,325)	550,577	687,114
2024	78,654,310	295,143,453	(6,012,989)	45,014,268	(7,548,000)	(34,803,550)	550,577	687,114
2025	77,761,000	291,773,506	(5,984,836)	44,190,291	(7,450,050)	(34,514,225)	550,577	687,114
2026	79,170,901	297,093,871	(6,048,709)	45,505,024	(7,632,075)	(35,124,800)	550,577	687,114
2027	77,511,568	290,853,820	(6,006,644)	44,249,893	(7,471,275)	(34,768,475)	550,577	687,114
2028	77,985,017	292,626,211	(5,985,400)	44,598,592	(7,494,675)	(34,815,075)	550,577	687,114
2029	76,949,499	288,742,406	(5,995,317)	43,953,906	(7,507,125)	(34,810,950)	550,577	687,114
2030	77,634,234	291,312,000	(5,985,494)	44,357,000	(7,494,825)	(34,815,050)	550,577	687,114
2031	74,001,272	277,590,875	(5,989,113)	43,293,315	(7,813,125)	(34,452,000)	550,577	687,114
2032	79,351,399	297,798,550	(6,059,237)	44,731,484	(7,908,300)	(34,774,175)	550,577	687,114
2033	80,676,779	302,666,088	(6,024,927)	47,116,818	(7,942,800)	(34,811,900)	550,577	687,114
2034	80,369,668	301,620,321	(6,054,396)	45,258,668	(7,991,350)	(34,688,400)	550,577	687,114
2035	77,743,829	291,736,345	(6,056,370)	44,449,989	(7,716,375)	(35,001,675)	550,577	687,114
TOTAL	2,332,211,393	8,684,302,885	(223,764,724)	1,347,673,640	(260,244,892)	(1,404,239,461)	15,999,403	19,795,951

TABLE B-3. Power Costs and Credits, Transmission costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant

(in dollars)

Sheet 3 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 4B (EBX) Cherry Valley Pumping P.	Reach 29A Oso Pumping Plant	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 Pumping Plants	
	[17]	[18]	[19]	[20]	[21]	[22]	
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	37,731
1963	0	0	0	0	0	0	56,414
1964	0	0	0	0	0	0	71,745
1965	0	0	0	0	0	0	138,653
1966	0	0	0	0	0	0	189,402
1967	0	0	0	0	0	0	248,881
1968	0	0	0	0	118,578	0	1,979,249
1969	0	0	0	0	76,920	0	1,296,935
1970	0	0	0	0	134,749	0	1,115,566
1971	0	0	0	0	168,689	0	1,500,385
1972	0	157,005	0	(385,696)	213,251	0	4,300,002
1973	0	238,650	0	(1,193,216)	120,014	0	5,369,270
1974	0	286,640	0	(1,823,397)	119,505	0	5,785,555
1975	0	421,687	0	(2,835,302)	92,012	0	6,669,772
1976	0	278,869	0	(2,512,021)	146,530	0	6,674,450
1977	0	17,319	0	(1,701,284)	84,225	0	327,513
1978	0	215,573	0	(2,361,377)	190,745	0	11,252,189
1979	0	122,134	0	(2,752,003)	203,143	0	9,752,263
1980	0	86,893	0	(2,728,494)	182,996	0	8,927,799
1981	0	382,330	0	(2,854,192)	189,573	0	14,811,510
1982	0	444,009	(973,898)	(3,476,126)	182,427	0	13,978,041
1983	0	59,561	(1,314,237)	(3,904,690)	18,936	0	(6,346,070)
1984	0	135,658	(2,285,362)	844,120	117,585	0	(568,150)
1985	0	739,708	(8,476,552)	(19,162,735)	155,931	0	(15,517,771)
1986	0	1,037,512	(6,269,528)	(11,462,662)	317,622	0	10,434,322
1987	0	914,642	(6,757,040)	(11,630,562)	266,825	0	1,749,955
1988	0	951,580	(7,448,747)	(12,677,211)	237,272	0	1,826,082
1989	0	1,543,985	(8,790,866)	(14,657,167)	309,851	0	20,823,882
1990	0	3,032,334	(11,692,826)	(19,863,014)	466,262	0	49,616,226
1991	0	778,874	(5,250,121)	(8,731,129)	17,608	0	4,660,962
1992	0	541,093	(5,955,563)	(9,599,392)	111,742	0	(7,440,605)
1993	0	(244,261)	(4,607,075)	(9,740,511)	(122,190)	0	(29,754,040)
1994	0	1,039,474	(6,228,273)	(10,867,596)	226,378	(1,127)	10,567,408
1995	0	342,312	(3,827,718)	(7,403,219)	261,423	0	(5,229,549)
1996	0	908,180	(5,026,221)	(8,969,945)	321,137	0	14,933,619
1997	0	990,932	(5,184,788)	(9,027,058)	322,753	208,816	18,123,700
1998	0	(66,088)	(1,888,975)	(4,963,075)	(56,675)	(87,016)	(25,947,387)
1999	0	666,901	(5,526,541)	(9,954,674)	156,194	234,077	(6,262,367)
2000	0	1,216,343	(9,464,490)	(17,958,033)	231,346	380,555	(6,759,453)
2001	0	6,445,378	(7,987,833)	(13,981,232)	1,086,309	2,152,324	210,718,677
2002	0	3,834,216	(10,286,902)	(18,455,024)	545,459	1,320,943	89,954,176
2003	0	4,519,298	(10,281,922)	(17,307,974)	641,112	1,482,405	330,019,661
2004	7,027	5,385,468	(12,033,953)	(20,022,179)	661,852	1,718,113	141,094,059
2005	2,519	4,130,683	(8,251,156)	(13,698,272)	829,541	1,669,939	161,776,375
2006	19,624	3,489,643	(7,208,025)	(12,038,160)	850,765	1,672,305	147,816,885
2007	14,485	7,564,612	(11,322,469)	(21,045,663)	1,134,539	2,085,774	211,653,367
2008	140,682	8,739,115	(11,688,872)	(20,484,588)	1,794,103	4,721,123	333,039,977
2009	167,735	8,633,076	(9,310,000)	(16,515,000)	1,948,382	4,787,727	366,000,415
2010	123,300	7,118,877	(10,232,500)	(18,087,500)	1,573,852	3,889,671	266,219,632
2011	141,595	12,365,818	(15,783,600)	(26,489,900)	2,264,824	6,239,963	365,218,190
2012	141,595	12,373,474	(15,166,000)	(25,589,750)	2,336,702	6,454,695	374,867,998
2013	141,595	13,918,366	(15,745,900)	(26,533,450)	2,547,685	7,084,989	439,110,240
2014	141,595	15,349,465	(16,350,900)	(27,474,150)	2,723,114	7,609,082	474,927,704
2015	141,595	15,419,192	(16,195,075)	(27,196,050)	2,761,600	7,724,051	491,740,173
2016	141,595	15,739,959	(16,378,000)	(27,521,050)	2,788,158	7,803,401	511,372,734
2017	141,595	15,696,846	(16,553,625)	(27,844,950)	2,750,241	7,690,117	498,239,286
2018	141,595	15,544,061	(15,866,450)	(26,739,700)	2,825,074	7,913,681	506,178,162
2019	141,595	17,559,068	(17,564,050)	(29,744,150)	2,890,864	8,110,219	554,551,114
2020	141,595	16,044,998	(16,962,875)	(28,605,000)	2,741,373	7,663,627	507,121,460
2021	141,595	16,155,784	(17,103,250)	(28,864,150)	2,737,142	7,650,979	507,675,081
2022	141,595	15,727,148	(17,179,400)	(28,996,400)	2,653,707	7,401,724	484,928,401
2023	141,595	15,807,631	(17,170,050)	(28,980,700)	2,668,532	7,446,018	492,769,285
2024	141,595	16,387,961	(17,174,325)	(28,988,450)	2,765,254	7,734,964	520,882,028
2025	141,595	16,314,747	(17,174,375)	(28,988,500)	2,752,954	7,698,222	504,503,010
2026	141,595	16,425,910	(17,174,325)	(28,988,450)	2,771,611	7,753,965	526,921,547
2027	141,595	16,205,915	(17,206,350)	(29,039,650)	2,730,292	7,630,518	508,308,745
2028	141,595	16,265,072	(17,146,300)	(28,938,450)	2,749,021	7,686,477	513,324,605
2029	141,595	16,085,129	(17,174,300)	(28,988,500)	2,714,431	7,583,139	502,922,965
2030	141,595	16,214,075	(17,174,350)	(28,988,550)	2,736,056	7,647,746	510,552,197
2031	141,595	15,049,909	(16,066,325)	(27,113,650)	2,699,071	7,537,250	482,492,367
2032	141,595	16,913,407	(17,670,050)	(29,942,350)	2,752,216	7,696,018	519,688,928
2033	141,595	16,367,702	(16,256,200)	(27,577,100)	2,885,041	8,104,777	536,108,514
2034	141,595	17,032,373	(17,689,125)	(29,983,550)	2,784,081	7,791,214	526,340,109
2035	141,595	16,235,962	(17,192,050)	(29,116,400)	2,727,873	7,623,291	508,868,337
TOTAL	4,015,248	470,200,187	(624,689,704)	(1,093,220,253)	84,410,188	215,515,757	14,551,510,494

Tables B-4 through B-17 Follow

TABLE B-4. Annual Table A Amounts to Project Water

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	6,215	38,986	45,201
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1999	15,850	39,170	55,020	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2000	16,325	39,620	55,945	48,000	42,000	100,000	210,000	25,000	45,486	70,486
2001	20,725	45,836	66,561	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2002	21,100	46,296	67,396	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2003	21,475	46,756	68,231	78,400	42,000	100,000	220,400	25,000	45,486	70,486
2004	21,850	47,206	69,056	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2005	22,225	47,256	69,481	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2006	22,550	47,306	69,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2007	22,875	47,356	70,231	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2008	23,200	47,406	70,606	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2009	23,525	47,456	70,981	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2010	23,850	47,506	71,356	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2011	24,175	47,556	71,731	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2012	24,500	47,606	72,106	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2013	24,775	47,656	72,431	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2014	25,150	47,706	72,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2015	25,825	47,756	73,581	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2016	26,450	47,756	74,206	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2017	27,075	47,756	74,831	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2018	27,700	47,756	75,456	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2019	28,325	47,756	76,081	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2020	28,925	47,756	76,681	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2021	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2022	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2023	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2024	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2025	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2026	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2027	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2028	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2029	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2030	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2031	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2032	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2033	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2034	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2035	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
TOTAL	1,048,440	2,049,856	3,098,296	3,720,815	2,459,248	6,510,783	12,690,846	1,189,430	2,218,494	3,407,924

a) Table A quantities for the South Bay area were supplied by non-Project water for the period June 1962 through November 1967. Actual delivery quantities of Project water are shown for 1967.
 b) District's Table A quantities exclude amounts during the period 1968 through 1987 that were supplied by non-Project water.

TABLE B-4. Annual Table A Amounts to Project Water

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[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	3,770	9,548	867,118
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	820,246	933,646	3,700	5,100	97,200	1,091,946
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	28,850	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,313,450
1991	53,411	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,338,011
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	53,370	3,000	134,600	982,460	1,117,060	4,000	5,700	118,500	1,301,630
1997	53,370	3,000	134,600	978,130	1,112,730	4,000	5,700	118,500	1,297,300
1998	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
1999	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
2000	53,370	3,000	134,600	886,130	1,020,730	4,000	5,700	118,500	1,205,300
2001	53,370	3,000	134,600	866,349	1,000,949	4,000	5,700	118,500	1,185,519
2002	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,527	1,182,519
2003	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,127	1,182,119
2004	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2005	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2006	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2007	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2008	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2009	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2010	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2011	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2012	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2013	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2014	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2015	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2016	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2017	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2018	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2019	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2020	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2021	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2022	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2023	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2024	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2025	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2026	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2027	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2028	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2029	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2030	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2031	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2032	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2033	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2034	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2035	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
TOTAL	3,361,478	199,000	7,693,900	52,271,303	59,965,203	403,050	352,822	6,173,823	70,455,376

TABLE B-4. Annual Table A Amounts to Project Water

(in acre-feet)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[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	75,800	17,300	102,600	28,800
1999	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
2000	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2001	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2002	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2003	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2004	141,400	95,200	33,000	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2005	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2006	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2007	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2008	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2009	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2010	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2011	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2012	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2013	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2014	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2015	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2016	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2017	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2018	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2019	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2020	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2021	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2022	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2023	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2024	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2025	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2026	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2027	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2028	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2029	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2030	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2031	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2032	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2033	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2034	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2035	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
TOTAL	7,432,000	4,545,098	4,334,011	321,556	2,476,500	127,210	3,760,043	1,127,720	5,909,177	1,641,322

TABLE B-4. Annual Table A Amounts to Project Water

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	11,538
1968	0	0	0	3,700	0	300	250	550	0	191,500
1969	0	0	0	5,000	0	350	270	620	0	267,395
1970	0	0	0	5,700	0	400	300	700	0	322,600
1971	0	0	0	6,700	0	450	440	890	0	375,590
1972	0	154,772	0	209,423	0	500	470	970	0	741,759
1973	0	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	0	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	0	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	0	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	0	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	0	856,300	0	1,049,584	0	1,200	650	1,850	0	1,818,034
1979	0	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	6,800	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	7,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	8,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	9,800	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,164
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	3,257,736
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	4,079,666
1991	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,126,567
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	0	2,011,500	20,000	2,492,900	9,600	1,200	1,300	12,100	0	4,111,341
1997	0	2,011,500	20,000	2,492,900	9,600	1,200	1,350	12,150	0	4,084,866
1998	0	2,011,500	20,000	2,517,900	9,600	1,200	1,400	12,200	0	4,086,021
1999	2,000	2,011,500	20,000	2,519,900	9,600	2,890	1,450	13,940	0	4,119,646
2000	3,000	2,011,500	20,000	2,565,900	9,600	2,890	1,510	14,000	0	4,121,631
2001	4,000	2,011,500	20,000	2,566,900	9,600	3,500	1,570	14,670	0	4,124,136
2002	4,000	2,011,500	20,000	2,569,900	9,600	3,500	1,630	14,730	0	4,125,031
2003	5,000	2,011,500	20,000	2,570,900	9,600	3,500	1,690	14,790	0	4,126,926
2004	6,000	2,011,500	20,000	2,581,800	9,600	3,500	0	13,100	0	4,127,061
2005	6,500	1,911,500	20,000	2,582,300	9,600	1,200	0	10,800	0	4,125,686
2006	7,000	1,911,500	20,000	2,582,800	9,600	1,200	324	11,124	0	4,126,885
2007	8,650	1,911,500	20,000	2,584,450	9,600	1,200	720	11,520	0	4,129,306
2008	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,020	39,120	0	4,165,931
2009	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,090	39,190	0	4,166,376
2010	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,160	39,260	0	4,166,821
2011	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,240	39,340	0	4,167,276
2012	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,320	39,420	0	4,167,731
2013	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,410	39,510	0	4,168,146
2014	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,500	39,600	0	4,168,661
2015	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,600	39,700	0	4,169,486
2016	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,170,211
2017	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,170,836
2018	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,171,461
2019	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,086
2020	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,686
2021	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2022	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2023	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2024	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2025	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2026	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2027	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2028	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2029	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2030	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2031	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2032	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2033	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2034	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
2035	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,700	39,800	0	4,172,786
TOTAL	748,350	109,260,272	988,000	142,671,259	449,900	826,280	106,474	1,382,654	0	233,706,355

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 1 of 16

Calendar Year	Grizzly Valley Pipeline PC	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT					
		Reach 1	Reach 3A	Reach 3A1 NC	Reach 3B NC (a)	Total	Reach 1		Reach 2 AC	Reach 4 AC	Reach 5	
							FC&WCD	AC			ACWD	FC&WCD
		FC&WCD	SCWA	SCWA	FC&WCD	FC&WCD			ACWD	FC&WCD		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1962	0	0	0	0	0	0	8,412	141	353	0	0	0
1963	0	0	0	0	0	0	10,914	814	917	0	0	0
1964	0	0	0	0	0	0	19,238	248	1,425	0	0	0
1965	0	0	0	0	0	0	15,280	637	1,830	138	0	0
1966	0	0	0	0	0	0	0	2,475	2,537	499	0	0
1967	0	0	0	0	0	0	0	1,527	2,391	862	0	0
1968	0	0	0	0	1,214	1,214	0	1,608	3,799	721	0	5
1969	0	0	0	0	2,687	2,687	0	1,165	3,459	1,851	0	160
1970	70	0	0	0	3,618	3,618	0	1,345	4,558	3,182	0	164
1971	64	0	0	0	2,521	2,521	0	546	1,908	2,403	0	160
1972	505	0	0	0	3,647	3,647	0	1,066	4,605	2,041	1,489	2,777
1973	679	0	0	0	3,792	3,792	0	430	1,123	1,193	0	229
1974	648	0	0	0	4,870	4,870	0	177	0	975	0	162
1975	405	0	0	0	6,840	6,840	0	137	1,783	1,864	0	120
1976	382	0	0	0	7,122	7,122	0	265	7,204	3,384	0	817
1977	303	0	0	0	8,226	8,226	0	210	4,491	2,213	0	524
1978	278	0	0	0	6,034	6,034	0	422	2,426	3,754	0	2,034
1979	329	0	0	0	6,561	6,561	0	197	4,283	5,567	0	3,937
1980	295	0	0	0	6,707	6,707	0	77	3,883	6,686	1,508	0
1981	355	0	0	0	9,001	9,001	0	1,250	4,648	5,273	5,752	1,157
1982	305	0	0	0	1,213	1,213	0	473	3,043	4,406	0	630
1983	262	0	0	0	2,287	2,287	0	179	2,712	1,714	0	50
1984	272	0	0	0	2,923	2,923	0	165	4,219	2,219	0	55
1985	254	0	0	0	4,039	4,039	0	213	5,199	2,060	0	63
1986	317	1,400	0	0	3,519	4,919	0	200	6,052	2,062	0	212
1987	452	1,550	0	0	7,693	9,243	0	218	7,538	2,372	0	285
1988	523	1	9,725	0	5,392	15,118	0	222	8,302	4,681	0	189
1989	486	10	17,246	0	6,195	23,451	0	222	8,051	6,562	0	418
1990	548	3,275	15,856	0	6,940	26,071	0	256	8,160	8,347	0	593
1991	420	3,117	3,855	0	1,380	8,352	0	162	3,676	3,269	0	359
1992	485	5,553	9,220	0	4,001	18,774	0	217	5,177	2,188	0	154
1993	444	14,709	14,471	0	5,286	34,466	0	190	5,843	8,430	1,650	5,964
1994	492	10,343	14,913	0	6,792	32,048	0	132	4,482	5,427	0	822
1995	308	5,452	15,893	0	5,182	26,527	0	278	6,236	7,195	0	955
1996	360	12,930	17,069	0	4,893	34,892	0	277	6,151	5,119	0	388
1997	231	16,029	17,501	0	4,341	37,871	0	138	6,647	6,501	1,323	1,582
1998	0	11,562	18,204	0	5,359	35,125	0	106	3,748	2,493	0	1,277
1999	0	15,191	19,562	0	5,304	40,057	0	148	5,048	8,227	0	1,444
2000	0	15,490	21,525	0	4,958	41,973	0	110	7,464	9,761	0	946
2001	0	14,849	19,737	0	9,345	43,931	0	105	7,822	4,879	0	3,010
2002	0	18,841	19,719	0	6,875	45,435	0	93	7,758	11,619	0	2,446
2003	0	17,260	16,691	9	7,837	41,597	0	108	7,916	11,348	0	2,887
2004	0	20,951	22,051	135	7,999	51,136	0	72	11,754	9,737	0	3,763
2005	0	18,290	19,529	160	7,509	45,488	0	1,430	11,520	10,100	0	1,826
2006	0	16,573	18,943	208	7,581	43,305	0	830	11,546	4,097	0	2,123
2007	0	19,187	27,741	180	11,277	58,385	0	179	10,066	2,563	0	3,107
2008	2,020	13,716	28,129	125	15,400	57,370	0	231	6,690	5,493	0	3,300
2009	2,090	13,716	27,129	125	19,400	60,370	0	231	7,810	10,860	0	3,300
2010	2,160	13,716	33,790	125	19,600	67,231	0	10,531	7,660	10,929	0	3,300
2011	2,240	13,716	33,840	125	19,900	67,581	0	15,031	7,060	10,959	0	3,300
2012	2,320	13,716	33,890	125	20,200	67,931	0	15,831	7,060	10,965	0	3,300
2013	2,410	13,716	33,940	0	25,150	72,806	0	13,260	8,993	25,255	0	4,327
2014	2,500	13,716	33,990	0	25,150	72,856	0	13,260	8,993	25,255	0	4,327
2015	2,600	13,716	34,040	0	25,825	73,581	0	13,260	8,993	25,255	0	4,327
2016	2,700	13,716	34,040	0	26,450	74,206	0	13,260	8,993	25,255	0	4,327
2017	2,700	13,716	34,040	0	27,075	74,831	0	13,260	8,993	25,255	0	4,327
2018	2,700	13,716	34,040	0	27,700	75,456	0	13,260	8,993	25,255	0	3,777
2019	2,700	13,716	34,040	0	28,325	76,081	0	13,260	8,993	25,255	0	4,327
2020	2,700	13,716	34,040	0	28,325	76,081	0	13,260	8,993	25,255	0	4,327
2021	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2022	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2023	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2024	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2025	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2026	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2027	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2028	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2029	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2030	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2031	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2032	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2033	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2034	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
2035	2,700	13,716	34,040	0	29,025	76,781	0	13,260	8,993	25,255	0	4,327
TOTAL	82,812	626,611	1,278,999	1,317	962,635	2,869,562	53,844	368,295	476,872	820,053	11,722	163,265

a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 2 of 16

Calendar Year	SOUTH BAY AQUEDUCT (b) (Continued)					CALIFORNIA AQUEDUCT					
	Reach 6 AC	Reach 7	Reach 8	Reach 9	Total	NORTH SAN JOAQUIN DIVISION					
						Reach 2A					
						FC&WCD	ACWD	ACWD	SCVWD	Total	KCWA
OFWD (c)	(M&I)	(AG)									
	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]
1962	0	0	0	0	8,906	0	0	0	0	0	0
1963	0	0	0	0	12,645	0	0	0	0	0	0
1964	0	0	0	0	20,911	0	0	0	0	0	0
1965	0	1,127	0	15,014	34,026	0	0	0	0	0	0
1966	0	14,864	0	34,538	54,913	0	0	0	0	0	0
1967	0	12,882	0	39,101	56,763	0	0	0	0	0	0
1968	0	24,817	0	70,105	101,055	3,084	0	0	0	0	0
1969	0	813	0	62,264	69,712	3,016	0	0	0	0	0
1970	0	0	0	80,311	89,560	5,911	0	0	0	0	0
1971	0	5,961	0	87,606	98,584	7,212	0	0	0	0	0
1972	0	26,182	0	100,266	138,426	8,166	0	0	0	0	0
1973	0	2,521	0	88,582	94,078	3,214	0	0	0	0	0
1974	0	0	4	88,000	89,318	3,471	0	0	0	0	0
1975	714	393	593	88,000	93,604	3,576	0	0	0	0	0
1976	5,461	13,774	7,526	88,000	126,431	4,112	0	0	0	0	0
1977	5,206	11,284	7,556	76,220	107,704	1,472	0	0	0	0	0
1978	2,348	854	5,009	95,727	112,574	3,906	0	0	0	0	0
1979	5,341	3,430	7,444	91,991	122,190	6,149	0	0	0	0	0
1980	6,144	2,824	6,702	88,000	115,824	5,700	0	0	0	0	0
1981	7,262	7,595	8,570	88,000	129,507	4,300	0	0	0	0	0
1982	4,571	1,776	4,540	88,000	107,439	3,838	0	0	0	0	0
1983	111	0	3,157	86,733	94,656	3,822	0	0	0	0	0
1984	126	0	3,338	88,000	98,122	5,700	0	0	0	0	0
1985	7,537	11,203	7,813	88,000	122,088	5,433	0	0	0	0	0
1986	2,083	5,311	7,068	88,000	110,988	5,107	0	0	0	0	0
1987	12,993	15,488	9,902	88,000	136,796	5,625	0	0	0	0	0
1988	12,436	24,259	9,205	87,961	147,255	4,412	0	0	0	0	0
1989	10,974	17,340	8,702	90,000	142,269	6,091	0	0	300	0	0
1990	15,678	22,149	9,554	91,800	156,537	2,922	0	0	0	0	200
1991	1,945	9,155	3,493	28,200	50,259	141	0	0	0	0	0
1992	6,933	12,621	6,532	42,839	76,661	2,239	0	0	0	0	0
1993	13,208	1,792	6,829	62,065	105,971	2,858	0	0	0	0	0
1994	9,679	3,379	19,532	57,115	100,568	3,071	0	0	0	0	0
1995	15,427	21	17,772	28,756	76,640	5,169	0	0	0	0	0
1996	6,968	1,871	11,591	44,850	77,215	4,904	0	0	0	0	0
1997	12,654	1,876	10,864	60,601	102,186	5,238	0	0	0	0	0
1998	8,347	3,817	11,478	39,610	70,876	4,401	0	0	0	0	0
1999	13,133	5,326	16,226	52,945	102,497	4,871	0	0	0	0	0
2000	16,396	4,498	18,100	78,258	135,533	4,508	0	0	0	0	0
2001	13,593	0	18,004	47,922	95,335	3,592	638	0	0	0	0
2002	17,058	5,112	20,616	58,875	123,577	4,885	773	0	0	0	0
2003	16,684	5,037	12,753	75,981	132,714	4,266	917	0	7	0	0
2004	21,260	4,968	14,916	59,458	125,928	4,629	786	0	38	0	0
2005	16,597	4,139	10,160	52,364	108,136	4,194	1,046	0	299	0	0
2006	19,870	2,708	12,924	64,174	118,272	4,242	1,103	0	321	1,103	0
2007	23,205	8,255	15,107	71,690	134,172	3,567	1,031	0	320	0	0
2008	29,721	9,778	12,015	80,000	147,228	5,300	0	2,960	50	0	0
2009	24,821	7,002	17,597	80,000	151,621	5,700	0	2,960	50	0	0
2010	14,621	7,004	20,646	80,000	154,691	5,700	0	2,960	50	0	0
2011	12,071	7,004	20,646	80,000	156,071	5,700	0	2,960	50	0	0
2012	12,571	7,004	20,646	80,000	157,377	5,700	0	2,960	50	0	0
2013	10,834	6,982	35,018	90,000	194,669	5,700	0	2,960	53	0	0
2014	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2015	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2016	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2017	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2018	17,760	6,982	35,018	90,000	201,045	5,700	0	2,960	53	0	0
2019	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2020	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2021	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2022	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2023	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2024	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2025	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2026	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2027	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2028	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2029	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2030	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2031	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2032	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2033	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2034	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
2035	18,731	6,982	35,018	90,000	202,566	5,700	0	2,960	53	0	0
TOTAL	847,692	499,800	1,230,544	5,473,922	9,946,009	332,214	6,294	82,880	2,454	300	200

b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

c) Includes 425 AF of 1988 advance allocation and 141 AF of 1992 advance allocation.

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 3 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SAN LUIS									
	Reach 3					Reach 4				
	MWDSC [24]	DRWD [25]	SCVWD [26]	KCWA		KCWA		DRWD [31]	TLBWSD [32]	
(M&I) [27]				(AG) [28]	(M&I) [29]	(AG) [30]				
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	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	0	0	0	0	0	0	0	0	0	
1989	0	602	0	0	0	0	12,647	1,898	0	
1990	0	0	0	0	0	0	0	0	1,500	
1991	0	0	0	0	0	0	0	0	0	
1992	0	0	0	0	0	0	0	0	0	
1993	0	0	0	0	0	0	0	0	0	
1994	0	0	0	0	0	0	0	0	0	
1995	0	0	0	0	0	0	3,500	14,446	0	
1996	0	0	0	0	0	1,125	4,162	0	0	
1997	11,100	0	0	0	0	0	0	0	0	
1998	(11,100)	0	0	0	0	0	0	0	0	
1999	0	0	0	0	0	0	0	0	1,300	
2000	0	0	0	3,320	57,825	1,517	(11,928)	0	0	
2001	0	0	30,000	8,790	131,452	0	0	0	0	
2002	0	0	0	21,050	50,346	0	0	0	0	
2003	29,596	0	0	0	151,044	0	1,351	0	0	
2004	0	0	0	0	44,877	0	0	0	0	
2005	50,000	0	8,804	0	109,712	0	7,000	0	0	
2006	0	0	0	0	19,575	0	0	0	0	
2007	0	0	0	71,567	67,533	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	
2011	0	0	0	0	0	0	0	0	0	
2012	0	0	0	0	0	0	0	0	0	
2013	0	0	0	0	0	0	0	0	0	
2014	0	0	0	0	0	0	0	0	0	
2015	0	0	0	0	0	0	0	0	0	
2016	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
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	79,596	602	38,804	104,727	632,364	2,642	16,732	16,344	2,800	

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 4 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)											
	Reach 5						Reach 6					
	DRWD	KCWA		MWDSC	CLWA	TLBWSD	OFWD	CK	KCWA		MWDSC	TLBWSD
(M&I)		(AG)	(M&I)						(AG)			
[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	
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	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	1,550	0	0	0	0	0	0
1989	0	0	18,831	0	0	0	0	0	0	8,260	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	10,823	0	0	0	0	0	0	0	0	0	0	0
1993	27,200	0	28,200	0	5,095	1,624	2,000	0	0	31,200	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	21,776	0	0	0	0	0	0	3,932	0	0
1996	0	1,125	81,507	0	0	4,000	0	0	0	0	0	0
1997	0	9,080	154,940	0	0	3,500	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	20,400	33,340	0	3,000
1999	0	0	0	21,500	0	8,000	0	0	0	33,776	11,000	23,000
2000	0	8,130	57,647	0	0	0	0	0	1,457	35,847	0	3,000
2001	0	0	0	0	0	2,457	0	0	0	0	0	600
2002	0	0	0	0	0	3,000	0	0	0	0	0	0
2003	0	0	0	0	0	3,900	0	0	0	0	0	0
2004	0	0	0	0	0	3,850	0	0	0	0	0	0
2005	0	0	0	0	0	1,000	0	6,954	0	0	0	0
2006	0	0	0	0	0	3,000	0	2,659	0	0	0	0
2007	0	0	0	0	0	3,600	0	3,119	0	0	0	0
2008	0	0	0	0	0	0	0	5,200	0	0	0	0
2009	0	0	0	0	0	0	0	5,200	0	0	0	0
2010	0	0	0	0	0	0	0	5,200	0	0	0	0
2011	0	0	0	0	0	0	0	5,200	0	0	0	0
2012	0	0	0	0	0	0	0	5,200	0	0	0	0
2013	0	0	0	0	0	0	0	5,200	0	0	0	0
2014	0	0	0	0	0	0	0	5,200	0	0	0	0
2015	0	0	0	0	0	0	0	5,200	0	0	0	0
2016	0	0	0	0	0	0	0	5,200	0	0	0	0
2017	0	0	0	0	0	0	0	5,200	0	0	0	0
2018	0	0	0	0	0	0	0	5,200	0	0	0	0
2019	0	0	0	0	0	0	0	5,200	0	0	0	0
2020	0	0	0	0	0	0	0	5,200	0	0	0	0
2021	0	0	0	0	0	0	0	5,200	0	0	0	0
2022	0	0	0	0	0	0	0	5,200	0	0	0	0
2023	0	0	0	0	0	0	0	5,200	0	0	0	0
2024	0	0	0	0	0	0	0	5,200	0	0	0	0
2025	0	0	0	0	0	0	0	5,200	0	0	0	0
2026	0	0	0	0	0	0	0	5,200	0	0	0	0
2027	0	0	0	0	0	0	0	5,200	0	0	0	0
2028	0	0	0	0	0	0	0	5,200	0	0	0	0
2029	0	0	0	0	0	0	0	5,200	0	0	0	0
2030	0	0	0	0	0	0	0	5,200	0	0	0	0
2031	0	0	0	0	0	0	0	5,200	0	0	0	0
2032	0	0	0	0	0	0	0	5,200	0	0	0	0
2033	0	0	0	0	0	0	0	5,200	0	0	0	0
2034	0	0	0	0	0	0	0	5,200	0	0	0	0
2035	0	0	0	0	0	0	0	5,200	0	0	0	0
TOTAL	38,023	18,335	362,901	21,500	5,095	39,481	2,000	158,332	21,857	146,355	11,000	29,600

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 5 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION												
	Reach 7						Reach 8C						
	KCWA		CLWA	DRWD	TLBWSD	MWDSC	CK	KCWA		DRWD	TLBWSD	EWSID	CK
(M&I)	(AG)	(M&I)						(AG)					
[45]	[46]	[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	[56]	[57]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	25,100	1,978	900
1969	0	0	0	0	0	0	0	0	0	0	7,081	56	100
1970	0	0	0	0	0	0	0	0	0	0	0	3,942	0
1971	0	0	0	0	0	0	0	0	0	0	80,906	5,990	3,700
1972	0	0	0	0	0	0	0	0	0	0	144,843	5,795	1,400
1973	0	0	0	0	0	0	0	0	0	0	26,317	3,000	1,500
1974	0	0	0	0	0	0	0	0	0	0	32,603	3,000	1,500
1975	0	0	0	0	0	0	0	0	0	0	41,536	3,000	1,600
1976	0	0	0	0	0	0	0	0	0	0	26,595	3,000	1,600
1977	0	0	0	0	0	0	0	0	0	0	12,984	738	1,530
1978	0	0	0	0	0	0	0	0	0	0	3,934	454	2,070
1979	0	0	0	0	0	0	0	0	0	0	74,758	1,739	2,000
1980	0	0	0	0	0	0	0	0	0	0	35,140	894	2,200
1981	0	0	0	0	0	0	0	0	0	0	50,888	5,859	2,300
1982	0	0	0	0	0	0	0	0	0	0	4,405	361	1,536
1983	0	0	0	0	0	0	0	0	0	0	1,001	0	3,550
1984	0	0	0	0	0	0	0	0	0	0	3,677	0	3,100
1985	0	0	0	0	0	0	0	0	0	0	68,638	5,197	3,400
1986	0	0	0	0	0	0	0	0	0	0	40,017	1,170	3,700
1987	0	0	0	0	0	0	0	0	0	0	30,359	2,525	4,000
1988	0	0	0	0	0	0	0	0	0	0	46,281	3,475	4,000
1989	0	5,262	0	0	0	0	0	0	2,391	0	63,703	3,000	4,000
1990	0	0	0	0	0	0	0	0	0	0	23,504	1,279	2,000
1991	0	0	0	0	0	0	0	0	0	0	1,697	221	1,800
1992	0	0	0	0	0	0	0	0	280	0	15,982	1,354	1,800
1993	18,157	10,043	0	0	0	0	0	0	0	0	57,112	2,741	4,000
1994	0	0	2,100	0	0	0	0	0	0	0	21,510	1,666	2,116
1995	10,875	20,595	0	0	0	0	0	989	10,527	0	40,934	1,631	4,000
1996	3,424	69,704	0	0	0	0	0	0	1,500	95	84,130	1,868	4,000
1997	27,079	32,463	0	0	0	0	0	0	1,500	0	9,467	0	0
1998	3,998	62,081	0	200	0	0	0	0	1,000	90	8,956	542	15
1999	7,923	19,500	0	0	4,470	500	0	0	400	86	90,334	3,176	4,000
2000	0	20,970	1,200	0	17,519	20,000	0	0	400	166	63,842	1,799	3,600
2001	0	0	0	0	0	0	0	0	0	0	23,300	1,360	1,560
2002	0	0	0	0	12,067	0	0	0	0	14	34,009	1,405	2,854
2003	0	0	0	0	15,103	0	0	0	0	0	25,317	1,436	3,692
2004	0	0	0	0	0	0	0	0	0	0	30,546	3,562	5,803
2005	0	0	0	0	4,000	0	6,904	0	0	0	42,450	3,834	4,057
2006	0	0	0	0	6,000	0	2,500	0	0	0	34,367	3,282	1,105
2007	0	16,214	0	0	2,545	0	0	0	0	0	31,305	2,084	657
2008	0	0	0	0	0	0	0	0	0	0	38,369	3,000	3,800
2009	0	0	0	0	0	0	0	0	0	0	38,370	3,000	3,800
2010	0	0	0	0	0	0	0	0	0	0	31,370	3,000	3,800
2011	0	0	0	0	0	0	0	0	0	0	31,370	3,000	3,800
2012	0	0	0	0	0	0	0	0	0	0	31,370	3,000	3,800
2013	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2014	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2015	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2016	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2017	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2018	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2019	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2020	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2021	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2022	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2023	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2024	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2025	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2026	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2027	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2028	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2029	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2030	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2031	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2032	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2033	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2034	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
2035	0	0	0	0	0	0	0	0	0	0	35,569	3,000	3,800
TOTAL	71,456	256,832	3,300	200	61,704	20,500	9,404	989	15,327	3,122	2,448,464	172,413	201,351

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 6 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SOUTH SAN JOAQUIN DIVISION (continued)										
	Reach 8D						Reach 9				
	KCWA		DRWD	CK	SBC	SLOC	TLBWSD	DRWD	KCWA		TLBWSD
(M&I)	(AG)	(M&I)							(AG)		
[58]	[59]	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	
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	26,360	0	0	0	0	0	0	30,951	0
1969	0	0	31,375	0	0	0	0	0	0	24,489	0
1970	0	0	40,407	0	0	0	3,408	0	0	46,114	1,855
1971	0	0	41,053	0	0	0	41,579	0	0	58,356	0
1972	0	0	42,443	0	0	0	113,550	0	0	75,464	0
1973	0	1,500	22,057	0	0	0	24,147	0	0	54,583	0
1974	0	0	33,390	0	0	0	39,686	0	0	63,814	0
1975	0	0	40,555	0	0	0	44,722	0	0	50,021	0
1976	0	0	41,421	0	0	0	32,216	0	0	53,465	0
1977	0	0	11,153	0	0	0	5,097	0	0	24,668	0
1978	0	0	51,747	0	0	0	8,119	0	0	72,231	0
1979	0	0	38,544	0	0	0	80,363	0	0	74,524	0
1980	0	0	41,000	0	0	0	40,304	0	0	79,946	0
1981	0	0	41,000	0	0	0	32,550	0	0	76,508	0
1982	0	0	41,000	214	0	0	14,146	0	0	76,877	0
1983	0	0	42,900	0	0	0	5	0	2,217	84,573	0
1984	0	0	45,100	0	0	0	2,066	0	4,100	85,732	0
1985	0	0	46,251	0	0	0	41,153	0	0	67,696	0
1986	0	0	50,249	0	0	0	39,338	0	0	79,943	0
1987	0	0	46,288	0	0	0	62,725	0	0	97,732	0
1988	0	0	47,994	0	0	0	48,035	0	1,100	83,858	0
1989	0	0	52,158	0	0	0	63,947	0	0	91,134	0
1990	0	161	36,296	0	0	0	32,066	0	0	83,108	0
1991	0	0	927	0	0	0	483	0	13,683	601	0
1992	0	0	12,667	0	0	0	30,746	0	28	40,183	0
1993	0	0	23,221	0	0	0	65,732	197	5,945	53,597	0
1994	0	1,726	28,793	0	0	0	40,852	0	0	44,994	0
1995	2,959	27,270	45,240	0	0	0	57,435	0	0	64,076	0
1996	0	1,455	52,722	0	0	100	148,745	0	2,236	89,291	0
1997	0	0	57,496	0	0	100	9,402	4,900	0	72,013	0
1998	0	20,000	49,435	0	0	0	8,721	0	0	57,530	0
1999	0	9,000	58,290	0	0	0	162,631	0	0	72,734	0
2000	0	0	57,920	0	0	0	113,952	0	2,000	71,562	0
2001	0	6,089	39,801	0	0	0	58,369	0	0	54,198	0
2002	0	7,522	48,179	0	0	0	47,426	0	0	60,957	0
2003	0	8,350	45,732	0	0	0	61,521	0	0	54,724	0
2004	0	4,979	45,823	3,250	0	0	55,625	0	0	54,330	0
2005	0	0	58,627	1,891	0	0	92,552	0	0	53,206	0
2006	0	0	61,410	3,266	0	0	64,840	0	0	56,909	0
2007	0	7,740	39,974	1,921	0	0	49,633	0	0	66,018	0
2008	0	0	49,343	0	0	0	57,553	0	0	70,300	0
2009	0	0	57,343	0	0	0	57,552	0	0	76,300	0
2010	0	0	57,343	0	0	0	57,552	0	0	76,300	0
2011	0	0	57,343	0	0	0	57,552	0	0	76,300	0
2012	0	0	57,343	0	0	0	57,552	0	0	76,300	0
2013	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2014	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2015	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2016	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2017	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2018	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2019	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2020	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2021	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2022	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2023	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2024	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2025	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2026	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2027	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2028	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2029	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2030	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2031	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2032	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2033	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2034	0	0	57,343	0	0	0	53,353	0	0	75,270	0
2035	0	0	57,343	0	0	0	53,353	0	0	75,270	0
TOTAL	2,959	95,792	3,234,602	10,542	0	200	3,352,767	5,097	31,309	4,609,420	1,855

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 7 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A									
	KCWA		DRWD	AC		CLWA	SCVWD	ACWD	MWDSC	TLBWS
(M&I)	(AG)	FC&WCD								
[70]	[71]	[72]	[73]	[74]	[75]	[76]	[77]	[78]		
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	2,842
1970	0	158	0	0	0	0	0	0	0	4,315
1971	0	9,973	0	0	0	0	0	0	0	0
1972	0	5,876	0	0	0	0	0	0	0	0
1973	0	22,948	0	0	0	0	0	0	0	0
1974	10,019	22,719	0	0	0	0	0	0	0	0
1975	2,791	72,121	0	0	0	0	0	0	0	0
1976	74	50,444	0	0	0	0	0	0	0	0
1977	201	34,451	0	0	0	0	0	0	0	0
1978	0	161,889	0	0	0	0	0	0	0	0
1979	285	153,245	0	0	0	0	0	0	0	0
1980	3,780	131,836	0	0	0	0	0	0	0	0
1981	341	133,500	0	0	0	0	0	0	0	0
1982	4,700	164,832	0	0	0	0	0	0	0	0
1983	0	146,493	0	0	0	0	0	0	0	0
1984	6,910	150,302	0	0	0	0	0	0	0	0
1985	6,495	153,473	0	0	0	0	0	0	0	0
1986	5,065	198,099	0	0	0	0	0	0	0	0
1987	900	228,521	0	0	0	0	0	0	0	0
1988	9,529	212,495	0	0	0	0	0	0	0	0
1989	21,038	251,979	0	0	0	0	0	0	0	0
1990	25,189	47,472	0	0	0	0	0	0	0	0
1991	1,142	6,820	0	0	0	0	0	0	0	0
1992	3,685	89,390	0	0	0	0	0	0	0	0
1993	775	233,862	0	0	0	0	0	44,496	0	0
1994	5,227	126,792	0	0	0	0	0	0	0	0
1995	366	229,448	0	0	0	0	0	50,000	0	0
1996	6,666	199,854	0	0	0	45,000	6,200	95,000	0	0
1997	3,577	157,385	900	0	0	35,000	10,000	125,000	0	0
1998	2,603	163,587	0	1,970	0	23,800	3,780	39,500	0	0
1999	1,657	190,787	0	22,910	0	30,000	16,100	75,850	0	0
2000	16,880	274,000	0	23,940	0	23,730	13,380	9,208	0	0
2001	160	98,175	0	5,000	0	0	0	0	0	0
2002	7,645	163,998	0	14,287	24,000	3,311	2,083	0	0	0
2003	2,648	172,243	0	6,500	0	33,000	18,800	70,940	0	0
2004	65,743	122,099	0	5,740	32,522	0	8,000	0	0	0
2005	22,087	210,578	0	0	0	55,448	28,422	31,210	0	0
2006	0	237,623	5,000	5,740	0	64,036	27,447	0	0	0
2007	0	203,794	3,000	717	0	3,892	1,029	0	0	0
2008	0	201,460	0	5,200	0	10,000	18,207	0	0	0
2009	0	200,268	0	5,200	0	10,000	15,401	168,300	0	0
2010	0	200,268	0	5,200	0	10,000	12,350	185,550	0	0
2011	0	200,268	0	5,200	0	10,000	12,350	185,550	0	0
2012	0	200,268	0	5,200	0	10,000	12,350	185,550	0	0
2013	0	201,660	0	0	0	10,000	0	247,682	0	0
2014	0	201,660	0	0	0	10,000	0	247,682	0	0
2015	0	201,660	0	0	0	10,000	0	247,682	0	0
2016	0	201,660	0	0	0	10,000	0	247,682	0	0
2017	0	201,660	0	0	0	10,000	0	247,682	0	0
2018	0	201,660	0	0	0	10,000	0	247,682	0	0
2019	0	201,660	0	0	0	10,000	0	247,682	0	0
2020	0	201,660	0	0	0	10,000	0	247,682	0	0
2021	0	201,660	0	0	0	10,000	0	247,682	0	0
2022	0	201,660	0	0	0	10,000	0	247,682	0	0
2023	0	201,660	0	0	0	10,000	0	247,682	0	0
2024	0	201,660	0	0	0	10,000	0	247,682	0	0
2025	0	201,660	0	0	0	10,000	0	247,682	0	0
2026	0	201,660	0	0	0	10,000	0	247,682	0	0
2027	0	201,660	0	0	0	10,000	0	247,682	0	0
2028	0	201,660	0	0	0	10,000	0	247,682	0	0
2029	0	201,660	0	0	0	10,000	0	247,682	0	0
2030	0	201,660	0	0	0	10,000	0	247,682	0	0
2031	0	201,660	0	0	0	10,000	0	247,682	0	0
2032	0	201,660	0	0	0	10,000	0	247,682	0	0
2033	0	201,660	0	0	0	10,000	0	247,682	0	0
2034	0	201,660	0	0	0	10,000	0	247,682	0	0
2035	0	201,660	0	0	0	10,000	0	247,682	0	0
TOTAL	238,178	10,871,973	8,900	112,804	56,522	597,017	205,899	6,962,840	7,157	

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 8 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SOUTH SAN JOAQUIN DIVISION (continued)										
	Reach 11B			Reach 12D		Reach 12E					
	KCWA		DRWD	KCWA		ACWD	AC		CLWA	SCVWD	DRWD
(M&I)	(AG)	(M&I)		(AG)	FC&WCD						
	[79]	[80]	[81]	[82]	[83]	[84]	[85]	[86]	[87]	[88]	[89]
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	24,776	0	0	0	0	0	0	0	0	0
1969	0	64,682	0	0	0	0	0	0	0	0	0
1970	0	72,279	0	0	0	0	0	0	0	0	0
1971	0	63,773	0	0	0	0	0	0	0	0	0
1972	0	72,358	0	0	0	0	0	0	0	0	0
1973	0	67,544	0	0	0	0	0	0	0	0	0
1974	0	87,476	0	0	0	0	0	0	0	0	0
1975	0	85,675	0	0	0	0	0	0	0	0	0
1976	0	85,067	0	0	0	0	0	0	0	0	0
1977	3,981	29,603	0	0	0	0	0	0	0	0	0
1978	0	88,753	0	0	0	0	0	0	0	0	0
1979	484	108,379	0	0	0	0	0	0	0	0	0
1980	3,112	103,207	0	0	0	0	0	0	0	0	0
1981	494	104,395	0	0	0	0	0	0	0	0	0
1982	798	99,081	0	0	0	0	0	0	0	0	0
1983	2,069	94,117	0	0	0	0	0	0	0	0	0
1984	2,349	124,819	0	0	0	0	0	0	0	0	0
1985	10,666	118,646	0	0	0	0	0	0	0	0	0
1986	8,673	124,836	0	0	0	0	0	0	0	0	0
1987	13,074	111,877	0	0	0	0	0	0	0	0	0
1988	13,509	114,031	0	0	0	0	0	0	0	0	0
1989	9,986	127,058	0	0	0	0	0	0	0	0	0
1990	9,319	104,107	0	0	0	0	0	0	0	0	0
1991	6,099	118	0	0	0	0	0	0	0	0	0
1992	7,419	35,093	0	0	0	0	0	0	0	0	0
1993	2,696	72,645	0	0	0	0	0	0	0	0	5,504
1994	3,506	71,202	0	0	0	0	0	0	0	0	0
1995	1,154	97,072	0	0	0	0	0	0	0	1,000	0
1996	1,185	96,250	0	0	0	0	0	0	0	4,131	0
1997	1,111	104,823	0	0	0	0	0	0	0	8,012	1,486
1998	1,311	72,646	0	0	0	0	0	0	0	5,925	24,234
1999	2,127	92,262	0	0	0	0	0	0	0	1,321	62,162
2000	3,793	89,623	1,500	21	0	0	0	0	0	953	159,731
2001	636	73,105	0	41	0	0	0	0	0	0	0
2002	1,457	91,123	0	760	6	0	0	0	0	0	0
2003	1,379	87,174	0	2,431	152	0	0	0	0	0	45,989
2004	1,299	97,722	0	3,419	768	0	0	0	0	1,600	0
2005	824	93,554	0	2,841	644	1,878	3,419	20,000	2,619	1,154	15,384
2006	0	98,417	0	2,513	1,556	0	9,914	20,000	0	0	5,065
2007	4,030	94,334	0	2,164	2,284	0	0	8,200	0	0	5,000
2008	0	90,900	0	6,500	0	0	14,000	20,000	0	0	0
2009	0	87,600	0	6,500	0	0	14,000	10,600	0	0	0
2010	0	87,600	0	6,500	0	0	14,000	8,600	0	0	0
2011	0	87,600	0	6,500	0	0	14,000	7,600	0	0	0
2012	0	87,600	0	6,500	0	0	12,000	5,600	0	0	0
2013	0	89,708	0	6,500	0	0	10,000	0	0	0	0
2014	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2015	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2016	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2017	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2018	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2019	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2020	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2021	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2022	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2023	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2024	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2025	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2026	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2027	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2028	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2029	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2030	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2031	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2032	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2033	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2034	0	103,391	0	6,500	0	0	10,000	0	0	0	0
2035	0	103,391	0	6,500	0	0	10,000	0	0	0	0
TOTAL	118,540	6,249,312	1,500	196,190	5,410	1,878	311,333	100,600	2,619	24,096	324,555

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 9 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 12E		Reach 13B							Reach 14A		Reach 14B	
	KCWA		KCWA		AC FC&WCD	SCVWD	MWDSC	DRWD	TLBWS	KCWA		KCWA	
	(M&I)	(AG)	(M&I)	(AG)						(M&I)	(AG)	(M&I)	(AG)
	[90]	[91]	[92]	[93]	[94]	[95]	[96]	[97]	[98]	[99]	[100]	[101]	[102]
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	9,279	0	4,891	0	0	0	0	0	0	0	0	3
1971	0	28,056	0	0	0	0	0	0	0	0	23,844	0	49,929
1972	0	62,342	0	17,388	0	0	0	0	0	0	26,621	0	77,034
1973	0	13,082	0	9,297	0	0	0	0	0	0	15,328	0	47,040
1974	2,651	4,248	8,038	4,246	0	0	0	0	0	0	7,794	0	32,356
1975	0	10,787	8,538	7,059	0	0	0	0	0	0	10,306	0	27,736
1976	37,519	20,555	5,626	8,855	0	0	0	0	0	0	268	0	35,296
1977	20,280	1,737	0	5,024	0	0	0	0	0	0	8,299	0	13,539
1978	47,133	15,011	21,773	7,601	0	0	0	0	0	0	34,029	0	72,351
1979	50,740	61,567	5,663	17,766	0	0	0	0	0	3,012	27,356	0	59,413
1980	32,039	22,252	0	22,515	0	0	0	0	0	4,312	16,876	0	40,513
1981	59,917	58,470	7,844	14,037	0	0	0	0	0	4,511	13,007	8	42,753
1982	36,139	75,587	0	25,553	0	0	0	0	0	3,735	24,240	184	57,739
1983	0	10,950	0	3,491	0	0	0	0	0	1,168	20,302	0	57,922
1984	63,941	39,929	12,117	26,178	0	0	0	0	0	137	35,369	10	79,179
1985	69,839	84,117	0	67,711	0	0	0	0	0	206	33,103	0	72,855
1986	62,109	51,540	0	66,551	0	0	0	0	0	180	26,384	0	70,864
1987	95,297	86,223	5,609	40,374	0	0	0	0	0	610	30,098	9	67,710
1988	86,390	123,249	9,298	47,167	0	0	0	0	0	622	32,778	19	75,968
1989	83,965	146,544	5,504	57,114	0	0	0	0	0	721	29,292	7	82,201
1990	82,164	38,973	7,645	20,423	0	0	0	0	0	673	26,800	13	81,076
1991	8,842	303	0	0	0	0	0	0	0	768	0	0	0
1992	47,181	57,048	789	17,449	0	0	0	0	0	673	16,238	464	41,143
1993	84,822	285,554	12,798	88,157	0	0	0	0	0	629	17,832	0	62,493
1994	66,188	77,839	2,494	33,148	0	0	0	0	0	2,513	16,760	3,000	54,011
1995	107,130	181,097	8,751	110,685	0	0	0	0	3,500	3	21,234	0	67,391
1996	89,257	134,138	28,063	64,849	0	0	0	0	0	0	26,978	0	85,936
1997	32,061	128,329	43,803	49,312	0	0	0	0	0	0	23,035	0	79,790
1998	28,258	88,998	29,444	40,085	0	0	5,500	0	0	0	15,706	0	58,132
1999	110,161	255,343	12,969	92,998	0	0	0	0	0	0	21,153	0	67,576
2000	78,285	89,702	4,066	98,136	0	0	0	0	0	0	19,264	0	70,585
2001	5,256	46,205	4,044	29,881	0	0	1,733	0	0	1	12,451	0	49,602
2002	39,104	96,231	15,951	55,493	0	0	736	0	0	0	11,161	0	52,762
2003	64,196	87,339	35,239	91,739	0	0	1,865	350	0	0	13,685	0	44,576
2004	52,303	95,893	1,922	73,801	0	0	0	1,657	0	0	13,030	0	52,012
2005	43,835	340,281	21,781	269,631	2,321	9,014	192	14,540	0	0	15,663	0	56,739
2006	82,207	296,316	11,787	196,029	87	0	0	5,670	0	0	17,779	0	65,142
2007	1,179	88,795	0	72,240	0	0	0	2,161	0	0	21,435	0	67,955
2008	88,800	121,094	18,500	86,094	0	0	0	4,000	0	0	20,300	0	70,700
2009	88,800	108,586	18,500	82,250	0	0	0	0	0	0	22,200	0	72,800
2010	88,800	108,586	18,500	82,250	0	0	0	0	0	0	22,200	0	72,800
2011	88,800	108,586	18,500	82,250	0	0	0	0	0	0	22,200	0	72,800
2012	88,800	108,586	18,500	82,250	0	0	0	0	0	0	22,200	0	72,800
2013	85,260	147,842	19,740	84,447	0	0	0	0	0	0	19,500	0	63,700
2014	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2015	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2016	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2017	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2018	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2019	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2020	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2021	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2022	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2023	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2024	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2025	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2026	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2027	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2028	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2029	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2030	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2031	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2032	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2033	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2034	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
2035	85,260	128,162	19,740	104,187	0	0	0	0	0	0	19,500	0	63,700
TOTAL	4,175,368	6,836,753	878,076	4,648,529	2,408	9,014	7,557	30,847	3,500	24,474	1,283,098	3,714	3,946,322

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 10 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION								MOJAVE DIVISION			
	Reach 14C			Reach 15A		Reach 16A			Reach 18A	Reach 19		
	KCWA		MWDSC	KCWA		KCWA		AVEKWA	AVEKWA	MWA	AVEKWA	LCID
	(M&I)	(AG)		(M&I)	(AG)	(M&I)	(AG)					
	[103]	[103]	[104]	[105]	[106]	[107]	[108]	[109]	[110]	[111]	[112]	[113]
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	24,187	0	0	3,552	0	0	0	0	0	0	0
1972	0	35,016	0	0	6,064	0	4,768	0	0	0	0	0
1973	0	19,043	0	0	19,916	0	1,961	0	0	0	0	0
1974	0	12,601	0	0	18,000	3,000	1,564	0	0	0	1,223	0
1975	0	12,783	0	0	35,420	3,200	9,867	0	0	0	7,622	0
1976	0	9,005	0	0	39,551	3,500	11,667	0	3,808	0	23,063	0
1977	0	3,757	0	0	6,158	3,420	685	0	1,231	0	8,927	0
1978	0	24,542	0	0	31,148	7,989	1,655	0	1,321	0	36,333	0
1979	0	22,372	0	0	38,602	2,813	15,808	0	2,098	0	49,910	0
1980	0	19,953	0	0	37,817	2,700	16,145	0	2,610	0	61,534	0
1981	7	18,729	0	0	39,033	2,636	18,156	0	2,340	0	65,690	0
1982	0	26,479	0	0	47,782	1,921	16,577	0	1,669	0	41,127	0
1983	0	26,613	0	0	37,426	1,400	17,907	0	43	0	26,377	0
1984	2	34,996	0	0	49,848	1,338	24,246	0	90	0	22,462	0
1985	0	31,758	0	0	44,078	1,309	16,820	0	8	0	23,440	0
1986	0	34,566	0	0	42,461	1,213	15,559	0	8	0	16,898	0
1987	10	31,019	0	0	34,748	1,665	10,170	0	0	0	15,958	0
1988	1	37,165	0	16	41,978	1,925	8,987	0	0	0	13,471	0
1989	5	37,800	0	2	43,239	2,668	8,649	0	0	0	18,007	0
1990	9	34,174	0	6	36,347	2,819	8,608	0	0	0	17,281	0
1991	0	0	0	0	0	2,588	343	2,000	0	0	728	0
1992	0	18,084	0	0	24,243	2,087	8,275	0	0	0	7,238	0
1993	0	28,103	0	0	27,997	2,494	9,167	0	0	0	13,340	0
1994	1,000	22,624	0	0	29,511	3,011	13,877	0	0	0	19,122	0
1995	0	31,285	0	0	26,134	3,188	15,042	0	0	0	20,222	0
1996	0	38,879	0	0	36,186	2,573	18,142	0	0	0	23,919	0
1997	0	33,512	0	0	36,281	3,997	17,048	0	0	64	28,834	0
1998	0	23,097	0	0	28,712	3,751	17,032	0	0	1,345	22,466	0
1999	0	31,489	0	0	36,801	3,316	24,071	0	0	1,439	30,944	0
2000	0	33,716	0	0	40,063	3,015	20,919	0	0	1,361	34,786	0
2001	0	23,557	0	0	31,192	1,894	13,476	0	0	1,385	24,370	0
2002	0	27,138	0	0	41,552	4,227	14,520	0	0	1,370	14,297	0
2003	0	24,783	12,911	0	36,602	1,168	16,799	0	0	1,285	12,145	0
2004	0	30,313	0	0	40,184	2,239	19,714	0	0	1,223	11,201	0
2005	0	21,979	0	0	39,870	167	18,353	0	11	1,051	11,804	0
2006	1,413	20,193	5,440	0	46,244	279	22,570	0	2,063	1,021	16,375	0
2007	0	24,947	1,881	0	47,390	204	26,229	0	0	1,176	22,472	444
2008	0	27,800	0	0	51,800	3,620	0	0	0	1,385	17,126	0
2009	0	29,500	0	0	53,000	3,790	0	0	0	1,385	17,116	0
2010	0	29,500	0	0	53,000	3,790	3,790	0	0	1,385	17,068	0
2011	0	29,500	0	0	53,000	3,790	0	0	0	1,385	17,878	0
2012	0	29,500	0	0	53,000	3,790	0	0	0	1,385	18,104	0
2013	0	24,500	0	0	49,700	23,100	3,560	0	0	1,235	14,101	0
2014	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2015	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2016	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2017	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2018	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2019	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2020	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2021	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2022	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2023	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2024	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2025	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2026	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2027	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2028	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2029	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2030	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2031	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2032	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2033	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2034	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
2035	0	24,500	0	0	49,700	23,100	3,500	0	0	1,235	14,101	0
TOTAL	2,447	1,639,557	20,232	24	2,629,030	635,794	569,726	2,000	17,300	48,050	1,175,201	444

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 11 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (continued)										
	Reach 20A			Reach 20B		Reach 21			Reach 22A		Reach 22B
	PWD	MWA	AVEKWA	PWD	AVEKWA	LCID	PWD	AVEKWA	AVEKWA	LCID	MWDSC(d)
[114]	[115]	[116]	[117]	[118]	[119]	[120]	[121]	[122]	[123]	[124]	
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	0	0	0	338	0	0	0	0	
1973	0	0	0	0	0	290	0	0	0	(14,800)	
1974	0	0	0	0	0	400	0	0	0	(16,400)	
1975	0	0	420	0	0	520	0	0	0	(18,000)	
1976	0	0	471	0	416	589	0	0	0	(19,600)	
1977	0	0	773	0	271	111	0	0	0	0	
1978	0	0	5,549	0	934	208	0	0	0	(25,384)	
1979	0	0	7,555	0	930	133	0	0	0	(25,063)	
1980	0	0	7,605	0	655	191	0	0	3	(27,884)	
1981	0	0	10,333	0	966	1,270	0	0	46	(31,105)	
1982	0	0	7,313	0	8	0	0	174	0	(34,326)	
1983	0	0	6,253	0	20	38	0	268	0	(37,547)	
1984	0	0	9,558	0	2	1	0	550	0	(40,768)	
1985	1,510	0	11,613	32	217	0	16	1,786	0	(43,989)	
1986	3,041	0	13,808	45	0	163	10	1,735	0	(47,210)	
1987	2,389	0	15,493	1,624	151	1,080	1,366	2,273	5	(50,931)	
1988	366	0	17,117	1,261	281	419	143	3,210	0	(54,652)	
1989	381	0	23,481	7,848	112	971	780	3,591	0	(58,373)	
1990	282	0	25,843	8,292	84	1,747	34	3,988	0	(61,200)	
1991	84	1,391	4,282	3,830	131	522	0	2,427	0	(18,360)	
1992	185	1,310	18,518	3,850	650	251	0	3,859	0	(27,624)	
1993	164	1,514	23,662	7,597	996	734	0	5,098	0	0	
1994	299	1,399	25,250	8,119	124	1,098	0	4,657	0	0	
1995	328	1,227	22,385	6,633	0	480	0	4,679	0	0	
1996	354	1,316	26,979	11,080	0	494	0	5,458	0	0	
1997	313	1,272	27,999	11,548	0	444	0	5,549	0	0	
1998	196	0	25,985	8,557	0	404	0	4,468	0	0	
1999	377	0	32,409	12,901	36	342	0	5,684	0	0	
2000	0	0	37,819	9,060	80	0	0	5,890	5,002	0	
2001	0	0	33,216	10,427	282	0	0	4,989	0	0	
2002	0	0	36,311	18,496	1,662	0	0	5,404	0	0	
2003	0	0	39,532	11,547	2,299	0	0	6,063	0	0	
2004	0	0	40,408	12,139	1,774	0	23	6,995	0	0	
2005	0	0	41,496	11,678	1,336	0	34	5,184	0	5,942	
2006	0	0	53,878	12,487	1,415	0	5	6,653	0	0	
2007	0	0	46,703	19,609	1,349	936	25	7,711	0	0	
2008	300	0	45,804	19,000	1,545	2,300	0	6,225	0	0	
2009	0	0	45,814	21,300	1,545	2,300	0	6,225	0	0	
2010	0	0	45,891	21,300	1,539	2,300	0	6,202	0	0	
2011	0	0	47,006	21,300	1,584	2,300	0	6,388	0	0	
2012	0	0	48,418	21,300	1,634	2,300	0	6,580	0	0	
2013	0	0	48,724	21,300	1,925	2,300	0	5,950	0	0	
2014	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2015	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2016	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2017	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2018	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2019	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2020	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2021	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2022	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2023	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2024	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2025	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2026	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2027	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2028	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2029	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2030	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2031	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2032	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2033	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2034	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
2035	0	0	119,424	21,300	1,925	2,300	0	5,950	0	0	
TOTAL	10,568	9,429	3,609,002	792,760	69,293	78,574	2,436	5,002	275,962	5	(647,274)

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 provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 12 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (continued)									SANTA ANA DIVISION	
	Reach 22B				Reach 23	Reach 24				Reach 26A	
	MWA	CVWD(e)	DWA(e)	AVEKWA(f)	MWA	CLAWA	MWA	MWDSC(e)	SBVMWD	MWDSC(e)	SBVMWD(g)
[125]	[126]	[127]	[128]	[129]	[130]	[131]	[132]	[133]	[134]	[135]	
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	55	0	0	0	0	464	0	0	0	1,275	
1973	0	5,800	9,000	0	0	389	0	0	444	32,426	
1974	0	6,400	10,000	0	14	627	0	0	84,981	16,605	
1975	0	7,000	11,000	0	0	825	0	0	169,960	13,865	
1976	0	7,600	12,000	0	0	1,002	0	0	215,312	12,273	
1977	22	0	0	0	58	1,109	0	0	64,823	24,833	
1978	0	10,084	15,300	0	0	1,209	0	0	297,708	4,055	
1979	4,000	10,063	15,000	0	0	1,260	0	0	260,903	18	
1980	4,000	10,884	17,000	0	0	1,239	0	0	300,345	0	
1981	4,000	12,105	19,000	0	0	1,485	0	0	395,678	16,021	
1982	10,500	13,326	21,000	0	0	1,238	0	0	214,566	8,409	
1983	0	14,547	23,000	0	0	911	0	0	175,288	5,994	
1984	0	15,768	25,000	0	0	1,128	0	0	122,311	5,556	
1985	0	16,989	27,000	0	0	1,422	0	0	147,599	7,390	
1986	0	18,210	29,000	0	0	1,506	0	0	215,265	6,421	
1987	17	19,431	31,500	214	0	1,849	0	0	175,012	18,751	
1988	9	20,652	34,000	0	0	2,006	0	0	247,101	21,386	
1989	0	21,873	36,500	89	200	2,170	0	0	326,217	20,782	
1990	0	23,100	38,100	10	0	1,827	0	0	399,387	18,831	
1991	0	6,930	11,430	0	0	849	2,032	0	107,182	3,661	
1992	42	10,427	17,197	0	0	519	9,334	0	219,524	3,358	
1993	0	0	0	0	0	439	10,000	0	98,291	4,361	
1994	14,634	0	0	0	0	785	819	0	192,979	9,135	
1995	7,495	0	0	0	0	409	0	0	107,299	696	
1996	6,111	0	0	0	0	485	0	0	73,438	6,064	
1997	9,038	0	0	0	0	651	0	0	157,215	9,654	
1998	2,580	0	0	0	0	187	0	0	36,770	1,878	
1999	6,705	0	0	0	0	1,132	0	0	139,752	12,874	
2000	10,019	0	0	0	0	1,194	0	0	326,647	18,399	
2001	3,048	0	0	0	0	1,057	0	0	284,007	26,488	
2002	2,976	0	0	497	0	2,189	0	0	303,127	63,468	
2003	13,150	0	0	0	0	1,563	0	17,249	532,198	27,415	
2004	11,953	0	0	253	0	2,006	0	0	548,854	56,150	
2005	12,169	0	0	0	0	205	341	14,058	515,676	33,977	
2006	32,993	0	0	0	0	641	0	0	404,594	20,000	
2007	18,933	0	0	588	0	1,768	0	710	370,971	10,022	
2008	40,500	0	0	0	0	3,160	0	600	0	0	
2009	36,515	0	0	0	0	3,340	0	600	0	0	
2010	36,515	0	0	0	0	3,460	0	600	0	0	
2011	36,515	0	0	0	0	3,600	0	600	0	0	
2012	36,515	0	0	0	0	3,720	0	600	0	0	
2013	39,375	0	0	0	0	3,720	0	600	0	0	
2014	74,565	0	0	0	0	5,800	0	600	0	0	
2015	74,565	0	0	0	0	5,800	0	600	0	0	
2016	74,565	0	0	0	0	5,800	0	600	0	0	
2017	74,565	0	0	0	0	5,800	0	600	0	0	
2018	74,565	0	0	0	0	5,800	0	600	0	0	
2019	74,565	0	0	0	0	5,800	0	600	0	0	
2020	74,565	0	0	0	0	5,800	0	600	0	0	
2021	74,565	0	0	0	0	5,800	0	600	0	0	
2022	74,565	0	0	0	0	5,800	0	600	0	0	
2023	74,565	0	0	0	0	5,800	0	600	0	0	
2024	74,565	0	0	0	0	5,800	0	600	0	0	
2025	74,565	0	0	0	0	5,800	0	600	0	0	
2026	74,565	0	0	0	0	5,800	0	600	0	0	
2027	74,565	0	0	0	0	5,800	0	600	0	0	
2028	74,565	0	0	0	0	5,800	0	600	0	0	
2029	74,565	0	0	0	0	5,800	0	600	0	0	
2030	74,565	0	0	0	0	5,800	0	600	0	0	
2031	74,565	0	0	0	0	5,800	0	600	0	0	
2032	74,565	0	0	0	0	5,800	0	600	0	0	
2033	74,565	0	0	0	0	5,800	0	600	0	0	
2034	74,565	0	0	0	0	5,800	0	600	0	0	
2035	74,565	0	0	0	0	5,800	0	600	0	0	
TOTAL	2,040,814	251,189	402,027	1,651	272	188,345	22,526	31,307	17,510	8,231,224	542,491

e) 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.

f) 1988 advance allocation.

g.) Includes 1,650 AF recaptured from ground water storage in 1982, 10,000 AF in 1987, and 8,749 AF in 1988. This was water stored under DWR's Ground Water Demonstration Program.

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 13 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SANTA ANA DIVISION (continued)										
	Reach 26A				Reach 28G	Reach 28H			Reach 28J		
	SGVMWD	SGPWA	CVWD(e)	DWA(e)	MWDSC	CVWD	DWA	MWDSC	CVWD	DWA	MWDSC
[136]	[137]	[138]	[139]	[140]	[141]	[142]	[143]	[144]	[145]	[146]	
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	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	18.942	0	0	0	0	0	0
1974	612	0	0	0	0	0	0	0	0	0	0
1975	5,450	0	0	0	0	0	0	0	0	0	251
1976	6,071	0	0	0	0	0	55	0	0	0	2,000
1977	8,996	0	0	0	0	0	43	0	0	0	2,442
1978	7,771	0	0	0	0	0	48	0	0	0	64,054
1979	290	0	0	0	0	0	1,290	0	0	0	94,353
1980	1,085	0	0	0	0	0	3,013	0	0	0	91,532
1981	3,619	0	0	0	0	0	4,365	0	0	0	149,405
1982	12,599	0	0	0	0	0	3,961	0	0	0	155,629
1983	734	0	0	0	0	0	6,645	0	0	0	41,616
1984	7,656	0	0	0	0	0	109,743	0	0	0	5,672
1985	5,028	0	0	0	0	0	182,781	0	0	0	6,538
1986	9,454	0	0	0	0	0	131,439	0	0	0	30,071
1987	10,630	0	0	0	0	0	144,743	0	0	0	26,315
1988	8,948	0	0	0	0	0	199,641	0	0	0	22,209
1989	12,839	0	0	0	0	0	247,430	0	0	0	51,462
1990	16,649	0	0	0	0	0	257,796	0	0	0	36,060
1991	5,399	0	0	0	0	0	38,832	0	0	0	5,958
1992	7,908	0	0	0	0	0	85,341	0	0	0	12,223
1993	14,397	0	23,100	38,100	0	0	61,841	0	0	0	4,588
1994	15,230	0	14,102	23,257	0	0	134,262	0	0	0	4,725
1995	12,922	0	23,100	38,100	0	0	117,762	0	0	0	21,099
1996	15,989	0	62,219	102,622	0	0	144,906	0	0	0	12,418
1997	18,175	0	58,100	53,100	0	0	107,853	0	0	0	47,777
1998	9,310	0	78,100	58,100	0	6,582	7,708	7,708	1,027	4,839	50,411
1999	21,729	0	50,480	58,100	0	0	206,689	0	0	0	8,163
2000	15,140	0	42,323	58,234	0	0	379,713	0	0	0	7,864
2001	2,360	0	9,100	15,010	0	0	260,984	0	0	0	33,414
2002	24,851	0	16,755	27,640	0	0	340,635	0	0	0	41,552
2003	21,934	116	14,443	23,819	0	0	246,485	0	0	0	50,776
2004	12,541	841	15,465	21,190	0	0	357,995	0	0	0	20,437
2005	13,984	692	42,519	49,089	0	0	242,245	0	0	0	114,499
2006	16,284	0	121,100	50,000	0	0	342,734	0	0	0	32,242
2007	10,000	0	66,007	27,253	0	7,221	271,874	2,981	0	0	48,923
2008	28,800	0	84,770	35,000	0	0	102,710	0	0	0	299,197
2009	28,800	0	121,100	50,000	0	0	102,710	0	0	0	299,197
2010	28,800	0	138,350	50,000	0	0	102,710	0	0	0	299,197
2011	28,800	0	138,350	50,000	0	0	102,710	0	0	0	299,197
2012	28,800	0	138,350	50,000	0	0	102,710	0	0	0	299,197
2013	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2014	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2015	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2016	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2017	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2018	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2019	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2020	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2021	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2022	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2023	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2024	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2025	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2026	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2027	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2028	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2029	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2030	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2031	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2032	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2033	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2034	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
2035	28,800	0	138,350	50,000	0	0	81,110	0	0	0	248,457
TOTAL	1,162,984	1,649	4,439,883	2,028,614	18,942	13,803	10,689	7,089,697	1,027	4,839	8,507,174

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 14 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)				
	SANTA ANA DIVISION (continued)				
	Reach EBX1		Reach EBX2C	Reach EBX3A	Reach EBX4B
	MWDSC	SBVMWD	SBVMWD	SBVMWD	SGVMWD
	[148]	[149]	[150]	[151]	[152]
1962	0	0	0	0	0
1963	0	0	0	0	0
1964	0	0	0	0	0
1965	0	0	0	0	0
1966	0	0	0	0	0
1967	0	0	0	0	0
1968	0	0	0	0	0
1969	0	0	0	0	0
1970	0	0	0	0	0
1971	0	0	0	0	0
1972	0	0	0	0	0
1973	0	0	0	0	0
1974	0	0	0	0	0
1975	0	0	0	0	0
1976	0	0	0	0	0
1977	0	0	0	0	0
1978	0	0	0	0	0
1979	0	0	0	0	0
1980	0	0	0	0	0
1981	0	0	0	0	0
1982	0	0	0	0	0
1983	0	0	0	0	0
1984	0	0	0	0	0
1985	0	0	0	0	0
1986	0	0	0	0	0
1987	0	0	0	0	0
1988	0	0	0	0	0
1989	0	0	0	0	0
1990	0	0	0	0	0
1991	0	0	0	0	0
1992	0	0	0	0	0
1993	0	0	0	0	0
1994	0	0	0	0	0
1995	0	0	0	0	0
1996	0	0	0	0	0
1997	0	0	0	0	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	0	0	0	0	0
2001	0	0	0	0	0
2002	0	0	0	0	0
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	147,432	11,832	885	2,614	4,278
2007	94,208	38,151	3,130	2,172	4,008
2008	604,230	102,000	0	0	17,300
2009	501,570	102,000	0	0	17,300
2010	452,150	102,000	0	0	17,300
2011	452,150	102,000	0	0	17,300
2012	452,150	102,000	0	0	17,300
2013	446,777	102,000	0	0	17,300
2014	446,777	102,000	0	0	17,300
2015	446,777	102,000	0	0	17,300
2016	446,777	102,000	0	0	17,300
2017	446,777	102,000	0	0	17,300
2018	446,777	102,000	0	0	17,300
2019	446,777	102,000	0	0	17,300
2020	446,777	102,000	0	0	17,300
2021	446,777	102,000	0	0	17,300
2022	446,777	102,000	0	0	17,300
2023	446,777	102,000	0	0	17,300
2024	446,777	102,000	0	0	17,300
2025	446,777	102,000	0	0	17,300
2026	446,777	102,000	0	0	17,300
2027	446,777	102,000	0	0	17,300
2028	446,777	102,000	0	0	17,300
2029	446,777	102,000	0	0	17,300
2030	446,777	102,000	0	0	17,300
2031	446,777	102,000	0	0	17,300
2032	446,777	102,000	0	0	17,300
2033	446,777	102,000	0	0	17,300
2034	446,777	102,000	0	0	17,300
2035	446,777	102,000	0	0	17,300
TOTAL	12,979,761	2,905,983	4,015	4,786	492,687

TABLE B-5A. Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 15 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	WEST BRANCH									
	Reach 29F	Reach 29H	Reach 30							SBC
	AVEKWA	VCFCD	CVWD	DWA	MWDSC(h)	VCFCD	SBVMWD	CLWA	FC&WCD	
[153]	[154]	[155]	[156]	[157]	[158]	[159]	[160]	[161]		
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	53	0	0	0	71,938	0	0	0	0	
1973	20	0	0	0	155,297	0	0	0	0	
1974	36	0	0	0	209,136	0	0	0	0	
1975	26	0	0	0	374,280	0	0	0	0	
1976	24	0	0	0	420,684	0	0	0	0	
1977	0	0	0	0	122,447	0	0	0	0	
1978	0	0	0	0	171,139	0	0	0	0	
1979	0	0	0	0	145,591	0	0	7	0	
1980	0	0	0	0	164,721	0	0	1,210	0	
1981	0	0	0	0	277,503	0	0	5,761	0	
1982	0	0	0	0	351,362	0	0	9,516	0	
1983	0	0	0	0	157,519	0	0	9,476	0	
1984	0	0	0	0	260,624	0	0	11,477	0	
1985	0	0	0	0	390,696	0	0	12,401	0	
1986	0	0	0	0	379,275	0	0	13,928	0	
1987	0	0	0	0	417,285	0	0	16,167	0	
1988	0	0	0	0	488,265	0	0	18,904	0	
1989	0	0	0	0	589,962	0	0	21,719	0	
1990	0	4,836	0	0	764,380	0	0	22,139	0	
1991	0	988	0	0	257,835	0	0	3,846	1,240	
1992	0	0	0	0	420,849	0	0	14,812	0	
1993	6	0	0	0	437,470	0	0	13,787	0	
1994	0	0	0	0	475,900	0	0	14,919	0	
1995	0	0	0	0	139,882	0	0	17,747	0	
1996	0	0	0	0	267,618	0	0	18,448	0	
1997	11	0	10,240	16,890	271,379	1,850	0	22,842	0	
1998	7	0	0	0	187,277	1,850	0	19,782	0	
1999	0	0	0	0	327,001	1,850	0	28,813	0	
2000	0	2,200	0	0	632,991	1,850	0	31,085	0	
2001	0	0	0	0	444,764	1,850	0	30,701	0	
2002	0	3,148	0	0	723,605	1,850	8,601	42,080	0	
2003	0	3,150	0	0	678,964	1,850	0	51,735	0	
2004	0	4,047	0	0	797,294	1,203	0	47,463	0	
2005	0	0	0	0	538,839	1,665	0	36,747	0	
2006	0	0	0	0	574,679	1,850	0	40,017	0	
2007	0	1,890	0	0	711,831	1,110	0	45,919	0	
2008	0	3,150	0	0	756,693	16,850	0	27,600	0	
2009	0	3,150	0	0	639,723	16,850	0	37,000	0	
2010	0	3,150	0	0	671,893	16,850	0	39,000	0	
2011	0	3,150	0	0	671,893	16,850	0	40,000	0	
2012	0	3,150	0	0	671,893	16,850	0	42,000	0	
2013	0	3,150	0	0	687,474	16,850	0	50,000	0	
2014	0	3,150	0	0	887,474	16,850	0	89,200	0	
2015	0	3,150	0	0	887,474	16,850	0	89,200	0	
2016	0	3,150	0	0	887,474	16,850	0	89,200	0	
2017	0	3,150	0	0	887,474	16,850	0	89,200	0	
2018	0	3,150	0	0	887,474	16,850	0	89,200	0	
2019	0	3,150	0	0	887,474	16,850	0	89,200	0	
2020	0	3,150	0	0	887,474	16,850	0	89,200	0	
2021	0	3,150	0	0	887,474	16,850	0	89,200	0	
2022	0	3,150	0	0	887,474	16,850	0	89,200	0	
2023	0	3,150	0	0	887,474	16,850	0	89,200	0	
2024	0	3,150	0	0	887,474	16,850	0	89,200	0	
2025	0	3,150	0	0	887,474	16,850	0	89,200	0	
2026	0	3,150	0	0	887,474	16,850	0	89,200	0	
2027	0	3,150	0	0	887,474	16,850	0	89,200	0	
2028	0	3,150	0	0	887,474	16,850	0	89,200	0	
2029	0	3,150	0	0	887,474	16,850	0	89,200	0	
2030	0	3,150	0	0	887,474	16,850	0	89,200	0	
2031	0	3,150	0	0	887,474	16,850	0	89,200	0	
2032	0	3,150	0	0	887,474	16,850	0	89,200	0	
2033	0	3,150	0	0	887,474	16,850	0	89,200	0	
2034	0	3,150	0	0	887,474	16,850	0	89,200	0	
2035	0	3,150	0	0	887,474	16,850	0	89,200	0	
TOTAL	183	108,459	10,240	16,890	37,424,279	490,578	8,601	2,821,448	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

(in acre-feet)

Sheet 16 of 16

Calendar Year	CALIFORNIA AQUEDUCT (continued)								TOTAL	GRAND TOTAL
	COASTAL BRANCH									
	Reach 31A				Reach 33A					
	DRWD	CK	KCWA		CLWA	MWDSC	SLOC FC&WCD	SBC FC&WCD		
(M&I)			(AG)							
[162]	[163]	[164]	[165]	[166]		[167]	[168]	[169]	[170]	
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	0	71,657	7,382	0	0	192,188	294,457
1969	0	0	0	0	52,094	9,970	0	0	195,705	268,104
1970	0	0	0	0	71,910	11,739	0	0	276,211	369,459
1971	0	0	0	0	98,481	12,490	0	0	553,081	654,250
1972	0	0	0	0	107,850	13,905	0	0	895,006	1,037,584
1973	0	0	0	0	69,227	9,418	0	0	638,930	737,479
1974	0	0	0	0	68,474	9,700	0	0	783,984	878,820
1975	0	0	0	0	74,516	10,700	0	0	1,129,728	1,230,577
1976	0	0	0	0	78,358	11,700	0	0	1,245,662	1,379,597
1977	0	0	0	0	35,504	5,075	0	0	465,442	581,675
1978	0	0	0	0	81,242	11,362	0	0	1,339,268	1,458,154
1979	0	0	0	0	104,017	19,138	0	0	1,537,075	1,666,155
1980	0	0	0	0	97,497	13,882	0	0	1,413,363	1,536,189
1981	0	0	0	0	97,054	12,700	0	0	1,779,479	1,918,342
1982	0	0	0	0	83,076	12,700	0	0	1,641,571	1,750,528
1983	0	0	0	0	87,859	12,659	0	0	1,089,626	1,186,831
1984	0	0	0	0	119,098	12,741	0	0	1,489,814	1,591,131
1985	0	0	0	0	110,124	12,099	0	0	1,863,544	1,989,925
1986	0	0	0	0	118,298	13,301	0	0	1,882,290	1,998,514
1987	0	0	0	0	116,259	11,821	0	0	1,984,570	2,131,061
1988	0	0	0	0	109,435	11,534	0	0	2,221,538	2,384,434
1989	0	0	0	0	102,156	14,645	0	0	2,686,838	2,853,044
1990	0	0	0	0	103,362	6,440	0	0	2,398,121	2,581,277
1991	0	0	0	0	780	716	0	0	489,489	548,520
1992	0	0	0	0	73,748	5,887	0	0	1,374,775	1,470,695
1993	0	0	0	0	90,764	4,157	0	0	2,173,352	2,314,233
1994	0	0	200	0	77,536	9,422	0	0	1,727,504	1,860,612
1995	0	0	0	0	85,050	9,486	0	0	1,926,835	2,030,310
1996	0	0	0	0	100,578	14,052	0	0	2,429,928	2,542,395
1997	0	0	0	0	97,020	4,870	0	0	2,263,966	2,404,254
1998	0	0	0	0	86,879	3,311	1,099	7,439	1,657,381	1,763,882
1999	0	0	0	0	92,095	4,086	3,743	20,137	2,755,025	2,897,579
2000	0	0	0	0	87,554	8,395	5,662	3,962	3,360,734	3,538,240
2001	0	0	0	0	63,448	1,238	0	4,283	18,946	2,033,996
2002	0	0	0	0	65,055	2,737	0	4,355	2,742,315	2,911,327
2003	0	0	0	0	65,691	4,001	0	4,453	26,988	3,136,285
2004	0	0	0	0	66,498	3,776	0	4,185	29,705	3,291,641
2005	4,684	0	0	0	68,190	2,709	0	4,251	23,344	3,599,377
2006	0	0	0	0	85,214	2,735	0	4,209	23,275	3,526,551
2007	0	49	0	0	93,954	6,071	0	3,776	27,740	3,023,174
2008	0	305	0	0	96,600	0	0	25,000	30,569	3,463,569
2009	0	305	0	0	98,100	0	0	25,000	45,486	3,472,001
2010	0	305	0	0	98,100	0	0	25,000	45,486	3,483,110
2011	0	305	0	0	98,100	0	0	25,000	45,486	3,481,616
2012	0	305	0	0	98,100	0	0	25,000	45,486	3,481,616
2013	0	305	0	0	87,600	6,000	0	25,000	45,486	3,503,036
2014	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2015	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2016	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2017	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2018	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2019	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2020	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2021	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2022	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2023	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2024	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2025	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2026	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2027	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2028	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2029	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2030	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2031	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2032	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2033	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2034	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
2035	0	305	0	0	87,600	6,000	0	25,000	45,486	3,863,889
TOTAL	4,684	8,589	200	5,861,402	489,750	5,662	741,888	1,505,240	176,870,804	189,769,187

TABLE B-5B. Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA ^(b)				CENTRAL COASTAL AREA		
	Napa (a) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	88,000	107,439	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	6,195	17,256	23,451	26,227	26,042	90,000	142,269	0	0	0
1990	6,940	19,131	26,071	33,034	31,703	92,000	156,737	0	0	0
1991	1,380	6,972	8,352	9,411	12,648	28,200	50,259	0	1,240	1,240
1992	4,001	14,773	18,774	14,669	19,153	42,839	76,661	0	0	0
1993	5,286	29,180	34,466	33,635	10,271	62,065	105,971	0	0	0
1994	6,792	25,256	32,048	20,542	22,911	57,115	100,568	0	0	0
1995	5,182	21,345	26,527	30,091	17,793	28,756	76,640	0	0	0
1996	4,893	29,999	34,892	18,903	19,662	89,850	128,415	100	0	100
1997	4,341	33,530	37,871	27,522	24,063	95,601	147,186	1,199	7,439	8,638
1998	5,359	29,766	35,125	17,941	19,075	63,410	100,426	3,592	18,618	22,210
1999	5,304	34,753	40,057	50,910	37,652	82,945	171,507	3,743	20,137	23,880
2000	4,958	37,015	41,973	58,617	35,978	101,988	196,583	3,962	22,741	26,703
2001	9,345	34,586	43,931	34,409	18,004	77,922	130,335	4,283	18,946	23,229
2002	6,875	38,560	45,435	53,261	27,811	62,186	143,258	4,355	27,636	31,991
2003	7,646	33,951	41,597	45,450	36,590	108,981	191,021	4,453	26,968	31,421
2004	8,134	43,002	51,136	52,364	27,884	59,458	139,706	4,165	29,705	33,870
2005	7,669	37,819	45,488	47,512	44,599	128,249	220,360	4,251	23,344	27,595
2006	7,789	35,516	43,305	54,528	43,079	128,210	225,817	4,209	23,275	27,484
2007	11,457	46,928	58,385	40,157	24,391	75,382	139,930	3,776	27,740	31,516
2008	15,525	41,845	57,370	64,685	40,000	90,000	194,685	25,000	30,569	55,569
2009	19,525	40,845	60,370	66,272	40,000	90,000	196,272	25,000	45,486	70,486
2010	19,725	47,506	67,231	66,291	40,000	90,000	196,291	25,000	45,486	70,486
2011	20,025	47,556	67,581	67,671	40,000	90,000	197,671	25,000	45,486	70,486
2012	20,325	47,606	67,931	66,977	40,000	90,000	196,977	25,000	45,486	70,486
2013	25,150	47,656	72,806	72,722	42,000	100,000	214,722	25,000	45,486	70,486
2014	25,150	47,706	72,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2015	25,825	47,756	73,581	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2016	26,450	47,756	74,206	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2017	27,075	47,756	74,831	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2018	27,700	47,756	75,456	79,098	42,000	100,000	221,098	25,000	45,486	70,486
2019	28,325	47,756	76,081	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2020	28,325	47,756	76,081	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2021	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2022	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2023	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2024	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2025	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2026	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2027	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2028	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2029	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2030	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2031	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2032	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2033	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2034	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2035	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
TOTAL	963,952	1,905,610	2,869,562	3,105,176	2,003,687	6,121,576	11,230,439	742,088	1,506,480	2,248,568

a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.
 b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

TABLE B-5B. Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[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	75,444	759,738
1981	41,000	5,859	75,758	615,642	691,400	2,300	4,300	83,438	828,297
1982	41,000	361	47,477	697,823	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	769,696	860,600	3,100	5,700	5,743	920,243
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	117,174	852,731	969,905	4,000	5,625	93,084	1,121,427
1988	47,994	3,475	122,409	887,111	1,009,520	4,000	4,412	95,866	1,165,267
1989	57,049	3,000	123,896	1,022,166	1,146,062	4,000	6,091	127,950	1,344,152
1990	36,296	1,279	127,837	584,611	712,448	2,000	2,922	57,070	812,015
1991	927	221	33,122	8,965	42,087	0	141	2,180	45,556
1992	23,770	1,354	62,326	420,894	483,220	1,806	2,239	46,728	559,117
1993	50,618	2,741	128,316	1,039,614	1,167,930	4,000	4,858	124,468	1,354,615
1994	28,793	1,666	87,139	570,020	657,159	2,116	3,071	62,362	755,167
1995	60,686	1,631	135,415	1,016,114	1,151,529	4,000	5,169	101,869	1,324,884
1996	56,948	1,868	135,654	1,049,409	1,185,063	4,000	4,904	236,875	1,489,658
1997	71,308	0	120,708	987,451	1,108,159	0	5,238	22,369	1,207,074
1998	55,650	542	89,765	768,825	858,590	15	4,401	20,677	939,875
1999	59,697	3,176	138,153	1,039,985	1,178,138	4,000	4,871	289,735	1,539,617
2000	60,539	1,799	122,484	1,055,885	1,178,369	3,600	4,508	198,313	1,447,128
2001	41,548	1,360	21,460	632,831	654,291	1,560	3,592	84,726	787,077
2002	48,915	1,405	90,967	737,864	828,831	2,854	4,885	96,502	983,392
2003	46,082	1,436	107,978	856,252	964,230	3,692	4,266	105,841	1,125,547
2004	49,080	3,562	127,711	716,220	843,931	9,053	4,629	90,021	1,000,276
2005	79,005	3,834	92,581	1,305,400	1,397,981	19,806	4,194	140,002	1,644,822
2006	72,080	3,282	99,302	1,163,567	1,262,869	9,530	4,242	108,207	1,460,210
2007	45,135	2,084	80,175	900,862	981,037	5,746	3,567	87,083	1,124,652
2008	53,343	3,000	117,420	840,008	957,428	9,305	5,300	95,922	1,124,298
2009	57,343	3,000	117,590	833,564	951,154	9,305	5,700	95,922	1,122,424
2010	57,343	3,000	117,590	837,354	954,944	9,305	5,700	88,922	1,119,214
2011	57,343	3,000	117,590	833,564	951,154	9,305	5,700	88,922	1,115,424
2012	57,343	3,000	117,590	833,564	951,154	9,305	5,700	88,922	1,115,424
2013	57,343	3,000	134,600	850,447	985,047	9,305	5,700	88,922	1,149,317
2014	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2015	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2016	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2017	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2018	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2019	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2020	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2021	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2022	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2023	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2024	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2025	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2026	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2027	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2028	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2029	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2030	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2031	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2032	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2033	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2034	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
2035	57,343	3,000	134,600	864,130	998,730	9,305	5,700	88,922	1,163,000
TOTAL	3,368,017	172,413	6,533,573	50,759,715	57,293,288	388,218	334,214	5,947,628	67,503,778

TABLE B-5B. Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency(c)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	7,382	0	0	0	0	0	0	0	0
1969	0	9,970	0	0	0	0	0	0	0	0
1970	0	11,739	0	0	0	0	0	0	0	0
1971	0	12,490	0	0	0	0	0	0	0	0
1972	53	13,905	0	464	0	338	55	0	1,275	0
1973	20	9,418	5,800	389	9,000	290	0	0	32,426	0
1974	1,259	9,700	6,400	627	10,000	400	14	0	16,605	612
1975	8,068	10,700	7,000	825	11,000	520	0	0	13,865	5,450
1976	27,782	11,700	7,600	1,002	12,000	589	0	0	12,273	6,071
1977	11,202	5,075	0	1,109	0	111	80	0	24,833	8,996
1978	44,137	11,362	10,084	1,209	15,300	208	0	0	4,055	7,771
1979	60,493	19,145	10,063	1,260	15,000	133	4,000	0	18	290
1980	72,407	15,092	10,884	1,239	17,000	191	4,000	0	0	1,085
1981	79,375	18,461	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619
1982	50,291	22,216	13,326	1,238	21,000	0	10,500	0	8,409	12,599
1983	32,961	22,135	14,547	911	23,000	38	0	0	5,994	734
1984	32,662	24,218	15,768	1,128	25,000	1	0	0	5,556	7,656
1985	37,064	24,500	16,989	1,422	27,000	0	0	1,558	7,390	5,028
1986	32,449	27,229	18,210	1,506	29,000	163	0	3,096	6,421	9,454
1987	34,089	27,988	19,431	1,849	31,500	1,085	17	5,379	18,751	10,630
1988	34,079	30,438	20,652	2,006	34,000	419	9	1,770	21,386	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	849	11,430	522	3,423	3,914	3,661	5,399
1992	30,265	20,699	10,427	519	17,197	251	10,686	4,035	3,358	7,908
1993	43,102	23,039	23,100	439	38,100	734	11,514	7,761	4,361	14,397
1994	49,153	26,441	14,102	785	23,257	1,098	16,852	8,418	9,135	15,230
1995	47,286	27,233	23,100	409	38,100	480	8,722	6,961	696	12,922
1996	56,356	32,500	62,219	485	102,622	494	7,427	11,434	6,064	15,989
1997	62,393	27,712	68,340	651	69,990	444	10,374	11,861	9,654	18,175
1998	52,926	20,093	85,709	187	70,647	404	3,925	8,752	1,878	9,310
1999	69,073	32,899	50,480	1,132	58,100	342	8,144	13,278	12,874	21,729
2000	83,577	40,680	42,323	1,194	58,234	0	11,380	9,060	18,399	15,140
2001	62,857	31,939	9,100	1,057	15,010	0	4,433	10,427	26,488	2,360
2002	58,171	68,817	16,755	2,189	27,640	0	4,346	18,496	72,069	24,851
2003	60,029	55,736	14,443	1,563	23,819	0	14,435	11,547	27,415	21,934
2004	59,731	83,761	15,465	2,006	21,190	0	13,176	12,162	56,150	12,541
2005	59,831	59,456	42,519	205	49,089	0	13,561	11,712	33,977	13,984
2006	80,384	62,752	121,100	641	50,000	0	34,014	12,492	35,331	16,284
2007	78,823	60,190	73,228	1,768	30,234	1,380	20,109	19,634	54,185	10,000
2008	70,700	47,600	84,770	3,160	35,000	2,300	41,885	19,300	102,600	28,800
2009	70,700	47,600	121,100	3,340	50,000	2,300	37,900	21,300	102,600	28,800
2010	70,700	47,600	138,350	3,460	50,000	2,300	37,900	21,300	102,600	28,800
2011	72,856	47,600	138,350	3,600	50,000	2,300	37,900	21,300	102,600	28,800
2012	74,736	47,600	138,350	3,720	50,000	2,300	37,900	21,300	102,600	28,800
2013	70,700	56,000	138,350	3,720	50,000	2,300	40,610	21,300	102,600	28,800
2014	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2015	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2016	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2017	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2018	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2019	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2020	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2021	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2022	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2023	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2024	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2025	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2026	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2027	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2028	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2029	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2030	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2031	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2032	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2033	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2034	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2035	141,400	95,200	138,350	5,800	50,000	2,300	75,800	21,300	102,600	28,800
TOTAL	5,155,594	3,476,715	4,716,142	188,345	2,463,059	79,023	2,121,091	805,764	3,483,386	1,162,984

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

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (contd.)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
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	1,536,456
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	1,750,862
1983	0	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	0	457,582	0	569,571	108	177	272	557	0	1,591,416
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	863,143	88	459	452	999	0	2,131,608
1988	0	902,564	0	1,056,271	303	385	523	1,211	0	2,385,122
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	0	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	0	391,447	988	442,693	265	328	420	1,013	0	549,113
1992	0	710,313	0	815,658	642	117	485	1,244	0	1,471,454
1993	0	652,190	0	818,737	746	256	444	1,446	0	2,315,235
1994	0	807,866	0	972,337	1,035	329	492	1,856	0	1,861,976
1995	0	436,042	0	601,951	910	203	308	1,421	0	2,031,423
1996	0	593,380	0	888,970	820	257	360	1,437	0	2,543,472
1997	0	721,810	1,850	1,003,254	1,005	185	231	1,421	0	2,405,444
1998	0	410,065	1,850	665,746	1,054	527	0	1,581	0	1,764,963
1999	0	852,617	1,850	1,122,518	1,096	286	0	1,382	0	2,898,961
2000	0	1,541,816	4,050	1,825,853	901	586	0	1,487	0	3,539,727
2001	0	1,023,169	1,850	1,188,690	1,065	513	0	1,578	0	2,174,840
2002	0	1,408,919	4,998	1,707,251	1,181	419	0	1,600	0	2,912,927
2003	116	1,686,973	5,000	1,923,010	1,324	551	0	1,875	0	3,314,471
2004	841	1,724,380	5,250	2,006,653	1,434	1,440	0	2,874	0	3,234,515
2005	692	1,528,045	1,665	1,814,736	1,894	527	0	2,421	0	3,755,422
2006	4,278	1,512,186	1,850	1,931,312	5,342	468	0	5,810	0	3,693,938
2007	4,009	1,504,688	3,000	1,861,248	2,327	956	0	3,283	0	3,219,014
2008	17,300	1,762,830	20,000	2,236,245	4,800	27,500	2,020	34,320	0	3,702,487
2009	17,300	1,711,500	20,000	2,234,440	4,800	27,500	2,090	34,390	0	3,718,382
2010	17,300	1,711,500	20,000	2,251,810	4,800	27,500	2,160	34,460	0	3,739,492
2011	17,300	1,711,500	20,000	2,254,106	4,800	27,500	2,240	34,540	0	3,739,808
2012	17,300	1,711,500	20,000	2,256,106	4,800	27,500	2,320	34,620	0	3,741,544
2013	17,300	1,711,500	20,000	2,263,180	9,600	27,500	2,410	39,510	0	3,810,021
2014	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,500	39,600	0	4,178,911
2015	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,600	39,700	0	4,179,736
2016	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,180,461
2017	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,181,086
2018	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,180,190
2019	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,182,336
2020	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,182,336
2021	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2022	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2023	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2024	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2025	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2026	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2027	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2028	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2029	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2030	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2031	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2032	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2033	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2034	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
2035	17,300	1,911,500	20,000	2,610,350	9,600	27,500	2,700	39,800	0	4,183,036
TOTAL	494,336	81,088,552	599,037	105,834,028	269,627	784,342	82,812	1,136,781	0	190,823,156

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 1 of 10

Calendar Year	NORTH BAY AQUEDUCT											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano County WA				Cordelia Pumping Plant Napa County FC&WCD			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery (a)	Total
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[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)	3,519	3,515
1987	0	0	0	0	0	0	0	0	0	0	7,693	7,693
1988	1	283	15,118	15,402	0	0	9,725	9,725	1	(1)	5,392	5,392
1989	0	758	23,451	24,209	0	0	17,246	17,246	0	(4)	6,195	6,191
1990	0	3	26,071	26,074	0	(634)	15,856	15,222	0	3	6,940	6,943
1991	0	667	8,352	9,019	0	124	3,855	3,979	0	198	1,380	1,578
1992	0	1,643	18,774	20,417	0	0	9,220	9,220	0	0	4,001	4,001
1993	0	1,153	34,466	35,619	0	0	14,471	14,471	0	0	5,286	5,286
1994	0	780	32,048	32,828	0	(6)	14,913	14,907	0	0	6,792	6,792
1995	0	908	26,527	27,435	0	0	15,893	15,893	0	0	5,182	5,182
1996	0	1,354	34,892	36,246	0	0	17,069	17,069	0	0	4,893	4,893
1997	0	1,422	37,871	39,293	0	0	17,501	17,501	0	0	4,341	4,341
1998	0	1,343	35,125	36,468	0	0	18,204	18,204	0	0	5,359	5,359
1999	0	2,522	40,057	42,579	0	0	19,562	19,562	0	0	5,304	5,304
2000	0	1,853	41,973	43,826	0	4	21,525	21,529	0	180	4,958	5,138
2001	0	1,760	43,931	45,691	0	0	19,737	19,737	0	0	9,345	9,345
2002	0	496	45,435	45,931	0	0	19,719	19,719	0	0	6,875	6,875
2003	0	3,991	41,597	45,588	0	0	16,700	16,700	0	0	7,637	7,637
2004	0	2,181	51,136	53,317	0	0	22,186	22,186	0	0	7,999	7,999
2005	0	935	45,488	46,423	0	0	19,689	19,689	0	0	7,509	7,509
2006	0	1,005	43,305	44,310	0	0	19,151	19,151	0	0	7,581	7,581
2007	0	1,189	58,385	59,574	0	0	27,921	27,921	0	0	11,277	11,277
2008	0	51	57,370	57,421	0	0	28,254	28,254	0	5	15,400	15,405
2009	0	51	60,370	60,421	0	0	27,254	27,254	0	5	19,400	19,405
2010	0	51	67,231	67,282	0	0	33,915	33,915	0	5	19,600	19,605
2011	0	51	67,581	67,632	0	0	33,965	33,965	0	5	19,900	19,905
2012	0	51	67,931	67,982	0	0	34,015	34,015	0	5	20,200	20,205
2013	0	51	72,806	72,857	0	0	33,940	33,940	0	5	25,150	25,155
2014	0	51	72,856	72,907	0	0	33,990	33,990	0	5	25,150	25,155
2015	0	51	73,581	73,632	0	0	34,040	34,040	0	5	25,825	25,830
2016	0	51	74,206	74,257	0	0	34,040	34,040	0	5	26,450	26,455
2017	0	51	74,831	74,882	0	0	34,040	34,040	0	5	27,075	27,080
2018	0	51	75,456	75,507	0	0	34,040	34,040	0	5	27,700	27,705
2019	0	51	76,081	76,132	0	0	34,040	34,040	0	5	28,325	28,330
2020	0	51	76,081	76,132	0	0	34,040	34,040	0	5	28,325	28,330
2021	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2022	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2023	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2024	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2025	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2026	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2027	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2028	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2029	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2030	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2031	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2032	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2033	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2034	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030
2035	0	51	76,781	76,832	0	0	34,040	34,040	0	5	29,025	29,030

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

(in acre-feet)

Sheet 2 of 10

Calendar Year	SOUTH BAY AQUEDUCT						CALIFORNIA AQUEDUCT									
	South Bay Pumping Plant						North San Joaquin Division Banks Pumping Plant Transportation Water									
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Conser- vation Water	Total		
				Water Supply (b)	Recreation					Water Supply	Recreation					
	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]		
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1962	9	272	0	8,906	0	9,187	0	0	0	0	0	0	0	0		
1963	71	185	0	12,645	0	12,901	0	0	0	0	0	0	0	0		
1964	171	152	0	20,911	0	21,234	0	0	0	0	0	0	0	0		
1965	93	729	0	34,026	0	34,848	0	0	0	0	0	0	0	0		
1966	0	1,746	0	54,913	0	56,659	0	0	0	0	0	0	0	0		
1967	0	1,677	0	56,763	0	58,440	5,746	1,183	0	11,538	0	18,467	2,957	21,424		
1968	0	1,847	0	101,055	0	102,902	11,079	74,464	0	293,243	0	378,786	531,275	910,061		
1969	3,449	2,668	0	69,712	0	75,829	7,336	44,287	0	265,417	0	317,040	531,185	848,225		
1970	16,279	1,086	(5,355)	89,560	0	101,570	23,947	20,767	(5,355)	365,771	0	405,130	(12,995)	392,135		
1971	0	1,815	8,854	98,584	0	109,253	23,207	(10,754)	8,854	651,665	8	672,980	7,708	680,688		
1972	0	3,557	2,273	138,426	0	144,256	145,066	9,057	(4,285)	1,033,432	6,489	1,189,759	48,300	1,238,059		
1973	0	(33)	(1,510)	94,078	0	92,535	214,941	(4,951)	2,902	733,008	1,155	947,055	55,846	1,002,901		
1974	0	1,287	(10,056)	89,318	0	80,549	247,894	(11,526)	(32,510)	873,302	2,118	1,079,278	54,683	1,133,961		
1975	0	320	8,550	93,604	0	102,474	110,149	(8,092)	16,101	1,223,332	3,377	1,344,867	(102,625)	1,242,242		
1976	0	2,431	1,391	126,431	141	130,394	67,834	5,443	(244,124)	1,372,093	1,745	1,202,991	(442,348)	760,643		
1977	0	2,866	2,685	107,704	112	113,367	0	39,897	(157,543)	573,146	1,111	456,611	(13,507)	443,104		
1978	0	2,165	(11,249)	112,574	126	103,616	67,457	(36,898)	35,129	1,451,842	1,177	1,518,707	752,078	2,270,786		
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	2,299	(1,850)	110,988	130	111,567	0	90,799	20,177	1,993,278	3,865	2,108,119	200,298	2,308,417		
1987	0	2,625	(584)	136,796	137	138,974	0	91,427	(23,116)	2,121,366	7,672	2,197,349	(458,725)	1,738,624		
1988	0	2,884	(698)	147,255	142	149,583	0	107,249	(35,484)	2,368,793	4,889	2,445,447	(303,583)	2,141,864		
1989	0	2,673	3,296	142,269	152	148,390	0	117,603	(38,058)	2,829,107	8,135	2,916,787	421,131	3,337,918		
1990	0	894	1,982	156,537	168	159,581	0	99,059	(290,965)	2,554,658	9,262	2,372,014	(374,027)	1,997,987		
1991	0	2,637	(4,532)	50,259	150	48,514	0	80,106	(79,038)	539,748	4,879	545,695	554,904	1,100,599		
1992	0	2,881	756	76,661	147	80,445	0	91,391	(218,170)	1,451,436	2,605	1,327,262	61,343	1,388,605		
1993	0	1,940	(20,051)	105,971	143	88,003	0	149,372	(273,789)	2,279,323	2,609	2,157,515	849,249	3,006,764		
1994	0	1,981	1,714	100,568	168	104,431	0	148,712	(120,985)	1,828,072	3,803	1,859,602	(324,640)	1,534,962		
1995	0	1,188	(12,333)	76,640	146	65,641	0	173,074	(397,605)	2,003,475	2,575	1,781,519	293,159	2,074,678		
1996	0	981	(1,990)	77,215	150	76,356	0	123,502	78,123	2,507,143	3,902	2,712,670	288,576	3,001,246		
1997	0	1,575	5,016	102,186	155	108,932	527	135,106	(98,334)	2,366,152	2,594	2,406,045	(50,000)	2,356,045		
1998	0	1,551	3,595	70,876	114	76,136	0	91,319	(346,039)	1,728,257	2,107	1,475,644	120,886	1,596,530		
1999	0	2,166	12,313	100,497	139	115,115	0	135,809	(17,569)	2,855,522	4,301	2,978,063	(307,839)	2,670,224		
2000	0	2,346	(20,958)	135,533	145	117,066	0	115,895	(13,232)	3,471,397	5,182	3,579,242	(15,487)	3,563,755		
2001	0	2,784	1,301	95,335	196	99,616	0	222,144	(17,529)	1,903,742	1,978	2,110,335	86,928	2,197,263		
2002	0	2,534	(13,938)	123,577	146	112,319	0	225,032	36,404	2,805,631	4,672	3,071,739	(151,719)	2,920,020		
2003	0	2,920	(1,399)	132,714	131	134,366	0	228,713	(49,580)	3,198,537	11,362	3,387,032	328,334	3,715,366		
2004	0	2,982	(7,240)	125,928	150	121,820	0	40,711	(4,079)	2,979,173	1,337	3,017,142	146,888	3,164,030		
2005	0	2,823	(3,565)	108,136	154	107,548	0	120,419	(163,243)	3,667,721	1,270	3,626,167	571,155	4,197,322		
2006	0	2,989	(9,645)	118,272	169	111,785	0	16,877	(347,981)	3,571,009	1,208	3,241,113	80,098	3,321,211		
2007	0	2,840	14,928	134,172	146	152,086	0	65,369	186,420	2,720,400	830	2,973,019	(388,501)	2,584,518		
2008	0	3,270	185	147,228	400	151,686	0	101,686	178	3,610,797	8,660	3,721,321	(88,628)	3,632,693		
2009	0	3,270	185	151,621	400	155,476	0	101,686	182	3,623,622	8,660	3,734,150	69,276	3,803,426		
2010	0	3,351	0	154,691	400	158,442	0	128,523	4,288	3,637,801	8,660	3,779,272	182,790	3,962,242		
2011	0	3,351	0	156,071	400	159,822	0	128,364	64,678	3,637,687	8,660	3,839,389	137,242	3,976,631		
2012	0	3,351	0	157,377	400	161,128	0	128,100	(67,943)	3,638,993	8,660	3,707,810	(260,827)	3,446,983		
2013	0	3,351	0	194,669	400	198,420	0	128,264	9,749	3,697,705	8,660	3,844,378	145,525	3,989,903		
2014	0	3,351	0	202,566	400	206,317	0	130,280	16,625	4,066,455	8,660	4,222,020	(186,678)	4,035,342		
2015	0	3,351	0	202,566	400	206,317	0	130,445	32,003	4,066,455	8,660	4,237,563	(31,516)	4,206,047		
2016	0	3,351	0	202,566	400	206,317	0	128,415	(28,401)	4,066,455	8,660	4,175,129	205,134	4,380,263		
2017	0	3,351	0	202,566	400	206,317	0	128,602	61,309	4,066,455	8,660	4,265,026	119,885	4,384,911		
2018	0	3,351	0	201,045	400	204,796	0	128,369	(80,817)	4,064,934	8,660	4,121,146	(194,534)	3,926,612		
2019	0	3,351	0	202,566	400	206,317	0	128,613	50,179	4,066,455	8,660	4,253,907	77,224	4,331,131		
2020	0	3,351	0	202,566	400	206,317	0	128,690	(366)	4,066,455	8,660	4,203,439	(6,687)	4,196,752		
2021	0	3,351	0	202,566	400	206,317	0	128,769	10,725	4,066,455	8,660	4,214,609	(1,095)	4,213,514		
2022	0	3,351	0	202,566	400	206,317	0	128,846	(3,483)	4,066,455	8,660	4,200,478	(185,907)	4,014,571		
2023	0	3,351	0	202,566	400	206,317	0	128,818	(18,971)	4,066,455	8,660	4,184,962	115,791	4,300,753		
2024	0	3,351	0	202,566	400	206,317	0	128,625	11,289	4,066,455	8,660	4,215,029	79,858	4,294,887		
2025	0	3,351	0	202,566	400	206,317	0	130,380	(12,518)	4,066,455	8,660	4,192,977	(237,205)	3,945,772		
2026	0	3,351	0	202,566	400	206,317	0	128,700	24,308	4,066,455	8,660	4,228,123	246,850	4,474,973		
2027	0	3,351	0	202,566	400	206,317	0	128,692	(17,799)	4,066,455	8,660	4,186,008	(12,304)	4,173,704		
2028	0	3,351	0	202,566	400	206,317	0	128,783	12,291	4,06						

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 3 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	San Luis Division						South San Joaquin Division					
	Dos Amigos Pumping Plant						Buena Vista Pumping Plant					
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recrea- tion	Water Supply					Recrea- tion		
	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[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	(272,625)	1,407,663	1,514	1,173,902	0	49,205	(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)	593,820	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	2,068,717	0	42,838	139,689	992,606	4,804	1,179,937
1986	0	51,963	19,989	1,877,183	3,426	1,952,561	0	36,751	37,546	1,014,294	3,285	1,091,876
1987	0	64,827	(25,707)	1,978,945	7,121	2,025,186	0	30,495	(25,522)	1,027,361	6,937	1,039,271
1988	0	72,679	(34,592)	2,217,126	4,490	2,259,703	0	38,804	(29,747)	1,244,196	4,360	1,257,613
1989	0	90,090	(29,411)	2,679,845	7,652	2,748,176	0	29,594	(60,826)	1,532,625	7,490	1,508,883
1990	0	115,074	(11,323)	2,394,999	8,922	2,507,672	0	46,865	(15,092)	1,769,991	8,879	1,810,643
1991	0	92,227	9,325	489,348	4,605	595,505	0	39,274	96,506	446,916	4,560	587,256
1992	0	118,796	(225,603)	1,372,536	2,079	1,267,808	0	28,138	(98,271)	920,978	1,995	852,840
1993	0	136,432	(220,537)	2,170,494	1,864	2,088,253	0	14,186	(128,363)	908,200	1,676	796,699
1994	0	152,414	(78,957)	1,724,433	3,098	1,800,988	0	35,083	(88,211)	1,107,122	2,918	1,056,912
1995	0	137,937	(12,473)	1,921,666	1,711	2,048,841	0	33,963	(16,431)	706,742	1,669	725,943
1996	0	45,591	14,927	2,425,024	2,998	2,488,540	0	31,304	15,438	988,612	2,928	1,038,282
1997	527	107,033	(66,814)	2,247,628	2,090	2,290,464	0	42,670	40,852	1,054,461	2,076	1,140,059
1998	0	95,185	(338,076)	1,664,080	1,589	1,422,778	0	41,910	(106,487)	753,731	1,585	690,739
1999	0	95,262	(2,778)	2,750,154	3,285	2,845,923	0	48,502	(2,807)	1,131,826	3,279	1,180,800
2000	0	134,231	7,726	3,270,211	4,222	3,416,390	0	37,514	7,726	1,809,219	4,216	1,858,675
2001	0	150,830	(18,830)	1,615,422	1,218	1,748,640	0	31,361	(18,830)	1,318,987	1,211	1,332,729
2002	0	92,905	50,342	2,625,006	3,968	2,772,221	0	41,565	50,342	1,831,874	3,961	1,927,742
2003	0	85,360	(48,181)	2,879,993	10,656	2,927,828	0	43,352	(48,181)	1,985,852	10,645	1,901,668
2004	0	25,865	3,161	2,807,781	652	2,837,459	0	41,551	3,161	2,102,335	649	2,147,696
2005	0	62,569	(159,678)	3,425,322	581	3,328,794	0	35,019	(159,678)	1,848,012	559	1,723,912
2006	0	(2,205)	(130,258)	3,501,308	504	3,369,349	0	30,271	(120,122)	2,077,130	504	1,987,783
2007	0	56,193	109,739	2,452,077	312	2,618,321	0	43,400	118,196	2,005,912	305	2,167,813
2008	0	73,506	(7)	3,455,259	7,210	3,535,968	0	44,044	(7)	2,390,465	7,010	2,441,512
2009	0	73,506	(3)	3,463,291	7,210	3,544,004	0	44,044	(3)	2,236,830	7,010	2,287,881
2010	0	70,198	4,288	3,474,400	7,210	3,556,096	0	40,736	4,288	2,242,740	7,010	2,294,774
2011	0	70,389	64,678	3,472,906	7,210	3,615,183	0	40,927	64,678	2,242,246	7,010	2,354,861
2012	0	70,279	(67,943)	3,472,906	7,210	3,482,452	0	40,817	(67,943)	2,246,246	7,010	2,226,130
2013	0	70,217	9,749	3,494,323	7,210	3,581,499	0	40,755	9,749	2,193,558	7,010	2,251,072
2014	0	70,525	16,625	3,855,176	7,210	3,949,536	0	41,063	16,625	2,540,668	7,010	2,605,366
2015	0	70,654	32,003	3,855,176	7,210	3,965,043	0	41,192	32,003	2,540,668	7,010	2,620,873
2016	0	70,354	(28,401)	3,855,176	7,210	3,904,339	0	40,892	(28,401)	2,540,668	7,010	2,560,169
2017	0	70,586	61,309	3,855,176	7,210	3,994,281	0	41,124	61,309	2,540,668	7,010	2,850,111
2018	0	70,740	(80,817)	3,855,176	7,210	3,852,309	0	41,278	(80,817)	2,540,668	7,010	2,508,139
2019	0	70,564	50,179	3,855,176	7,210	3,983,129	0	41,102	50,179	2,540,668	7,010	2,638,959
2020	0	70,628	(366)	3,855,176	7,210	3,932,648	0	41,166	(366)	2,540,668	7,010	2,588,478
2021	0	70,711	10,725	3,855,176	7,210	3,943,822	0	41,249	10,725	2,540,668	7,010	2,599,652
2022	0	70,705	(3,483)	3,855,176	7,210	3,929,608	0	41,243	(3,483)	2,540,668	7,010	2,585,438
2023	0	70,696	(18,971)	3,855,176	7,210	3,914,111	0	41,234	(18,971)	2,540,668	7,010	2,569,941
2024	0	70,575	11,289	3,855,176	7,210	3,944,250	0	41,113	11,289	2,540,668	7,010	2,600,080
2025	0	70,638	(12,518)	3,855,176	7,210	3,920,506	0	41,176	(12,518)	2,540,668	7,010	2,576,336
2026	0	70,650	24,308	3,855,176	7,210	3,957,344	0	41,188	24,308	2,540,668	7,010	2,613,174
2027	0	70,563	(17,799)	3,855,176	7,210	3,915,150	0	41,101	(17,799)	2,540,668	7,010	2,570,980
2028	0	70,703	12,291	3,855,176	7,210	3,945,380	0	41,241	12,291	2,540,668	7,010	2,801,210
2029	0	70,630	(9,046)	3,855,176	7,210	3,923,970	0	41,168	(9,046)	2,540,668	7,010	2,579,800
2030	0	70,694	20,756	3,855,176	7,210	3,953,836	0	41,232	20,756	2,540,668	7,010	2,609,666
2031	0	70,566	(97,726)	3,855,176	7,210	3,835,226	0	41,104	(97,726)	2,540,668	7,010	2,491,056
2032	0	70,168	84,999	3,855,176	7,210	4,017,553	0	40,706	84,999	2,540,668	7,010	2,673,383
2033	0	70,373	(94,652)	3,855,176	7,210	3,838,107	0	40,911	(94,652)	2,540,668	7,010	2,493,937
2034	0	69,865	69,593	3,855,176	7,210	4,001,844	0	40,403	69,593	2,540,668	7,010	2,657,674
2035	0	69,205	(242,659)	3,855,176	7,210	3,688,932	0	39,743	(242,659)	2,540,668	7,010	2,344,762

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 4 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	South San Joaquin Division (continued)											
	Teerink Pumping Plant					Chrisman Pumping Plant						
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]	[50]	
1961	0	0	0	0	0	0	0	0	0	0	0	
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	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	198	2	0	0	0	200	0	0	0	0	0	
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	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	28,200	121,904	631,121	674	847,546	65,027	26,705	121,904	599,973	674	814,283
1979	12,302	50,663	(15,299)	625,561	502	637,729	12,302	50,580	(15,299)	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	38,747	37,546	882,300	3,285	961,878	0	41,421	37,546	839,839	3,285	922,091
1987	0	47,815	(25,522)	897,905	6,937	927,135	0	33,195	(25,522)	863,157	6,937	877,767
1988	0	53,815	(29,747)	1,097,643	4,360	1,126,071	0	39,775	(29,747)	1,055,649	4,360	1,070,037
1989	0	49,088	(60,826)	1,382,599	7,490	1,378,351	0	42,307	(60,826)	1,339,358	7,490	1,328,329
1990	0	66,868	(15,092)	1,627,246	8,879	1,687,901	0	56,663	(15,092)	1,590,893	8,879	1,641,343
1991	0	40,564	105,176	446,148	4,560	596,448	0	34,016	105,176	446,148	4,560	589,900
1992	0	31,820	(92,123)	844,376	1,995	786,068	0	34,477	(92,123)	820,133	1,995	794,482
1993	0	27,158	(127,738)	799,143	1,676	700,239	0	28,614	(127,738)	771,146	1,676	673,698
1994	0	50,802	(88,211)	1,007,214	2,918	972,723	0	57,203	(88,211)	977,703	2,918	949,613
1995	0	48,705	(16,431)	586,829	1,669	620,772	0	36,309	(16,431)	560,695	1,669	582,242
1996	0	58,437	15,438	836,819	2,928	913,622	0	43,710	15,438	800,633	2,928	862,709
1997	0	73,656	40,852	918,124	2,076	1,034,708	0	62,275	40,852	881,843	2,076	987,046
1998	0	61,137	(106,487)	656,796	1,585	613,031	0	47,523	(106,487)	628,084	1,585	570,705
1999	0	77,334	(2,807)	1,011,608	3,279	1,089,414	0	55,514	(2,807)	974,807	3,279	1,030,793
2000	0	87,084	7,726	1,685,654	4,216	1,784,680	0	49,690	7,726	1,645,591	4,216	1,707,223
2001	0	71,588	(18,830)	1,234,014	1,211	1,287,983	0	54,742	(18,830)	1,202,822	1,211	1,239,945
2002	0	108,309	50,342	1,740,813	3,961	1,903,425	0	69,443	50,342	1,699,261	3,961	1,823,007
2003	0	106,973	(48,181)	1,812,277	10,645	1,881,714	0	57,291	(48,181)	1,775,675	10,645	1,795,430
2004	0	122,559	3,161	2,032,492	649	2,158,861	0	60,847	3,161	1,992,308	649	2,056,965
2005	0	99,523	(159,678)	1,753,631	559	1,694,035	0	53,502	(159,678)	1,713,761	559	1,608,144
2006	0	128,022	(120,122)	1,967,163	504	1,975,567	0	46,463	(120,122)	1,920,919	504	1,847,764
2007	0	139,502	118,196	1,913,919	305	2,171,922	0	59,454	118,196	1,866,529	305	2,044,484
2008	0	40,414	(7)	2,271,665	7,010	2,319,082	0	40,164	(7)	2,219,865	7,010	2,267,032
2009	0	40,414	(3)	2,112,330	7,010	2,159,751	0	40,164	(3)	2,059,330	7,010	2,106,501
2010	0	37,106	4,288	2,118,240	7,010	2,166,644	0	36,856	4,288	2,065,240	7,010	2,113,394
2011	0	37,297	64,678	2,117,746	7,010	2,226,731	0	37,047	64,678	2,064,746	7,010	2,173,481
2012	0	37,187	(67,943)	2,121,746	7,010	2,098,000	0	36,937	(67,943)	2,068,746	7,010	2,044,750
2013	0	37,125	9,749	2,085,858	7,010	2,139,742	0	36,875	9,749	2,036,158	7,010	2,089,792
2014	0	37,433	16,625	2,432,968	7,010	2,494,036	0	37,183	16,625	2,383,268	7,010	2,444,086
2015	0	37,562	32,003	2,432,968	7,010	2,509,543	0	37,312	32,003	2,383,268	7,010	2,459,593
2016	0	37,262	(28,401)	2,432,968	7,010	2,448,839	0	37,012	(28,401)	2,383,268	7,010	2,398,889
2017	0	37,494	61,309	2,432,968	7,010	2,538,781	0	37,244	61,309	2,383,268	7,010	2,488,831
2018	0	37,648	(80,817)	2,432,968	7,010	2,396,809	0	37,398	(80,817)	2,383,268	7,010	2,346,859
2019	0	37,472	50,179	2,432,968	7,010	2,527,629	0	37,222	50,179	2,383,268	7,010	2,477,679
2020	0	37,536	(366)	2,432,968	7,010	2,477,148	0	37,286	(366)	2,383,268	7,010	2,427,198
2021	0	37,619	10,725	2,432,968	7,010	2,488,322	0	37,369	10,725	2,383,268	7,010	2,438,372
2022	0	37,613	(3,483)	2,432,968	7,010	2,474,108	0	37,363	(3,483)	2,383,268	7,010	2,424,158
2023	0	37,604	(18,971)	2,432,968	7,010	2,458,611	0	37,354	(18,971)	2,383,268	7,010	2,408,661
2024	0	37,483	11,289	2,432,968	7,010	2,488,750	0	37,233	11,289	2,383,268	7,010	2,438,800
2025	0	37,546	(12,518)	2,432,968	7,010	2,465,006	0	37,296	(12,518)	2,383,268	7,010	2,415,056
2026	0	37,558	24,308	2,432,968	7,010	2,501,844	0	37,308	24,308	2,383,268	7,010	2,451,894
2027	0	37,471	(17,799)	2,432,968	7,010	2,459,650	0	37,221	(17,799)	2,383,268	7,010	2,409,700
2028	0	37,611	12,291	2,432,968	7,010	2,489,880	0	37,361	12,291	2,383,268	7,010	2,439,930
2029	0	37,538	(9,046)	2,432,968	7,010	2,468,470	0	37,288	(9,046)	2,383,268	7,010	2,418,520
2030	0	37,602	20,756	2,432,968	7,010	2,498,336	0	37,352	20,756	2,383,268	7,010	2,448,386
2031	0	37,474	(97,726)	2,432,968	7,010	2,379,726	0	37,224	(97,726)	2,383,268	7,010	2,329,776
2032	0	37,076	84,999	2,432,968	7,010	2,562,053	0	36,826	84,999	2,383,268	7,010	2,512,103
2033	0	37,281	(94,652)	2,432,968	7,010	2,382,607	0	37,031	(94,652)	2,383,268	7,010	2,332,657
2034	0	36,773	69,593	2,432,968	7,010	2,546,344	0	36,523	69,593	2,383,268	7,010	2,496,394
2035	0	36,113	(242,659)	2,432,968	7,010	2,233,432	0	35,863	(242,659)	2,383,268	7,010	2,183,482

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 5 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	Tehachapi Division						Mojave Division					
	Edmonston Pumping Plant						Alamo Powerplant					
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recrea- tion	Water Supply					Recrea- tion		
	[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]	[59]	[60]	[61]	[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	36,918	37,546	823,067	3,285	900,816	0	14,735	12,258	429,864	1,508	458,365
1987	0	29,580	(25,522)	851,322	6,937	862,317	0	11,665	(15,270)	417,870	1,239	415,504
1988	0	42,017	(29,747)	1,044,737	4,360	1,061,367	0	21,696	1,101	537,568	971	561,336
1989	0	32,270	(60,826)	1,328,041	7,490	1,306,975	0	4,686	(20,363)	716,360	1,407	702,090
1990	0	42,198	(15,092)	1,579,466	8,879	1,615,451	0	8,898	(5,916)	788,111	1,388	792,481
1991	0	33,999	105,176	441,217	4,560	584,952	0	17,908	34,422	177,308	394	230,032
1992	0	23,121	(92,123)	809,771	1,995	742,764	0	14,873	(17,115)	374,110	423	372,291
1993	0	11,946	(127,738)	759,485	1,676	645,369	0	9,304	(3,455)	308,222	443	314,514
1994	0	40,808	(88,211)	960,815	2,918	916,330	0	21,837	3,395	469,996	430	495,658
1995	0	36,001	(16,431)	542,465	1,669	563,704	0	14,139	(30,761)	384,836	427	368,641
1996	0	37,357	15,438	779,918	2,928	835,641	0	7,247	(11,410)	493,852	565	490,254
1997	0	51,475	40,852	860,798	2,076	955,201	0	20,725	38,960	537,586	507	597,778
1998	0	48,601	(106,487)	607,301	1,585	551,000	0	21,456	16,361	398,385	363	436,565
1999	0	52,726	(2,807)	947,420	3,279	1,000,618	0	26,644	(8,486)	589,756	396	608,310
2000	0	43,072	7,726	1,621,657	4,216	1,676,671	0	8,983	(10,472)	953,531	449	952,491
2001	0	39,544	(18,830)	1,187,452	1,211	1,209,377	0	14,526	3,478	710,137	452	728,593
2002	0	60,037	50,342	1,680,514	3,961	1,794,854	0	15,190	8,398	901,230	490	925,308
2003	0	53,320	(48,181)	1,757,708	10,645	1,773,492	0	13,676	(20,787)	1,022,009	355	1,015,253
2004	0	57,962	3,161	1,970,355	649	2,032,127	0	15,581	17,207	1,120,348	171	1,153,307
2005	0	40,949	(159,678)	1,695,241	559	1,577,071	0	2,561	(50,014)	1,117,990	84	1,070,621
2006	0	52,291	(120,122)	1,898,070	504	1,830,743	0	13,170	8,653	1,281,524	98	1,303,445
2007	0	65,423	118,196	1,840,096	305	2,024,020	0	17,957	(5,091)	1,374,546	103	1,092,315
2008	0	38,614	(7)	2,216,245	7,010	2,261,862	0	21,272	(81)	1,411,952	1,630	1,434,773
2009	0	38,614	(3)	2,055,540	7,010	2,101,161	0	21,272	(78)	1,358,817	1,630	1,381,641
2010	0	35,306	4,288	2,057,660	7,010	2,104,264	0	21,001	3,921	1,326,767	1,630	1,353,319
2011	0	35,497	64,678	2,060,956	7,010	2,168,141	0	20,971	26,001	1,329,063	1,630	1,377,665
2012	0	35,387	(67,943)	2,064,956	7,010	2,039,410	0	20,962	(41,797)	1,331,063	1,630	1,311,858
2013	0	35,325	9,749	2,009,498	7,010	2,061,582	0	20,835	4,742	1,252,024	1,630	1,279,231
2014	0	35,633	16,625	2,356,668	7,010	2,415,936	0	21,002	2,759	1,359,994	1,630	1,385,385
2015	0	35,762	32,003	2,356,668	7,010	2,431,443	0	21,066	22,604	1,359,994	1,630	1,405,294
2016	0	35,462	(28,401)	2,356,668	7,010	2,370,739	0	20,829	(21,084)	1,359,994	1,630	1,361,369
2017	0	35,694	61,309	2,356,668	7,010	2,460,681	0	20,895	33,266	1,359,994	1,630	1,415,785
2018	0	35,848	(80,817)	2,356,668	7,010	2,318,709	0	20,998	(50,078)	1,359,994	1,630	1,332,544
2019	0	35,672	50,179	2,356,668	7,010	2,449,529	0	20,924	31,508	1,359,994	1,630	1,414,056
2020	0	35,736	(366)	2,356,668	7,010	2,399,048	0	20,947	(3,398)	1,359,994	1,630	1,379,173
2021	0	35,819	10,725	2,356,668	7,010	2,410,222	0	20,946	(1,117)	1,359,994	1,630	1,381,453
2022	0	35,813	(3,483)	2,356,668	7,010	2,396,008	0	20,940	(3,434)	1,359,994	1,630	1,379,130
2023	0	35,804	(18,971)	2,356,668	7,010	2,380,511	0	20,939	(18,638)	1,359,994	1,630	1,363,925
2024	0	35,683	11,289	2,356,668	7,010	2,410,650	0	20,881	21,309	1,359,994	1,630	1,403,814
2025	0	35,746	(12,518)	2,356,668	7,010	2,386,906	0	20,965	(11,624)	1,359,994	1,630	1,370,965
2026	0	35,758	24,308	2,356,668	7,010	2,423,744	0	20,930	13,030	1,359,994	1,630	1,395,584
2027	0	35,671	(17,799)	2,356,668	7,010	2,381,550	0	20,861	(6,161)	1,359,994	1,630	1,376,324
2028	0	35,811	12,291	2,356,668	7,010	2,411,780	0	20,961	4,006	1,359,994	1,630	1,386,591
2029	0	35,738	(9,046)	2,356,668	7,010	2,390,370	0	20,955	(913)	1,359,994	1,630	1,381,666
2030	0	35,802	20,756	2,356,668	7,010	2,420,236	0	20,930	8,528	1,359,994	1,630	1,391,082
2031	0	35,674	(97,726)	2,356,668	7,010	2,301,626	0	20,956	(31,057)	1,359,994	1,630	1,351,523
2032	0	35,276	84,999	2,356,668	7,010	2,483,953	0	20,865	43,953	1,359,994	1,630	1,426,442
2033	0	35,481	(94,652)	2,356,668	7,010	2,304,507	0	20,854	(37,929)	1,359,994	1,630	1,344,549
2034	0	34,973	69,593	2,356,668	7,010	2,468,244	0	20,769	28,588	1,359,994	1,630	1,410,981
2035	0	34,313	(242,659)	2,356,668	7,010	2,155,332	0	20,892	(49,219)	1,359,994	1,630	1,333,297

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 6 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)														
	Mojave Division (continued)														
	Pearblossom Pumping Plant						Mojave Siphon Powerplant								
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total			
Water Supply				Recreation	Water Supply					Recreation					
[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[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	42,168	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	30,876	12,258	394,156	1,508	438,798	0	0	0	0	0	0			
1987	0	27,552	(15,270)	377,531	1,239	391,052	0	0	0	0	0	0			
1988	0	32,209	1,101	501,300	971	535,581	0	1,977	1,101	501,291	971	505,340			
1989	0	31,500	(20,363)	661,189	1,407	673,733	0	29,110	(20,363)	661,100	1,407	671,254			
1990	0	32,672	(5,916)	730,560	1,388	758,704	0	23,692	(5,916)	730,550	1,388	749,714			
1991	0	15,209	34,774	163,913	394	214,290	0	(543)	34,774	163,913	394	198,538			
1992	0	13,989	(17,451)	338,249	423	335,210	0	(13,193)	(17,451)	338,207	423	307,986			
1993	0	9,779	(3,455)	255,117	443	261,884	0	(11,922)	(3,455)	255,117	443	240,183			
1994	0	150	3,395	409,928	430	413,903	0	1,601	3,395	395,294	430	400,720			
1995	0	6,820	(29,282)	328,862	427	306,847	0	10,458	(29,282)	321,387	427	302,990			
1996	0	9,514	(11,410)	424,252	565	422,921	0	(5,577)	(11,410)	418,141	565	401,719			
1997	0	(1,124)	38,960	461,563	507	499,906	0	5,171	38,960	452,525	507	497,163			
1998	0	(2,087)	16,361	334,965	363	349,602	0	11,496	16,361	332,385	363	360,605			
1999	0	(1,154)	(8,486)	505,624	396	496,380	0	11,065	(8,486)	498,919	396	501,894			
2000	0	(23,296)	(10,472)	859,533	449	826,214	0	4,896	(10,472)	849,514	449	844,387			
2001	0	(9,304)	3,478	635,468	452	630,094	0	7,403	3,478	632,420	452	643,753			
2002	0	3,810	8,398	823,690	490	836,388	0	9,300	8,398	820,217	490	838,405			
2003	0	2,814	(20,787)	949,148	355	931,530	0	(6,586)	(20,787)	935,998	355	908,980			
2004	0	(15,558)	17,207	1,047,485	171	1,049,305	0	5,034	17,207	1,035,279	171	1,057,691			
2005	0	(18,967)	(50,014)	1,045,396	84	976,499	0	827	(50,014)	1,027,285	84	978,182			
2006	0	(21,986)	8,653	1,187,627	98	1,174,392	0	(845)	8,653	987,593	98	995,499			
2007	0	(13,055)	(5,091)	978,921	103	960,878	0	3,060	(5,091)	794,980	103	793,052			
2008	0	15,922	(81)	1,318,267	1,430	1,335,538	0	12,452	(81)	554,237	1,430	568,038			
2009	0	15,922	(78)	1,263,132	1,430	1,280,406	0	12,452	(78)	605,747	1,430	619,551			
2010	0	15,651	3,921	1,231,082	1,430	1,252,084	0	12,181	3,921	1,231,082	1,430	1,248,614			
2011	0	15,621	26,001	1,231,222	1,430	1,274,274	0	12,151	26,001	1,231,082	1,430	1,270,664			
2012	0	15,612	(41,797)	1,231,342	1,430	1,206,587	0	12,142	(41,797)	1,231,082	1,430	1,202,857			
2013	0	15,485	4,742	1,156,489	1,430	1,178,146	0	12,015	4,742	1,231,082	1,430	1,249,269			
2014	0	15,652	2,759	1,193,759	1,430	1,213,600	0	12,182	2,759	1,231,082	1,430	1,247,453			
2015	0	15,716	22,604	1,193,759	1,430	1,233,509	0	12,246	22,604	1,231,082	1,430	1,267,362			
2016	0	15,479	(21,084)	1,193,759	1,430	1,189,584	0	12,009	(21,084)	1,231,082	1,430	1,223,437			
2017	0	15,545	33,266	1,193,759	1,430	1,244,000	0	12,075	33,266	1,231,082	1,430	1,277,853			
2018	0	15,648	(50,078)	1,193,759	1,430	1,160,759	0	12,178	(50,078)	1,231,082	1,430	1,194,612			
2019	0	15,574	31,508	1,193,759	1,430	1,242,271	0	12,104	31,508	1,231,082	1,430	1,276,124			
2020	0	15,597	(3,398)	1,193,759	1,430	1,207,388	0	12,127	(3,398)	1,231,082	1,430	1,241,241			
2021	0	15,596	(1,117)	1,193,759	1,430	1,209,668	0	12,126	(1,117)	1,231,082	1,430	1,243,521			
2022	0	15,590	(3,434)	1,193,759	1,430	1,207,345	0	12,120	(3,434)	1,231,082	1,430	1,241,198			
2023	0	15,589	(18,638)	1,193,759	1,430	1,192,140	0	12,119	(18,638)	1,231,082	1,430	1,225,993			
2024	0	15,531	21,309	1,193,759	1,430	1,232,029	0	12,061	21,309	1,231,082	1,430	1,265,882			
2025	0	15,615	(11,624)	1,193,759	1,430	1,199,180	0	12,145	(11,624)	1,231,082	1,430	1,233,033			
2026	0	15,580	13,030	1,193,759	1,430	1,223,799	0	12,110	13,030	1,231,082	1,430	1,257,652			
2027	0	15,511	(6,161)	1,193,759	1,430	1,204,539	0	12,041	(6,161)	1,231,082	1,430	1,238,392			
2028	0	15,611	4,006	1,193,759	1,430	1,214,806	0	12,141	4,006	1,231,082	1,430	1,248,659			
2029	0	15,605	(913)	1,193,759	1,430	1,209,881	0	12,135	(913)	1,231,082	1,430	1,243,734			
2030	0	15,580	8,528	1,193,759	1,430	1,219,297	0	12,110	8,528	1,231,082	1,430	1,253,150			
2031	0	15,606	(31,057)	1,193,759	1,430	1,179,738	0	12,136	(31,057)	1,231,082	1,430	1,213,591			
2032	0	15,515	43,953	1,193,759	1,430	1,254,657	0	12,045	43,953	1,231,082	1,430	1,288,510			
2033	0	15,504	(37,929)	1,193,759	1,430	1,172,764	0	12,034	(37,929)	1,231,082	1,430	1,206,817			
2034	0	15,419	28,588	1,193,759	1,430	1,239,196	0	11,949	28,588	1,231,082	1,430	1,273,049			
2035	0	15,542	(49,219)	1,193,759	1,430	1,161,512	0	12,072	(49,219)	1,231,082	1,430	1,195,365			

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 7 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Santa Ana Division									
	Devil Canyon Powerplant					Greenspot Pumping Plant				
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
Water Supply				Recreation						
[75]	[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	[84]	
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	37	0	0	1,275	0	1,312	0	0	0	
1973	40,848	14,745	0	51,812	0	107,405	0	0	0	
1974	74,666	8,367	(4,925)	102,198	0	180,306	0	0	0	
1975	10,000	1,995	(6,719)	189,526	0	194,802	0	0	0	
1976	4,168	5,180	(9,182)	235,711	23	235,900	0	0	0	
1977	0	8,082	(5,235)	101,137	469	104,453	0	0	0	
1978	14,820	3,754	21,686	373,636	481	414,377	0	0	0	
1979	12,302	5,620	(27,107)	356,854	485	348,154	0	0	0	
1980	0	9,468	12,714	395,975	742	418,899	0	0	0	
1981	0	8,401	(23,448)	569,088	807	554,848	0	0	0	
1982	0	6,012	44,469	399,799	1,798	452,078	0	0	0	
1983	0	8,597	5,188	230,277	1,078	245,140	0	0	0	
1984	0	12,861	(850)	250,938	1,414	264,363	0	0	0	
1985	0	14,325	(8,791)	349,336	956	355,826	0	0	0	
1986	0	9,486	8,339	392,650	1,378	411,853	0	0	0	
1987	0	7,923	(11,335)	375,451	1,118	373,157	0	0	0	
1988	0	11,090	2,238	499,285	861	513,474	0	0	0	
1989	0	13,116	(5,487)	658,730	1,301	667,660	0	0	0	
1990	0	13,439	(4,622)	728,723	1,281	738,821	0	0	0	
1991	0	10,836	18,308	161,032	340	190,516	0	0	0	
1992	0	9,157	(9,084)	328,354	371	328,798	0	0	0	
1993	0	5,602	5,593	244,678	364	256,237	0	0	0	
1994	0	10,915	(11,045)	393,690	357	393,917	0	0	0	
1995	0	11,268	2,331	320,978	358	334,935	0	0	0	
1996	0	9,496	13,015	417,656	494	440,661	0	0	0	
1997	0	8,087	(19,685)	451,874	416	440,692	0	0	0	
1998	0	6,700	16,643	332,198	310	355,851	0	0	0	
1999	0	9,784	(4,177)	497,787	341	503,735	0	0	0	
2000	0	7,407	(11,040)	848,320	375	845,062	0	0	0	
2001	0	9,324	8,183	631,363	374	649,244	0	0	0	
2002	0	10,315	9,682	818,028	413	838,438	0	0	0	
2003	0	9,198	(18,298)	917,186	260	908,346	0	0	0	
2004	0	11,166	15,150	1,033,273	85	1,059,674	0	0	0	
2005	0	4,500	(63,441)	1,012,681	0	953,740	0	0	0	
2006	0	8,208	7,571	1,153,993	0	1,169,772	0	7,777	7,777	
2007	0	8,216	(5,872)	930,922	0	933,266	0	9,311	9,311	
2008	0	8,204	(81)	1,274,007	1,250	1,283,380	0	17,300	17,300	
2009	0	8,204	(78)	1,222,677	1,250	1,232,053	0	17,300	17,300	
2010	0	8,504	10,523	1,190,507	1,250	1,210,784	0	17,300	17,300	
2011	0	8,519	1,352	1,190,507	1,250	1,201,628	0	17,300	17,300	
2012	0	8,482	(22,894)	1,190,507	1,250	1,177,345	0	17,300	17,300	
2013	0	8,499	16,733	1,112,794	1,250	1,139,276	0	17,300	17,300	
2014	0	8,522	(4,585)	1,112,794	1,250	1,117,981	0	17,300	17,300	
2015	0	8,499	2,964	1,112,794	1,250	1,125,507	0	17,300	17,300	
2016	0	8,483	(1,269)	1,112,794	1,250	1,121,258	0	17,300	17,300	
2017	0	8,502	9,828	1,112,794	1,250	1,132,374	0	17,300	17,300	
2018	0	8,484	(19,777)	1,112,794	1,250	1,102,751	0	17,300	17,300	
2019	0	8,492	17,408	1,112,794	1,250	1,139,944	0	17,300	17,300	
2020	0	8,483	(17,305)	1,112,794	1,250	1,105,222	0	17,300	17,300	
2021	0	8,486	(398)	1,112,794	1,250	1,122,132	0	17,300	17,300	
2022	0	8,486	13,735	1,112,794	1,250	1,136,265	0	17,300	17,300	
2023	0	8,482	(8,417)	1,112,794	1,250	1,114,109	0	17,300	17,300	
2024	0	8,462	689	1,112,794	1,250	1,123,195	0	17,300	17,300	
2025	0	8,489	4,591	1,112,794	1,250	1,127,124	0	17,300	17,300	
2026	0	8,475	(3,819)	1,112,794	1,250	1,118,700	0	17,300	17,300	
2027	0	8,479	745	1,112,794	1,250	1,123,268	0	17,300	17,300	
2028	0	8,481	(5,355)	1,112,794	1,250	1,117,170	0	17,300	17,300	
2029	0	8,481	2,909	1,112,794	1,250	1,125,434	0	17,300	17,300	
2030	0	8,480	296	1,112,794	1,250	1,122,820	0	17,300	17,300	
2031	0	8,475	(1,976)	1,112,794	1,250	1,120,543	0	17,300	17,300	
2032	0	8,449	18,821	1,112,794	1,250	1,141,314	0	17,300	17,300	
2033	0	8,449	(23,419)	1,112,794	1,250	1,099,074	0	17,300	17,300	
2034	0	8,443	21,651	1,112,794	1,250	1,144,138	0	17,300	17,300	
2035	0	8,451	(31,434)	1,112,794	1,250	1,091,061	0	17,300	17,300	

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

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Calendar Year	CALIFORNIA AQUEDUCT (continued)														
	Santa Ana Division (continued)								West Branch, California Aqueduct						
	Crafton Hills Pumping Plant				Cherry Valley Pumping Plant				Oso Pumping Plant						
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	
											Water Supply	Recreation			
1961	[85] 0	[86] 0	[87] 0	[88] 0	[89] 0	[90] 0	[91] 0	[92] 0	[93] 0	[94] 0	[95] 0	[96] 0	[97] 0	[98] 0	
1962	0	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	0	
1964	0	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	0	
1966	0	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	0	
1968	0	0	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	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	2,444	133	0	0	0	2,577	
1972	0	0	0	0	0	0	0	0	63,883	6,557	(6,405)	71,991	6,481	142,507	
1973	0	0	0	0	0	0	0	0	124,461	16,995	4,029	155,317	1,075	301,877	
1974	0	0	0	0	0	0	0	0	160,860	12,702	(4,146)	209,172	2,064	380,652	
1975	0	0	0	0	0	0	0	0	93,352	23,008	7,704	374,306	3,288	501,658	
1976	0	0	0	0	0	0	0	0	56,954	15,845	(136,116)	420,708	1,429	358,820	
1977	0	0	0	0	0	0	0	0	0	4,407	(98,685)	122,447	(20)	28,149	
1978	0	0	0	0	0	0	0	0	45,105	9,061	52,774	171,139	176	278,255	
1979	0	0	0	0	0	0	0	0	0	25,355	(18,781)	145,598	0	152,172	
1980	0	0	0	0	0	0	0	0	0	24,576	(140,168)	165,931	481	50,820	
1981	0	0	0	0	0	0	0	0	0	15,254	59,637	283,264	3,179	361,334	
1982	0	0	0	0	0	0	0	0	0	23,824	61,685	360,878	2,126	448,513	
1983	0	0	0	0	0	0	0	0	0	23,601	(74,308)	166,995	6,111	122,399	
1984	0	0	0	0	0	0	0	0	0	12,461	(138,146)	272,101	3,750	150,166	
1985	0	0	0	0	0	0	0	0	0	28,257	142,219	403,097	3,728	577,301	
1986	0	0	0	0	0	0	0	0	0	22,387	25,288	393,203	1,777	442,655	
1987	0	0	0	0	0	0	0	0	0	18,164	(10,252)	433,452	5,698	447,062	
1988	0	0	0	0	0	0	0	0	0	20,461	(30,848)	507,169	3,389	500,171	
1989	0	0	0	0	0	0	0	0	0	27,914	(40,463)	611,681	6,083	605,215	
1990	0	0	0	0	0	0	0	0	0	33,666	(9,176)	791,355	7,491	823,336	
1991	0	0	0	0	0	0	0	0	0	16,460	70,754	263,909	4,166	355,289	
1992	0	0	0	0	0	0	0	0	0	8,238	(75,008)	435,661	1,572	370,463	
1993	0	0	0	0	0	0	0	0	0	2,674	(124,283)	451,263	1,233	330,887	
1994	0	0	0	0	0	0	0	0	0	18,688	(91,606)	490,819	2,488	420,389	
1995	0	0	0	0	0	0	0	0	0	21,775	14,330	157,629	1,242	194,976	
1996	0	0	0	0	0	0	0	0	0	30,121	26,848	286,066	2,363	345,398	
1997	0	0	0	0	0	0	0	0	0	30,468	1,892	323,212	1,569	357,141	
1998	0	0	0	0	0	0	0	0	0	26,851	(122,848)	208,916	1,222	114,141	
1999	0	0	0	0	0	0	0	0	0	25,690	5,679	357,664	2,883	391,916	
2000	0	0	0	0	0	0	0	0	0	33,658	18,198	668,126	3,767	723,749	
2001	0	0	0	0	0	0	0	0	0	24,551	(22,308)	477,315	759	480,317	
2002	0	0	0	0	0	0	0	0	0	44,692	41,944	779,284	3,471	869,391	
2003	0	0	0	0	0	0	0	0	0	39,495	(27,394)	735,699	10,290	758,090	
2004	0	0	0	0	0	0	0	0	0	41,947	(14,046)	850,007	478	878,386	
2005	0	0	0	0	0	0	0	0	0	38,154	(109,664)	577,251	475	506,216	
2006	0	0	6,892	6,892	0	0	4,278	4,278	0	36,732	(128,775)	616,546	406	524,909	
2007	0	0	6,181	6,181	0	0	4,009	4,009	0	45,368	123,287	760,750	202	929,607	
2008	0	0	17,300	17,300	0	0	17,300	17,300	0	17,292	74	804,293	5,380	827,039	
2009	0	0	17,300	17,300	0	0	17,300	17,300	0	17,292	75	696,723	5,380	719,470	
2010	0	0	17,300	17,300	0	0	17,300	17,300	0	14,255	367	730,893	5,380	750,895	
2011	0	0	17,300	17,300	0	0	17,300	17,300	0	14,476	38,677	731,893	5,380	790,426	
2012	0	0	17,300	17,300	0	0	17,300	17,300	0	14,375	(26,146)	733,893	5,380	727,502	
2013	0	0	17,300	17,300	0	0	17,300	17,300	0	14,440	5,007	757,474	5,380	782,301	
2014	0	0	17,300	17,300	0	0	17,300	17,300	0	14,581	13,866	996,674	5,380	1,030,501	
2015	0	0	17,300	17,300	0	0	17,300	17,300	0	14,646	9,399	996,674	5,380	1,026,099	
2016	0	0	17,300	17,300	0	0	17,300	17,300	0	14,583	(7,317)	996,674	5,380	1,009,320	
2017	0	0	17,300	17,300	0	0	17,300	17,300	0	14,749	28,043	996,674	5,380	1,044,846	
2018	0	0	17,300	17,300	0	0	17,300	17,300	0	14,800	(30,739)	996,674	5,380	986,115	
2019	0	0	17,300	17,300	0	0	17,300	17,300	0	14,698	18,671	996,674	5,380	1,035,423	
2020	0	0	17,300	17,300	0	0	17,300	17,300	0	14,739	3,032	996,674	5,380	1,019,825	
2021	0	0	17,300	17,300	0	0	17,300	17,300	0	14,823	11,842	996,674	5,380	1,028,719	
2022	0	0	17,300	17,300	0	0	17,300	17,300	0	14,823	(49)	996,674	5,380	1,016,828	
2023	0	0	17,300	17,300	0	0	17,300	17,300	0	14,815	(333)	996,674	5,380	1,016,536	
2024	0	0	17,300	17,300	0	0	17,300	17,300	0	14,752	(10,020)	996,674	5,380	1,006,786	
2025	0	0	17,300	17,300	0	0	17,300	17,300	0	14,731	(894)	996,674	5,380	1,015,891	
2026	0	0	17,300	17,300	0	0	17,300	17,300	0	14,778	11,278	996,674	5,380	1,028,110	
2027	0	0	17,300	17,300	0	0	17,300	17,300	0	14,760	(11,638)	996,674	5,380	1,005,176	
2028	0	0	17,300	17,300	0	0	17,300	17,300	0	14,800	8,285	996,674	5,380	1,025,139	
2029	0	0	17,300	17,300	0	0	17,300	17,300	0	14,733	(8,133)	996,674	5,380	1,008,654	
2030	0	0	17,300	17,300	0	0	17,300	17,300	0	14,822	12,228	996,674	5,380	1,029,104	
2031	0	0	17,300	17,300	0	0	17,300	17,300	0	14,668	(66,669)	996,674	5,380	950,053	
2032	0	0	17,300	17,300	0	0	17,300	17,300	0	14,361	41,046	996,674	5,380	1,057,461	
2033	0	0	17,300	17,300	0	0	17,300	17,300	0	14,577	(56,723)	996,674	5,380	959,908	
2034	0	0	17,300	17,300	0	0	17,300	17,300	0	14,154	41,005	996,674	5,380	1,057,213	
2035	0	0	17,300	17,300	0	0	17,300	17,300	0	13,371	(193,440)	996,674	5,380	821,985	

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 9 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	West Branch, California Aqueduct (continued)										
	Warne Powerplant					Castaic Powerplant					
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries	
Water Supply				Recrea- tion	Water Supply					Recrea- tion	
[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]	[108]	[109]	[110]
1961	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	57,364	1,788	(6,162)	71,938	6,481	131,409
1973	0	0	0	0	0	37,198	6,430	4,542	155,297	1,075	204,542
1974	0	0	0	0	0	82,364	1,772	(950)	209,136	541	292,863
1975	0	0	0	0	0	90,460	5,002	(1,534)	374,280	1,563	469,771
1976	0	0	0	0	0	55,990	(7,695)	(132,036)	420,684	1,429	338,372
1977	0	0	0	0	0	0	(1,485)	(102,532)	122,447	(20)	18,410
1978	0	0	0	0	0	45,105	(2,264)	129,523	171,139	176	343,679
1979	0	0	0	0	0	0	(2,339)	(20,400)	145,598	0	122,859
1980	0	0	0	0	0	0	991	(118,026)	165,931	481	49,377
1981	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	(60,135)	59,069	360,878	1,187	360,999
1983	0	20,780	(74,308)	166,995	6,111	119,578	(33,418)	(46,904)	166,995	2,618	89,291
1984	0	13,572	(139,219)	275,212	2,208	151,773	(29,618)	(139,545)	275,212	2,201	108,250
1985	0	29,286	141,492	403,097	874	574,749	(4,622)	135,007	403,097	844	534,326
1986	0	21,579	25,288	393,203	1,777	441,847	(6,664)	21,520	393,203	623	408,682
1987	0	20,885	(10,252)	433,452	5,698	449,783	(519)	(6,241)	433,452	2,734	429,426
1988	0	23,253	(31,453)	507,169	3,389	502,358	12,650	(28,498)	507,169	1,359	492,680
1989	0	27,131	(40,463)	611,681	6,083	604,432	634	(40,154)	611,681	3,161	575,322
1990	0	34,208	(9,176)	791,355	7,491	823,878	(14,012)	(15,101)	786,519	3,419	760,825
1991	0	16,908	70,754	263,909	4,166	355,737	(871)	89,637	262,921	2,283	353,970
1992	0	9,638	(75,008)	435,661	1,572	371,863	(609)	(71,795)	435,661	1,543	364,800
1993	0	1,922	(124,283)	451,257	1,233	330,129	21,959	(77,428)	451,257	1,211	396,999
1994	0	23,151	(91,606)	490,819	2,488	424,852	5,205	(95,738)	490,819	2,465	402,751
1995	0	15,860	14,330	157,629	1,242	189,061	20,400	75,863	157,629	1,223	255,115
1996	0	21,191	26,848	286,066	2,363	336,468	(5,621)	19,088	286,066	2,362	301,895
1997	0	23,437	1,892	323,201	1,569	350,099	0	11,119	(1,802)	1,566	334,084
1998	0	26,864	(122,848)	208,909	1,222	114,147	24,544	(57,726)	208,909	1,222	176,949
1999	0	21,822	8,120	357,664	2,883	390,489	(3,670)	6,280	357,664	2,865	363,139
2000	0	27,237	18,198	668,126	3,767	717,328	(19,645)	9,320	665,926	1,556	657,157
2001	0	17,404	(22,308)	477,315	759	473,170	(5,949)	(16,588)	477,315	746	455,524
2002	0	35,058	41,944	779,284	3,471	859,757	10,071	35,623	776,136	305	822,135
2003	0	28,167	(27,394)	735,699	10,290	746,762	9,075	(17,034)	732,549	356	724,946
2004	0	31,034	(14,046)	850,007	478	867,473	9,120	(11,440)	845,960	456	844,096
2005	0	29,111	(109,664)	577,251	475	497,173	21,155	(61,490)	577,251	472	537,388
2006	0	23,453	(128,775)	616,546	406	511,630	4,173	(121,607)	616,546	396	499,508
2007	0	29,978	123,287	760,750	202	914,217	(1,664)	117,880	758,860	196	875,272
2008	0	15,382	74	804,293	5,380	825,129	9,657	74	801,143	2,330	813,204
2009	0	15,382	75	696,723	5,380	717,560	9,657	75	693,573	2,330	705,635
2010	0	12,345	367	730,893	5,380	748,985	6,060	367	727,743	2,330	736,500
2011	0	12,566	38,677	731,893	5,380	788,516	6,281	38,677	728,743	2,330	776,031
2012	0	12,465	(26,146)	733,893	5,380	725,592	6,180	(26,146)	730,743	2,330	713,107
2013	0	12,530	5,007	757,474	5,380	780,391	6,245	5,007	754,324	2,330	767,906
2014	0	12,671	13,866	996,674	5,380	1,028,591	6,386	13,866	993,524	2,330	1,016,106
2015	0	12,736	9,399	996,674	5,380	1,024,189	6,451	9,399	993,524	2,330	1,011,704
2016	0	12,673	(7,317)	996,674	5,380	1,007,410	6,388	(7,317)	993,524	2,330	994,925
2017	0	12,839	28,043	996,674	5,380	1,042,936	6,554	28,043	993,524	2,330	1,030,451
2018	0	12,890	(30,739)	996,674	5,380	984,205	6,605	(30,739)	993,524	2,330	971,720
2019	0	12,788	18,671	996,674	5,380	1,033,513	6,503	18,671	993,524	2,330	1,021,028
2020	0	12,829	3,032	996,674	5,380	1,017,915	6,544	3,032	993,524	2,330	1,005,430
2021	0	12,913	11,842	996,674	5,380	1,026,809	6,628	11,842	993,524	2,330	1,014,324
2022	0	12,913	(49)	996,674	5,380	1,014,918	6,628	(49)	993,524	2,330	1,002,433
2023	0	12,905	(333)	996,674	5,380	1,014,626	6,620	(333)	993,524	2,330	1,002,141
2024	0	12,842	(10,020)	996,674	5,380	1,004,876	6,557	(10,020)	993,524	2,330	992,391
2025	0	12,821	(894)	996,674	5,380	1,013,981	6,536	(894)	993,524	2,330	1,001,496
2026	0	12,868	11,278	996,674	5,380	1,026,200	6,583	11,278	993,524	2,330	1,013,715
2027	0	12,850	(11,638)	996,674	5,380	1,003,266	6,565	(11,638)	993,524	2,330	990,781
2028	0	12,890	8,285	996,674	5,380	1,023,229	6,605	8,285	993,524	2,330	1,010,744
2029	0	12,823	(8,133)	996,674	5,380	1,006,744	6,538	(8,133)	993,524	2,330	994,259
2030	0	12,912	12,228	996,674	5,380	1,027,194	6,627	12,228	993,524	2,330	1,014,709
2031	0	12,758	(66,669)	996,674	5,380	948,143	6,473	(66,669)	993,524	2,330	935,658
2032	0	12,451	41,046	996,674	5,380	1,055,551	6,166	41,046	993,524	2,330	1,043,066
2033	0	12,667	(56,723)	996,674	5,380	957,998	6,382	(56,723)	993,524	2,330	945,513
2034	0	12,244	41,005	996,674	5,380	1,055,303	5,959	41,005	993,524	2,330	1,042,818
2035	0	11,461	(193,440)	996,674	5,380	820,075	5,176	(193,440)	993,524	2,330	807,590

TABLE B-6. Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 10 of 10

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			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	
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	210	873	79,039	80,122	210	0	0	210
1969	0	1,042	62,064	63,106	0	0	0	0
1970	0	638	83,649	84,287	0	0	0	0
1971	0	3,455	110,971	114,426	0	0	0	0
1972	0	1,745	121,755	123,500	0	0	0	0
1973	0	5,479	78,645	84,124	0	0	0	0
1974	0	7,344	78,174	85,518	0	0	0	0
1975	0	5,819	85,216	91,035	0	0	0	0
1976	0	6,562	90,058	96,620	0	0	0	0
1977	0	5,777	40,579	46,356	0	0	0	0
1978	0	9,085	92,604	101,689	0	0	0	0
1979	0	10,896	123,155	134,051	0	0	0	0
1980	0	9,449	111,379	120,828	0	0	0	0
1981	0	13,232	109,754	122,986	0	0	0	0
1982	0	7,984	95,776	103,760	0	0	0	0
1983	0	5,710	100,518	106,228	0	0	0	0
1984	0	5,740	126,387	132,127	0	0	0	0
1985	0	7,563	120,823	128,386	0	0	0	0
1986	0	8,719	131,599	140,318	0	0	0	0
1987	0	11,363	128,080	139,443	0	0	0	0
1988	0	12,831	120,969	133,800	0	0	0	0
1989	0	11,454	116,801	128,255	0	0	0	0
1990	0	13,022	109,802	122,824	0	0	0	0
1991	0	5,802	1,496	7,298	0	0	0	0
1992	0	7,893	79,635	87,528	0	0	0	0
1993	0	9,282	94,921	104,203	0	0	0	0
1994	0	8,515	87,158	95,673	0	0	0	0
1995	0	6,986	94,536	101,522	0	0	0	0
1996	0	9,663	114,630	124,293	0	0	0	0
1997	527	8,343	110,428	119,298	527	0	8,538	9,065
1998	0	8,415	109,400	117,815	0	0	22,210	22,210
1999	0	2,453	120,061	122,514	0	303	23,880	24,183
2000	0	(429)	122,652	122,223	0	0	26,703	26,703
2001	0	(742)	87,915	87,173	0	0	23,229	23,229
2002	0	638	99,783	100,421	0	(151)	31,991	31,840
2003	0	161	101,113	101,274	0	284	31,421	31,705
2004	0	492	104,144	104,636	0	480	33,870	34,350
2005	0	1,484	103,178	104,662	0	573	27,595	28,168
2006	0	802	115,433	116,235	0	2,034	27,484	29,518
2007	0	802	131,590	132,392	0	293	31,516	31,809
2008	0	802	152,474	153,276	0	212	55,569	55,781
2009	0	802	168,891	169,693	0	212	70,486	70,698
2010	0	802	168,891	169,693	0	212	70,486	70,698
2011	0	802	168,891	169,693	0	212	70,486	70,698
2012	0	802	168,891	169,693	0	212	70,486	70,698
2013	0	802	164,391	165,193	0	212	70,486	70,698
2014	0	802	164,391	165,193	0	212	70,486	70,698
2015	0	802	164,391	165,193	0	212	70,486	70,698
2016	0	802	164,391	165,193	0	212	70,486	70,698
2017	0	802	164,391	165,193	0	212	70,486	70,698
2018	0	802	164,391	165,193	0	212	70,486	70,698
2019	0	802	164,391	165,193	0	212	70,486	70,698
2020	0	802	164,391	165,193	0	212	70,486	70,698
2021	0	802	164,391	165,193	0	212	70,486	70,698
2022	0	802	164,391	165,193	0	212	70,486	70,698
2023	0	802	164,391	165,193	0	212	70,486	70,698
2024	0	802	164,391	165,193	0	212	70,486	70,698
2025	0	802	164,391	165,193	0	212	70,486	70,698
2026	0	802	164,391	165,193	0	212	70,486	70,698
2027	0	802	164,391	165,193	0	212	70,486	70,698
2028	0	802	164,391	165,193	0	212	70,486	70,698
2029	0	802	164,391	165,193	0	212	70,486	70,698
2030	0	802	164,391	165,193	0	212	70,486	70,698
2031	0	802	164,391	165,193	0	212	70,486	70,698
2032	0	802	164,391	165,193	0	212	70,486	70,698
2033	0	802	164,391	165,193	0	212	70,486	70,698
2034	0	802	164,391	165,193	0	212	70,486	70,698
2035	0	802	164,391	165,193	0	212	70,486	70,698

TABLE B-7. Reconciliation of Capital Costs Allocated to Water Supply and Power Generation

(Thousands of Dollars)

Item	Project Costs Allocated to Water Supply and Power Generation							Capital Costs Allocated to Other Purposes	Total State Water Project Capital Cost
	Misc. Income Credited to Construction (a)	Allowance for Future Price Escalation (b)	Costs of Construction of Delivery Structures (c)	Costs of Requested Excess Capacity and Future Enlargement (d)	Capital Cost Component of Delta Water Charge (e)	Capital Cost Component of Transportation Water Charge (f)	Water Supply and Power Total (g)		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
CONSERVATION FACILITIES									
Upper Feather Division									
Frenchman Dam & Lake	180	0	0	0	601	0	781	2,876	3,657
Grizzly Valley Dam & Lake Davis	65	0	0	0	0	0	65	9,338	9,403
Antelope Dam & Lake	1	0	0	0	0	0	1	5,863	5,864
Abbey Bridge Dam & Reservoir	0	0	0	0	0	0	0	520	520
Dixie Refuge Dam & Reservoir	0	0	0	0	0	0	0	236	236
Total, Upper Feather Division	246	0	0	0	601	0	847	18,833	19,680
Oroville Division									
Multipurpose Facilities	47,846	0	0	0	409,096	0	456,942	95,037	551,979
Specific Power Facilities	230	0	0	0	102,455	0	102,685	(1,110)	101,575
Total, Oroville Division	48,076	0	0	0	511,551	0	559,627	93,927	653,554
California Aqueduct									
North San Joaquin Division	1,210	0	0	0	80,788	0	81,998	2,595	84,593
San Luis Division	13,152	0	0	0	105,052	0	118,204	4,490	122,694
Total, California Aqueduct	14,362	0	0	0	185,840	0	200,202	7,085	207,287
Delta Facilities	37,311	0	0	0	326,783	0	364,094	15,118	379,212
Planning and Pre-Operation	5,302	0	0	0	57,086	0	62,388	0	62,388
TOTAL, CONSERVATION FACILITIES	105,297	0	0	0	1,081,861	0	1,187,158	134,963	1,322,121
TRANSPORTATION FACILITIES									
Upper Feather Division									
Grizzly Valley Pipeline	(1)	0	275	0	0	347	621	61	682
North Bay Aqueduct	358,785	0	676	0	0	108,791	468,252	0	468,252
South Bay Aqueduct	146,022	0	1,749	0	0	117,873	265,644	23,431	289,075
California Aqueduct									
North San Joaquin Division	6,008	0	161	0	0	192,002	198,171	5,776	203,947
San Luis Division	9,186	0	0	0	0	135,337	144,523	8,030	152,553
South San Joaquin Division	(2,591)	0	3,885	2,093	0	299,316	302,703	17,833	320,536
Tehachapi Division	(5,230)	0	0	5,230	0	343,403	343,403	20,717	364,120
Mojave Division	(41,107)	0	841	0	0	330,374	290,108	40,266	330,374
Santa Ana Division	49,274	0	6,010	5,331	0	451,162	511,777	45,432	557,209
West Branch	465	0	476	37	0	510,591	511,569	33,764	545,333
Coastal Branch	(176)	0	176	0	0	504,638	504,638	0	504,638
Total, California Aqueduct	15,829	0	11,549	12,691	0	2,766,823	2,806,892	171,818	2,978,710
TOTAL, TRANSPORTATION FACILITIES	520,635	0	14,249	12,691	0	2,993,834	3,541,409	195,310	3,736,719
East Branch Enlargement	0	0	0	0	0	853,239	853,239	0	853,239
East Branch Extention	0	0	0	0	0	375,669	375,669	0	375,669
Coastal Power Allocation	0	0	0	0	0	30,708	30,708	0	30,708
Agricultural Drainage Facilities	0	0	0	0	0	0	0	99,382	99,382
Off-Aqueduct Power Generation Facilities	0	0	0	0	0	517,466	517,466	0	517,466
Small Hydro Power Generation Facilities	0	0	0	0	14,095	83,594	97,689	0	97,689
Land Purchase - Kern Water Bank	0	0	0	0	34,686	0	34,686	0	34,686
Unassigned / Miscellaneous	0	0	0	0	0	0	0	105,405	105,405
Davis-Grunsky	0	0	0	0	0	0	0	130,000	130,000
TOTAL THROUGH 2015	625,932	0	14,249	12,691	1,130,642	4,854,510	6,638,024	665,060	7,303,084

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.

c) See Table B-8.

d) See Table B-9.

e) See Table B-13.

f) See Table B-10 (Published Appendix B 132-08 ,blue binder). Mojave Division total reduced by \$83,488,000 for costs included in "Small Hydro Power Generation Facilities" line.

TABLE B-8. SWP Capital Costs of Requested Delivery Structures

(in dollars)

Project Service Area and Water Supply Contractor	Calendar Year Capital Costs (a)						Total
	1952-2005	2006	2007	2008	2009	2010	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
FEATHER RIVER AREA							
County of Butte	136,546	0	27,326	31,301	26,000	0	221,173
Plumas County Flood Control and Water Conservation District	645	3,046	2,808	3,295	0	0	9,794
Thermalito Irrigation District (b)	43,939	0	0	0	0	0	43,939
Subtotal	181,130	3,046	30,134	34,596	26,000	0	274,906
NORTH BAY AREA							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	662,113	0	0	0	0	0	662,113
Subtotal	675,703	0	0	0	0	0	675,703
SOUTH BAY AREA							
Alameda County Flood Control and Water Conservation District, Zone 7	395,680	7,446	12,357	5,710	0	0	421,193
Alameda County Water District	239,579	0	0	0	0	0	239,579
Santa Clara Valley Water District	21,500	0	0	0	0	0	21,500
San Francisco Water Department (b)	1,066,680	0	0	0	0	0	1,066,680
Subtotal	1,723,439	7,446	12,357	5,710	0	0	1,748,952
CENTRAL COASTAL AREA							
San Luis Obispo County Flood Control and Water Conservation District	26,204	0	0	0	0	0	26,204
Santa Barbara County Flood Control and Water Conservation District	67,058	0	0	0	0	0	67,058
Subtotal	93,262	0	0	0	0	0	93,262
SAN JOAQUIN VALLEY AREA							
Castaic Lake Water Agency	82,567	0	0	0	0	0	82,567
Dudley Ridge Water District	304,541	0	0	0	0	0	304,541
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District (c)	5,292	0	0	15,000	0	0	20,292
Kern County Water Agency	3,059,982	39,766	53,251	68,747	75,000	0	3,296,746
Oak Flat Water District	46,882	3,390	52,113	28,580	20,000	0	150,965
Tracy Golf and Country Club (c)	6,932	0	0	0	0	0	6,932
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	3,793,379	43,156	105,364	112,327	95,000	0	4,149,226
SOUTHERN CALIFORNIA AREA							
Antelope Valley-East Kern Water Agency	418,914	15,522	25,385	23,345	25,000	0	508,166
Castaic Lake Water Agency	375,093	500	0	0	0	0	375,593
Coachella Valley Water District	14,206	0	0	0	0	0	14,206
Crestline-Lake Arrowhead Water Agency	25,298	0	0	0	0	0	25,298
Desert Water Agency	23,438	0	0	0	0	0	23,438
Littlerock Creek Irrigation District	23,732	0	0	0	0	0	23,732
Mojave Water Agency	211,765	0	0	0	0	0	211,765
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	960,685	0	0	0	0	0	960,685
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Geronio Pass Water Agency	66,530	8,139	14,412	9,969	5,000	0	104,050
The Metropolitan Water District of Southern California	4,814,078	0	0	0	0	0	4,814,078
Ventura County Watershed Protection District	79,699	0	0	0	0	0	79,699
Subtotal	7,178,663	24,161	39,797	33,314	30,000	0	7,305,935
TOTAL	13,645,576	77,809	187,652	185,947	151,000	0	14,247,984

- a) Approximate only, not to be construed as invoice amounts.
- b) Not a SWP water supply contractor.
- c) Not a SWP water supply contractor, but has contracted for water.

TABLE B-9. Capital Costs of Requested Excess Peaking Capacity

(in dollars unless otherwise indicated)

Sheet 1 of 2

Calendar Year	Total Advance Payments and Credits for Excess Capacity [1]	Total Incremental Costs for Excess Capacity [2]	Over payment (+) or Under payment (-) (a) [3]	Annual Surplus Money Investment Fund Interest Rate (b) [4]		Net Over or Underpayment With Interest (c) [6]
				Jan-Jun	Jul-Dec	
THE 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

(in dollars)

Sheet 2 of 2

Reach Number	ANNUAL REQUIRED ADVANCE OF FUNDS													Reach Total
	Incremental Costs and Advance Payments by Calendar Year													
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1981	
	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA														
<i>Incremental Costs</i>														
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
<i>Current Adjustment</i>														
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
28J	2. Interest Credits-Amendment 2 (e)													
									(1,532,433)				(10,104,646)	(11,637,079)
	3. Advance Payments Applied to Incremental Costs Amendment 5 (f)													
	0	1,240,000	1,483,180	2,469,325	(927,035)	1,729,160	3,215,258	2,967,475	1,690,000	(9,488,722)				4,378,641
	4. Interest Credits-Amendment 5 (g)													
										(2,721,803)				(2,721,803)
	5. Net Required Advance of Funds													
	0	9,296,000	10,578,143	3,992,577	7,383,616	5,155,896	4,301,303	(1,277,332)	(14,233,829)	(12,210,525)			(10,461,314)	2,524,535
SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT														
<i>Incremental Costs</i>														
25			25,730	44,053	38,075	17,959	5,900	6,835						138,552
			25,730	44,053	38,075	17,959	5,900	6,835						138,552
<i>Current Adjustments</i>														
	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													
			0	184,422	49,052	44,911	61,588	(20,263)	(180,465)				(h) (86,133)	53,112
ANTELOPE VALLEY-EAST KERN WATER AGENCY														
<i>Incremental Costs</i>														
29A				1,645	6,326	13,376	10,048	2,018	308	96		190		34,007
29F						1,700	1,700							3,400
				1,645	6,326	15,076	11,748	2,018	308	96		190		37,407
<i>Current Adjustment</i>														
	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													
				85,495	52,625	101,648	34,062	(12,794)	(205,354)	0		0	(h) (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

(in dollars)

Sheet 1 of 8

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	1,819,349	29,569,463	85,732	14,715	17,144	13,982
1987	32	11,873,826	7,214,307	1,628,932	1,670,596	22,387,661	126,377	15,693	27,881	32,931
1988	55	3,287,756	1,648,431	1,015,971	686,821	6,638,979	290,505	36,744	51,786	25,078
1989	44	1,056,583	950,985	224,567	374,886	2,607,021	130,609	16,848	35,518	12,582
1990	63	493,522	537,881	145,694	71,938	1,249,035	275,732	32,387	99,251	40,263
1991	54	76,599	17,130	24,846	70,542	189,117	1,153,109	26,900	53,613	21,889
1992	42	56,492	6,525	18,333	37,778	119,128	401,906	53,036	61,799	51,386
1993	30	104,317	24,579	40,129	82,032	251,057	313,476	55,679	79,149	39,293
1994	14	68,065	13,463	27,107	45,909	154,544	(211,712)	29,017	362,585	36,350
1995	3	26,002	5,920	7,337	20,617	59,876	265,751	42,516	48,189	21,436
1996	0	14,790	3,334	6,614	14,606	39,344	139,573	13,049	25,751	10,677
1997	3	67,264	35,545	38,585	(13,571)	127,823	203,476	31,135	36,986	16,906
1998	7	15,410	6,392	6,797	10,396	38,995	67,974	6,120	14,731	4,616
1999	2	71,950	35,515	33,879	32,613	173,957	162,161	25,329	35,716	24,347
2000	24	29,992	8,327	11,711	4,156	54,186	100,654	15,688	24,144	19,652
2001	20	10,597	3,904	3,892	1,954	20,347	436,756	4,272	118,836	4,207
2002	14	27,018	18,971	15,254	4,614	65,857	3,068,535	5,648	329,244	64,425
2003	0	14,733	9,242	4,658	46,313	74,946	4,465,566	200,125	199,457	360,387
2004	0	24,222	2,418	2,387	145,422	174,449	1,257,762	861,149	472,174	99,594
2005	0	89,100	4	9	33,810	122,923	1,224,166	859,794	702,448	(100)
2006	5	31,833	343	145	879,143	911,464	2,850,446	628,947	1,080,136	637
2007	0	69,114	114	35	3,220,978	3,290,241	3,091,281	602,713	1,687,283	2,056
2008	0	662,783	153,128	12,992	5,252,545	6,081,448	10,926,228	155,714	1,712,717	33,434
2009	0	1,048,590	166,514	11,538	1,643,747	2,870,389	3,853,046	263,194	2,937,766	40,796
2010	0	703,815	141,506	0	345,393	1,190,714	959,006	83,568	1,441,763	23,149
2011	0	157,278	124,042	0	79,827	361,147	187,313	11,624	35,174	11,177
2012	0	156,300	123,271	0	79,331	358,902	186,149	11,552	34,955	11,107
2013	0	70,148	55,324	0	35,604	161,076	83,544	5,184	15,688	4,985
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
TOTAL	341,130	44,867,750	33,817,307	4,636,103	25,470,192	108,791,352	51,579,042	5,476,596	16,075,203	11,867,056

TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 2 of 8

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[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	1,462	1,398	5,077	(114,602)	(502,921)	1,487,516	38,451	1,023,046
1982	716	1,561	1,746	6,074	29,565	700,738	46,501	22,308	769,547
1983	407	5,721	8,143	23,367	651,388	706,104	84,435	211,619	1,002,158
1984	269	1,853	1,667	13,301	662,851	1,559,539	41,352	48,478	1,649,369
1985	402	1,657	2,129	6,750	80,035	677,955	24,812	19,404	722,171
1986	1,119	2,744	3,313	12,234	150,983	398,788	63,830	35,420	498,038
1987	1,496	3,081	3,560	21,842	232,861	799,672	88,945	41,659	930,276
1988	5,706	6,689	7,603	33,728	457,839	2,898,156	(128,051)	(56,448)	2,713,657
1989	2,641	3,878	4,755	14,489	221,320	6,898,872	346,589	173,993	7,419,454
1990	5,092	19,899	36,584	87,796	597,004	13,483,785	112,002	2,446,232	16,042,019
1991	1,942	5,059	7,357	31,682	1,301,551	13,914,632	133,121	114,981	14,162,734
1992	1,184	2,042	35,464	20,589	609,067	6,260,482	241,456	239,437	6,741,375
1993	3,618	6,028	8,873	42,200	548,316	2,542,869	257,330	200,072	3,000,271
1994	2,897	4,781	5,346	89,991	319,255	1,145,666	148,396	88,357	1,382,419
1995	11,556	3,635	14,769	24,750	432,602	1,462,211	217,940	131,995	1,812,146
1996	3,092	2,271	2,699	12,522	209,634	874,227	74,153	41,215	989,595
1997	1,454	4,141	3,655	20,589	318,342	2,064,446	146,851	84,303	2,295,600
1998	363	1,134	(6,005)	5,776	94,709	729,475	33,695	16,670	779,840
1999	1,533	3,304	12,727	31,634	296,751	2,208,776	88,951	90,639	2,388,366
2000	2,406	4,944	5,331	10,755	183,574	(706,517)	57,503	40,185	(608,829)
2001	91,721	68,849	404,226	1,190,653	2,319,520	371,407	91,792	8,926	472,125
2002	229,409	453,259	1,107,580	2,977,939	8,236,039	388,781	44,543	22,639	455,963
2003	67,216	509,964	477,926	1,409,227	7,689,868	178,153	22,778	13,565	214,496
2004	3,209	3,141	39,380	3,277,033	6,013,442	893,916	15,663	77,867	987,446
2005	5,334	5,239	4,803	731,389	3,533,073	293,412	39,870	98,327	431,609
2006	1,360	1,413	1,454	15,695	4,580,088	349,779	16,400	178,571	544,750
2007	7,616	7,605	7,674	11,338	5,417,566	375,074	60,885	123,124	559,083
2008	43,019	60,134	68,180	140,393	13,139,819	1,788,098	408,921	1,138,362	3,335,381
2009	72,241	91,099	100,117	190,084	7,548,343	2,351,299	577,984	1,992,109	4,921,392
2010	45,371	62,331	71,014	141,744	2,827,946	1,186,095	396,495	1,061,590	2,644,180
2011	3,600	18,466	26,078	72,298	365,730	408,989	154,688	103,788	667,465
2012	3,577	18,351	25,916	71,849	363,456	406,447	153,727	103,143	663,317
2013	1,606	8,236	11,631	32,246	163,120	182,413	68,993	46,291	297,697
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
TOTAL	1,140,792	5,193,398	7,268,842	19,271,674	117,872,603	119,119,406	44,528,714	28,353,706	192,001,826

**TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed
through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 3 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036
1966	2,312,372	8,527,843	5,765,798	4,230,221	7,708,334	28,544,568	201,274	5,197,322	2,539,278
1967	(44,527)	2,062,305	6,942,522	222,885	6,675,398	15,858,583	212,285	4,982,844	3,363,650
1968	119,884	395,689	973,956	179,917	461,031	2,130,477	64,234	611,192	940,074
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088
1972	15,990	90,852	17,053	14,621	281,343	419,859	10,818	13,349	16,603
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952
1978	8,539	428,395	7,006	3,536	6,994	454,470	7,584	40,453	17,395
1979	(35,394)	543,225	19,463	9,485	(242,253)	294,526	10,474	6,181	6,227
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706
1981	28,491	(2,244,127)	(44,017)	(15,456)	918,984	(1,356,125)	1,151	9,642	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	75,639	33,881	11,785	6,638	1,811,638	1,939,581	7,955	13,782	11,090
1984	31,748	87,083	26,712	12,754	3,053,662	3,211,959	26,489	9,959	6,268
1985	53,251	56,732	13,685	6,934	582,910	713,512	7,220	9,762	7,688
1986	73,979	201,509	50,668	19,223	1,282,469	1,627,848	8,902	25,011	20,503
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042
1988	(149,385)	224,154	(406,398)	(137,353)	923,622	454,640	9,833	(119,741)	(60,639)
1989	39,652	594,894	232,852	80,090	575,855	1,523,343	5,279	91,501	278,061
1990	39,270	259,895	79,589	29,606	461,219	869,579	5,814	41,345	2,016,434
1991	4,916,134	397,959	98,847	35,860	511,519	5,960,319	4,588	43,140	41,348
1992	(757,001)	545,729	211,854	74,544	396,398	471,524	3,546	103,695	109,225
1993	110,233	724,929	186,271	70,815	720,283	1,812,531	15,016	101,634	90,929
1994	1,151,976	288,018	63,862	27,812	710,770	2,242,438	6,770	42,455	40,696
1995	285,776	441,479	130,761	58,640	1,914,186	2,830,842	12,548	49,963	43,251
1996	31,942	(110,471)	34,529	12,219	588,712	556,931	6,444	29,863	27,050
1997	73,224	513,793	(277,781)	42,881	5,016,215	5,368,332	11,497	49,111	43,799
1998	19,692	304,115	34,319	16,542	2,819,556	3,194,224	2,562	11,115	8,955
1999	18,187	158,902	100,061	41,691	1,901,382	2,220,223	5,706	25,179	23,510
2000	101,618	373,699	78,036	36,186	1,139,073	1,728,612	3,922	23,591	29,281
2001	(10,513)	(47,112)	519,031	(3,546)	61,595	519,455	2,280	17,030	21,196
2002	12,237	24,434	6,079,343	3,454	(2,453,483)	3,665,985	3,627	44,010	20,221
2003	8,863	79,641	(5,372,496)	7,923	2,183,794	(3,092,275)	2,130	18,793	16,715
2004	(15,306)	(13,531)	(50,311)	(2,395)	(458,897)	(540,440)	22,528	6,090	3,964
2005	261	11,162	129,328	3,493	995,247	1,139,491	26,296	11,514	6,256
2006	1,421	33,596	(7,390)	1,978	(271,298)	(241,693)	6,331	3,827	2,362
2007	2	119,508	74,607	12,802	199,850	406,769	13,926	23,862	13,537
2008	130,458	267,689	221,439	66,459	271,334	957,379	3,547	130,678	86,957
2009	130,458	1,100,204	334,785	103,445	360,301	2,029,193	3,931	199,656	126,163
2010	0	997,040	241,383	72,953	287,238	1,598,614	3,621	142,805	93,882
2011	0	115,728	83,220	21,158	166,206	386,312	3,174	46,423	39,504
2012	0	115,008	82,702	21,026	165,173	383,909	3,155	46,135	39,259
2013	0	51,616	37,117	9,437	74,130	172,300	1,416	20,705	17,619
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
TOTAL	21,082,357	34,179,261	24,624,036	6,255,107	49,196,383	135,337,144	951,005	13,706,158	11,554,366

TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 4 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)								
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[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	14,885	26,473	20,972	25,515	(1,076,221)	27,551	33,674	(1,142,721)
1982	8,237	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)
1983	14,488	9,792	14,174	13,050	35,872	419,650	17,389	24,933	115,983
1984	7,533	27,613	87,907	49,271	22,732	54,590	75,453	63,060	63,537
1985	9,215	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782
1986	22,335	16,664	16,014	25,031	20,483	140,642	25,960	13,913	154,089
1987	16,704	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047
1988	(159,357)	(73,648)	(151,040)	(51,401)	(120,104)	161,077	(75,276)	(75,307)	144,369
1989	70,153	65,216	63,382	120,925	73,037	2,778,880	119,559	36,660	2,952,046
1990	34,841	29,230	27,269	49,082	34,048	715,031	44,187	14,537	440,017
1991	36,888	32,195	30,146	55,119	34,144	423,235	50,345	12,116	353,596
1992	103,321	99,765	98,178	192,455	97,638	991,603	185,311	9,210	387,615
1993	90,291	70,131	63,247	118,440	80,530	687,462	109,792	38,960	942,211
1994	65,737	29,221	26,997	50,234	35,154	400,534	44,481	17,426	324,942
1995	435,909	32,487	25,516	49,885	41,733	524,524	48,740	29,125	450,952
1996	253,433	19,489	15,020	30,202	29,333	403,125	26,945	16,405	253,622
1997	73,458	30,890	25,368	48,767	40,900	451,910	47,815	29,878	809,848
1998	14,618	7,107	5,773	10,697	9,676	288,667	10,799	6,819	119,562
1999	47,359	17,022	13,362	34,410	31,539	260,623	24,634	14,826	264,538
2000	43,459	21,186	32,480	40,180	25,119	168,825	15,243	11,006	151,512
2001	42,731	14,471	22,325	34,996	8,027	71,645	4,537	3,988	66,918
2002	87,805	19,626	7,157	78,600	47,505	276,160	22,632	34,980	164,596
2003	22,946	9,280	8,935	18,114	15,308	136,429	6,671	9,686	110,489
2004	5,594	3,375	4,258	7,098	5,927	53,324	5,667	1,542	51,186
2005	7,253	6,256	12,511	6,256	6,256	21,215	12,511	0	8,794
2006	2,310	1,938	3,573	2,039	5,636	6,561	3,538	3,441	7,762
2007	14,768	12,473	24,754	12,833	20,481	41,744	24,759	7,330	27,874
2008	90,986	92,588	130,038	76,028	106,832	407,760	121,642	28,589	246,610
2009	135,375	132,404	203,697	114,050	148,191	552,946	194,392	31,686	315,198
2010	98,808	99,632	142,964	82,723	114,176	433,624	134,391	29,192	258,967
2011	37,004	44,544	39,738	29,722	57,294	234,992	32,223	25,589	166,854
2012	36,774	44,268	39,491	29,537	56,938	233,532	32,023	25,430	165,817
2013	16,504	19,867	17,723	13,256	25,554	104,809	14,372	11,413	74,419
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
TOTAL	10,850,523	13,032,868	11,844,647	8,733,971	16,680,229	68,217,649	9,669,749	7,345,713	48,204,245

**TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed
through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 5 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN (contd.)		TEHACHAPI DIVISION			MOJAVE DIVISION			
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[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	626,615	339,536	10,831	37,085
1980	3,772,498	7,372,362	17,433,610	6,046	17,439,656	1,130,429	1,073,430	3,604	308,188
1981	(2,527,211)	(4,566,440)	(3,848,206)	6,908	(3,841,298)	1,218,824	845,702	4,498	48,625
1982	(1,850,736)	(3,296,600)	11,370,112	6,054	11,376,166	6,968,683	746,900	3,920	33,869
1983	166,232	864,390	8,862,914	8,269	8,871,183	10,909,386	64,660	2,596	40,793
1984	119,387	613,799	3,227,937	31,701	3,259,638	8,340,371	309,491	3,124	17,505
1985	82,117	165,866	1,926,289	10,460	1,936,749	5,264,156	227,986	3,885	68,422
1986	186,348	675,895	1,381,955	33,788	1,415,743	2,049,111	2,069,663	4,261	2,331,707
1987	194,936	718,184	671,183	13,807	684,990	1,347,722	(6,453)	4,684	562,540
1988	262,334	(308,900)	1,408,760	(49,734)	1,359,026	847,954	(104,961)	13,409	(159,892)
1989	5,955,356	12,610,055	504,715	64,660	569,375	376,980	207,150	50,953	31,173
1990	640,283	4,092,118	783,219	25,218	808,437	202,065	(402,573)	61,192	(637,062)
1991	774,129	1,890,989	691,578	33,405	724,983	273,021	22,218	81,545	(188,732)
1992	731,512	3,113,074	741,986	24,369	766,355	620,962	384,568	86,644	225,398
1993	857,038	3,265,681	1,223,402	35,370	1,258,772	1,131,166	248,287	72,746	110,869
1994	853,328	1,937,975	806,213	16,681	822,894	998,126	164,096	60,147	51,340
1995	628,941	2,373,574	1,538,497	19,443	1,557,940	390,433	157,481	45,990	92,925
1996	388,064	1,498,995	2,571,039	10,797	2,581,836	91,593	69,281	22,188	35,656
1997	481,458	2,144,699	1,009,249	18,265	1,027,514	135,402	92,607	13,590	65,433
1998	440,746	937,096	925,574	6,843	932,417	47,486	36,170	4,164	29,900
1999	361,516	1,124,224	662,144	12,166	674,310	113,232	49,150	5,329	171,935
2000	372,997	938,801	408,352	14,333	422,685	120,267	90,145	936	83,478
2001	167,694	477,838	266,815	10,891	277,706	65,580	186,973	2,223	343,775
2002	286,748	1,093,667	247,986	9,586	257,572	35,787	(139,334)	1,374	(111,675)
2003	159,972	535,468	189,013	12,339	201,352	84,433	(19,049)	0	(11,368)
2004	323,072	493,625	374,614	4,946	379,560	20,129	17,620	0	18,936
2005	43,428	168,546	2,263,047	6,256	2,269,303	26,711	18,767	0	25,023
2006	18,770	68,088	5,855,272	8,220	5,863,492	7,583	5,564	0	6,861
2007	99,095	337,436	3,829,739	24,803	3,854,542	50,507	37,011	0	48,705
2008	597,355	2,119,610	6,797,277	258,839	7,056,116	312,368	221,931	0	243,791
2009	868,843	3,026,532	8,251,496	316,667	8,568,163	423,047	335,331	0	389,345
2010	645,298	2,280,083	10,249,627	269,388	10,519,015	332,090	241,886	0	269,299
2011	268,601	1,025,662	908,782	193,350	1,102,132	180,717	83,660	0	64,899
2012	266,932	1,019,291	903,134	192,148	1,095,282	179,594	83,140	0	64,496
2013	119,799	457,456	405,326	86,236	491,562	80,602	37,313	0	28,946
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
TOTAL	78,524,837	299,315,960	288,927,075	55,959,884	344,886,959	52,425,314	24,697,546	759,941	19,448,850

TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 6 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	MOJAVE DIVISION (continued)							SANTA ANA DIVISION	
	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[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	1,754,670	29,960	80,482
1980	284,545	133,526	121,171	2,239,224	60,229	559,963	5,914,309	31,462	181,638
1981	32,214	13,223	6,466	(774,614)	138,917	203,941	1,737,796	5,864	69,031
1982	77,988	13,158	14,459	432,274	346,905	79,819	8,717,959	9,224	159,280
1983	58,714	25,900	10,363	451,428	2,029,405	58,989	13,652,234	4,304	528,764
1984	35,378	845,423	6,052	(83,811)	1,290,740	34,764	10,799,037	3,850	270,455
1985	(232,549)	(481,017)	1,945,477	608,583	966,160	51,634	8,422,737	5,555	62,571
1986	(2,046,222)	(1,334,975)	3,260,280	1,097,122	230,510	51,994	7,713,451	9,927	114,561
1987	(344,829)	55,519	64,264	3,631,282	146,850	91,223	5,552,802	4,908	27,208
1988	(147,290)	(70,564)	351,489	552,546	558,557	197,761	2,039,009	7,358	161,957
1989	60,657	30,217	534,658	4,161,037	1,496,776	433,072	7,382,673	8,092	(2,297,399)
1990	(403,413)	(635,623)	(97,841)	8,794,258	1,394,698	344,367	8,620,068	176,854	(1,657,576)
1991	(18,809)	(147,369)	(17,234)	7,985,326	3,624,824	139,105	11,753,895	202,286	(1,316,160)
1992	338,098	(263,897)	75,210	4,849,560	8,364,426	127,829	14,808,798	333,934	(1,878,502)
1993	180,598	133,941	49,144	2,094,764	15,390,366	159,211	19,571,092	1,506,787	3,979,221
1994	114,273	65,260	26,546	933,021	8,082,401	81,869	10,577,079	2,104,588	2,493,097
1995	121,499	66,503	30,918	1,096,953	5,924,175	123,653	8,050,530	3,310,564	500,791
1996	48,699	44,953	17,787	1,736,686	2,181,669	96,339	4,344,851	19,019,751	(100,474)
1997	39,973	55,881	27,865	809,666	(342,563)	102,390	1,000,244	7,645,602	(662,524)
1998	27,626	20,285	12,816	273,139	3,392,776	36,135	3,880,497	993,619	1,613,505
1999	58,392	37,660	17,874	1,006,721	2,208,657	123,472	3,792,422	224,119	843,638
2000	75,230	44,857	20,181	724,837	1,251,684	83,871	2,495,486	129,156	1,285,637
2001	121,907	77,799	54,526	550,843	342,965	26,780	1,773,371	73,031	447,282
2002	(82,663)	(7,369)	(43,431)	270,386	269,139	71,793	264,007	54,815	1,753,554
2003	(7,565)	(3,239)	(3,009)	382,019	146,659	30,254	599,135	86,731	350,994
2004	12,753	13,853	5,500	264,180	49,194	12,693	414,858	13,919	276,692
2005	18,767	25,023	6,256	62,195	104,442	143,825	431,009	16,594	120,006
2006	5,057	6,290	21,315	83,291	295,812	626,264	1,058,037	22,620	17,117
2007	36,919	48,308	55,487	300,870	922,276	176,040	1,676,123	14,426	56,900
2008	198,452	204,418	94,542	3,431,317	1,966,665	2,382,288	9,055,772	240,106	379,120
2009	309,308	345,706	134,570	10,285,393	458,980	1,335,840	14,017,520	266,118	560,055
2010	217,912	229,096	101,627	9,251,492	372,966	215,961	11,232,329	245,167	411,023
2011	62,645	29,657	46,294	451,366	231,429	189,308	1,339,975	214,910	159,365
2012	62,255	29,473	46,006	448,560	229,991	188,131	1,331,646	213,574	158,374
2013	27,940	13,228	20,647	201,314	103,220	84,433	597,643	95,852	71,078
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
TOTAL	18,623,301	9,300,704	13,417,898	149,882,569	68,394,094	57,017,584	413,967,801	61,985,373	46,663,826

TABLE B-10. Capital Costs of Each Aqueduct Reach to Be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 7 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)				WEST BRANCH					
	Reach 28G (a)	Reach 28H	Reach 28J	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[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	1,117,247	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	22,654	61,349	187,713	(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	220,029	24,295	
1984	14,462	12,259	49,547	350,573	71,759	68,930	2,870,259	335,942	17,285	
1985	17,816	11,481	54,070	151,493	142,244	25,386	2,126,670	102,366	21,971	
1986	31,564	25,037	86,794	267,883	133,914	62,294	274,660	141,894	36,149	
1987	17,141	8,005	45,528	102,790	13,936	453,949	711,773	192,511	27,931	
1988	41,892	21,113	90,784	323,104	427,544	118,010	1,660,959	203,130	95,930	
1989	28,708	12,619	51,556	(2,196,424)	207,067	430,662	584,186	241,811	97,472	
1990	27,478	12,817	55,408	(1,385,019)	197,428	355,480	386,882	813,211	54,269	
1991	142,139	15,524	62,794	(893,417)	219,321	344,386	453,336	1,132,520	55,176	
1992	34,185	13,422	69,479	(1,427,482)	541,026	295,312	464,421	4,402,524	47,182	
1993	44,300	27,047	162,854	5,720,209	464,987	320,182	643,189	3,361,457	74,198	
1994	16,351	11,673	54,581	4,680,290	203,666	231,527	362,717	306,148	33,758	
1995	35,402	28,202	164,254	4,039,213	344,358	392,647	536,253	468,656	34,007	
1996	76,723	73,629	344,747	19,414,376	150,901	161,394	427,223	203,201	15,357	
1997	50,662	20,720	268,293	7,322,753	298,002	71,310	432,940	276,180	50,095	
1998	10,268	8,970	479,138	3,105,500	346,973	21,003	2,028,979	181,951	49,377	
1999	84,683	45,293	324,223	1,521,956	296,520	37,641	1,080,682	125,373	51,213	
2000	64,095	41,331	114,224	1,634,443	212,174	33,747	238,676	116,588	13,241	
2001	20,193	13,635	88,656	642,797	43,281	6,448	104,127	110,850	10,737	
2002	53,787	12,619	196,949	2,071,724	171,190	30,767	252,912	60,146	7,881	
2003	1,096,665	2,482,178	179,465	4,196,033	50,516	9,140	103,157	57,710	51,000	
2004	1,736,590	856,794	24,931	2,908,926	48,551	6,994	28,690	108,375	216,380	
2005	2,049,472	409,829	270,555	2,866,456	273,242	12,511	53,630	6,256	51,947	
2006	2,302,499	408,907	2,573,468	5,324,611	661,248	25,216	131,439	2,013	2,302,784	
2007	271	1,106,165	3,671,972	4,849,734	108,828	73,936	1,992,808	270,552	7,400	
2008	3,514,339	124,823	4,936,085	9,194,473	1,867,250	325,781	604,504	997,505	304,102	
2009	2,018,490	138,346	65,406,337	68,389,346	1,087,417	1,280,662	736,474	356,712	337,048	
2010	1,065,059	127,454	141,204,245	143,052,948	220,626	1,099,563	628,612	306,280	310,513	
2011	106,995	111,724	197,885	790,879	140,682	113,654	455,525	225,689	272,190	
2012	106,330	111,030	196,655	785,963	139,807	112,948	452,693	224,287	270,498	
2013	47,721	49,830	88,259	352,740	62,746	50,691	203,169	100,660	121,400	
2014	0	0	0	0	0	0	0	0	0	
2015	0	0	0	0	0	0	0	0	0	
TOTAL	38,444,727	29,636,733	274,431,494	451,162,153	41,591,799	35,024,327	130,649,462	66,138,753	79,390,466	

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

(in dollars)

Sheet 8 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)										Grand Total		
	WEST BRANCH (cont.)		COASTAL BRANCH									Total	TOTAL
	Reach 30	Subtotal	Reach 31A	Reach 33A	Reach 33B	Reach 34	Reach 35	Reach 37	Reach 38	Subtotal			
[65]	[66]	[67]	[68]		[69]	[70]	[71]	[72]	[73]	[74]	[75]		
1952	1,408	5,655	0	0	0	0	0	0	0	0	98,857	99,353	
1953	4,346	17,457	0	0	0	0	0	0	0	0	309,387	311,812	
1954	5,743	23,074	0	0	0	0	0	0	0	0	394,688	402,143	
1955	1,943	7,809	0	0	0	0	0	0	0	0	159,842	169,342	
1956	2,077	8,348	0	0	0	0	0	0	0	0	255,679	351,551	
1957	7,684	30,877	0	0	0	0	0	0	0	0	708,753	1,464,452	
1958	13,931	55,142	0	0	0	0	0	0	0	0	1,331,616	2,286,623	
1959	44,384	134,727	28,046	49,114	0	7,441	8,236	0	0	92,837	2,096,392	2,967,412	
1960	84,703	255,409	34,404	70,450	0	8,507	14,265	0	0	127,626	2,937,049	4,660,833	
1961	123,330	239,953	13,801	17,868	0	1,501	3,931	0	0	37,101	4,650,264	8,545,244	
1962	348,366	671,447	10,121	7,798	0	524	1,689	0	0	20,132	5,827,774	8,875,171	
1963	521,491	1,167,566	20,470	14,299	0	880	2,943	0	0	38,592	18,981,487	24,610,278	
1964	1,372,464	2,232,275	315,418	26,963	0	1,687	5,639	0	0	349,707	31,550,813	41,736,060	
1965	3,383,950	4,943,858	747,023	36,178	0	2,118	7,060	0	0	792,379	57,936,405	62,664,743	
1966	9,364,753	14,872,117	2,258,915	35,864	0	1,736	5,764	0	0	2,302,279	124,748,128	129,110,330	
1967	17,618,827	53,187,979	6,310,419	38,331	0	1,891	6,213	0	0	6,356,854	187,465,580	194,146,365	
1968	15,736,691	57,595,765	2,707,580	30,784	0	1,324	4,369	0	0	2,744,057	192,593,079	197,978,911	
1969	16,228,175	34,690,908	423,797	26,549	0	907	2,905	0	0	454,158	182,530,023	184,473,490	
1970	22,330,328	50,497,652	269,194	24,368	0	851	2,787	0	0	297,200	206,720,774	207,082,650	
1971	16,890,503	40,115,145	164,446	32,230	0	1,315	3,804	0	0	201,795	158,414,033	158,624,739	
1972	3,818,001	2,874,264	131,332	17,601	0	522	1,660	0	0	151,115	68,228,670	68,362,291	
1973	13,426,222	25,999,878	182,493	16,154	0	542	1,758	0	0	200,947	45,110,823	45,263,853	
1974	2,988,318	4,334,592	190,866	18,799	0	463	1,405	0	0	211,533	24,036,199	24,402,166	
1975	1,808,235	4,782,778	64,582	36,012	0	2,255	6,656	0	0	109,505	21,065,768	21,318,838	
1976	1,253,067	4,931,230	198,266	68,898	0	5,088	14,988	0	0	287,240	17,183,961	17,492,910	
1977	345,023	7,238,418	918,473	81,305	0	1,834	5,387	0	0	1,006,999	15,165,801	15,544,382	
1978	763,445	11,312,134	52,994	83,300	0	1,302	3,852	0	0	141,448	18,661,117	19,119,151	
1979	282,145	24,133,453	38,182	108,951	0	1,505	4,433	0	0	153,071	31,202,118	31,857,362	
1980	2,055,206	32,733,044	189,070	376,036	0	1,152	3,449	0	0	569,707	73,891,101	74,986,833	
1981	275,460	22,193,909	19,897	(157,537)	0	1,427	4,261	0	0	(131,952)	15,246,649	15,742,773	
1982	351,376	18,460,292	(16,381)	(96,449)	0	588	1,787	0	0	(110,455)	38,256,580	39,705,931	
1983	566,545	7,843,883	85,496	67,106	0	794	2,398	0	0	155,794	34,705,281	38,044,649	
1984	1,118,954	4,483,129	28,568	54,074	0	986	2,959	0	0	86,587	24,454,091	30,382,250	
1985	284,243	2,702,880	36,834	54,314	0	2,111	6,263	0	0	99,522	14,914,930	28,537,556	
1986	213,353	862,264	82,358	223,134	0	17,458	51,279	0	0	374,229	13,435,351	43,155,828	
1987	158,313	1,558,413	53,817	1,061,939	0	92,506	272,968	0	0	1,481,230	11,711,428	34,331,982	
1988	222,068	2,727,641	183,853	1,141,272	0	99,456	293,612	0	0	1,718,193	11,026,370	18,123,243	
1989	148,674	1,709,872	84,678	893,765	0	77,283	228,038	0	0	1,283,764	30,302,112	33,130,497	
1990	119,438	1,926,708	133,868	1,100,167	0	103,785	277,889	0	0	1,615,709	32,589,619	34,435,721	
1991	229,315	2,434,054	164,610	1,635,283	0	123,603	363,889	0	0	2,287,385	38,320,942	39,811,664	
1992	206,495	5,956,960	183,240	1,220,510	1,495,646	566,230	240,553	102,051	74,162	3,882,392	34,312,996	35,041,233	
1993	296,349	5,160,362	344,928	5,274,657	5,052,431	1,345,211	688,935	268,937	358,367	13,333,467	53,122,385	53,921,788	
1994	168,426	1,306,242	282,150	15,905,886	21,341,196	8,915,445	2,363,238	678,753	1,315,559	50,802,227	73,751,564	74,225,377	
1995	304,983	2,080,904	1,196,326	45,172,271	62,947,362	23,975,738	20,849,939	7,029,108	7,117,197	168,287,940	191,033,089	191,525,570	
1996	98,522	1,056,598	948,730	42,987,442	54,300,990	26,475,298	18,790,572	7,213,823	6,616,310	157,333,164	187,776,346	188,025,324	
1997	233,956	1,362,483	562,583	11,209,633	13,893,576	10,456,863	4,149,105	545,378	798,606	41,615,744	62,137,369	62,583,537	
1998	67,874	2,696,157	248,671	2,355,322	4,159,441	3,368,320	952,615	192,567	280,779	11,557,715	27,083,446	27,217,157	
1999	118,013	1,709,442	288,236	2,906,010	4,398,935	2,616,574	356,318	36,680	51,648	10,654,401	24,085,344	24,556,054	
2000	187,926	802,352	132,435	228,901	2,965,936	2,746,120	17,830	0	0	6,091,222	13,504,772	13,742,556	
2001	23,847	299,290	103,281	(7,057)	568,968	3,960	(1,112)	0	0	668,040	5,130,622	7,470,509	
2002	62,684	585,580	98,021	147,827	105,972	77,266	13,119	0	0	442,205	8,836,703	17,138,613	
2003	34,280	305,803	42,071	43,753	31,706	25,734	6,272	0	0	149,536	3,109,548	10,874,362	
2004	17,442	426,432	27,034	14,576	22,446	3,605	2,229	0	0	69,890	5,140,297	11,328,188	
2005	593,265	990,851	29,204	(262,373)	37,518	0	0	0	0	(195,651)	8,101,614	11,757,610	
2006	167,744	3,290,444	7,660	574,601	37,543	95,619	109,813	0	0	825,236	16,732,965	22,224,522	
2007	37,600	2,491,124	38,805	1,282,620	42,768	210,275	202,053	0	0	1,776,521	15,951,332	24,659,139	
2008	927,117	5,026,259	288,997	762,241	717,606	343,514	213,111	0	0	2,325,469	39,070,459	58,291,726	
2009	5,814,938	9,613,251	460,840	967,493	795,350	380,730	236,199	0	0	2,840,612	113,406,009	123,824,741	
2010	12,682,001	15,247,595	319,115	799,282	732,733	350,755	217,604	0	0	2,419,489	188,994,253	193,012,913	
2011	508,400	1,716,140	77,835	524,402	642,302	307,466	190,748	0	0	1,742,753	8,771,318	9,498,195	
2012	505,240	1,705,473	77,351	521,142	638,310	305,555	189,562	0	0	1,731,920	8,716,801	9,439,159	
2013	226,752	765,418	34,715	233,889	286,473	137,133	85,076	0	0	777,286	3,912,102	4,236,298	
2014	0	0	0	0	0	0	0	0	0	0	0	0	
2015	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	157,796,352	510,591,159	21,919,718	140,057,948	175,215,208	83,272,753	51,492,315	16,067,297	16,612,628	504,637,867	2,851,900,869	3,078,905,954	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 1 of 9

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT				
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	56,288	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	81,769	81,769	1,128,840	212,974	242,118	110,786	
1981	3,847	0	0	0	101,340	101,340	884,763	130,126	167,118	204,772	
1982	11,075	0	0	0	191,987	191,987	1,156,605	141,718	249,447	96,020	
1983	1,928	0	0	0	80,215	80,215	1,258,144	84,360	373,875	152,255	
1984	3,765	0	0	0	139,121	139,121	1,998,984	113,797	340,344	34,461	
1985	2,888	0	0	0	259,515	259,515	2,044,121	207,478	427,930	247,308	
1986	2,787	0	0	0	229,508	229,508	1,834,838	285,908	305,149	159,054	
1987	2,388	0	0	0	310,683	310,683	2,118,974	163,714	400,547	283,067	
1988	545	0	(94)	0	330,156	330,062	2,068,655	186,275	299,934	370,212	
1989	1,800	473,408	178,069	237,480	373,427	1,262,384	2,164,688	163,481	320,734	497,038	
1990	788	556,610	244,897	123,144	427,257	1,351,908	2,233,036	251,434	355,022	571,415	
1991	3,654	651,307	302,327	205,516	428,470	1,587,620	1,806,699	152,509	95,745	93,986	
1992	647	443,912	189,330	265,462	280,505	1,179,209	2,064,907	405,932	409,435	363,964	
1993	3,630	435,240	294,416	213,267	289,206	1,232,129	3,925,050	621,712	480,832	399,558	
1994	2,279	430,112	198,322	206,594	365,646	1,200,674	4,673,275	302,115	404,709	408,066	
1995	2,906	428,313	282,898	151,703	295,326	1,158,240	3,849,620	316,905	566,447	330,706	
1996	8,007	796,526	272,743	240,106	260,001	1,569,376	3,526,989	254,075	664,485	493,300	
1997	7,449	504,476	210,763	213,211	315,374	1,243,824	3,010,809	189,269	591,540	230,371	
1998	7,98	404,834	227,562	204,821	251,154	1,088,371	2,965,219	426,872	532,042	303,263	
1999	416	668,954	326,989	296,605	288,189	1,580,717	3,701,631	472,798	429,082	414,830	
2000	505	920,906	255,241	658,168	414,700	2,249,015	3,817,480	542,905	442,515	552,538	
2001	319	1,072,623	229,820	455,870	181,522	1,939,835	2,909,692	272,876	290,330	391,186	
2002	3,627	1,588,349	416,749	411,379	399,274	2,815,751	3,865,610	343,132	468,352	543,896	
2003	3,393	1,777,671	545,908	567,857	354,476	3,245,912	2,352,793	366,393	576,229	964,902	
2004	3,455	1,602,507	635,773	738,104	818,511	3,794,895	3,345,983	511,123	747,800	701,961	
2005	3,452	1,071,123	323,331	774,755	414,332	2,583,541	3,330,204	263,607	428,998	814,086	
2006	3,979	797,254	230,754	591,582	419,709	2,039,299	3,199,184	360,138	707,986	656,135	
2007	3,955	1,018,152	984,200	705,870	199,762	2,907,984	4,598,348	445,637	747,980	739,988	
2008	3,213	1,006,531	329,249	672,790	431,429	2,439,999	3,908,489	410,882	629,033	922,264	
2009	1,836	1,095,321	353,115	731,470	471,007	2,650,913	4,379,747	448,390	681,052	986,042	
2010	1,926	1,099,918	375,939	743,438	459,385	2,678,680	4,322,189	481,987	728,808	1,047,240	
2011	4,704	1,122,486	313,033	560,774	472,623	2,468,916	4,965,439	580,128	936,244	811,423	
2012	4,704	1,122,793	313,080	560,933	472,732	2,469,538	4,966,316	580,227	936,419	811,707	
2013	4,704	1,123,783	313,100	561,446	473,011	2,471,340	4,967,364	580,330	936,675	812,814	
2014	4,703	1,124,581	312,926	561,880	473,125	2,472,512	4,965,732	580,114	936,462	814,004	
2015	4,705	1,125,417	313,172	562,297	473,482	2,474,368	4,969,577	580,563	937,184	814,590	
2016	4,702	1,123,881	312,841	561,520	472,891	2,471,133	4,964,052	579,923	936,119	813,330	
2017	4,703	1,124,527	312,959	561,849	473,128	2,472,463	4,966,083	580,156	936,515	813,891	
2018	4,704	1,125,696	312,981	562,455	473,452	2,474,574	4,967,315	580,278	936,816	815,194	
2019	4,698	1,123,994	312,692	561,590	472,840	2,471,116	4,962,191	579,692	935,809	813,688	
2020	4,704	1,124,917	313,021	562,048	473,268	2,473,254	4,967,203	580,282	936,739	814,248	
2021	4,707	1,125,317	313,264	562,236	473,510	2,474,327	4,970,666	580,698	937,361	814,334	
2022	4,703	1,125,402	312,936	562,309	473,350	2,473,997	4,966,464	580,181	936,651	814,938	
2023	4,702	1,123,939	312,882	561,548	472,932	2,471,301	4,964,626	579,994	936,222	813,331	
2024	4,702	1,124,565	312,880	561,874	473,097	2,472,416	4,965,093	580,033	936,351	814,055	
2025	4,707	1,125,691	313,241	562,433	473,595	2,474,960	4,970,660	580,687	937,389	814,799	
2026	4,697	1,123,663	312,603	561,426	472,703	2,470,395	4,960,774	579,527	935,543	813,443	
2027	4,714	1,127,189	313,691	563,180	474,247	2,478,307	4,977,729	581,517	938,714	815,832	
2028	4,697	1,123,633	312,522	561,418	472,652	2,470,225	4,959,698	579,396	935,354	813,533	
2029	4,704	1,124,920	313,081	562,042	473,301	2,473,344	4,967,993	580,380	936,874	814,155	
2030	4,702	1,123,732	312,845	561,441	472,856	2,470,874	4,963,973	579,914	936,093	813,150	
2031	4,713	1,127,789	313,624	563,497	474,370	2,479,280	4,977,341	581,454	938,695	816,627	
2032	4,694	1,123,019	312,332	561,113	472,381	2,468,845	4,956,723	579,046	934,798	813,122	
2033	4,705	1,124,915	313,213	562,031	473,375	2,473,534	4,969,721	580,590	937,169	813,944	
2034	4,704	1,125,362	313,114	562,272	473,437	2,474,185	4,968,782	580,466	937,042	814,612	
2035	4,694	1,123,162	312,385	561,181	472,448	2,469,176	4,957,535	579,144	934,951	813,204	
TOTAL	214,861	46,958,410	15,232,719	23,455,985	22,337,647	107,984,761	219,809,896	24,811,257	38,912,907	35,106,230	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 3 of 9

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	1,176,463	222,942	127,625	281,860	2,052,397	57,726	274,848	185,155
1981	265,766	1,065,358	193,048	90,533	1,612,157	3,226,862	80,121	198,256	144,187
1982	279,250	1,241,285	209,371	114,421	1,433,180	3,277,507	59,424	269,086	233,494
1983	214,468	1,949,017	339,809	131,377	2,143,678	4,778,349	49,448	383,476	223,078
1984	241,273	2,233,969	335,166	163,858	2,111,386	5,085,652	42,062	458,489	300,924
1985	322,068	2,882,583	360,431	176,577	1,603,532	5,345,191	58,820	495,500	213,368
1986	416,027	2,996,792	472,551	252,188	601,250	4,738,808	90,730	478,786	596,800
1987	362,738	3,104,592	424,107	236,349	439,232	4,567,018	113,962	412,042	446,067
1988	365,209	2,954,186	456,864	231,754	639,242	4,647,255	96,728	379,073	417,991
1989	263,171	3,182,472	393,589	332,986	633,419	4,805,637	83,282	389,698	400,853
1990	397,353	4,011,110	579,073	464,639	729,132	6,181,307	111,019	436,849	515,611
1991	256,473	4,388,184	543,760	728,156	765,765	6,682,338	104,414	496,794	465,940
1992	302,021	3,792,401	795,587	363,134	815,590	6,068,733	118,315	511,982	417,871
1993	439,725	4,337,616	1,008,394	551,849	734,796	7,072,380	230,338	745,885	490,159
1994	282,579	4,376,461	816,129	396,768	492,860	6,364,797	125,398	602,404	572,555
1995	107,995	5,026,076	1,066,971	440,006	1,356,668	7,997,716	185,681	657,282	432,072
1996	1,003,229	4,738,221	931,944	683,323	1,034,376	8,391,093	112,062	416,294	472,350
1997	859,665	5,761,996	924,289	254,934	646,209	8,447,093	128,190	449,316	728,436
1998	690,845	5,520,206	1,242,589	534,931	654,538	8,643,109	115,748	457,845	429,433
1999	697,893	5,684,969	1,219,793	531,972	670,006	8,804,633	104,822	396,623	409,411
2000	712,071	5,849,518	1,033,992	528,537	876,030	9,000,148	104,381	467,347	513,824
2001	(558,917)	7,151,253	851,983	373,030	679,856	8,497,205	58,436	553,295	603,147
2002	1,071,739	5,193,633	673,240	255,190	738,467	7,932,269	55,252	729,942	417,109
2003	1,026,535	6,039,979	750,339	304,182	620,749	8,741,784	62,618	674,449	643,946
2004	655,509	7,033,601	725,042	344,853	606,863	9,365,868	37,161	484,074	337,980
2005	543,533	6,050,102	976,242	396,412	793,183	8,759,472	28,760	405,593	298,717
2006	1,148,263	6,131,086	1,551,613	620,757	932,463	10,384,182	49,270	617,318	879,869
2007	995,341	7,328,519	2,074,995	758,915	905,046	12,092,816	205,263	1,015,736	551,199
2008	1,460,343	11,155,764	2,266,544	831,781	1,151,751	16,866,183	99,434	658,078	685,028
2009	1,429,933	14,392,031	2,326,837	855,606	1,191,556	20,195,963	103,933	686,350	714,639
2010	1,432,558	10,783,614	2,314,613	856,100	1,214,186	16,601,071	109,010	718,258	748,057
2011	986,720	5,551,658	1,188,475	560,197	764,972	9,052,022	331,363	1,259,926	1,033,432
2012	987,149	5,553,783	1,188,657	560,389	765,223	9,055,201	331,418	1,260,293	1,033,754
2013	989,343	5,562,725	1,188,716	561,129	766,161	9,068,074	331,457	1,261,530	1,034,905
2014	992,301	5,572,961	1,188,026	561,913	767,119	9,082,320	331,303	1,262,629	1,036,018
2015	992,750	5,576,909	1,188,956	562,321	767,677	9,088,613	331,561	1,263,563	1,036,779
2016	991,189	5,567,765	1,187,708	561,457	766,528	9,074,647	331,201	1,261,788	1,035,268
2017	991,979	5,571,956	1,188,146	561,841	767,033	9,080,955	331,330	1,262,545	1,035,922
2018	994,560	5,582,450	1,188,215	562,711	768,135	9,096,071	331,378	1,264,000	1,037,279
2019	992,382	5,571,189	1,187,127	561,688	766,792	9,079,178	331,057	1,262,007	1,035,547
2020	992,513	5,574,628	1,188,378	562,083	767,348	9,084,950	331,400	1,263,008	1,036,326
2021	991,942	5,574,519	1,189,307	562,153	767,482	9,085,403	331,647	1,263,386	1,036,570
2022	994,181	5,580,525	1,188,036	562,538	767,906	9,093,186	331,325	1,263,663	1,036,984
2023	991,068	5,567,639	1,187,863	561,459	766,540	9,074,569	331,243	1,261,836	1,035,296
2024	992,557	5,573,553	1,187,842	561,948	767,151	9,083,051	331,254	1,262,630	1,036,043
2025	992,963	5,578,386	1,189,209	562,462	767,866	9,090,886	331,632	1,263,869	1,037,033
2026	992,152	5,569,489	1,186,790	561,520	766,563	9,076,514	330,963	1,261,632	1,035,236
2027	993,692	5,585,286	1,190,928	563,183	768,858	9,101,947	332,106	1,265,540	1,038,385
2028	992,585	5,570,480	1,186,478	561,576	766,816	9,077,735	330,884	1,261,835	1,035,278
2029	992,136	5,573,680	1,188,614	562,023	767,284	9,083,737	331,460	1,262,976	1,036,270
2030	990,812	5,566,304	1,187,722	561,337	766,378	9,072,553	331,202	1,261,599	1,035,086
2031	995,508	5,591,939	1,190,658	563,706	769,507	9,111,318	332,051	1,266,328	1,039,159
2032	992,328	5,567,755	1,185,752	561,289	766,217	9,073,341	330,682	1,260,956	1,034,730
2033	991,299	5,571,529	1,189,128	561,890	767,142	9,080,988	331,590	1,262,904	1,036,138
2034	992,967	5,577,280	1,188,735	562,330	767,679	9,088,991	331,503	1,263,518	1,036,763
2035	992,330	5,568,248	1,185,956	561,346	766,302	9,074,182	330,737	1,261,108	1,034,847
TOTAL	44,012,614	305,261,127	60,004,790	27,892,224	50,347,125	487,517,880	11,738,502	49,415,589	41,830,484

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(In dollars)

Sheet 4 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[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	72,589	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	1,988,619	189,132	238,607	1,437,614	
1981	199,927	76,965	33,322	113,202	171,669	1,741,488	163,934	161,182	1,799,832	
1982	264,947	158,178	142,631	224,170	224,051	1,793,867	195,086	15,768	1,933,859	
1983	308,801	136,350	124,724	203,733	217,324	2,421,794	199,708	181,879	2,550,842	
1984	396,448	163,331	108,212	188,724	245,764	3,312,127	329,490	204,332	3,215,901	
1985	298,337	198,368	154,995	194,327	360,308	3,463,178	237,127	180,068	3,627,049	
1986	422,493	248,170	242,660	346,410	349,369	3,781,427	320,984	360,156	3,574,451	
1987	488,226	334,059	325,697	469,378	322,824	3,731,912	463,757	238,813	4,080,465	
1988	532,489	290,881	220,658	374,653	318,253	3,451,893	411,110	313,806	3,746,920	
1989	733,030	268,025	207,487	595,433	380,883	3,512,884	333,996	220,978	3,751,081	
1990	651,465	363,652	225,171	480,738	480,738	4,021,727	439,953	212,851	4,817,643	
1991	716,328	328,683	269,873	371,312	433,313	4,309,082	424,704	273,169	4,566,702	
1992	574,145	334,579	270,768	409,314	423,717	4,734,368	729,211	571,412	4,270,793	
1993	723,450	413,722	278,375	496,851	594,201	5,182,830	664,063	423,780	5,266,124	
1994	703,493	346,600	239,873	482,301	445,909	4,012,614	414,899	254,393	3,727,019	
1995	881,902	405,045	242,253	622,654	507,102	4,607,154	309,283	315,905	3,973,757	
1996	984,784	367,570	238,622	519,560	604,736	4,892,967	214,773	187,784	4,331,630	
1997	1,864,113	309,696	254,080	516,115	429,771	5,094,202	209,221	275,610	4,011,366	
1998	1,011,284	295,927	170,556	384,226	484,072	4,752,549	309,440	248,178	4,694,822	
1999	1,125,514	373,814	171,495	399,331	504,020	5,041,004	351,551	231,593	4,753,855	
2000	924,210	407,081	329,756	651,715	567,781	5,957,878	343,438	141,041	5,385,171	
2001	870,742	413,016	893,071	519,027	660,369	4,701,148	(133,796)	(94,419)	6,007,151	
2002	1,309,728	381,311	295,967	959,788	862,655	5,969,394	39,304	256,180	5,598,378	
2003	817,168	338,931	233,756	690,414	612,296	6,182,663	(128,254)	24,819	6,974,013	
2004	609,367	244,096	173,363	623,894	584,409	7,283,893	(107,944)	(142,634)	8,848,430	
2005	900,730	212,859	119,774	851,677	469,847	6,309,805	(169,521)	(182,675)	5,897,939	
2006	590,234	250,291	135,307	820,342	605,497	5,734,618	344,255	113,394	6,630,051	
2007	643,116	391,784	319,686	748,782	517,228	6,288,527	817,049	251,031	9,811,907	
2008	881,175	293,170	204,948	829,005	626,993	8,126,112	365,652	216,400	10,984,008	
2009	919,608	305,578	212,744	865,795	654,161	9,376,919	380,714	225,089	8,964,905	
2010	962,984	319,582	221,541	907,317	684,823	8,100,060	397,713	234,896	7,603,304	
2011	1,049,986	786,449	714,671	1,111,428	1,168,382	7,222,409	986,313	681,364	6,879,529	
2012	1,050,145	786,666	714,938	1,111,700	1,168,701	7,224,138	986,629	681,587	6,880,939	
2013	1,050,197	787,358	716,029	1,112,434	1,169,723	7,228,736	987,799	682,444	6,883,750	
2014	1,049,590	787,913	717,256	1,112,848	1,170,543	7,231,137	988,971	683,327	6,883,594	
2015	1,050,411	788,500	717,766	1,113,687	1,171,414	7,236,590	989,693	683,821	6,888,863	
2016	1,049,307	787,423	716,610	1,112,256	1,169,817	7,227,379	988,223	682,790	6,880,692	
2017	1,049,695	787,875	717,139	1,112,838	1,170,487	7,231,094	988,866	683,242	6,883,841	
2018	1,049,755	788,686	718,417	1,113,701	1,171,687	7,236,491	990,242	684,245	6,887,136	
2019	1,048,791	787,500	717,009	1,112,198	1,169,928	7,226,849	988,536	683,038	6,879,073	
2020	1,049,901	788,151	717,469	1,113,180	1,170,893	7,233,282	989,265	683,528	6,885,636	
2021	1,050,720	788,427	717,484	1,113,699	1,171,308	7,236,746	989,462	683,636	6,889,745	
2022	1,049,598	788,485	718,179	1,113,449	1,171,390	7,234,871	989,950	684,041	6,885,792	
2023	1,049,444	787,462	716,600	1,112,337	1,169,876	7,227,910	988,246	682,797	6,881,353	
2024	1,049,425	787,901	717,321	1,112,791	1,170,524	7,230,719	989,006	683,354	6,882,936	
2025	1,050,634	788,689	717,952	1,113,945	1,171,695	7,238,271	989,937	683,992	6,890,412	
2026	1,048,496	787,270	716,792	1,111,873	1,169,582	7,224,743	988,242	682,831	6,877,089	
2027	1,052,150	789,740	718,850	1,115,464	1,173,260	7,248,158	991,216	684,870	6,900,031	
2028	1,048,220	787,247	716,902	1,111,774	1,169,550	7,224,049	988,300	682,884	6,875,984	
2029	1,050,107	788,147	717,359	1,113,238	1,170,894	7,233,708	989,192	683,468	6,886,414	
2030	1,049,320	787,316	716,431	1,112,152	1,169,661	7,226,718	988,039	682,651	6,880,340	
2031	1,051,912	790,158	719,652	1,115,837	1,173,873	7,250,396	992,019	685,466	6,900,728	
2032	1,047,578	786,818	716,549	1,111,147	1,168,910	7,219,957	987,783	682,532	6,871,966	
2033	1,050,563	788,145	717,116	1,113,361	1,170,895	7,234,607	989,031	683,331	6,888,092	
2034	1,050,215	788,458	717,804	1,113,590	1,171,352	7,235,933	989,687	683,828	6,887,980	
2035	1,047,759	786,917	716,611	1,111,302	1,169,059	7,220,977	987,892	682,606	6,873,023	
TOTAL	50,431,785	29,784,783	25,866,353	45,273,253	45,479,155	340,516,342	35,278,487	24,409,923	336,837,526	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 5 of 9

CALIFORNIA AQUEDUCT (continued)										
Calendar Year	SOUTH SAN JOAQUIN DIVISION (continued)		TEHACHAPI DIVISION			MOJAVE DIVISION				
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A	
	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[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	2,231,456	7,463,378	4,749,245	54,806	4,804,051	116,487	446,175	0	290,719	
1981	2,762,773	7,646,858	5,485,957	64,886	5,550,843	316,590	585,003	0	325,112	
1982	2,961,383	8,475,944	6,349,080	55,997	6,405,077	447,739	638,615	0	275,763	
1983	4,302,165	11,303,322	14,153,033	96,397	14,249,430	345,229	564,698	0	368,139	
1984	5,077,824	14,043,628	18,448,383	77,201	18,525,584	267,497	563,588	0	413,443	
1985	5,683,454	14,964,899	18,134,698	137,928	18,272,626	298,932	475,028	0	450,444	
1986	5,780,666	16,593,102	19,297,129	109,938	19,407,067	703,413	350,906	0	347,690	
1987	5,636,043	17,063,245	17,398,908	98,355	17,497,263	1,261,056	558,996	0	818,475	
1988	5,150,238	15,704,693	17,697,838	138,405	17,836,243	1,242,139	560,911	0	585,014	
1989	5,458,633	16,336,263	17,641,151	88,488	17,729,639	1,049,615	283,065	0	366,590	
1990	6,440,643	18,959,051	19,995,760	99,868	20,095,628	1,298,537	229,083	0	469,502	
1991	5,805,189	18,565,503	19,903,346	131,558	20,034,904	1,432,360	665,443	0	1,025,089	
1992	6,471,964	19,838,439	18,194,788	279,610	18,474,398	1,167,898	738,238	0	666,181	
1993	7,583,165	23,092,943	19,051,939	199,640	19,251,579	1,868,745	606,763	0	1,232,409	
1994	7,142,378	19,069,838	17,354,702	204,963	17,559,665	1,699,479	763,493	0	1,145,700	
1995	6,540,575	19,680,665	19,360,033	191,516	19,551,549	1,284,146	614,314	0	1,941,939	
1996	7,065,052	20,408,184	19,041,451	237,846	19,279,297	1,163,708	576,674	0	1,335,804	
1997	7,387,904	21,710,020	19,724,881	176,120	19,901,001	1,330,450	730,628	0	1,401,562	
1998	7,530,927	20,885,007	23,227,152	182,754	23,409,906	1,513,656	309,052	0	7,568,901	
1999	8,717,679	22,580,702	19,690,120	152,644	19,842,764	3,104,013	632,659	0	5,313,388	
2000	12,484,909	28,278,532	23,258,426	245,010	23,503,436	1,876,491	740,777	0	1,382,646	
2001	15,785,706	30,836,893	24,056,649	618,258	24,674,907	2,440,376	2,549,692	0	1,843,160	
2002	11,475,179	28,350,187	20,789,485	472,793	21,262,278	1,405,443	800,065	0	785,244	
2003	11,510,629	28,637,448	20,858,132	283,196	21,141,328	3,734,791	673,419	0	707,540	
2004	14,644,290	33,620,379	26,619,990	244,908	26,864,898	1,819,685	1,349,413	0	1,303,773	
2005	13,897,911	29,041,416	16,531,418	1,498,315	18,029,733	5,650,827	1,487,195	0	1,530,171	
2006	14,046,774	30,917,220	14,974,091	247,441	15,221,532	4,217,154	642,005	0	684,170	
2007	8,171,327	29,632,635	14,661,392	989,816	15,651,208	3,992,040	759,305	0	993,688	
2008	16,011,634	39,981,637	19,878,279	742,645	20,620,924	5,274,824	1,079,670	0	1,745,752	
2009	18,700,426	42,110,861	20,649,597	776,497	21,426,094	5,518,178	1,116,913	0	1,824,492	
2010	14,468,114	35,475,659	22,817,545	814,702	23,632,247	5,778,093	1,155,771	0	1,886,001	
2011	9,931,836	33,157,088	28,136,787	413,638	28,550,425	2,378,153	1,275,329	0	1,915,004	
2012	9,934,247	33,165,155	28,142,128	413,737	28,555,865	2,378,806	1,276,974	0	1,916,229	
2013	9,940,826	33,187,188	28,150,708	414,019	28,564,727	2,380,880	1,286,329	0	1,922,294	
2014	9,944,512	33,199,641	28,145,555	414,181	28,559,736	2,382,526	1,299,807	0	1,930,319	
2015	9,952,005	33,224,653	28,167,229	414,490	28,581,719	2,384,302	1,300,483	0	1,931,611	
2016	9,939,254	33,182,008	28,134,922	413,959	28,548,881	2,381,062	1,295,765	0	1,927,426	
2017	9,944,424	33,199,298	28,147,073	414,177	28,561,250	2,382,430	1,298,565	0	1,929,630	
2018	9,952,135	33,225,152	28,157,147	414,500	28,571,647	2,384,855	1,309,401	0	1,936,652	
2019	9,938,710	33,180,243	28,126,230	413,942	28,540,172	2,381,294	1,301,863	0	1,930,808	
2020	9,947,487	33,209,526	28,153,893	414,304	28,568,197	2,383,255	1,300,560	0	1,931,123	
2021	9,952,124	33,224,954	28,172,183	414,495	28,586,678	2,384,111	1,296,833	0	1,929,586	
2022	9,949,892	33,217,619	28,152,003	414,411	28,566,414	2,384,269	1,308,351	0	1,935,815	
2023	9,939,974	33,184,374	28,137,904	413,989	28,551,893	2,381,195	1,295,231	0	1,927,227	
2024	9,944,012	33,197,916	28,142,366	414,161	28,556,527	2,382,512	1,301,647	0	1,931,328	
2025	9,954,340	33,232,401	28,173,458	414,592	28,588,050	2,384,892	1,301,326	0	1,932,384	
2026	9,935,820	33,170,569	28,118,170	413,823	28,531,993	2,380,601	1,301,520	0	1,930,276	
2027	9,967,894	33,277,664	28,213,183	415,153	28,628,336	2,388,073	1,301,952	0	1,934,367	
2028	9,934,943	33,167,650	28,112,829	413,787	28,526,616	2,380,521	1,303,678	0	1,931,377	
2029	9,948,011	33,211,244	28,157,754	414,326	28,572,080	2,383,272	1,298,760	0	1,930,187	
2030	9,938,317	33,178,832	28,133,995	413,919	28,547,914	2,380,766	1,294,414	0	1,926,570	
2031	9,971,202	33,288,781	28,213,379	415,296	28,628,675	2,389,319	1,310,154	0	1,939,391	
2032	9,929,334	33,148,942	28,096,162	413,553	28,509,715	2,379,219	1,303,599	0	1,930,654	
2033	9,949,117	33,214,890	28,166,158	414,367	28,580,525	2,383,276	1,294,491	0	1,927,916	
2034	9,951,160	33,221,791	28,163,147	414,458	28,577,605	2,384,194	1,302,070	0	1,932,423	
2035	9,930,717	33,153,555	28,100,634	413,613	28,514,247	2,379,537	1,303,568	0	1,930,821	
TOTAL	528,202,278	1,565,064,460	1,284,731,992	20,496,142	1,305,228,134	123,730,589	57,141,895	0	90,629,392	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 6 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION (continued)							SANTA ANA DIVISION		
	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	
	[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[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	2,670,387	147,009	688,605	4,870,700	72,651	1,532,535	
1981	292,081	181,062	119,602	3,030,407	134,895	47,750	5,032,502	35,662	1,575,444	
1982	330,502	186,109	125,429	3,248,883	299,712	623,755	6,176,507	28,852	1,822,250	
1983	326,767	219,943	140,523	3,899,769	223,626	384,292	6,472,986	19,017	1,663,599	
1984	329,933	266,919	146,866	4,783,997	59,337	1,104,149	6,935,729	11,319	2,325,661	
1985	388,327	799,514	125,780	5,330,501	261,135	811,346	8,941,007	17,764	2,707,662	
1986	315,566	242,158	178,847	6,190,812	156,053	515,945	9,001,390	31,012	2,768,728	
1987	357,971	298,190	236,263	5,731,239	151,796	732,607	10,146,593	19,362	2,847,390	
1988	400,005	331,099	149,876	6,910,472	253,833	970,052	11,403,401	36,576	3,087,873	
1989	345,614	194,047	138,825	5,963,386	349,544	1,242,144	9,932,830	30,881	3,190,809	
1990	202,412	273,748	49,174	6,905,442	436,785	1,891,053	11,755,736	25,518	3,330,913	
1991	516,257	478,555	231,223	7,488,366	263,723	1,561,051	13,662,067	32,172	3,847,589	
1992	696,623	585,072	168,251	7,076,997	317,042	622,116	12,038,418	55,819	4,043,878	
1993	818,675	509,309	207,818	7,765,751	359,632	1,708,915	15,078,017	72,464	5,638,325	
1994	957,350	873,215	241,679	7,691,548	1,220,795	1,245,936	15,839,195	105,373	5,139,991	
1995	2,411,412	355,198	179,930	6,994,639	842,041	746,371	15,369,990	96,781	4,357,648	
1996	1,713,145	790,618	136,397	8,590,347	889,842	(78,782)	15,117,753	156,395	4,051,744	
1997	2,043,179	640,177	189,241	8,138,580	1,586,227	3,355,446	19,415,490	177,217	4,585,198	
1998	508,030	297,621	115,100	8,887,728	1,924,868	1,134,837	22,259,793	142,703	4,866,225	
1999	1,583,887	1,344,804	158,127	9,548,762	2,027,154	1,340,712	25,053,506	189,880	5,957,072	
2000	1,437,269	974,362	165,942	9,541,048	1,711,994	1,520,219	19,350,748	353,640	4,203,640	
2001	1,526,739	1,071,309	476,330	7,684,613	1,893,231	25,579	19,511,029	298,329	2,435,173	
2002	583,717	1,157,056	291,096	11,281,918	1,684,767	946,719	18,909,025	509,094	3,423,421	
2003	621,363	467,741	278,116	13,346,098	2,096,392	(411,867)	21,513,563	368,565	3,753,401	
2004	1,025,345	1,043,564	404,058	10,581,130	2,128,942	1,106,945	20,762,855	427,842	5,460,064	
2005	867,731	670,878	347,544	7,735,531	2,415,710	2,214,193	22,919,780	452,745	5,645,457	
2006	2,391,350	657,567	518,416	11,994,557	1,927,690	1,436,887	24,469,796	396,666	5,626,331	
2007	1,485,376	861,535	450,442	12,201,494	3,184,249	1,949,871	25,877,980	436,469	7,833,299	
2008	1,609,241	690,823	437,020	13,872,516	2,703,496	2,094,948	29,508,290	450,129	7,284,552	
2009	1,675,721	718,427	453,635	15,070,397	2,832,627	2,346,476	31,556,866	470,647	8,605,205	
2010	1,745,693	746,724	471,092	15,363,706	2,956,578	2,415,991	32,519,649	493,803	8,717,092	
2011	1,123,609	844,266	465,675	10,076,559	545,657	2,698,660	21,322,912	82,759	7,369,775	
2012	1,124,713	844,919	466,160	10,081,937	545,979	2,304,705	20,940,422	82,771	7,371,217	
2013	1,130,737	848,333	468,826	10,107,421	547,624	1,214,716	19,907,160	82,775	7,373,735	
2014	1,139,220	853,008	472,610	10,139,984	549,816	3,178,453	21,945,743	82,726	7,372,812	
2015	1,139,893	853,555	472,883	10,146,921	550,168	1,207,912	19,987,728	82,791	7,378,475	
2016	1,136,541	851,438	471,431	10,127,115	548,979	3,464,754	22,204,511	82,704	7,369,908	
2017	1,138,453	852,597	472,267	10,137,079	549,581	2,023,484	20,784,086	82,736	7,373,159	
2018	1,145,430	856,554	475,358	10,166,717	551,508	2,384,619	21,211,094	82,740	7,376,118	
2019	1,140,308	853,465	473,120	10,140,163	549,860	3,446,061	22,216,942	82,666	7,367,825	
2020	1,139,788	853,392	472,855	10,143,712	549,982	2,107,799	20,882,466	82,751	7,374,996	
2021	1,137,635	852,339	471,875	10,138,842	549,580	936,615	19,697,416	82,815	7,379,645	
2022	1,144,712	856,114	475,043	10,162,666	551,225	2,203,614	21,021,809	82,726	7,374,737	
2023	1,136,239	851,296	471,295	10,126,395	548,892	3,403,765	22,141,535	82,715	7,370,662	
2024	1,140,352	853,616	473,119	10,143,531	550,004	2,016,481	20,792,590	82,714	7,372,021	
2025	1,140,499	853,936	473,144	10,150,415	550,343	2,242,781	21,029,720	82,810	7,380,116	
2026	1,140,001	853,234	472,995	10,137,244	549,679	3,528,148	22,293,698	82,642	7,365,709	
2027	1,141,340	854,720	473,474	10,161,710	550,920	1,817,108	20,623,664	82,929	7,390,486	
2028	1,141,311	853,917	473,581	10,141,407	549,993	976,343	19,752,128	82,620	7,364,390	
2029	1,138,699	852,817	472,361	10,140,085	549,710	3,330,791	22,096,682	82,767	7,375,943	
2030	1,135,676	850,954	471,046	10,123,359	548,700	3,464,679	22,196,164	82,705	7,369,617	
2031	1,146,540	857,608	475,784	10,182,262	552,272	272,730	19,126,059	82,910	7,390,786	
2032	1,141,072	853,655	473,493	10,137,141	549,784	3,300,642	22,069,259	82,569	7,360,044	
2033	1,136,084	851,430	471,190	10,131,423	549,095	1,738,271	20,483,176	82,806	7,378,000	
2034	1,140,855	854,060	473,318	10,149,712	550,331	1,490,445	20,277,408	82,776	7,377,450	
2035	1,141,104	853,710	473,503	10,138,014	549,790	5,097,318	23,867,365	82,583	7,361,201	
TOTAL	59,260,174	40,253,369	19,959,424	522,178,930	51,842,827	98,807,256	1,063,803,856	8,421,725	323,932,341	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 7 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)				SANTA ANA DIVISION - EAST BRANCH EXTENSION					
	Reach 28G	Reach 28H	Reach 28J	Subtotal	Reach 1	Reach 2A	Reach 2B	Reach 2C	Reach 2D	
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[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	0	0	0	0	0	
1973	136,352	79	0	836,300	0	0	0	0	0	
1974	155,262	34,693	854,637	1,868,372	0	0	0	0	0	
1975	110,729	69,082	723,814	1,817,983	0	0	0	0	0	
1976	138,575	100,400	635,853	2,029,323	0	0	0	0	0	
1977	127,543	92,647	825,880	2,521,394	0	0	0	0	0	
1978	166,919	68,363	835,082	2,297,500	0	0	0	0	0	
1979	142,586	92,812	265,525	1,820,574	0	0	0	0	0	
1980	158,340	129,897	1,120,131	3,013,554	0	0	0	0	0	
1981	160,053	111,722	333,550	2,216,431	0	0	0	0	0	
1982	205,350	135,463	1,518,759	3,708,674	0	0	0	0	0	
1983	244,720	124,651	412,806	2,484,793	0	0	0	0	0	
1984	240,496	190,924	769,068	3,537,468	0	0	0	0	0	
1985	451,600	182,242	871,492	4,230,760	0	0	0	0	0	
1986	439,048	256,526	982,332	4,477,646	0	0	0	0	0	
1987	278,094	218,717	1,118,529	4,482,092	0	0	0	0	0	
1988	271,868	200,811	1,176,659	4,773,787	0	0	0	0	0	
1989	230,953	281,861	1,130,035	4,864,539	0	0	0	0	0	
1990	437,812	308,144	1,538,449	5,640,836	0	0	0	0	0	
1991	843,388	632,912	1,630,321	6,986,382	0	0	0	0	0	
1992	281,864	5,636,464	1,102,519	11,120,544	0	0	0	0	0	
1993	382,195	570,563	994,721	7,658,268	0	0	0	0	0	
1994	617,136	415,603	1,022,412	7,300,515	0	0	0	0	0	
1995	1,308,828	704,154	894,338	7,361,749	0	0	0	0	0	
1996	1,001,063	1,041,697	1,316,493	7,567,392	0	0	0	0	0	
1997	493,841	949,188	953,590	7,159,034	0	0	0	0	0	
1998	379,997	991,426	(67,444)	6,302,907	0	0	0	0	0	
1999	493,493	1,964,137	845,343	9,449,925	0	0	0	0	0	
2000	844,558	1,004,569	1,130,423	7,536,830	0	0	0	0	0	
2001	1,668,195	811,163	5,688,912	10,901,772	0	0	0	0	0	
2002	1,252,893	424,389	2,197,952	7,807,749	0	0	0	0	0	
2003	546,192	376,265	1,279,384	6,323,807	0	728	372,802	117	0	
2004	1,239,635	440,811	3,465,088	11,033,440	12,139	2,882	505,956	330	0	
2005	1,519,906	684,733	(1,749,483)	6,553,358	8,599	1,747	523,395	1,445	0	
2006	651,595	320,174	4,173,183	11,167,949	8,006	3,028	518,624	7,763	1,593	
2007	854,970	661,978	2,502,314	12,289,030	170,284	6,339	1,135,013	6,858	3,367	
2008	1,031,309	699,504	5,960,637	15,426,131	10,441	2,812	567,778	4,924	1,651	
2009	1,078,318	731,389	4,273,735	15,159,294	10,917	2,940	593,658	5,148	1,727	
2010	1,131,373	767,375	4,422,129	15,531,772	11,454	3,085	622,867	5,401	1,811	
2011	768,293	535,749	2,323,303	11,079,879	11,454	3,085	622,867	5,401	1,811	
2012	768,411	535,829	2,543,034	11,301,262	11,454	3,085	622,867	5,401	1,811	
2013	768,449	535,856	2,862,510	11,623,325	11,454	3,085	622,867	5,401	1,811	
2014	768,003	535,544	2,397,525	11,156,610	11,454	3,085	622,867	5,401	1,811	
2015	768,605	535,965	2,701,729	11,467,565	11,454	3,085	622,867	5,401	1,811	
2016	767,796	535,402	2,317,328	11,073,138	11,454	3,085	622,867	5,401	1,811	
2017	768,082	535,599	3,052,368	11,811,944	11,454	3,085	622,867	5,401	1,811	
2018	768,124	535,631	2,472,574	11,235,187	11,454	3,085	622,867	5,401	1,811	
2019	767,420	535,139	3,077,613	11,830,663	11,454	3,085	622,867	5,401	1,811	
2020	768,232	535,705	2,170,093	10,931,777	11,454	3,085	622,867	5,401	1,811	
2021	768,832	536,122	2,548,237	11,315,651	11,454	3,085	622,867	5,401	1,811	
2022	768,010	535,550	3,539,707	12,300,730	11,454	3,085	622,867	5,401	1,811	
2023	767,898	535,471	2,477,950	11,234,696	11,454	3,085	622,867	5,401	1,811	
2024	767,882	535,463	2,862,894	11,620,974	11,454	3,085	622,867	5,401	1,811	
2025	768,767	536,078	2,083,091	10,850,862	11,454	3,085	622,867	5,401	1,811	
2026	767,204	534,987	3,444,124	12,194,666	11,454	3,085	622,867	5,401	1,811	
2027	769,878	536,853	1,758,638	10,538,784	11,454	3,085	622,867	5,401	1,811	
2028	767,002	534,847	2,765,561	11,514,420	11,454	3,085	622,867	5,401	1,811	
2029	768,381	535,808	2,612,268	11,375,167	11,454	3,085	622,867	5,401	1,811	
2030	767,807	535,408	2,691,046	11,446,583	11,454	3,085	622,867	5,401	1,811	
2031	769,705	536,732	3,589,983	12,370,116	11,454	3,085	622,867	5,401	1,811	
2032	766,532	534,520	1,975,656	10,719,321	11,454	3,085	622,867	5,401	1,811	
2033	768,715	536,041	2,906,973	11,672,535	11,454	3,085	622,867	5,401	1,811	
2034	768,460	535,864	2,634,154	11,398,704	11,454	3,085	622,867	5,401	1,811	
2035	766,665	534,612	3,493,270	12,238,331	11,454	3,085	622,867	5,401	1,811	
TOTAL	40,920,311	35,818,333	124,450,797	533,543,507	518,190	100,686	20,411,768	167,011	55,424	

TABLE B-11. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 8 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SANTA ANA DIVISION - EAST BRANCH EXTENSION (continued)						WEST BRANCH				
	Reach 2E	Reach 3A	Reach 3B	Reach 4A	Reach 4B	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	
	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	
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	0	0	0	0	0	719,255	159,249	199,145	234,196	
1973	0	0	0	0	0	0	779,949	339,363	122,664	264,850	
1974	0	0	0	0	0	0	883,312	158,366	112,458	350,160	
1975	0	0	0	0	0	0	1,049,990	176,676	194,724	801,457	
1976	0	0	0	0	0	0	1,220,429	215,588	202,591	624,614	
1977	0	0	0	0	0	0	1,268,813	116,939	218,129	684,679	
1978	0	0	0	0	0	0	1,174,708	342,479	267,308	415,641	
1979	0	0	0	0	0	0	1,366,942	285,575	284,188	972,584	
1980	0	0	0	0	0	0	1,698,215	224,472	455,619	874,259	
1981	0	0	0	0	0	0	1,783,405	123,264	615,047	2,305,110	
1982	0	0	0	0	0	0	1,919,979	190,500	702,265	2,208,264	
1983	0	0	0	0	0	0	2,739,814	149,333	888,475	745,939	
1984	0	0	0	0	0	0	3,463,038	81,260	2,358,495	537,207	
1985	0	0	0	0	0	0	3,866,946	295,836	3,047,591	975,729	
1986	0	0	0	0	0	0	3,791,427	457,604	2,893,171	1,480,015	
1987	0	0	0	0	0	0	3,423,494	213,106	2,933,342	944,604	
1988	0	0	0	0	0	0	3,447,403	255,113	3,017,463	883,714	
1989	0	0	0	0	0	0	4,025,641	405,583	2,738,143	1,398,165	
1990	0	0	0	0	0	0	4,088,481	383,655	3,232,445	3,153,869	
1991	0	0	0	0	0	0	3,862,056	304,143	3,550,063	639,527	
1992	0	0	0	0	0	0	4,286,050	327,802	3,892,480	1,014,551	
1993	0	0	0	0	0	0	3,969,075	343,304	4,515,385	1,670,952	
1994	0	0	0	0	0	0	3,649,861	293,376	3,359,381	1,879,417	
1995	0	0	0	0	0	0	4,137,046	883,315	4,750,275	1,588,080	
1996	0	0	0	0	0	0	4,511,858	966,044	3,593,671	4,208,195	
1997	0	0	0	0	0	0	4,543,506	1,030,809	2,429,066	3,755,901	
1998	0	0	0	0	0	0	4,871,761	464,376	3,473,405	2,398,630	
1999	0	0	0	0	0	0	4,768,390	4,338,174	4,924,176	1,391,028	
2000	0	0	0	0	0	0	5,460,691	782,887	4,277,874	2,361,194	
2001	0	0	0	0	0	0	5,908,798	1,533,322	5,137,414	4,393,983	
2002	0	0	0	0	0	0	5,341,880	1,480,328	4,082,857	4,442,291	
2003	0	460,230	360	355	33,614	868,206	4,461,372	1,294,437	3,728,632	3,336,304	
2004	300	257,753	337	5,058	71,164	855,919	8,918,901	1,346,046	3,491,206	5,059,781	
2005	0	481,968	9,036	8,353	216,418	1,250,961	5,793,476	2,573,701	9,044,275	(471,235)	
2006	0	376,467	322	2,354	63,588	981,745	6,797,081	1,246,018	5,130,725	2,935,588	
2007	0	686,985	79,406	32,883	180,084	2,301,219	6,517,410	1,301,999	11,262,770	4,441,682	
2008	0	474,325	19,689	10,864	138,021	1,230,505	6,993,593	1,179,402	8,826,590	4,140,598	
2009	0	495,946	20,587	11,360	144,312	1,286,595	7,353,172	1,218,786	10,588,316	4,461,460	
2010	0	520,348	21,600	11,918	151,412	1,349,896	7,755,002	1,263,233	10,943,343	4,636,586	
2011	0	520,348	21,600	11,918	151,412	1,349,896	7,444,294	799,043	3,632,928	4,412,510	
2012	0	520,348	21,600	11,918	151,412	1,349,896	7,445,723	800,645	3,633,924	4,418,109	
2013	0	520,348	21,600	11,918	151,412	1,349,896	7,448,078	810,674	3,637,117	4,452,554	
2014	0	520,348	21,600	11,918	151,412	1,349,896	7,446,849	825,690	3,639,691	4,503,083	
2015	0	520,348	21,600	11,918	151,412	1,349,896	7,452,579	825,868	3,642,393	4,504,955	
2016	0	520,348	21,600	11,918	151,412	1,349,896	7,443,998	821,283	3,637,426	4,487,324	
2017	0	520,348	21,600	11,918	151,412	1,349,896	7,447,242	824,059	3,639,510	4,497,431	
2018	0	520,348	21,600	11,918	151,412	1,349,896	7,450,005	835,807	3,643,256	4,537,628	
2019	0	520,348	21,600	11,918	151,412	1,349,896	7,441,770	828,044	3,637,781	4,509,258	
2020	0	520,348	21,600	11,918	151,412	1,349,896	7,449,064	826,098	3,640,767	4,503,908	
2021	0	520,348	21,600	11,918	151,412	1,349,896	7,453,859	821,603	3,642,059	4,489,919	
2022	0	520,348	21,600	11,918	151,412	1,349,896	7,448,639	834,499	3,642,327	4,532,452	
2023	0	520,348	21,600	11,918	151,412	1,349,896	7,444,787	820,505	3,637,602	4,484,345	
2024	0	520,348	21,600	11,918	151,412	1,349,896	7,446,030	827,418	3,639,627	4,507,989	
2025	0	520,348	21,600	11,918	151,412	1,349,896	7,454,239	826,495	3,643,258	4,506,271	
2026	0	520,348	21,600	11,918	151,412	1,349,896	7,439,639	827,710	3,636,707	4,507,395	
2027	0	520,348	21,600	11,918	151,412	1,349,896	7,464,734	826,283	3,648,126	4,507,833	
2028	0	520,348	21,600	11,918	151,412	1,349,896	7,438,248	830,363	3,636,617	4,516,715	
2029	0	520,348	21,600	11,918	151,412	1,349,896	7,450,062	823,889	3,640,767	4,496,318	
2030	0	520,348	21,600	11,918	151,412	1,349,896	7,443,750	819,637	3,636,935	4,481,141	
2031	0	520,348	21,600	11,918	151,412	1,349,896	7,464,861	835,215	3,650,053	4,538,305	
2032	0	520,348	21,600	11,918	151,412	1,349,896	7,433,849	830,660	3,634,626	4,516,745	
2033	0	520,348	21,600	11,918	151,412	1,349,896	7,452,239	819,000	3,640,756	4,480,419	
2034	0	520,348	21,600	11,918	151,412	1,349,896	7,451,522	827,477	3,642,203	4,509,482	
2035	0	520,348	21,600	11,918	151,412	1,349,896	7,435,025	830,216	3,635,080	4,514,708	
TOTAL	300	16,762,722	691,337	381,095	4,783,913	43,872,446	338,803,305	49,343,644	226,476,703	190,556,366	

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

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AQUEDUCT				SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT		
	Reach 1	Reach 3A	Reach 3B	Total	Reach 1	Reach 1	Reach 4	Reach 14A
	Barker Slough Pumping Plant	Cordelia Pumping Plant (Solano)	Cordelia Pumping Plant (Napa) (b)		South Bay & Del Valle Pumping Plants (c)	Banks Pumping Plant	Dos Amigos Pumping Plant	Buena Vista Pumping Plant
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1962	0	0	0	0	36,970	0	0	0
1963	0	0	0	0	57,711	0	0	0
1964	0	0	0	0	74,134	0	0	0
1965	0	0	0	0	142,609	0	0	0
1966	0	0	0	0	192,605	0	0	0
1967	0	0	0	0	223,117	13,881	0	0
1968	0	0	6,989	6,989	336,671	452,630	202,947	0
1969	0	0	8,551	8,551	257,579	293,741	135,425	0
1970	0	0	13,598	13,598	396,358	346,215	211,197	1
1971	0	0	10,609	10,609	381,662	574,015	225,188	138,001
1972	0	0	14,434	14,434	598,702	933,292	502,196	241,714
1973	0	0	14,449	14,449	493,490	688,030	381,232	306,268
1974	0	0	17,473	17,473	565,575	783,562	447,772	358,739
1975	0	0	14,779	14,779	349,758	1,341,019	518,816	550,860
1976	0	0	20,856	20,856	571,361	1,638,453	641,115	755,747
1977	0	0	22,635	22,635	512,996	1,013,307	284,828	298,300
1978	0	0	21,692	21,692	586,355	2,339,502	607,042	732,036
1979	0	0	16,237	16,237	605,136	3,554,256	1,008,564	818,816
1980	0	0	19,945	19,945	523,369	2,083,336	1,129,152	1,051,629
1981	0	0	23,842	23,842	567,692	3,952,931	1,939,189	1,336,867
1982	0	0	12,157	12,157	605,780	3,092,031	1,363,705	1,200,226
1983	0	0	2,342	2,342	82,222	879,916	343,597	341,584
1984	0	0	4,822	4,822	271,543	1,695,568	885,941	678,307
1985	0	0	10,188	10,188	451,020	3,171,920	1,613,745	1,397,490
1986	0	0	15,501	15,501	807,984	6,601,752	2,627,407	2,405,224
1987	0	0	27,223	27,223	886,956	5,753,132	2,523,544	2,240,552
1988	17,813	0	24,020	41,833	909,300	6,280,898	2,611,297	2,562,330
1989	29,819	43,846	26,519	100,184	1,161,160	9,748,180	3,910,492	3,964,188
1990	52,210	67,109	40,775	160,094	1,834,626	10,467,177	4,501,309	5,785,069
1991	10,429	10,118	5,252	25,799	378,966	1,923,595	490,766	903,923
1992	13,319	13,070	9,406	35,795	311,251	3,211,086	1,168,304	1,255,567
1993	(11,941)	(8,753)	(5,392)	(26,086)	(158,214)	532,899	345,215	(124,821)
1994	46,538	39,910	29,105	115,553	799,370	5,658,038	2,298,300	2,510,629
1995	20,014	20,620	11,791	52,425	247,645	4,017,881	1,513,362	1,919,965
1996	57,320	47,288	23,483	128,091	718,807	8,112,547	3,969,388	2,430,979
1997	67,416	52,935	21,955	142,306	1,038,568	6,900,694	2,845,506	2,589,077
1998	(10,647)	(9,488)	(4,554)	(24,689)	(121,313)	238,073	(314,172)	(245,259)
1999	31,618	25,288	10,570	67,476	514,166	5,319,699	2,316,189	1,587,062
2000	58,651	42,587	15,094	116,332	861,671	8,025,528	3,046,708	2,966,168
2001	360,761	250,331	214,209	825,301	4,068,696	24,182,487	9,885,380	14,868,284
2002	191,948	105,385	61,953	359,286	2,258,767	17,207,932	6,949,418	8,493,564
2003	181,608	118,767	98,077	398,452	2,567,656	21,542,492	9,051,535	10,696,186
2004	246,316	136,402	105,066	487,784	2,452,187	21,375,154	9,167,252	12,084,098
2005	279,237	144,265	146,323	569,825	2,745,626	29,059,637	12,814,469	12,402,303
2006	208,754	287,013	145,028	640,795	2,690,955	25,655,625	11,136,200	11,825,610
2007	430,204	292,170	249,929	972,303	4,077,287	27,301,503	10,998,532	16,007,485
2008	483,149	470,598	410,143	1,363,890	5,887,390	41,371,070	17,740,437	21,509,016
2009	626,481	557,677	612,462	1,796,620	7,398,947	50,840,811	21,868,352	24,884,584
2010	525,542	524,977	492,079	1,542,598	5,774,302	38,755,458	16,415,205	18,678,559
2011	521,480	414,700	452,397	1,388,577	6,862,226	43,394,832	19,444,903	23,589,222
2012	540,348	428,969	478,218	1,447,535	7,089,080	42,423,344	20,784,419	25,670,970
2013	589,622	470,850	537,819	1,598,291	7,785,740	54,337,286	22,785,351	27,970,764
2014	632,756	505,673	593,302	1,731,731	8,344,762	49,163,463	24,802,656	30,582,842
2015	648,898	513,314	624,897	1,787,109	8,466,138	54,942,963	25,185,913	31,035,974
2016	661,703	518,585	652,426	1,832,714	8,549,901	63,245,061	26,109,311	32,565,809
2017	659,734	511,059	662,387	1,833,180	8,430,312	55,792,453	25,200,314	31,097,753
2018	683,878	525,913	705,794	1,915,585	8,665,129	55,874,264	26,638,937	33,356,592
2019	706,293	538,973	748,266	1,993,532	8,873,805	64,301,400	27,456,726	34,302,187
2020	677,336	509,300	724,801	1,911,437	8,402,344	57,165,837	25,924,223	32,458,173
2021	677,619	508,458	727,014	1,913,091	8,388,994	56,046,916	25,915,008	32,451,002
2022	657,561	491,896	701,131	1,850,588	8,125,859	51,944,758	25,135,665	31,539,971
2023	661,127	494,839	705,730	1,861,696	8,172,616	56,082,584	25,410,832	31,958,847
2024	684,378	514,039	735,733	1,934,150	8,477,659	61,489,663	26,265,645	32,915,484
2025	681,422	511,596	731,918	1,924,936	8,438,868	51,591,990	26,178,060	32,852,815
2026	685,907	515,300	737,707	1,938,914	8,497,708	64,050,787	26,317,603	32,958,763
2027	675,974	507,099	724,889	1,907,962	8,367,390	57,457,250	26,079,015	32,803,619
2028	680,476	510,815	730,698	1,921,989	8,426,466	58,510,481	26,049,849	32,624,068
2029	672,160	503,950	719,969	1,896,079	8,317,374	55,861,853	25,837,932	32,455,244
2030	677,360	508,244	726,678	1,912,282	8,385,574	58,195,349	25,870,595	32,370,251
2031	668,468	500,902	715,204	1,884,574	8,268,929	52,737,611	25,694,124	32,382,538
2032	681,243	511,450	731,691	1,924,384	8,436,539	57,385,736	25,897,242	32,271,037
2033	714,140	538,611	774,134	2,026,885	8,868,061	60,923,181	27,896,709	35,250,235
2034	688,904	517,775	741,574	1,948,253	8,537,036	57,052,951	26,333,099	32,879,798
2035	675,392	506,617	724,137	1,906,146	8,359,766	60,317,800	27,726,468	36,068,203
TOTAL	20,420,738	15,811,042	20,150,129	56,381,909	266,535,447	1,809,210,766	809,262,645	989,813,088

a) Excludes 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**

(in dollars)

Sheet 2 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 15A Wheeler Ridge Pumping Plant	Reach 16A Chrisman Pumping Plant	Reach 17E Edmonston Pumping Plant	Reach 18A Alamo Powerplant	Reach 22B Pearblossom Pumping Plant	Reach 23 Mojave Siphon Powerplant	Reach 24 Silverwood Lake (d)
	[9]	[10]	[11]	[12]	[13]	[14]	[15]
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	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	17,664	0	0	0	0	0	0
1972	97,004	180,602	542,625	0	25,568	0	0
1973	278,923	441,598	1,548,428	0	231,389	0	0
1974	367,266	618,864	2,164,223	0	354,093	0	0
1975	595,252	1,149,731	4,010,395	0	604,161	0	0
1976	756,175	1,561,385	5,443,936	0	932,444	0	0
1977	337,889	703,802	2,360,624	0	358,028	0	0
1978	658,404	1,186,696	4,180,131	0	1,551,015	0	0
1979	791,488	1,581,250	5,475,688	0	1,881,587	0	0
1980	1,047,495	2,102,439	7,028,235	0	1,762,063	0	0
1981	1,319,739	2,838,773	9,351,931	0	2,296,771	0	0
1982	1,213,660	2,424,920	8,352,207	0	1,498,620	0	0
1983	304,715	540,330	1,582,582	0	341,957	0	384,275
1984	602,408	1,129,131	3,448,759	0	622,123	0	0
1985	1,397,098	2,781,953	9,261,674	0	1,195,768	0	0
1986	2,432,322	4,999,949	16,956,023	(1,013,756)	2,359,599	0	0
1987	2,223,371	4,456,059	14,684,476	(1,026,193)	1,831,238	0	131,606
1988	2,560,462	5,126,229	16,819,159	(744,374)	2,375,784	0	0
1989	3,974,290	8,369,623	28,090,313	(766,443)	4,102,557	0	686,468
1990	6,019,952	13,630,073	48,369,421	(834,673)	6,504,876	0	89,075
1991	1,031,345	2,426,220	8,641,086	(269,625)	996,352	0	0
1992	1,314,358	2,642,161	8,854,347	(934,311)	1,167,670	0	156,847
1993	(102,311)	(582,580)	(2,649,876)	(56,908)	(253,503)	0	(34,870)
1994	2,516,185	5,276,189	18,302,830	(58,712)	2,572,826	0	0
1995	841,178	1,677,210	5,571,517	(1,242,189)	1,025,717	0	467,095
1996	2,231,167	4,723,600	16,483,976	(2,644,648)	2,487,165	(857,876)	1,959,474
1997	2,417,154	5,424,334	19,413,834	(2,488,338)	3,037,087	(1,680,469)	0
1998	(219,762)	(488,690)	(1,683,606)	(1,969,187)	(402,338)	(1,217,950)	(144,207)
1999	1,295,067	3,326,334	12,889,920	(2,811,928)	1,795,375	(2,482,354)	(4)
2000	3,038,567	6,993,106	25,232,756	(5,129,549)	3,969,325	(4,429,149)	(4)
2001	15,252,650	34,362,262	126,969,963	(3,298,048)	19,044,251	(3,649,034)	(3)
2002	8,803,124	19,884,738	73,074,994	(4,926,146)	10,767,871	(5,255,302)	(2)
2003	11,139,389	25,395,242	93,471,975	(3,431,664)	14,896,580	(6,760,773)	(1)
2004	12,682,850	28,967,907	106,508,265	(6,227,543)	16,646,955	(7,691,607)	0
2005	12,757,307	28,986,888	102,884,712	(6,140,331)	18,267,341	(6,778,759)	0
2006	12,221,482	27,669,314	101,493,156	(18,246,652)	18,993,458	(6,387,729)	0
2007	16,776,090	37,597,250	137,710,764	(6,494,577)	22,076,636	(7,474,378)	0
2008	24,858,385	52,532,355	187,774,679	(7,301,702)	34,587,329	(8,432,625)	0
2009	28,586,275	60,289,242	215,297,060	(7,030,080)	40,912,723	(8,455,905)	0
2010	21,460,524	45,255,945	161,539,390	(8,623,986)	29,892,040	(8,689,526)	0
2011	23,385,330	54,728,337	205,309,069	(5,476,030)	31,245,304	(11,985,066)	0
2012	25,518,167	59,812,225	224,394,413	(5,853,849)	34,595,673	(13,708,370)	3,105,998
2013	27,749,349	65,055,946	244,040,384	(5,635,689)	37,506,256	(14,366,938)	2,188,242
2014	30,336,071	71,176,979	267,030,333	(5,676,198)	40,560,765	(14,395,517)	0
2015	30,779,417	72,222,058	270,946,117	(5,682,522)	41,383,883	(14,316,484)	0
2016	32,345,415	75,962,306	285,103,709	(5,928,505)	44,255,305	(15,673,337)	4,228,307
2017	30,848,011	72,392,747	271,600,068	(5,657,887)	41,555,204	(14,286,403)	0
2018	33,143,645	77,858,323	292,262,902	(6,075,456)	46,044,029	(17,336,467)	6,569,801
2019	34,067,660	80,042,074	300,433,318	(5,770,535)	45,077,187	(14,846,837)	0
2020	32,260,168	75,781,191	284,462,372	(5,885,945)	43,757,965	(15,778,213)	0
2021	32,254,365	75,769,394	284,419,598	(5,902,327)	43,793,569	(15,853,376)	151,523
2022	31,366,207	73,680,414	276,598,181	(5,939,614)	42,233,650	(15,899,674)	3,498,893
2023	31,790,831	74,691,498	280,417,857	(6,021,247)	43,156,975	(16,423,531)	2,121,563
2024	32,716,378	76,863,332	288,534,269	(5,825,294)	43,616,009	(15,336,504)	0
2025	32,661,341	76,737,474	288,077,239	(5,936,943)	43,990,525	(16,033,322)	3,438,553
2026	32,755,851	76,954,987	288,871,937	(5,894,456)	44,388,034	(15,727,496)	0
2027	32,624,994	76,661,342	287,815,034	(5,935,376)	43,853,879	(15,925,247)	1,472,019
2028	32,425,483	76,173,985	285,939,361	(5,870,591)	43,825,904	(15,687,727)	0
2029	32,274,115	75,827,892	284,671,408	(5,901,278)	43,368,208	(15,850,575)	804,642
2030	32,170,740	75,569,449	283,660,632	(5,851,730)	43,427,949	(15,565,550)	0
2031	32,217,812	75,700,350	284,229,296	(6,026,651)	43,807,849	(17,425,034)	6,088,435
2032	32,053,673	75,281,804	282,538,485	(5,776,979)	42,560,327	(15,473,051)	0
2033	35,061,181	82,427,198	309,516,738	(6,094,136)	47,960,310	(17,947,926)	3,331,764
2034	32,663,449	76,727,653	287,985,695	(5,835,615)	43,599,190	(16,021,700)	0
2035	36,034,458	84,857,295	318,988,310	(6,177,639)	45,684,052	(17,815,475)	4,153,037
TOTAL	997,400,712	2,307,138,687	8,585,299,297	(240,344,055)	1,338,558,502	(469,923,256)	44,848,526

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 withdrawal for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in 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**

(in dollars)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 26A	EBX Reach 2B	EBX Reach 3A	EBX Reach 4B	Reach 28J	Reach 29A	Reach 29G
	Devil Canyon Powerplant [16]	Greenspot Pumping Plant [17]	Crafton Hills Pumping Plant [18]	Cherry Valley Pumping Plant [19]	Lake Perris (d) [20]	Oso Pumping Plant [21]	Warne Powerplant [22]
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	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0
1972	(3,024)	0	0	0	0	102,315	0
1973	(436,768)	0	0	0	0	158,587	0
1974	(521,656)	0	0	0	0	193,311	0
1975	(1,071,023)	0	0	0	0	350,436	0
1976	(1,519,156)	0	0	0	0	362,767	0
1977	(1,175,966)	0	0	0	0	111,135	0
1978	(3,038,194)	0	0	0	0	125,183	0
1979	(3,419,581)	0	0	0	0	138,384	0
1980	(3,318,152)	0	0	0	0	236,768	0
1981	(3,842,971)	0	0	0	0	444,280	0
1982	(2,736,072)	0	0	0	0	539,245	(783,626)
1983	(5,478,830)	0	0	0	0	71,197	(495,041)
1984	(7,326,265)	0	0	0	(10,080)	240,134	(2,027,345)
1985	(10,477,567)	0	0	0	(56,570)	874,069	(5,930,176)
1986	(11,484,996)	0	0	0	0	1,269,590	(5,579,301)
1987	(10,814,483)	0	0	0	53,242	1,325,936	(6,304,539)
1988	(14,495,967)	0	0	0	0	1,421,097	(6,993,235)
1989	(18,532,961)	0	0	0	89,890	2,013,335	(8,235,085)
1990	(20,911,839)	0	0	0	147,163	2,857,409	(11,011,065)
1991	(4,884,013)	0	0	0	0	534,818	(3,600,495)
1992	(9,513,281)	0	0	0	(61,233)	717,740	(5,508,780)
1993	(7,502,549)	0	0	0	0	68,719	(4,525,955)
1994	(11,662,318)	0	0	0	147,989	1,203,006	(5,813,538)
1995	(9,742,248)	0	0	0	0	247,869	(1,934,202)
1996	(12,358,465)	0	0	0	0	895,929	(4,248,531)
1997	(13,293,791)	0	0	0	111,776	897,657	(4,797,589)
1998	(10,183,555)	0	0	0	0	(25,895)	(740,480)
1999	(14,772,635)	0	0	0	(4)	677,032	(5,526,541)
2000	(25,856,637)	0	0	0	(4)	1,216,343	(9,464,490)
2001	(19,498,071)	0	0	0	(3)	6,445,378	(7,987,833)
2002	(24,635,887)	0	0	0	(2)	3,834,216	(10,286,902)
2003	(28,000,328)	0	0	0	(1)	4,519,298	(10,281,922)
2004	(31,217,777)	0	0	0	0	5,385,468	(12,033,953)
2005	(30,592,888)	0	0	0	0	4,130,683	(8,251,156)
2006	(34,523,432)	145,736	159,676	19,624	0	3,833,868	(8,780,170)
2007	(27,812,496)	197,660	165,349	11,537	0	6,779,536	(10,607,268)
2008	(35,583,065)	544,807	675,558	140,682	0	8,498,764	(11,393,707)
2009	(34,157,283)	676,957	840,480	174,668	0	9,099,641	(9,862,386)
2010	(33,250,529)	503,949	624,568	130,175	0	7,162,909	(10,341,348)
2011	(31,890,275)	550,577	687,114	141,595	0	11,450,099	(14,650,186)
2012	(32,767,470)	550,577	687,114	141,595	3,146,088	12,482,173	(15,339,504)
2013	(32,068,590)	550,577	687,114	141,595	0	13,476,655	(15,283,505)
2014	(32,629,954)	550,577	687,114	141,595	780,212	14,845,607	(15,843,534)
2015	(33,013,046)	550,577	687,114	141,595	0	14,977,022	(15,759,992)
2016	(33,748,878)	550,577	687,114	141,595	235,610	15,542,750	(16,203,459)
2017	(33,391,072)	550,577	687,114	141,595	0	14,973,152	(15,819,348)
2018	(34,321,831)	550,577	687,114	141,595	3,731,220	15,710,502	(16,067,464)
2019	(33,900,323)	550,577	687,114	141,595	0	16,901,949	(16,937,989)
2020	(34,903,652)	550,577	687,114	141,595	3,156,924	15,680,761	(16,608,908)
2021	(34,521,662)	550,577	687,114	141,595	72,588	15,652,525	(16,601,300)
2022	(34,090,661)	550,577	687,114	141,595	0	15,415,429	(16,870,586)
2023	(34,763,245)	550,577	687,114	141,595	1,506,880	15,498,767	(16,866,257)
2024	(34,481,262)	550,577	687,114	141,595	0	16,223,363	(17,034,145)
2025	(34,075,419)	550,577	687,114	141,595	0	16,006,131	(16,881,236)
2026	(34,939,364)	550,577	687,114	141,595	714,376	15,923,663	(16,680,182)
2027	(34,444,274)	550,577	687,114	141,595	0	16,068,842	(17,093,295)
2028	(34,678,703)	550,577	687,114	141,595	984,722	15,813,440	(16,701,317)
2029	(34,419,980)	550,577	687,114	141,595	0	15,894,082	(17,002,513)
2030	(34,504,176)	550,577	687,114	141,595	0	15,703,123	(16,664,066)
2031	(34,213,751)	550,577	687,114	141,595	358,165	15,788,438	(16,888,685)
2032	(33,905,212)	550,577	687,114	141,595	0	15,846,907	(16,684,442)
2033	(35,043,969)	550,577	687,114	141,595	4,704,436	16,994,611	(16,912,490)
2034	(33,738,101)	550,577	687,114	141,595	0	16,057,051	(16,706,378)
2035	(35,698,878)	550,577	687,114	141,595	6,420,643	19,686,443	(20,894,271)
TOTAL	(1,389,800,467)	15,833,535	19,643,481	4,016,561	26,234,027	467,571,644	(608,341,711)

**TABLE B-12. Variable OMP&R Costs to Be Reimbursed through
Variable OMP&R Component of Transportation Charge^a**

(in dollars)

Sheet 4 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 29H	Reach 29J	Reach 30	Reach 31A	Reach 33A	Total	
	Pyramid Lake (d [23]	Castaic Powerplant [24]	Castaic Lake (d [25]	Las Perillas & Badger Hill Pumping Plants [26]	Devil's Den, Bluestone & Polonio Pumping Plants [27]		
1962	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	13,881	236,998
1968	0	0	0	118,676	0	774,253	1,117,913
1969	0	0	0	78,350	0	507,516	773,646
1970	0	0	0	136,429	0	693,842	1,103,798
1971	0	0	0	166,296	0	1,121,164	1,513,435
1972	0	(211,144)	0	237,638	0	2,648,786	3,261,922
1973	0	(1,057,564)	0	120,913	0	2,661,036	3,168,975
1974	0	(1,547,884)	0	118,582	0	3,336,872	3,919,920
1975	0	(2,455,461)	0	94,848	0	5,689,034	6,053,571
1976	0	(2,827,557)	0	141,260	0	7,886,569	8,478,786
1977	0	(3,734,462)	0	71,311	0	628,796	1,164,427
1978	0	(1,542,479)	0	179,925	0	6,979,261	7,587,308
1979	0	(2,773,323)	0	192,126	0	9,249,255	9,870,628
1980	0	(3,408,863)	0	168,458	0	9,882,560	10,425,874
1981	0	(2,834,322)	0	169,177	0	16,972,365	17,563,899
1982	0	(3,463,971)	0	168,390	0	12,859,335	13,477,272
1983	65,741	(3,260,764)	(3,176,515)	17,920	0	(7,537,336)	(7,452,772)
1984	0	(2,336,089)	(2,151,129)	112,679	0	(4,435,858)	(4,159,493)
1985	0	(15,698,638)	0	146,843	0	(10,322,391)	(9,861,183)
1986	0	(11,072,448)	0	297,886	0	10,799,251	11,622,736
1987	68,410	(11,562,269)	(41,897)	245,082	0	5,787,267	6,701,446
1988	54,038	(12,292,638)	(211,526)	214,519	0	5,288,073	6,239,206
1989	14,390	(14,514,469)	126,791	282,180	0	23,323,739	24,585,083
1990	0	(20,116,506)	245,180	416,832	0	46,159,453	48,154,173
1991	439,068	(6,579,194)	0	3,610	0	2,057,456	2,462,221
1992	0	(9,493,502)	(935,650)	101,665	0	(5,857,012)	(5,509,966)
1993	(13,291)	(9,266,007)	(446,527)	(111,306)	0	(24,723,671)	(24,907,971)
1994	20,518	(10,547,914)	(86,993)	206,258	0	12,537,293	13,452,216
1995	0	(4,049,615)	0	243,434	0	(443,026)	(142,956)
1996	0	(8,457,232)	0	296,170	0	15,023,643	15,870,541
1997	0	(8,727,328)	(897)	298,483	208,816	13,156,006	14,336,880
1998	(931,305)	(3,360,851)	(2,108,804)	(51,634)	(87,016)	(23,936,638)	(24,082,640)
1999	(4)	(9,954,674)	(4)	159,358	234,077	(5,948,035)	(5,366,393)
2000	(4)	(17,958,033)	(4)	231,346	380,555	(7,737,472)	(6,759,469)
2001	(3)	(13,981,232)	(3)	1,086,309	2,152,324	205,835,058	210,729,055
2002	(2)	(18,455,024)	(2)	545,459	1,320,943	87,322,990	89,941,043
2003	(1)	(17,307,974)	(1)	641,112	1,482,405	127,053,549	130,019,657
2004	0	(20,022,179)	0	661,852	1,718,113	138,004,855	140,944,826
2005	0	(13,698,272)	0	829,541	1,669,939	158,341,414	161,656,865
2006	0	(14,679,220)	0	851,191	1,529,589	132,917,326	136,249,076
2007	0	(19,258,969)	0	1,311,758	2,138,250	207,424,664	212,474,254
2008	0	(20,180,772)	0	1,784,716	4,703,180	313,829,108	321,080,388
2009	0	(17,557,263)	0	2,388,725	7,241,797	386,038,399	395,233,966
2010	0	(18,340,604)	0	1,841,333	5,606,694	268,620,755	275,937,655
2011	0	(24,875,719)	0	2,254,120	6,221,251	333,524,477	341,775,280
2012	0	(26,222,616)	2,997,738	2,325,658	6,435,339	371,179,682	379,716,297
2013	0	(26,064,151)	0	2,535,316	7,063,743	412,669,705	422,053,736
2014	0	(26,863,563)	0	2,709,893	7,586,265	445,545,606	455,622,099
2015	0	(26,707,346)	0	2,748,193	7,700,889	457,822,325	468,075,572
2016	0	(27,482,296)	1,153,942	2,774,622	7,780,001	493,644,959	504,027,574
2017	0	(26,847,105)	0	2,736,889	7,667,057	459,241,119	469,504,611
2018	0	(27,339,700)	4,943,495	2,811,358	7,889,950	507,073,386	517,654,100
2019	0	(28,942,915)	0	2,876,829	8,085,899	514,525,916	525,393,253
2020	0	(28,266,268)	0	2,728,064	7,640,646	480,952,624	491,266,405
2021	0	(28,272,254)	0	2,723,853	7,628,036	477,106,744	487,408,829
2022	0	(28,738,698)	7,223	2,640,823	7,379,529	461,280,796	471,257,243
2023	0	(28,731,507)	50,219	2,655,576	7,423,690	471,339,618	481,373,930
2024	0	(29,021,546)	1,576,015	2,751,829	7,711,769	490,344,291	500,756,100
2025	0	(28,757,749)	138,589	2,739,589	7,675,138	481,782,061	492,145,865
2026	0	(28,411,063)	0	2,758,155	7,730,713	493,151,594	503,588,216
2027	0	(29,120,047)	1,810,105	2,717,037	7,607,637	485,831,820	496,107,172
2028	0	(28,445,427)	0	2,735,675	7,663,428	482,741,917	493,090,372
2029	0	(28,967,070)	1,247,154	2,701,253	7,560,400	477,742,053	487,955,506
2030	0	(28,383,330)	0	2,722,773	7,624,813	477,726,108	488,023,964
2031	0	(28,790,500)	10,153,135	2,685,967	7,514,648	487,393,033	497,546,536
2032	0	(28,520,193)	0	2,738,854	7,672,940	475,266,414	485,627,337
2033	0	(28,977,402)	9,693,603	2,875,015	8,080,473	541,118,817	552,013,763
2034	0	(28,566,228)	0	2,770,564	7,767,851	484,348,565	494,833,854
2035	0	(35,819,961)	31,997,480	2,714,629	7,600,431	567,222,311	577,488,223
TOTAL	(282,445)	(1,085,721,364)	56,980,717	84,648,234	219,012,202	13,981,059,326	14,303,976,682

TABLE B-13. Capital and Operating Costs of Project Conservation Facilities to Be Reimbursed through Delta Water Charge

(in 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))	Total
	Capital Costs (a)	Capital Cost Credits (b)	Operating Costs (c)	Application of Oroville Power Revenues to:			
				Capital Costs (d)	Operating Costs (e)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	
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	14,463,274	(4,850,000)	0	0	0	0	9,613,274
1961	18,729,965	(431,527)	0	0	0	0	18,298,438
1962	9,099,967	(479,280)	0	0	0	0	8,620,687
1963	73,098,107	(478,743)	(14,000)	0	0	0	72,605,364
1964	62,629,003	(751,330)	(14,000)	0	0	107,780	81,971,453
1965	71,048,877	(763,541)	(14,000)	0	0	551,850	70,823,186
1966	125,376,541	(748,649)	(14,000)	0	0	1,081,023	125,694,915
1967	94,481,603	(812,145)	(13,446)	0	0	1,189,212	94,845,224
1968	39,986,145	(431,574)	1,303,821	(951,000)	0	793,399	40,700,791
1969	5,367,865	(259,015)	2,890,772	(11,007,000)	0	601,867	(2,405,511)
1970	4,208,411	(203,733)	4,818,634	(14,650,000)	(1,500,000)	516,659	(6,810,029)
1971	3,956,703	(193,631)	6,026,480	(14,650,000)	(1,500,000)	408,754	(5,951,694)
1972	4,662,254	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,003,722)
1973	4,090,078	(136,997)	6,136,774	(14,650,000)	(1,500,000)	203,384	(5,857,761)
1974	6,852,718	(137,503)	6,944,723	(17,950,000)	(1,500,000)	201,907	(5,588,155)
1975	8,343,833	(234,567)	7,697,390	(14,650,000)	(1,500,000)	146,188	(197,156)
1976	6,189,617	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(2,893,056)
1977	21,554,452	(150,214)	10,547,977	(14,650,000)	(1,500,000)	857,419	16,659,634
1978	8,031,393	(64,566)	12,851,158	(14,650,000)	(1,500,000)	2,131,286	6,799,271
1979	9,751,861	0	9,547,014	(14,650,000)	(1,500,000)	2,131,884	5,280,759
1980	11,345,574	0	13,258,298	(14,650,000)	(1,500,000)	3,638,851	12,092,723
1981	11,921,267	0	10,326,538	(14,650,000)	(1,500,000)	4,597,474	10,695,279
1982	17,479,060	0	16,154,872	(14,650,000)	(1,500,000)	4,594,682	22,078,614
1983	12,763,378	0	22,251,331	(34,705,000)	(8,735,000)	3,751,993	(4,673,298)
1984	9,367,268	0	22,700,224	(14,650,000)	(10,348,000)	2,979,126	(10,048,618)
1985	12,538,173	0	23,462,283	(14,650,000)	(8,198,000)	2,069,024	15,221,480
1986	21,586,489	0	26,479,379	(14,650,000)	(9,107,000)	1,602,419	25,911,287
1987	32,734,633	0	23,479,839	(14,650,000)	(9,451,000)	1,762,179	33,875,651
1988	33,028,679	0	25,832,491	(14,650,000)	(8,677,000)	1,808,899	37,343,069
1989	11,075,132	0	28,442,946	(14,650,000)	(8,102,000)	2,678,007	19,444,085
1990	28,764,328	0	37,430,837	(14,650,000)	(8,498,000)	1,436,712	44,483,877
1991	37,462,303	0	76,586,733	(14,650,000)	(9,487,000)	1,727,664	91,639,700
1992	29,169,134	0	32,280,753	(14,650,000)	(8,526,000)	1,707,822	39,981,709
1993	22,366,872	0	36,984,149	(14,650,000)	(8,768,000)	1,708,490	37,541,511
1994	14,709,626	0	41,193,816	(14,650,000)	(7,484,000)	2,134,392	35,903,834
1995	15,120,857	0	46,177,149	(14,650,000)	(4,976,939)	2,042,481	43,713,548
1996	11,006,838	0	50,883,067	(14,650,000)	(5,503,289)	2,448,692	44,185,308
1997	15,304,365	0	51,775,267	(14,650,000)	(5,740,515)	1,699,730	48,388,847
1998	3,960,201	0	54,635,342	(14,650,000)	(8,165,000)	1,193,198	36,983,741
1999	6,093,496	0	55,911,570	(14,650,000)	(9,198,000)	9,686	38,166,752
2000	9,850,769	0	56,694,844	(14,709,325)	(10,452,028)	13,491	41,397,751
2001	9,848,141	0	76,188,738	(16,229,333)	(15,231,433)	23,866	54,599,979
2002	19,435,202	0	68,449,271	(19,569,786)	(22,034,770)	9,433	46,304,343
2003	22,575,172	0	77,756,386	(21,093,018)	(30,910,299)	28,826	48,338,074
2004	17,525,768	0	92,069,142	(18,391,690)	(34,155,125)	7,548	57,055,643
2005	(5,120,751)	0	103,486,017	(15,668,967)	(23,020,957)	0	59,675,342
2006	8,236,951	0	101,891,842	(15,292,151)	(25,134,386)	0	69,702,256
2007	7,694,799	0	87,730,780	(14,650,000)	(17,929,399)	0	62,846,180
2008	32,687,720	0	115,466,102	(14,650,000)	(16,037,251)	0	117,466,571
2009	40,355,173	0	154,842,568	(16,053,070)	(16,241,163)	0	162,903,508
2010	34,650,845	0	168,887,318	(16,053,070)	(16,186,497)	0	171,298,596
2011	25,752,832	0	72,965,186	(16,053,070)	(9,040,000)	0	73,624,948
2012	25,730,689	0	61,055,717	(16,053,070)	(9,040,000)	0	61,693,357
2013	22,883,054	0	64,554,692	(16,053,070)	(9,040,000)	0	62,344,677
2014	20,397,903	0	62,866,439	(16,053,070)	(9,040,000)	0	58,171,273
2015	20,397,903	0	60,630,568	(16,053,070)	(9,040,000)	0	55,935,402
2016	20,397,903	0	64,791,188	(16,053,070)	(9,040,000)	0	60,096,022
2017	20,397,903	0	63,865,857	(16,053,070)	(9,040,000)	0	59,170,691
2018	20,397,903	0	64,356,800	(16,053,070)	(9,040,000)	0	59,661,634
2019	397,903	0	63,074,658	(16,053,070)	(9,040,000)	0	38,379,492
2020	397,903	0	60,306,488	(16,053,070)	(9,040,000)	0	35,611,322
2021	397,903	0	65,614,826	(16,053,070)	(9,040,000)	0	40,919,660
2022	397,903	0	64,192,768	(16,053,070)	(9,040,000)	0	39,497,601
2023	397,903	0	60,856,937	(16,053,070)	(9,040,000)	0	36,161,770
2024	397,903	0	61,913,881	(16,053,070)	(9,040,000)	0	37,218,714
2025	397,903	0	67,000,427	(16,053,070)	(9,040,000)	0	42,305,260
2026	397,903	0	64,048,920	(16,053,070)	(9,040,000)	0	39,353,753
2027	397,903	0	60,380,158	(16,053,070)	(9,040,000)	0	35,684,991
2028	397,903	0	60,895,843	(16,053,070)	(9,040,000)	0	36,200,676
2029	397,903	0	67,679,576	(16,053,070)	(9,040,000)	0	42,984,408
2030	397,903	0	62,905,367	(14,650,000)	(9,040,000)	0	39,613,270
2031	397,903	0	61,413,195	(14,650,000)	(9,040,000)	0	38,121,098
2032	397,903	0	60,832,534	(14,650,000)	(9,040,000)	0	37,540,437
2033	397,903	0	66,475,221	(14,650,000)	(9,040,000)	0	43,183,124
2034	397,903	0	62,825,581	(14,650,000)	(9,040,000)	0	39,533,484
2035	397,903	0	63,438,376	(14,650,000)	(14,000,000)	0	35,186,279
TOTAL	1,360,036,639	(11,528,320)	3,469,705,439	(1,050,081,734)	(616,748,051)	57,085,905	3,208,469,878

- 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 2007 reflected in the Delta Water Charge.

TABLE B-14. Capital Costs of Transportation Facilities Allocated to Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA (a)	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	83	114	410	607	122	224	346
1953	0	0	0	323	479	1,808	2,610	336	620	956
1954	0	0	0	819	1,306	5,150	7,275	421	777	1,198
1955	0	0	0	977	1,570	6,297	8,844	211	390	601
1956	0	0	0	8,844	14,459	63,816	87,119	227	418	645
1957	15,199	11,436	26,635	21,564	35,240	649,596	706,400	291	536	827
1958	33,420	16,591	50,011	67,764	71,717	733,414	872,895	720	1,328	2,048
1959	20,697	6,591	27,288	154,255	143,730	493,050	791,035	10,636	69,139	79,775
1960	9,097	8,830	17,927	296,492	275,610	1,018,661	1,590,763	15,255	99,794	115,049
1961	6,950	7,445	14,395	853,506	802,675	1,914,709	3,570,890	10,163	36,681	46,844
1962	(194)	(926)	(1,120)	545,123	615,141	1,686,041	2,846,305	17,281	39,570	56,851
1963	1,319	1,111	2,430	657,426	1,281,271	3,243,838	5,182,535	68,821	140,841	209,662
1964	38,393	35,466	73,859	712,650	1,747,783	7,251,800	9,712,233	138,614	282,003	420,617
1965	198,833	62,221	261,054	360,779	606,025	3,414,457	4,381,261	250,706	497,152	747,858
1966	461,619	49,917	511,536	592,714	592,598	2,245,215	3,430,527	587,951	1,117,486	1,705,437
1967	1,569,498	40,379	1,609,877	796,995	803,951	2,401,862	4,002,808	936,412	1,762,694	2,699,106
1968	859,613	61,691	921,304	736,470	696,075	1,997,924	3,430,469	351,131	675,220	1,026,351
1969	74,388	59,318	133,706	269,698	293,275	764,959	1,327,923	76,966	164,583	241,549
1970	43,361	67,877	111,238	58,676	61,200	135,569	255,445	47,891	109,224	157,115
1971	26,763	34,052	60,815	12,086	18,227	84,089	114,402	28,638	80,715	109,353
1972	19,643	18,905	38,548	12,293	12,763	63,610	88,666	19,289	50,230	69,519
1973	56,510	30,874	87,384	10,494	12,136	39,380	62,010	23,010	56,178	79,188
1974	165,830	65,832	231,662	15,722	24,402	73,119	113,243	25,037	61,383	86,420
1975	91,824	89,234	181,058	16,730	15,806	41,394	73,930	14,740	61,416	76,156
1976	57,765	83,651	141,416	34,004	34,663	109,610	178,277	33,638	130,440	164,078
1977	64,167	80,147	144,314	46,229	45,115	133,375	224,719	108,324	264,720	373,044
1978	69,319	81,717	151,036	71,234	66,008	174,898	312,140	21,415	103,822	125,237
1979	191,273	282,907	474,180	45,468	42,943	110,665	199,076	22,941	125,669	148,610
1980	264,433	386,006	650,439	134,522	124,352	304,614	563,488	103,258	462,895	566,153
1981	227,606	383,086	610,692	(33,738)	(29,856)	(65,637)	(129,231)	(15,416)	(135,240)	(150,656)
1982	549,184	870,611	1,419,795	7,876	8,321	27,065	43,282	4,102	(58,882)	(54,780)
1983	1,254,900	1,433,061	2,687,961	138,413	131,515	339,246	609,174	32,196	110,287	142,483
1984	2,547,878	2,750,040	5,297,918	152,992	140,971	351,921	645,884	35,448	107,723	143,171
1985	7,143,123	6,443,613	13,586,736	19,776	19,245	53,491	92,512	17,424	78,896	96,320
1986	10,565,937	16,926,630	27,492,567	32,034	31,581	88,070	151,685	44,135	306,452	350,587
1987	7,979,832	12,599,507	20,579,339	50,153	48,675	138,959	237,787	126,995	1,342,116	1,469,111
1988	2,312,909	4,343,513	6,656,422	116,181	112,294	302,461	530,936	156,473	1,479,545	1,636,018
1989	1,224,538	1,553,352	2,777,890	108,320	102,804	260,092	471,216	152,173	1,210,940	1,363,113
1990	443,002	824,055	1,267,057	224,283	224,188	625,213	1,073,684	222,208	1,559,457	1,781,665
1991	99,848	89,269	189,117	413,426	383,368	946,246	1,743,040	298,398	2,184,088	2,482,486
1992	57,045	62,083	119,128	182,231	169,968	442,055	794,254	361,210	3,504,755	3,865,965
1993	122,423	128,634	251,057	129,344	125,312	342,416	597,072	1,170,649	11,997,954	13,168,603
1994	71,274	83,270	154,544	46,042	58,050	229,649	333,741	4,260,734	46,401,596	50,662,330
1995	30,605	29,271	59,876	97,808	97,063	257,484	452,355	12,268,787	155,255,849	167,524,636
1996	20,275	19,069	39,344	49,854	48,056	127,493	225,403	11,284,548	145,409,409	156,693,957
1997	20,039	107,784	127,823	82,598	78,996	209,517	371,111	3,184,506	38,158,718	41,343,224
1998	17,423	21,572	38,995	27,302	24,121	63,057	114,480	883,110	10,563,359	11,446,469
1999	67,602	106,355	173,957	74,165	73,552	208,296	356,013	928,738	9,596,058	10,524,796
2000	16,252	37,932	54,184	27,445	28,844	80,346	136,635	488,160	5,529,102	6,017,262
2001	6,598	13,750	20,348	140,394	270,055	1,856,845	2,267,294	72,358	539,206	611,564
2002	19,917	45,940	65,857	805,478	1,189,615	5,876,842	7,871,935	63,183	376,338	439,521
2003	54,234	20,712	74,946	1,156,873	1,331,273	4,619,173	7,107,319	(2,558)	77,219	74,661
2004	153,537	20,912	174,449	594,344	572,306	4,645,748	5,812,398	9,185	48,719	57,904
2005	60,245	62,677	122,922	611,544	587,622	2,131,911	3,331,077	(10,804)	(179,970)	(190,774)
2006	888,719	22,745	911,464	1,000,638	954,823	2,291,038	4,246,499	69,474	755,133	824,607
2007	3,241,526	48,714	3,290,240	1,168,919	1,134,423	2,715,058	5,018,400	154,926	1,610,112	1,765,038
2008	5,508,002	573,446	6,081,448	2,866,717	2,720,470	6,627,881	12,215,068	221,732	1,970,577	2,192,309
2009	2,018,807	851,582	2,870,389	1,542,145	1,572,686	3,944,622	7,059,453	285,434	2,344,692	2,630,126
2010	608,559	582,155	1,190,714	538,121	583,166	1,536,150	2,657,437	230,489	2,034,595	2,265,084
2011	174,138	187,009	361,147	57,864	66,366	232,238	356,468	147,764	1,557,765	1,705,529
2012	173,056	185,846	358,902	57,504	65,954	230,795	354,253	146,846	1,548,082	1,694,928
2013	77,668	83,408	161,076	25,808	29,600	103,581	158,989	65,904	694,780	760,684
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
TOTAL	52,096,401	53,092,875	105,189,276	19,046,794	21,396,061	71,002,643	111,445,498	40,272,956	454,375,579	494,648,535

Note: Allocated capital costs as a result of permanent water transfers under Monterey are not reflected on this Table

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

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District (b)	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Storage District	Total
				Municipal and Industrial	Municipal and (c) Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
1952	389	20	58	938	119	9,129	20	12	785	11,470
1953	1,076	53	161	2,887	345	27,383	55	33	2,157	34,150
1954	1,350	68	201	3,373	417	32,369	69	43	2,718	40,608
1955	677	34	101	1,497	197	14,721	35	23	1,371	18,656
1956	726	34	108	2,702	273	24,255	35	25	1,416	29,574
1957	932	38	139	6,048	494	49,932	39	29	1,707	59,358
1958	2,308	102	344	14,374	1,153	119,049	104	61	4,368	141,863
1959	7,384	364	2,517	26,218	2,597	253,891	372	381	14,757	308,481
1960	12,940	630	3,666	34,054	4,155	352,166	644	498	25,696	434,449
1961	21,848	1,063	3,954	51,407	6,500	538,707	1,087	598	43,377	668,541
1962	49,320	2,410	7,867	94,933	13,834	1,017,146	2,465	1,879	98,141	1,287,995
1963	208,757	10,687	32,172	364,014	55,715	3,934,636	10,932	5,990	425,330	5,048,233
1964	328,286	16,961	64,890	600,152	88,904	6,636,279	17,350	11,942	672,013	8,436,777
1965	538,215	27,481	117,996	1,098,999	152,930	11,999,892	28,116	21,802	1,095,126	15,080,552
1966	1,107,757	52,586	279,172	2,218,832	339,222	24,857,487	53,789	38,891	2,173,090	31,120,826
1967	852,537	39,537	445,562	2,012,744	286,990	23,629,026	40,444	34,775	1,653,429	28,995,044
1968	198,739	9,739	166,267	1,104,132	70,086	11,544,942	9,962	12,238	396,075	13,512,180
1969	94,436	4,793	35,473	616,516	27,216	6,416,147	4,903	7,302	191,574	7,398,360
1970	54,344	2,720	21,686	414,659	15,520	4,145,046	2,782	3,999	109,470	4,770,226
1971	25,462	1,291	12,094	190,552	7,114	1,622,274	1,320	540	51,618	1,912,265
1972	11,589	589	8,354	82,886	3,409	723,623	602	343	23,526	854,921
1973	6,657	335	10,201	39,973	1,980	458,527	343	221	13,448	531,685
1974	9,478	469	11,044	45,420	2,766	483,866	479	326	18,979	572,827
1975	13,329	677	5,246	36,467	3,710	382,743	692	425	27,048	470,337
1976	17,506	837	12,615	53,085	5,621	654,026	856	1,152	34,455	780,153
1977	9,672	436	47,790	36,478	3,753	886,672	446	494	18,497	1,004,238
1978	23,499	(30,406)	6,178	54,219	6,579	575,169	1,209	1,402	47,446	685,295
1979	25,051	1,295	5,664	53,866	6,610	559,746	1,325	1,862	51,293	706,712
1980	144,980	(4,617)	31,160	321,890	38,126	3,211,810	7,682	7,144	297,215	4,055,390
1981	(5,427)	(15,464)	200	(44,773)	(1,223)	(385,275)	(296)	1,752	(11,324)	(461,830)
1982	49,916	2,584	6,600	83,283	13,142	654,692	2,638	1,252	102,287	916,394
1983	52,429	(35,295)	12,125	110,465	13,872	1,073,500	2,769	1,327	107,337	1,338,529
1984	86,345	4,474	14,303	154,799	22,764	1,617,225	4,572	2,678	177,020	2,084,180
1985	25,435	1,311	5,649	47,055	6,766	484,485	1,341	1,176	52,013	625,231
1986	38,309	(41,067)	9,862	171,661	10,320	796,097	2,009	778	78,142	966,111
1987	28,769	1,476	7,004	55,537	7,969	616,845	1,509	1,491	58,679	779,279
1988	52,329	2,831	17,078	70,572	12,049	909,046	2,894	4,620	109,713	1,181,132
1989	156,099	6,019	27,551	352,103	42,943	3,834,481	8,201	12,134	318,604	4,760,135
1990	292,361	15,142	50,360	553,394	87,199	6,094,021	15,487	22,729	599,233	7,729,926
1991	349,413	18,103	60,419	580,572	91,765	6,447,565	18,515	23,486	716,292	8,306,130
1992	125,891	6,439	28,019	241,559	34,559	2,711,639	6,585	10,883	256,370	3,421,944
1993	86,113	4,375	30,245	174,630	23,840	2,059,168	4,474	4,698	174,772	2,562,315
1994	64,762	3,323	23,894	124,518	17,633	1,488,418	3,398	2,173	132,095	1,860,214
1995	82,969	(1,000)	72,734	167,698	24,390	2,472,332	4,355	2,824	169,318	2,995,620
1996	27,611	(61,913)	51,990	68,870	8,812	1,233,548	1,437	1,590	56,092	1,388,037
1997	136,503	7,041	48,721	241,400	36,417	2,951,687	7,195	3,706	279,205	3,711,875
1998	70,737	(121,004)	23,083	122,934	18,622	1,474,568	3,742	1,278	144,963	1,738,923
1999	81,197	4,192	26,645	142,983	21,661	1,715,933	4,285	3,846	166,160	2,166,902
2000	21,089	1,073	9,822	45,704	6,013	547,927	1,096	(1,081)	42,826	674,469
2001	17,776	907	7,862	36,078	5,062	432,671	927	781	36,153	538,217
2002	74,205	3,811	16,014	132,974	20,050	1,498,693	3,898	727	151,445	1,901,817
2003	(51,175)	(2,675)	(5,510)	(76,111)	(13,087)	(822,799)	(2,736)	337	(105,393)	(1,079,149)
2004	7,784	398	2,528	17,202	2,101	185,079	408	1,521	15,858	232,879
2005	28,539	1,471	5,725	52,620	7,554	538,644	1,503	560	58,351	694,967
2006	5,314	272	1,181	21,770	1,423	105,318	279	613	10,832	147,002
2007	17,647	894	4,589	40,880	4,828	372,623	914	733	35,757	478,865
2008	77,716	3,911	26,175	166,912	21,765	1,792,868	4,001	3,701	156,978	2,254,027
2009	126,015	6,354	42,051	260,228	35,044	2,855,782	6,500	4,937	254,772	3,591,683
2010	77,526	3,890	27,666	176,173	21,835	1,826,338	3,979	2,673	156,352	2,296,432
2011	19,406	964	6,821	45,410	5,731	507,447	986	953	38,931	626,649
2012	19,285	958	6,779	45,128	5,696	504,294	979	947	38,689	622,755
2013	8,655	430	3,042	20,254	2,556	226,327	440	425	17,364	279,493
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
TOTAL	6,020,787	(33,549)	2,003,907	13,887,797	1,766,406	153,981,846	306,441	276,678	12,092,011	190,302,324

b) Costs from Table B-10 allocated to Empire West Side Irrigation District are reduced herein by \$31,588 in 1978; \$12,129 in 1980; \$15,173 in 1981; \$38,004 in 1983; \$43,033 in 1986; \$5,261 in 1995; \$63,318 in 1996 and \$124,667 in 1998 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

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (d)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1952	3,158	1,042	850	254	1,402	70	1,695	418	6,079	1,550
1953	10,026	3,327	2,668	799	4,401	222	5,318	1,328	19,058	4,852
1954	12,742	4,193	3,465	1,031	5,714	285	6,908	1,691	24,608	6,290
1955	5,411	1,881	1,374	401	2,267	115	2,756	715	9,229	2,377
1956	9,775	3,590	2,196	612	3,622	191	4,449	1,267	13,138	3,438
1957	26,306	9,255	6,343	1,816	10,461	540	12,767	3,450	40,646	10,534
1958	49,204	17,599	11,581	3,290	19,099	991	23,360	6,414	72,708	18,898
1959	70,247	29,740	15,869	4,616	26,171	1,347	31,759	9,030	98,596	25,519
1960	84,552	38,760	22,068	6,797	36,395	1,547	43,260	10,772	147,170	37,469
1961	126,542	54,262	34,613	12,530	57,086	2,245	63,709	16,437	236,164	57,707
1962	198,558	85,352	43,719	13,861	72,102	3,344	84,709	24,943	253,435	64,330
1963	580,138	255,252	116,797	33,149	192,624	9,828	234,926	73,256	610,277	160,624
1964	1,094,365	501,858	209,462	55,445	345,446	18,442	429,605	137,769	1,026,066	276,118
1965	1,908,076	947,523	385,533	103,757	635,825	32,819	786,986	244,587	1,913,090	512,862
1966	3,960,302	2,150,972	812,655	215,858	1,340,235	69,325	1,664,584	517,269	3,943,586	1,062,417
1967	4,976,538	4,100,531	1,077,422	296,069	1,776,892	88,301	2,182,240	653,250	5,821,681	1,550,239
1968	5,924,474	3,998,942	1,350,742	368,156	2,227,646	107,350	2,738,009	783,940	7,982,824	2,122,940
1969	5,822,708	3,079,426	1,690,259	539,851	2,787,631	121,303	3,256,507	865,455	10,898,185	2,769,647
1970	5,032,959	3,277,778	2,050,788	695,345	3,382,251	106,381	3,872,367	736,775	13,795,809	3,457,109
1971	2,577,507	2,146,954	1,071,523	338,581	1,767,179	48,337	2,087,223	347,057	8,137,053	1,987,120
1972	973,436	283,257	331,759	92,079	547,138	19,134	668,550	134,360	5,821,137	973,970
1973	354,407	914,303	158,579	82,223	261,557	6,304	238,094	46,102	1,760,570	403,582
1974	451,450	280,861	259,175	74,113	427,433	8,143	518,453	59,145	1,617,394	425,927
1975	253,438	246,492	193,632	52,821	319,337	4,954	392,110	33,995	1,533,664	407,913
1976	237,539	255,238	136,751	37,235	225,529	4,245	277,807	31,002	962,280	255,901
1977	199,554	371,469	91,384	25,858	150,711	3,757	183,609	15,445	591,445	155,537
1978	302,111	470,176	78,573	22,226	129,584	5,233	157,815	38,654	428,989	111,769
1979	357,678	938,985	81,807	21,795	134,915	5,965	166,931	44,410	403,569	108,408
1980	1,867,517	1,777,294	423,755	113,166	698,855	32,435	864,104	240,899	2,040,757	548,085
1981	(158,728)	610,795	(47,102)	(8,865)	(77,678)	(2,576)	(102,568)	(19,588)	(143,875)	(43,557)
1982	1,557,934	861,928	298,770	78,903	492,728	26,237	613,587	196,672	1,421,407	388,261
1983	2,062,512	521,349	396,033	115,678	653,134	34,699	803,945	259,939	2,126,313	581,672
1984	1,518,361	295,783	297,559	85,097	490,731	27,272	606,124	188,562	1,546,628	423,408
1985	896,226	158,810	217,115	62,532	358,064	13,104	441,299	107,533	1,116,949	305,291
1986	841,555	104,860	221,194	58,152	364,790	9,038	454,702	93,309	1,048,625	286,302
1987	333,052	105,625	166,099	43,992	273,928	5,566	340,485	40,716	783,725	213,202
1988	259,234	174,155	65,831	22,723	108,570	3,384	128,339	26,743	429,498	113,644
1989	1,045,999	434,394	323,138	97,036	532,920	16,777	649,616	125,344	1,375,722	372,048
1990	678,053	374,313	332,566	97,789	548,468	7,335	672,344	67,179	1,509,745	409,710
1991	831,687	401,961	367,196	120,925	605,579	11,966	733,443	92,625	1,979,364	540,210
1992	633,272	356,952	270,826	131,328	446,647	9,556	501,634	76,760	2,093,387	573,386
1993	634,283	332,089	222,347	171,095	366,700	10,194	353,470	73,955	3,848,084	1,046,752
1994	467,409	165,607	132,599	93,839	218,685	7,255	218,494	53,209	2,347,599	637,733
1995	459,990	293,308	132,690	78,390	218,835	7,436	232,377	54,544	1,959,986	530,666
1996	299,764	206,742	110,520	44,965	182,270	4,885	211,872	35,808	4,004,066	972,829
1997	438,898	249,699	103,382	24,640	170,497	7,397	214,534	54,452	2,819,566	397,103
1998	234,379	202,650	62,492	41,136	103,063	3,989	106,009	29,551	3,550,447	303,255
1999	268,224	175,939	89,312	40,069	147,294	4,812	167,592	35,399	5,481,780	235,054
2000	139,035	77,889	54,795	23,903	90,369	2,665	103,194	19,150	13,636,062	171,107
2001	130,754	44,790	50,816	15,641	83,805	2,989	102,254	20,949	19,271,172	96,254
2002	167,056	107,515	34,405	11,395	56,741	2,453	68,208	18,551	9,606,903	126,427
2003	(45,647)	(11,440)	2,964	2,129	4,889	(800)	4,230	(5,944)	3,760,236	27,246
2004	63,550	39,157	20,270	5,614	33,429	1,142	41,333	8,311	2,049,997	38,649
2005	184,751	105,245	38,520	11,938	63,527	3,215	75,979	23,651	956,455	60,919
2006	327,057	244,870	69,967	26,087	115,394	5,501	129,287	41,172	1,978,640	117,302
2007	267,036	188,958	65,754	25,185	108,442	4,700	126,016	34,352	2,100,382	121,910
2008	698,665	429,826	269,310	106,227	444,161	12,833	493,270	92,418	2,153,833	498,969
2009	946,440	662,918	501,103	143,363	826,421	17,689	1,004,745	126,171	2,763,642	705,641
2010	897,731	802,377	444,176	117,219	732,531	16,288	911,078	117,883	2,225,795	591,333
2011	179,323	117,479	52,094	16,757	85,914	3,268	102,215	23,962	357,961	93,014
2012	178,209	116,748	51,770	16,652	85,380	3,248	101,580	23,813	355,736	92,436
2013	79,980	52,397	23,234	7,474	38,319	1,457	45,589	10,687	159,654	41,485
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
TOTAL	54,986,762	35,252,000	16,107,087	5,142,722	26,564,055	988,127	31,656,886	7,239,062	167,754,692	28,316,770

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

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California (e)	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1952	962	69,020	370	86,870	0	0	0	0	59	99,352
1953	3,011	217,634	1,187	273,831	0	0	0	0	264	311,811
1954	3,904	279,967	1,496	352,294	0	0	0	0	766	402,141
1955	1,474	111,602	670	140,272	0	0	0	0	969	169,342
1956	2,127	179,335	1,299	225,039	0	0	0	0	9,172	351,549
1957	6,526	516,050	3,367	648,061	0	0	0	0	23,172	1,464,453
1958	11,701	945,684	6,390	1,186,919	0	0	2	2	32,888	2,286,626
1959	15,815	1,364,298	9,894	1,702,901	0	0	14	14	57,918	2,967,412
1960	23,307	1,914,521	12,798	2,379,416	0	0	28	28	123,202	4,660,834
1961	36,153	3,212,125	18,770	3,928,343	0	0	10	10	316,220	8,545,243
1962	40,012	3,543,471	29,069	4,456,905	0	0	32	32	228,202	8,875,170
1963	99,266	11,185,928	86,807	13,638,872	0	0	51	51	528,496	24,610,279
1964	170,012	18,065,455	164,709	22,494,752	0	0	7,791	7,791	590,034	41,736,063
1965	316,082	33,763,577	307,475	41,856,192	0	0	3,139	3,139	332,680	62,664,741
1966	654,194	74,485,027	681,898	91,558,322	0	0	(48)	(48)	783,728	129,110,328
1967	958,406	130,589,417	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	1,314,841	147,502,290	1,360,687	177,782,841	0	0	51,573	51,573	1,254,192	197,978,910
1969	1,726,891	140,096,646	1,085,026	174,739,535	0	0	234,232	234,232	398,183	184,473,488
1970	2,160,122	161,983,078	1,147,609	201,698,371	0	0	16,227	16,227	74,028	207,082,650
1971	1,237,573	133,903,316	738,822	156,388,245	0	0	27,204	27,204	12,457	158,624,741
1972	434,507	43,931,880	66,878	50,872,072	0	0	9	9	13,182	51,936,917
1973	256,711	39,723,010	290,020	44,495,462	0	0	25	25	8,099	45,263,853
1974	264,349	18,896,593	86,362	23,369,398	0	0	45	45	28,570	24,402,165
1975	253,838	16,732,939	83,975	20,509,108	0	0	21	21	8,226	21,318,836
1976	158,850	13,545,451	84,623	16,212,451	0	0	51	51	16,486	17,492,912
1977	96,517	11,769,352	110,833	13,776,860	0	0	28	28	21,181	15,544,384
1978	69,152	15,781,696	174,876	17,770,854	0	0	38	38	28,876	19,073,476
1979	66,847	27,627,424	343,361	30,302,095	0	0	23	23	26,668	31,857,364
1980	337,811	59,493,774	641,586	69,080,038	0	0	26	26	59,169	74,974,703
1981	(26,356)	15,661,179	224,257	15,865,338	0	0	34	34	(6,746)	15,727,601
1982	238,792	30,873,857	316,107	37,365,183	0	0	11	11	16,086	39,705,931
1983	357,812	25,056,047	187,121	33,156,254	0	0	19	19	72,225	38,006,645
1984	260,327	16,317,441	103,160	22,160,453	0	0	26	26	83,252	30,414,884
1985	187,699	10,243,779	56,162	14,164,563	0	0	29	29	16,338	28,581,729
1986	176,057	8,365,310	34,777	12,058,671	0	0	31	31	16,248	41,035,900
1987	131,163	6,955,356	36,142	9,429,051	0	0	32	32	29,062	32,523,661
1988	70,260	6,628,545	57,117	8,086,043	0	0	55	55	50,083	18,140,689
1989	227,772	18,531,880	153,200	23,885,646	0	0	44	44	43,324	33,301,368
1990	251,185	17,430,869	125,376	22,504,932	0	0	63	63	96,419	34,453,746
1991	331,235	20,792,168	132,558	26,940,917	0	0	54	54	149,922	39,811,666
1992	351,492	21,196,762	116,999	26,759,001	0	0	42	42	80,900	35,041,234
1993	646,980	29,471,748	105,693	37,283,390	0	0	30	30	59,324	53,921,791
1994	394,936	16,392,019	50,941	21,180,325	0	0	14	14	34,208	74,225,376
1995	331,399	16,078,395	72,214	20,450,220	0	0	3	3	42,395	191,525,105
1996	1,100,219	23,237,696	49,282	30,460,918	0	0	0	0	21,388	188,829,047
1997	1,987,864	13,530,777	72,335	20,071,144	0	0	3	3	34,976	65,660,156
1998	3,352,042	11,284,364	65,745	19,339,122	0	0	7	7	11,234	32,689,230
1999	6,139,881	9,063,618	54,504	21,903,478	0	0	2	2	34,616	35,159,764
2000	17,011,985	5,393,221	24,010	36,747,385	0	0	24	24	16,912	43,646,871
2001	24,661,236	2,988,800	13,047	47,482,508	0	0	20	20	68,013	50,987,964
2002	11,956,286	5,297,703	34,824	27,488,467	0	0	14	14	380,629	38,148,240
2003	4,700,433	3,956,554	(4,162)	12,390,688	0	0	0	0	590,120	19,158,585
2004	2,388,748	4,291,031	13,324	8,994,556	0	0	0	0	601,409	15,873,595
2005	843,756	6,606,733	35,971	9,010,660	0	0	0	0	631,819	13,600,671
2006	1,884,507	13,921,013	89,639	18,950,436	0	0	5	5	1,167,320	26,247,333
2007	2,214,102	12,150,259	67,756	17,474,832	0	0	0	0	2,798,065	30,825,440
2008	311,169	28,892,133	145,309	34,548,123	0	0	0	0	1,000,750	58,291,725
2009	436,401	98,734,236	215,491	107,084,261	0	0	0	0	588,827	123,824,739
2010	364,113	176,904,742	257,058	184,382,324	0	0	0	0	220,921	193,012,912
2011	57,713	5,292,759	39,298	6,421,757	0	0	0	0	26,645	9,498,195
2012	57,354	5,259,863	39,054	6,381,843	0	0	0	0	26,479	9,439,160
2013	25,740	2,360,628	17,527	2,864,171	0	0	0	0	11,884	4,236,297
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
TOTAL	94,145,265	1,800,599,845	11,821,769	2,280,575,041	0	0	341,130	341,130	15,471,555	3,197,973,359

e) Costs from Table B-10 allocated to MWDSC are reduced herein by \$16,425,374 in 1972 under provisions of Amendment No. 7 to its water contract.

TABLE B-15. Capital Cost Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	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	Total
				Municipal and Industrial	Municipal and (d Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[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	2,724	0	0	0	0	0	0	2,724
1965	0	0	6,027	64,262	9,281	0	0	0	0	79,571
1966	0	0	12,035	120,217	17,068	0	0	0	0	149,319
1967	0	0	26,249	233,186	34,339	0	0	0	0	293,774
1968	77,603	1,757	48,934	335,663	48,951	424,728	9,404	4,745	65,490	1,017,274
1969	77,738	5,271	57,399	391,879	52,519	872,244	10,154	5,157	247,790	1,720,152
1970	85,200	5,271	59,206	423,268	53,905	1,060,909	10,442	5,364	183,368	1,886,933
1971	97,139	5,271	60,310	444,380	54,695	1,409,079	10,608	5,776	195,129	2,282,387
1972	108,535	5,271	60,925	454,082	55,057	2,109,974	10,690	11,070	601,963	3,417,567
1973	119,389	5,271	61,351	458,302	55,231	2,433,531	10,733	6,395	232,829	3,383,031
1974	181,199	5,271	61,870	460,337	55,331	2,725,192	10,766	7,161	386,461	3,893,589
1975	220,082	5,271	62,432	462,650	55,472	3,264,032	10,808	7,377	461,139	4,549,263
1976	167,801	5,271	62,700	464,506	55,661	3,518,595	10,849	8,332	329,888	4,623,603
1977	164,973	5,271	63,342	467,209	55,947	3,855,370	10,911	7,633	315,417	4,946,073
1978	176,370	0	65,775	469,066	56,138	4,285,571	11,016	8,046	338,403	5,410,386
1979	209,169	5,271	66,090	471,827	56,473	4,705,740	11,082	8,252	380,858	5,914,762
1980	222,497	5,271	66,378	474,569	56,810	5,135,026	11,153	11,759	383,313	6,366,776
1981	222,497	5,271	67,964	490,958	58,751	5,619,910	11,561	8,871	406,299	6,892,083
1982	222,497	5,271	67,975	488,679	58,689	6,067,424	11,548	9,283	428,752	7,360,117
1983	232,808	5,271	68,311	492,919	59,358	6,576,916	11,681	7,777	51,045	7,506,085
1984	244,747	5,271	68,928	498,543	60,064	6,899,566	11,830	9,902	334,721	8,133,572
1985	256,143	5,271	69,656	506,425	61,223	7,347,079	12,065	10,109	243,509	8,511,480
1986	267,539	5,271	69,944	508,820	61,568	7,476,035	12,137	10,521	519,636	8,931,470
1987	278,935	5,271	70,449	512,489	62,096	8,243,021	12,247	10,728	542,089	9,737,324
1988	290,331	5,271	70,809	515,348	62,506	8,665,014	12,330	11,140	564,542	10,197,291
1989	301,728	5,271	71,694	519,003	63,130	9,869,433	12,497	11,553	587,530	10,541,839
1990	156,562	5,271	73,130	537,356	65,369	9,285,702	12,932	11,759	633,507	10,871,587
1991	289,848	5,271	75,772	566,393	69,944	9,285,702	13,757	11,759	633,507	10,951,954
1992	313,124	5,271	78,965	597,071	74,793	9,285,702	14,752	11,759	633,507	11,014,944
1993	313,124	5,271	80,456	609,930	76,633	9,285,702	15,120	11,759	633,507	11,031,502
1994	313,124	5,271	82,079	619,299	77,912	9,285,702	15,392	11,759	633,507	11,044,045
1995	313,124	5,271	83,371	626,034	78,865	9,285,702	15,603	11,759	633,507	11,053,237
1996	289,627	5,271	87,340	635,184	80,196	8,967,034	15,956	11,759	633,507	10,725,874
1997	289,627	5,271	90,203	638,976	80,681	8,901,316	16,128	11,759	633,507	10,667,468
1998	289,626	5,271	92,911	652,398	82,706	8,641,205	16,583	11,759	633,507	10,425,966
1999	289,626	5,271	94,208	659,302	83,752	8,641,205	16,818	11,759	633,507	10,435,449
2000	289,626	5,271	95,721	667,421	84,982	7,994,983	17,090	11,759	633,507	9,800,360
2001	289,626	5,271	96,285	670,045	85,327	7,865,254	17,167	11,759	633,507	9,674,241
2002	311,601	5,271	96,742	672,142	85,621	7,865,254	17,231	11,759	594,806	9,660,428
2003	311,601	5,271	97,685	679,971	86,802	7,865,254	17,471	11,759	592,584	9,668,398
2004	311,601	5,271	97,356	675,429	86,021	7,853,205	44,764	11,759	510,214	9,595,620
2005	311,601	5,271	97,509	676,470	86,148	7,853,205	44,792	11,759	510,214	9,596,969
2006	311,601	5,271	97,861	679,705	86,612	7,853,205	46,561	11,759	508,534	9,601,110
2007	311,601	5,271	97,935	681,065	86,701	7,853,205	46,580	11,759	508,534	9,602,651
2008	311,601	5,271	98,226	683,664	87,008	7,853,205	46,642	11,759	508,534	9,605,911
2009	335,099	5,271	99,921	694,471	88,417	8,227,609	46,934	11,759	508,534	10,018,016
2010	335,099	5,271	102,698	711,653	90,731	8,227,609	47,417	11,759	508,534	10,040,771
2011	335,099	5,271	104,563	723,531	92,203	8,227,609	47,724	11,759	508,534	10,056,293
2012	335,099	5,271	105,033	726,662	92,599	8,227,609	47,801	11,759	508,534	10,060,367
2013	335,099	5,271	105,512	729,849	93,001	8,227,609	47,880	11,759	508,534	10,064,514
2014	335,099	5,271	103,009	731,316	93,186	8,227,609	47,916	11,759	508,534	10,063,700
2015	335,099	5,271	99,705	667,054	83,905	8,227,609	47,916	11,759	508,534	9,986,852
2016	335,099	5,271	93,697	611,099	76,118	8,227,609	47,916	11,759	508,534	9,917,104
2017	335,099	5,271	79,484	498,130	58,847	8,227,609	47,916	11,759	508,534	9,772,649
2018	335,099	5,271	56,798	395,653	44,236	8,227,609	38,513	11,759	508,534	9,623,472
2019	335,099	5,271	48,333	339,437	40,667	8,227,609	37,762	11,759	508,534	9,554,471
2020	335,099	5,271	46,527	308,048	39,281	8,227,609	37,474	11,759	508,534	9,519,603
2021	335,099	5,271	45,423	286,936	38,491	8,227,609	37,308	11,759	508,534	9,496,430
2022	335,099	5,271	44,807	277,234	38,129	8,227,609	37,226	11,759	508,534	9,485,669
2023	335,099	5,271	44,382	273,014	37,956	8,227,609	37,184	11,759	508,534	9,480,807
2024	335,099	5,271	43,862	270,979	37,855	8,227,609	37,150	11,759	508,534	9,478,118
2025	335,099	5,271	43,300	268,667	37,714	8,227,609	37,108	11,759	508,534	9,475,061
2026	335,099	5,271	43,033	266,810	37,525	8,227,609	37,067	11,759	508,534	9,472,707
2027	335,099	5,271	42,391	264,107	37,239	8,227,609	37,006	11,759	508,534	9,469,014
2028	335,099	5,271	39,957	262,250	37,048	8,227,609	36,901	11,759	508,534	9,464,428
2029	335,099	5,271	39,643	259,489	36,713	8,227,609	36,834	11,759	508,534	9,460,951
2030	335,099	5,271	39,354	256,747	36,376	8,227,609	36,763	11,759	508,534	9,457,513
2031	335,099	5,271	37,768	240,358	34,435	8,227,609	36,355	11,759	508,534	9,437,188
2032	335,099	5,271	37,758	242,638	34,497	8,227,609	36,368	11,759	508,534	9,439,533
2033	335,099	5,271	37,422	238,397	33,828	8,227,609	36,235	11,759	508,534	9,434,155
2034	335,099	5,271	36,804	232,773	33,122	8,227,609	36,087	11,759	508,534	9,427,058
2035	335,099	5,271	36,076	224,892	31,963	8,227,609	35,851	11,759	508,534	9,417,054
TOTAL	18,890,464	349,643	4,840,487	33,958,641	4,302,419	485,531,574	1,792,470	727,865	32,866,093	583,259,656

d) 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

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County W.P. District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	690,539	0	776,021	0	0	0	0	0	1,400,081
1964	21,728	1,260,042	9,374	1,595,448	0	0	0	0	0	2,543,381
1965	21,859	2,179,810	17,760	2,706,589	0	0	405	405	0	4,279,539
1966	37,952	3,898,819	33,415	4,841,844	0	0	564	564	0	6,781,538
1967	71,260	7,691,085	68,133	9,511,856	0	0	562	562	0	11,921,674
1968	120,056	14,340,331	133,256	17,437,226	0	0	564	564	0	21,067,625
1969	187,000	21,850,137	202,534	26,510,563	0	0	3,190	3,190	0	31,181,777
1970	274,923	28,982,865	257,777	35,429,564	0	0	15,116	15,116	0	40,383,771
1971	384,903	37,229,879	316,207	45,718,288	0	0	15,942	15,942	0	51,095,831
1972	447,913	44,047,132	353,823	53,691,731	0	0	17,327	17,327	0	60,219,309
1973	470,035	46,283,635	357,228	56,285,951	0	0	17,327	17,327	0	62,820,117
1974	483,106	48,306,053	371,994	58,553,285	0	0	17,329	17,329	0	65,610,107
1975	496,565	49,268,119	376,391	59,745,733	0	0	17,331	17,331	0	67,481,703
1976	509,489	50,120,026	380,667	60,791,223	0	0	17,332	17,332	0	68,618,870
1977	517,576	50,809,655	384,975	61,617,957	0	0	17,335	17,335	0	69,793,648
1978	522,490	51,408,868	390,618	62,320,602	0	0	17,336	17,336	0	70,999,619
1979	526,011	52,212,368	399,522	63,226,889	0	0	17,338	17,338	0	72,441,921
1980	529,415	53,618,983	417,004	64,771,278	0	0	17,339	17,339	0	74,481,650
1981	546,614	56,648,010	449,669	68,295,448	0	0	17,341	17,341	0	78,625,065
1982	545,272	57,445,385	461,087	69,102,172	0	0	17,342	17,342	0	79,916,273
1983	557,430	59,017,274	477,181	71,008,468	0	0	17,343	17,343	0	82,041,088
1984	575,647	60,292,946	486,708	72,697,141	0	0	17,344	17,344	0	84,536,423
1985	588,902	61,123,708	491,961	73,828,217	0	0	17,345	17,345	0	86,359,949
1986	598,458	61,645,242	494,820	74,560,106	0	0	17,347	17,347	0	88,214,092
1987	607,471	62,073,455	496,600	75,170,368	0	0	17,348	17,348	0	91,064,243
1988	614,224	62,431,535	498,461	75,656,961	0	0	17,350	17,350	0	93,159,836
1989	617,863	62,774,747	501,420	76,076,677	0	0	17,353	17,353	0	94,383,976
1990	629,735	63,740,657	509,405	77,325,276	0	0	17,355	17,355	0	96,115,135
1991	642,915	64,655,258	515,983	78,507,138	0	0	17,358	17,358	0	97,689,011
1992	660,418	65,753,902	522,988	79,931,394	0	0	17,361	17,361	0	99,418,276
1993	679,129	66,882,231	529,216	81,356,851	0	0	17,363	17,363	0	101,119,366
1994	713,838	68,463,303	534,886	83,358,278	0	0	17,365	17,365	0	103,888,809
1995	735,201	69,349,936	537,642	84,504,760	0	0	17,366	17,366	0	107,813,277
1996	753,283	70,227,179	541,582	85,621,569	0	0	17,366	17,366	0	117,773,741
1997	813,865	71,506,673	544,296	87,299,852	0	0	17,366	17,366	0	128,037,605
1998	924,385	72,258,932	548,317	88,929,419	0	0	17,366	17,366	0	131,754,137
1999	1,112,663	72,892,733	552,010	90,017,078	0	0	17,366	17,366	0	133,503,517
2000	1,461,267	73,407,341	555,105	92,467,630	0	0	17,367	17,367	0	136,100,341
2001	2,438,239	73,717,086	556,484	94,580,587	0	0	17,368	17,368	0	139,079,194
2002	3,871,700	73,891,014	557,242	97,358,619	0	0	17,369	17,369	0	142,018,268
2003	4,575,618	74,203,116	559,292	98,979,559	0	0	17,370	17,370	0	144,177,908
2004	4,856,130	74,439,679	559,044	99,774,997	0	0	17,370	17,370	0	145,398,645
2005	5,000,750	68,332,606	559,850	100,322,412	0	0	17,370	17,370	0	146,338,586
2006	5,052,619	68,667,749	562,062	100,881,578	0	0	17,370	17,370	0	147,126,750
2007	5,170,362	69,398,864	567,662	102,081,609	0	0	17,370	17,370	0	148,748,454
2008	5,311,105	70,034,424	571,969	103,203,763	0	0	17,370	17,370	0	150,589,289
2009	5,331,252	71,614,206	581,377	105,462,632	0	0	17,370	17,370	0	154,752,302
2010	5,360,066	76,349,277	595,606	112,561,167	0	0	17,370	17,370	0	162,793,064
2011	5,384,616	84,618,864	612,937	125,024,237	0	0	17,370	17,370	0	175,718,014
2012	5,388,595	84,952,955	615,647	125,472,450	0	0	17,370	17,370	0	176,342,657
2013	5,384,496	84,672,631	618,405	125,118,013	0	0	17,370	17,370	0	175,522,274
2014	5,381,307	84,315,355	610,300	124,567,600	0	0	17,370	17,370	0	174,722,990
2015	5,372,651	83,446,959	601,914	123,410,757	0	0	16,966	16,966	0	172,933,940
2016	5,356,558	81,820,157	586,259	121,258,070	0	0	16,806	16,806	0	170,408,826
2017	5,323,251	78,228,319	551,541	116,546,829	0	0	16,808	16,808	0	165,220,516
2018	5,274,454	71,864,289	486,418	108,512,698	0	0	16,806	16,806	0	156,526,129
2019	5,207,510	64,745,080	417,140	99,303,519	0	0	14,180	14,180	0	146,900,683
2020	5,119,588	58,085,578	361,897	90,262,708	0	0	2,254	2,254	0	137,706,794
2021	5,009,607	50,437,675	303,468	79,853,100	0	0	1,428	1,428	0	127,245,443
2022	4,946,597	44,564,142	265,852	71,808,021	0	0	43	43	0	119,174,504
2023	4,924,475	43,097,633	262,447	69,212,380	0	0	43	43	0	116,530,505
2024	4,911,405	41,194,724	247,680	66,929,894	0	0	42	42	0	114,232,699
2025	4,897,946	40,344,093	243,283	65,730,723	0	0	39	39	0	113,005,579
2026	4,885,022	39,596,606	239,008	64,677,870	0	0	38	38	0	111,932,015
2027	4,876,934	38,983,825	234,699	63,844,444	0	0	36	36	0	111,068,404
2028	4,872,020	38,420,314	229,057	63,132,432	0	0	34	34	0	110,311,718
2029	4,868,499	37,647,047	220,153	62,210,685	0	0	32	32	0	109,353,454
2030	4,865,096	36,263,931	202,671	60,635,799	0	0	31	31	0	107,728,935
2031	4,847,896	33,353,147	170,005	57,046,550	0	0	30	30	0	104,020,744
2032	4,849,238	32,548,809	158,587	56,224,547	0	0	28	28	0	103,181,902
2033	4,837,080	31,047,172	142,493	54,285,822	0	0	27	27	0	101,158,059
2034	4,818,863	29,870,542	132,966	52,572,861	0	0	26	26	0	99,244,694
2035	4,805,609	29,115,521	127,714	51,433,720	0	0	25	25	0	97,754,969
TOTAL	193,378,013	3,930,672,181	29,033,148	5,385,529,503	0	0	868,351	868,351	0	7,593,605,210

TABLE B-16A. Minimum OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Calendar Year	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	Total	
	[11]	[12]	[13]	Municipal and Industrial	Agricultural					[14]
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	37,806	1,963	5,639	60,701	678,086	2,008	2,073	77,591	865,867	
1969	45,479	2,235	30,158	80,554	1,197,126	2,286	2,085	90,773	1,450,696	
1970	46,969	2,292	35,450	96,673	1,381,493	2,344	2,158	93,408	1,660,787	
1971	47,997	2,314	35,366	106,654	1,643,163	2,366	2,288	94,874	1,935,022	
1972	49,866	2,414	37,844	122,313	1,729,169	2,469	2,254	98,777	2,045,106	
1973	50,006	2,385	36,180	125,553	1,719,873	2,440	2,310	98,330	2,037,077	
1974	52,818	2,556	36,570	135,661	1,823,065	2,614	2,529	104,609	2,160,422	
1975	66,963	3,243	44,251	162,738	2,235,242	3,317	3,191	132,663	2,651,608	
1976	66,504	3,328	45,364	159,303	2,215,999	3,404	2,919	133,940	2,630,761	
1977	75,595	3,812	49,192	189,661	2,522,290	3,898	3,708	152,838	3,000,994	
1978	70,688	3,503	49,725	174,897	2,427,163	3,583	3,644	141,672	2,874,875	
1979	68,879	3,436	48,142	173,677	2,378,315	3,514	3,492	138,993	2,817,948	
1980	95,898	4,722	59,551	235,741	3,146,570	4,830	4,777	191,582	3,743,671	
1981	118,448	5,965	66,183	266,353	3,440,557	6,099	5,187	239,323	4,148,115	
1982	134,083	6,711	67,061	311,879	3,848,922	6,862	6,382	270,061	4,651,961	
1983	184,902	9,242	80,869	426,485	5,030,031	9,450	8,494	372,182	6,121,655	
1984	194,228	9,656	95,555	471,854	5,636,134	9,874	8,719	389,892	6,815,912	
1985	200,694	9,957	115,227	486,162	6,042,593	10,182	8,982	402,457	7,276,254	
1986	207,028	10,302	110,479	530,803	6,372,710	10,536	10,341	415,776	7,667,975	
1987	205,002	10,259	109,401	533,451	6,378,437	10,493	10,517	412,889	7,670,449	
1988	203,711	10,223	122,903	516,432	6,388,497	10,455	10,341	410,868	7,673,430	
1989	224,049	11,269	116,197	564,169	6,747,046	11,526	11,102	452,406	8,137,764	
1990	271,051	13,666	148,238	664,040	8,111,616	13,976	13,206	547,974	9,783,767	
1991	275,748	13,854	144,486	662,755	8,111,610	14,168	13,218	556,474	9,792,313	
1992	317,889	16,027	162,466	764,224	9,115,453	16,393	18,209	642,672	11,053,333	
1993	359,879	17,989	184,477	831,662	10,372,245	18,399	19,560	724,397	12,528,608	
1994	309,084	15,486	224,254	738,619	9,789,833	15,839	16,434	622,879	11,732,428	
1995	395,441	19,918	220,899	898,339	11,190,121	20,373	21,551	799,070	13,565,712	
1996	362,623	19,968	301,835	902,162	11,872,821	20,424	21,664	796,711	14,298,208	
1997	366,476	20,154	186,450	942,987	10,558,144	20,613	19,344	806,084	12,920,252	
1998	453,027	24,560	288,906	1,098,213	12,207,859	25,122	21,594	995,194	15,114,476	
1999	378,699	20,889	272,342	984,246	10,924,358	21,364	21,511	832,731	13,556,140	
2000	383,439	21,089	207,531	1,069,880	9,937,608	21,569	22,694	841,923	12,505,732	
2001	462,404	25,444	231,676	1,280,623	11,239,895	26,023	31,679	1,015,604	14,313,348	
2002	425,710	21,551	224,731	1,160,115	10,228,485	22,041	25,564	812,862	12,921,059	
2003	492,395	25,086	242,311	1,253,230	11,230,255	25,658	30,576	940,332	14,239,843	
2004	452,017	23,155	246,564	1,216,248	10,795,591	63,079	25,920	748,385	13,570,958	
2005	425,522	21,844	259,203	1,038,362	10,303,872	59,430	24,277	705,461	12,837,971	
2006	487,041	24,667	203,549	1,164,467	10,806,481	74,532	26,184	795,800	13,582,721	
2007	513,644	26,006	248,823	1,269,512	11,727,029	81,237	25,894	842,923	14,735,067	
2008	688,067	35,232	290,795	1,653,236	15,132,788	106,989	34,673	1,134,160	19,075,940	
2009	819,516	39,151	322,005	1,763,708	17,304,616	117,801	35,955	1,259,903	21,662,655	
2010	736,407	35,086	310,094	1,463,925	15,715,459	106,485	31,348	1,130,201	19,529,005	
2011	520,696	24,105	317,137	1,178,213	12,989,543	78,005	27,505	784,817	15,920,021	
2012	520,817	24,110	317,206	1,178,491	12,992,574	78,023	27,509	784,998	15,923,728	
2013	521,222	24,129	317,381	1,179,360	13,001,783	78,081	27,520	785,603	15,935,079	
2014	521,574	24,145	317,452	1,180,036	13,008,548	78,128	27,525	786,128	15,943,536	
2015	521,886	24,159	317,682	1,180,804	13,017,148	78,176	27,540	786,596	15,953,991	
2016	521,296	24,132	317,303	1,179,409	13,001,762	78,088	27,515	785,714	15,935,219	
2017	521,547	24,144	317,454	1,179,991	13,008,141	78,125	27,525	786,088	15,943,015	
2018	522,022	24,166	317,659	1,181,013	13,018,956	78,193	27,538	786,798	15,956,345	
2019	521,362	24,135	317,267	1,179,486	13,002,264	78,095	27,513	785,812	15,935,934	
2020	521,699	24,151	317,542	1,180,343	13,011,975	78,148	27,531	786,317	15,947,706	
2021	521,831	24,157	317,698	1,180,726	13,016,511	78,170	27,541	786,515	15,953,149	
2022	521,910	24,160	317,593	1,180,755	13,016,141	78,176	27,534	786,631	15,952,900	
2023	521,314	24,133	317,327	1,179,464	13,002,419	78,091	27,517	785,740	15,936,005	
2024	521,572	24,145	317,432	1,180,013	13,008,210	78,128	27,524	786,127	15,943,151	
2025	521,988	24,164	317,752	1,181,050	13,019,878	78,192	27,544	786,749	15,957,317	
2026	521,237	24,130	317,179	1,179,183	12,998,887	78,076	27,508	785,625	15,931,825	
2027	522,548	24,190	318,170	1,182,431	13,035,369	78,278	27,571	787,586	15,976,143	
2028	521,235	24,130	317,144	1,179,145	12,998,318	78,074	27,505	785,622	15,931,173	
2029	521,692	24,150	317,565	1,180,352	13,012,198	78,147	27,532	786,305	15,947,941	
2030	521,234	24,129	317,278	1,179,277	13,000,377	78,079	27,514	785,620	15,933,508	
2031	522,803	24,201	318,246	1,182,946	13,040,659	78,313	27,576	787,967	15,982,711	
2032	521,007	24,119	316,971	1,178,579	12,991,958	78,039	27,494	785,281	15,923,448	
2033	521,672	24,150	317,612	1,180,367	13,012,630	78,147	27,535	786,277	15,948,390	
2034	521,869	24,159	317,652	1,180,745	13,016,404	78,173	27,538	786,571	15,953,111	
2035	521,059	24,121	317,015	1,178,712	12,993,470	78,047	27,497	785,358	15,925,279	
TOTAL	24,862,783	1,206,223	14,255,659	58,253,158	636,874,742	2,969,257	1,306,699	42,119,989	781,848,511	

TABLE B-16A. Minimum OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County W.P. District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
1961	[30] 0	[31] 0	[32] 0	[33] 0	[34] 0	[35] 0	[36] 0	[37] 0	[38] 0	[39] 0
1962	0	0	0	0	0	0	0	0	3,219	42,918
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	378,875
1966	0	0	0	0	0	0	0	0	31,321	408,396
1967	0	0	0	0	0	0	0	0	47,718	634,505
1968	8,821	972,734	9,504	1,218,520	0	0	0	0	46,945	2,745,159
1969	11,704	1,295,607	12,610	1,654,809	0	0	0	0	52,963	4,074,937
1970	14,623	1,624,569	15,746	2,069,926	0	0	0	0	69,744	4,676,285
1971	24,302	2,716,584	26,118	3,421,554	0	0	54	54	55,532	6,185,714
1972	89,131	8,038,463	68,369	10,035,858	0	0	40	40	80,412	12,998,870
1973	117,779	9,890,316	78,313	12,289,297	0	0	1	1	54,219	15,194,233
1974	128,169	11,581,491	83,453	14,166,551	0	0	143	143	76,783	17,372,560
1975	147,899	13,584,548	101,893	16,593,957	0	0	1,069	1,069	84,547	20,517,423
1976	158,664	12,862,489	94,799	16,037,418	0	0	139	139	106,717	20,027,212
1977	178,774	16,203,699	121,966	19,892,685	0	0	892	892	98,618	24,213,491
1978	186,384	17,811,770	132,435	21,568,748	0	0	39	39	100,786	26,012,788
1979	186,688	16,414,289	126,756	20,238,759	0	0	3,235	3,235	119,352	24,675,595
1980	248,399	20,926,898	154,096	25,901,707	0	0	416	416	178,812	32,038,398
1981	259,244	23,731,024	186,592	29,224,859	0	0	3,847	3,847	185,347	35,516,365
1982	307,955	27,994,510	209,141	34,323,372	0	0	11,075	11,075	173,894	41,611,654
1983	394,524	38,953,367	326,258	47,754,649	0	0	1,928	1,928	220,926	56,802,779
1984	496,808	45,597,671	382,104	56,371,786	0	0	3,765	3,765	225,959	67,072,552
1985	531,765	50,064,444	416,652	61,532,075	0	0	2,888	2,888	340,322	73,228,724
1986	551,066	52,858,915	442,334	64,885,109	0	0	2,787	2,787	279,227	76,682,112
1987	564,352	50,737,631	411,276	62,892,289	0	0	2,388	2,388	345,116	75,240,983
1988	593,787	51,262,231	406,248	63,712,843	0	0	545	545	365,207	76,126,694
1989	576,852	52,638,942	431,020	64,815,348	0	0	1,800	1,800	422,329	78,708,338
1990	667,687	61,053,824	494,721	75,175,234	0	0	788	788	474,284	91,448,066
1991	711,803	60,874,529	470,139	75,935,908	0	0	3,654	3,654	214,683	91,098,893
1992	688,558	67,460,598	502,131	82,396,468	0	0	647	647	443,676	100,077,318
1993	828,208	68,749,547	538,751	85,955,989	0	0	3,630	3,630	599,571	107,321,034
1994	783,691	63,898,029	473,897	80,045,463	0	0	2,279	2,279	609,966	101,233,254
1995	785,191	68,079,888	523,512	85,080,006	0	0	2,906	2,906	534,971	107,378,967
1996	773,653	72,757,439	561,100	89,927,727	0	0	8,007	8,007	571,857	113,585,947
1997	917,372	75,655,465	564,455	94,454,556	0	0	7,449	7,449	428,638	114,939,130
1998	1,000,558	80,540,695	608,294	102,766,206	0	0	0	0	465,095	129,072,752
1999	1,055,217	85,194,217	628,098	107,895,924	0	0	0	0	559,471	134,985,915
2000	965,146	83,200,802	635,833	106,249,167	0	0	0	0	0	132,508,594
2001	950,957	93,944,025	708,297	118,693,354	0	0	0	0	0	147,888,372
2002	925,783	86,537,495	657,014	109,280,907	0	0	0	0	0	145,398,516
2003	1,311,937	83,423,547	619,998	108,355,941	0	0	3,393	3,393	0	140,268,666
2004	1,407,010	100,690,565	762,853	128,449,711	0	0	3,455	3,455	0	158,136,942
2005	1,607,128	77,834,448	676,165	109,587,285	0	0	3,452	3,452	0	136,790,248
2006	1,436,019	80,723,921	640,473	114,256,727	0	0	3,979	3,979	0	141,842,908
2007	2,057,796	104,080,761	856,925	141,161,396	0	0	3,955	3,955	0	173,440,599
2008	1,901,975	114,735,040	926,261	159,055,793	0	0	3,213	3,213	0	194,712,148
2009	2,048,397	118,416,632	964,315	165,079,073	0	0	1,836	1,836	0	204,748,275
2010	2,011,588	113,337,015	928,203	158,236,725	0	0	1,926	1,926	0	195,061,141
2011	1,700,463	92,298,988	775,292	128,563,176	0	0	4,704	4,704	0	160,661,739
2012	1,689,642	92,011,947	773,735	128,220,302	0	0	4,704	4,704	0	160,325,970
2013	1,660,146	92,089,272	778,755	128,091,975	0	0	4,704	4,704	0	160,216,480
2014	1,717,598	92,816,206	776,280	129,366,811	0	0	4,703	4,703	0	161,501,048
2015	1,662,333	91,631,430	775,364	127,615,884	0	0	4,705	4,705	0	159,772,606
2016	1,724,865	93,368,180	780,076	129,986,103	0	0	4,702	4,702	0	162,104,907
2017	1,684,632	92,751,501	778,700	129,144,158	0	0	4,703	4,703	0	161,278,238
2018	1,696,644	92,641,056	778,710	128,991,516	0	0	4,704	4,704	0	161,147,726
2019	1,724,857	94,184,644	783,067	131,100,954	0	0	4,698	4,698	0	163,217,498
2020	1,687,504	92,574,968	781,586	128,699,653	0	0	4,704	4,704	0	160,842,753
2021	1,654,286	91,157,863	773,636	126,974,619	0	0	4,707	4,707	0	159,132,049
2022	1,691,188	92,686,388	774,149	129,334,728	0	0	4,703	4,703	0	161,484,279
2023	1,723,148	93,049,024	776,681	129,688,868	0	0	4,702	4,702	0	161,809,884
2024	1,684,684	93,361,651	785,202	129,718,992	0	0	4,702	4,702	0	161,851,504
2025	1,692,058	91,052,846	767,697	127,146,097	0	0	4,707	4,707	0	159,309,742
2026	1,726,887	94,678,072	784,932	131,758,483	0	0	4,697	4,697	0	163,866,361
2027	1,681,286	88,270,005	747,139	124,032,335	0	0	4,714	4,714	0	156,236,738
2028	1,654,446	96,276,328	817,746	132,368,125	0	0	4,697	4,697	0	164,473,110
2029	1,722,161	91,632,675	763,638	128,262,089	0	0	4,704	4,704	0	160,406,953
2030	1,724,648	93,227,844	776,736	129,961,553	0	0	4,702	4,702	0	162,077,663
2031	1,638,454	88,573,386	748,281	124,495,170	0	0	4,713	4,713	0	156,708,695
2032	1,720,004	97,218,504	817,185	133,821,998	0	0	4,694	4,694	0	165,910,122
2033	1,676,579	91,125,625	766,728	127,310,571	0	0	4,705	4,705	0	159,459,186
2034	1,670,437	91,959,325	777,010	128,027,635	0	0	4,704	4,704	0	160,181,627
2035	1,771,220	95,765,615	785,254	133,409,642	0	0	4,694	4,694	0	165,501,959
TOTAL	72,993,534	4,605,354,017	37,422,697	6,174,733,116	0	0	209,196	209,196	8,723,728	7,684,957,169

TABLE B-16B. Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	2,696,450	3,737,556	0	0	0
1986	45,887	0	45,887	312,938	365,147	2,595,765	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	35,178	245,181	280,359	355,578	477,883	1,065,488	1,898,949	0	165,930	165,930
1992	74,573	230,716	305,289	405,244	529,119	1,183,466	2,117,829	0	0	0
1993	89,214	247,977	337,191	841,383	256,930	1,552,562	2,650,875	0	0	0
1994	111,942	229,598	341,540	501,812	559,683	1,395,238	2,456,733	0	0	0
1995	96,842	235,605	332,447	833,227	492,578	796,524	2,122,329	0	0	0
1996	63,698	205,414	269,112	367,297	304,845	1,189,291	1,861,433	711	105	816
1997	48,518	193,255	241,773	455,751	294,951	1,220,497	1,971,199	44,788	298,986	343,774
1998	82,317	251,217	333,534	380,321	380,282	1,103,662	1,864,265	198,376	1,028,220	1,226,596
1999	58,017	195,562	253,579	559,900	446,655	1,039,572	2,046,127	147,204	791,946	939,150
2000	28,759	128,393	157,152	374,808	237,138	748,820	1,360,766	82,628	474,268	556,896
2001	81,666	157,196	238,862	396,340	233,205	673,431	1,302,976	134,574	595,294	729,868
2002	40,384	128,219	168,603	384,774	230,122	521,729	1,136,625	91,976	586,079	678,055
2003	37,618	92,735	130,353	301,657	180,804	643,729	1,126,190	78,771	477,048	555,819
2004	50,258	128,102	178,360	447,529	209,965	546,009	1,203,503	52,709	661,706	754,485
2005	53,455	149,328	202,783	452,896	265,252	772,420	1,490,568	106,901	587,036	693,937
2006	59,239	127,708	186,947	476,295	277,304	798,098	1,551,697	109,498	605,502	715,000
2007	90,265	176,367	266,632	442,518	245,347	735,669	1,423,534	102,697	754,456	857,153
2008	271,993	538,171	810,164	1,090,143	740,803	1,461,512	3,292,458	381,781	1,124,726	1,506,507
2009	214,977	293,443	508,420	887,087	496,629	1,370,646	2,754,362	992,784	1,806,310	2,799,094
2010	220,086	359,678	579,764	899,248	535,019	1,388,949	2,823,216	1,006,041	1,830,431	2,836,472
2011	218,390	352,000	570,390	901,283	522,918	1,357,533	2,781,734	983,286	1,789,029	2,772,315
2012	221,651	352,424	574,075	910,293	522,869	1,357,405	2,790,567	983,193	1,788,861	2,772,054
2013	154,854	198,639	353,493	606,048	383,299	855,352	1,844,699	553,445	1,006,959	1,560,404
2014	34,706	44,577	79,283	151,982	85,906	191,705	429,593	124,040	225,683	349,723
2015	21,114	26,444	47,558	90,043	50,896	113,577	254,516	73,489	133,708	207,197
2016	18,523	22,651	41,174	77,128	43,596	97,286	218,010	62,948	114,530	177,478
2017	18,212	21,757	39,969	74,083	41,875	93,446	209,404	60,463	110,009	170,472
2018	7,752	9,052	16,804	30,190	17,421	38,876	86,487	25,155	45,767	70,922
2019	7,887	9,006	16,893	30,666	17,334	38,681	86,681	25,028	45,537	70,565
2020	8,480	9,683	18,163	32,972	18,637	41,590	93,199	26,910	48,961	75,871
2021	13,396	14,928	28,324	50,829	28,730	64,114	143,673	41,484	75,478	116,962
2022	12,714	14,168	26,882	48,241	27,268	60,850	136,359	39,372	71,635	111,007
2023	9,054	10,089	19,143	34,354	19,418	43,333	97,105	28,038	51,014	79,052
2024	6,606	7,361	13,967	25,065	14,168	31,617	70,850	20,457	37,221	57,678
2025	669	745	1,414	2,538	1,435	3,201	7,174	2,071	3,769	5,840
2026	960	1,070	2,030	3,643	2,059	4,595	10,297	2,973	5,409	8,382
2027	1,623	1,809	3,432	6,160	3,482	7,770	17,412	5,027	9,147	14,174
2028	1,006	1,121	2,127	3,818	2,158	4,816	10,792	3,116	5,669	8,785
2029	992	1,106	2,098	3,765	2,128	4,749	10,642	3,073	5,591	8,664
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	3,056,276	5,803,736	8,860,012	17,094,543	12,645,929	40,116,060	69,856,532	6,635,077	17,362,020	23,997,097

TABLE B-16B. Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural				
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[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	59,322	1,053,957	11,978,046	38,810	42,297	1,253,257	14,953,641
1986	552,172	12,858	885,988	11,788,714	40,659	38,275	872,008	14,190,674
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	13,048	3,111	570,942	146,276	0	1,354	30,685	765,416
1992	244,630	13,395	706,155	5,788,599	18,587	15,716	480,903	7,267,985
1993	471,706	25,543	1,202,455	11,405,212	37,276	36,803	1,159,908	14,338,903
1994	262,029	15,161	901,463	6,786,208	19,257	19,061	567,521	8,570,700
1995	626,214	16,830	1,486,494	12,489,555	41,275	36,377	1,051,178	15,747,923
1996	407,919	13,446	1,226,968	9,219,091	28,668	24,001	1,691,135	12,611,228
1997	423,144	(6)	794,476	7,471,645	(31)	22,025	137,304	8,848,557
1998	471,993	4,597	837,228	8,366,817	127	25,458	175,371	9,881,591
1999	360,554	19,182	874,948	7,723,883	24,159	20,065	1,749,925	10,772,716
2000	193,895	5,762	392,659	4,215,772	11,530	9,847	667,127	5,496,592
2001	200,485	6,563	113,854	2,948,087	7,528	11,821	287,409	3,575,747
2002	153,869	4,557	309,688	2,803,477	9,257	10,806	301,042	3,592,696
2003	125,188	3,901	301,142	2,626,386	10,030	7,904	287,531	3,362,082
2004	167,903	12,186	431,994	2,937,167	30,970	10,800	278,035	3,869,055
2005	315,142	14,807	358,007	5,609,958	76,490	11,047	540,681	6,926,132
2006	287,977	13,112	401,503	5,488,668	38,075	11,559	432,313	6,673,207
2007	188,520	8,704	240,767	3,501,090	24,131	10,161	363,729	4,337,102
2008	231,753	8,837	480,739	4,475,165	37,095	13,053	326,355	5,572,997
2009	349,714	18,296	779,769	6,283,020	57,935	23,709	584,993	8,097,436
2010	354,384	18,540	790,181	6,453,811	58,709	24,025	549,544	8,249,194
2011	346,368	18,121	772,309	6,222,910	57,381	23,482	537,114	7,977,685
2012	346,335	18,119	772,236	6,222,325	57,375	23,480	537,063	7,976,933
2013	194,954	10,199	670,416	3,524,260	32,297	13,217	302,316	4,747,659
2014	43,694	2,286	150,256	800,172	7,238	2,962	67,756	1,074,364
2015	25,887	1,354	89,021	474,070	4,289	1,755	40,143	636,519
2016	22,174	1,160	76,252	406,071	3,673	1,503	34,385	545,218
2017	21,298	1,114	73,242	390,043	3,528	1,444	33,028	523,697
2018	8,861	464	30,471	162,270	1,468	601	13,740	217,875
2019	8,816	461	30,318	161,453	1,461	598	13,671	216,778
2020	9,479	496	32,598	173,595	1,570	643	14,699	233,080
2021	14,613	765	50,252	267,609	2,421	991	22,660	359,311
2022	13,869	726	47,694	253,986	2,298	940	21,507	341,020
2023	9,877	517	33,964	180,873	1,636	670	15,316	242,853
2024	7,206	377	24,781	131,967	1,194	489	11,175	177,189
2025	730	38	2,509	13,363	121	49	1,132	17,942
2026	1,047	55	3,601	19,178	173	71	1,624	25,749
2027	1,771	93	6,090	32,431	293	120	2,746	43,544
2028	1,098	57	3,774	20,101	182	74	1,702	26,988
2029	1,082	57	3,722	19,822	179	73	1,678	26,613
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	9,985,494	436,202	22,225,118	205,018,498	939,295	643,244	18,375,856	257,623,707

TABLE B-16B. Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(in dollars)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[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	3,749,257	1,572,025	2,032,672	170,137	3,230,451	0	0	157,601	884,188	601,583
1986	3,159,857	1,694,487	2,097,408	173,460	3,340,188	15,873	0	301,486	739,563	1,088,901
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	1,048,414	531,160	1,022,405	125,256	1,686,304	65,111	473,291	488,207	540,119	796,531
1992	2,760,199	1,548,472	1,124,775	55,985	1,855,065	22,891	1,130,876	367,996	362,232	853,047
1993	3,559,487	1,332,392	2,256,338	29,498	3,721,492	60,615	1,101,799	640,919	425,969	1,406,255
1994	3,963,982	1,450,328	1,345,145	74,879	2,218,411	88,549	1,371,116	678,876	871,358	1,452,741
1995	4,324,009	1,901,361	2,498,462	44,237	4,120,837	43,892	881,146	636,541	75,278	1,397,623
1996	3,572,856	1,507,542	4,652,945	77,384	7,674,388	31,691	760,763	723,670	458,246	1,201,941
1997	3,411,379	1,468,949	4,294,703	42,135	4,319,206	24,319	891,191	648,652	625,340	1,175,556
1998	3,977,988	1,599,394	7,554,910	16,624	6,174,031	30,365	508,248	657,806	166,952	827,650
1999	3,696,973	1,694,851	3,195,685	71,662	3,678,076	18,305	501,486	710,674	815,001	1,375,575
2000	2,372,130	994,396	1,420,806	40,083	1,954,947	0	374,972	257,146	617,664	508,258
2001	2,680,895	1,418,179	460,256	53,460	759,169	0	213,385	445,872	1,339,699	119,363
2002	1,674,587	1,389,921	569,606	74,418	939,655	0	140,550	531,620	2,422,881	844,839
2003	1,445,146	1,353,956	411,258	44,506	678,236	0	405,376	277,984	780,631	624,561
2004	1,812,210	1,676,067	554,535	71,930	759,819	0	465,681	368,704	2,071,504	449,688
2005	2,047,638	1,443,555	1,721,141	32,667	1,987,091	0	542,366	400,828	1,568,493	566,063
2006	2,845,985	1,617,750	5,071,235	26,843	2,093,821	0	1,417,777	442,278	1,533,665	681,916
2007	2,972,602	1,853,225	3,205,888	77,402	1,323,631	0	2,010,674	706,155	2,622,909	176,169
2008	4,613,306	4,148,107	4,675,471	320,248	1,768,367	39,153	1,584,181	637,037	4,198,136	814,084
2009	3,820,948	2,209,873	7,741,097	213,503	3,196,159	124,302	2,409,006	1,151,148	6,558,518	1,840,988
2010	3,871,971	2,344,529	8,961,868	224,128	3,238,839	125,962	2,441,176	1,166,520	6,646,098	1,865,571
2011	3,899,798	2,342,883	8,759,162	227,922	3,165,581	123,113	2,385,959	1,140,135	6,495,772	1,823,375
2012	4,000,053	2,445,422	8,758,338	235,497	3,165,283	123,102	2,385,735	1,140,028	6,495,161	1,823,203
2013	2,130,054	1,649,492	4,930,115	132,563	1,781,755	69,295	1,440,340	641,728	3,656,161	1,026,291
2014	954,791	653,655	1,104,955	46,323	399,333	15,531	603,865	143,826	819,432	230,016
2015	565,676	387,265	654,642	27,444	236,589	9,201	357,766	85,211	485,481	136,275
2016	484,536	331,716	560,742	23,508	202,653	7,881	306,449	72,989	415,845	116,728
2017	465,411	318,623	538,609	22,580	194,654	7,570	294,353	70,108	399,431	112,121
2018	193,625	132,557	224,078	9,394	80,982	3,149	122,460	29,167	166,175	46,646
2019	192,651	131,890	222,950	9,347	80,575	3,134	121,843	29,020	165,339	46,411
2020	207,139	141,808	239,717	10,050	86,634	3,369	131,007	31,203	177,773	49,901
2021	319,320	218,608	369,541	15,492	133,553	5,194	201,957	48,101	274,051	76,927
2022	303,065	207,480	350,729	14,704	126,754	4,930	191,676	45,653	260,100	73,010
2023	215,823	147,754	249,767	10,471	90,266	3,511	136,499	32,511	185,227	51,993
2024	157,468	107,803	182,233	7,640	65,860	2,561	99,592	23,720	135,144	37,935
2025	15,945	10,916	18,453	774	6,669	259	10,084	2,402	13,684	3,841
2026	22,884	15,667	26,483	1,110	9,571	372	14,473	3,447	19,640	5,513
2027	38,697	26,492	44,783	1,877	16,185	629	24,474	5,829	33,211	9,322
2028	23,985	16,420	27,757	1,164	10,031	390	15,169	3,613	20,584	5,778
2029	23,652	16,192	27,372	1,147	9,892	385	14,959	3,563	20,299	5,698
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	95,922,287	53,742,365	102,874,573	3,622,125	84,795,569	1,363,946	28,499,558	17,374,098	63,701,847	30,849,823

TABLE B-16B. Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				TOTAL STATE WATER PROJECT (a)
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]
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	77,446,523	0	89,844,437	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	54,214,229	132,209	61,123,236	0	0	0	0	64,233,890
1992	0	72,401,054	0	82,482,592	0	0	0	0	92,173,695
1993	0	55,312,615	0	69,847,379	0	0	0	0	87,174,348
1994	0	72,838,621	0	86,354,006	0	0	0	0	97,722,979
1995	0	40,862,813	0	56,786,199	0	0	0	0	74,988,898
1996	0	36,536,259	401	57,198,086	0	0	0	0	71,940,675
1997	0	37,121,379	108,559	54,131,368	0	0	0	0	65,536,671
1998	0	30,341,609	149,170	52,004,747	0	0	0	0	65,310,733
1999	0	42,257,580	106,226	58,122,094	0	0	0	0	72,133,666
2000	0	43,977,877	123,318	52,641,597	0	0	0	0	60,213,003
2001	0	49,405,276	84,868	56,980,422	0	0	0	0	62,827,875
2002	0	45,579,833	154,113	54,322,023	0	0	0	0	59,898,002
2003	3,303	41,917,356	129,134	48,071,447	0	0	0	0	53,245,891
2004	44,621	58,640,223	170,747	67,085,729	0	0	0	0	73,091,132
2005	41,448	56,220,579	61,131	66,633,000	0	0	0	0	75,946,420
2006	265,078	60,701,335	70,268	76,767,951	0	0	0	0	85,894,802
2007	259,699	60,978,392	119,126	76,305,872	0	0	0	0	83,190,293
2008	945,840	97,340,396	337,268	121,421,594	0	0	0	0	132,603,720
2009	1,636,320	95,870,096	1,159,582	127,931,540	0	0	0	0	142,090,852
2010	1,658,170	95,945,746	1,175,067	129,665,645	0	0	0	0	144,154,291
2011	1,620,665	93,775,579	1,148,489	126,908,433	0	0	0	0	141,010,557
2012	1,620,512	93,766,757	1,148,381	127,107,472	0	0	0	0	141,221,101
2013	912,195	50,727,332	646,430	69,743,751	0	0	0	0	78,250,006
2014	204,444	12,817,993	144,880	18,139,044	0	0	0	0	20,072,007
2015	121,125	7,594,155	85,836	10,746,666	0	0	0	0	11,892,456
2016	103,751	6,504,865	73,524	9,205,187	0	0	0	0	10,187,067
2017	99,656	6,248,111	70,622	8,841,849	0	0	0	0	9,785,391
2018	41,460	2,599,405	29,381	3,678,479	0	0	0	0	4,070,567
2019	41,251	2,586,320	29,233	3,659,964	0	0	0	0	4,050,881
2020	44,354	2,780,824	31,431	3,935,210	0	0	0	0	4,355,523
2021	68,374	4,286,849	48,454	6,066,421	0	0	0	0	6,714,691
2022	64,894	4,068,622	45,987	5,757,604	0	0	0	0	6,372,872
2023	46,213	2,897,413	32,749	4,100,197	0	0	0	0	4,538,350
2024	33,718	2,113,991	23,894	2,991,559	0	0	0	0	3,311,243
2025	3,414	214,058	2,419	302,918	0	0	0	0	335,288
2026	4,900	307,219	3,472	434,751	0	0	0	0	481,209
2027	8,286	519,506	5,872	735,163	0	0	0	0	813,725
2028	5,136	321,991	3,639	455,657	0	0	0	0	504,349
2029	5,064	317,522	3,589	449,334	0	0	0	0	497,351
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	9,903,891	1,951,111,974	7,937,354	2,451,699,410	0	0	0	0	2,812,036,758

a) Costs allocated to contractors in 1989 through 2002 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

(in dollars per acre-foot)

Sheet 3 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 18A Alamo Powerplant		Reach 22B Pearblossom Pumping Plant		Reach 23 Mojave Siphon Powerplant		Reach 26A Devil Canyon Powerplant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
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	14.2519509	27.5575267	0	0	-2.3717647	25.1857620
1973	0	0	4.4326545	17.7300693	0	0	-8.4298618	9.3002075
1974	0	0	3.4431782	15.7782207	0	0	-5.1043660	10.6738547
1975	0	0	3.1739313	15.4688438	0	0	-5.6510611	9.8177827
1976	0	0	3.9391130	17.8038848	0	0	-6.4449941	11.3588907
1977	0	0	3.4988957	21.2829827	0	0	-11.6274558	9.6555269
1978	0	0	4.1619043	17.3612680	0	0	-8.1314274	9.2298406
1979	0	0	5.2283922	22.8319775	0	0	-9.5825772	13.2494003
1980	0	0	4.4253989	23.7315648	0	0	-11.5446606	12.1869042
1981	0	0	4.0325337	22.7957992	0	0	-6.7528607	16.0429385
1982	0	0	3.7143664	22.0995404	0	0	-6.9141441	15.1853963
1983	0	0	1.7592652	11.9990051	0	0	-23.7923414	-11.7933363
1984	0	0	2.5203002	17.5460979	0	0	-29.2940447	-11.7479468
1985	0	0	3.5406919	24.5146535	0	0	-30.7672356	-6.2525821
1986	-2.3583180	34.1759895	6.0306655	40.2065640	0	0	-29.2499580	10.9566060
1987	-2.5482255	29.4907224	5.0997322	34.5904546	0	0	-29.7006533	4.8898013
1988	-1.3847067	28.6841141	4.7880132	33.4721273	0	0	-29.0334518	4.4386755
1989	-1.1019487	38.4996363	6.4559997	44.9556360	0	0	-28.3706997	16.5849363
1990	-1.0673268	51.9071913	9.0317647	60.9389560	0	0	-28.8797266	32.0592294
1991	-1.5206590	34.1859899	6.1338271	40.3198170	0	0	-30.3294563	9.9903607
1992	-2.6080003	19.5839837	3.6796265	23.2636102	0	0	-29.7938993	-6.5302891
1993	-0.1885524	-4.2578449	-0.9592579	-5.2171028	0	0	-30.6629489	-35.8800517
1994	-0.1279266	37.6304211	6.5139903	44.1444114	0	0	-30.4781656	13.6662458
1995	-3.4425314	16.2738280	3.4305039	19.7043319	0	0	-30.3517624	-10.6474305
1996	-5.9839345	33.4220040	6.6794995	40.1015035	-2.3423415	37.7591620	-29.5900574	8.1691046
1997	-4.7847800	34.0059735	6.8397922	40.8457657	-3.8632009	36.9825648	-30.6066647	6.3759001
1998	-5.0614104	-10.4573480	-1.2355351	-11.6928831	-3.7700558	-15.4629389	-30.6550762	-46.1180151
1999	-4.7679511	17.6372106	3.5508098	21.1880204	-4.9754645	16.2125559	-29.6766184	-13.4640625
2000	-5.3795304	21.1155661	4.6180019	25.7335679	-5.2137446	20.5198234	-30.4798154	-9.9599920
2001	-4.6442419	173.3048710	29.9688592	203.2737301	5.7699535	197.5037766	-30.8825050	166.6212716
2002	-5.4660253	68.1938768	13.0727227	81.2665995	-6.4072093	74.8593902	-30.1161904	44.7431998
2003	-3.3577630	85.7888308	15.6946862	101.4835169	-7.2230635	94.2604534	-30.5285166	63.7319369
2004	-5.5585791	85.4644603	15.8923087	101.3567690	-7.4295016	93.9272674	-30.2125160	63.7147514
2005	-5.4922951	97.7623487	17.4740873	115.2364360	-6.5987131	108.6377229	-30.2097976	78.4279253
2006	-14.2409000	75.9167000	15.9960000	91.9127000	-5.5334000	86.3793000	-29.9165000	56.4628000
2007	-6.0171412	120.2313281	22.5520096	142.7833377	-6.2569768	136.5263609	-29.8762900	106.6500710
2008	-5.1713527	139.7523799	26.2369682	165.9893481	-7.0591482	158.9301999	-27.9300385	131.0001614
2009	-5.1736769	173.8450684	32.3899032	206.2349716	-7.0786363	199.1563353	-27.9364727	171.2198626
2010	-6.5000000	127.7574322	24.2811117	152.0385439	-7.2742057	144.7643382	-27.9297213	116.8346169
2011	-4.1202186	161.0954116	25.3774738	186.4728854	-10.0329794	176.4399060	-26.7871380	149.6527680
2012	-4.3978754	174.2804029	28.0959094	202.3763123	-11.4755978	190.9007145	-27.5239628	163.3767517
2013	-4.5012629	196.1629690	32.4311393	228.5941083	-12.0288998	216.5672085	-28.8180827	187.7491258
2014	-4.1736932	182.0296926	33.9773484	216.0070410	-12.0508246	203.9562164	-29.3225466	174.6336698
2015	-4.1783435	186.0063772	34.6668658	220.6732430	-11.9846640	208.6885790	-29.6668079	179.0217711
2016	-4.3592141	196.9292699	37.0722269	234.0014968	-13.1205176	220.8809792	-30.3280556	190.5529236
2017	-4.1602291	186.6387482	34.8103794	221.4491276	-11.9594824	209.4896452	-30.0065173	179.4831279
2018	-4.4672664	199.6238915	38.5706232	238.1945147	-14.5127621	223.6817526	-30.8429328	192.8388198
2019	-4.2430590	207.2626323	37.7607100	245.0233423	-12.4286352	232.5947071	-30.4641500	202.1305571
2020	-4.3279197	194.9920500	36.6556103	231.6476603	-13.2083117	218.4393486	-31.3657799	187.0735687
2021	-4.3399652	194.6741475	36.6854360	231.3595835	-13.2712322	218.0883513	-31.0225089	187.0658424
2022	-4.3673823	188.5168001	35.3787070	223.8955071	-13.3099889	210.5855182	-30.6351951	179.9503231
2023	-4.4274069	191.9301380	36.1521675	228.0823055	-13.7485220	214.3337835	-31.2396049	183.0941786
2024	-4.2833232	198.7378851	36.5368952	235.2745803	-12.8385469	222.4360334	-30.9862045	191.4498289
2025	-4.3654185	195.9050628	36.8504236	232.7554864	-13.4218690	219.3336174	-30.6214977	188.7121197
2026	-4.3341777	199.5453230	37.1834133	236.7287366	-13.1658550	223.5628813	-31.3978725	192.1650088
2027	-4.3642660	197.1453679	36.7395971	233.8813250	-13.3313973	220.5499277	-30.9529649	189.5969268
2028	-4.3166298	196.2913780	36.7125220	233.0039000	-13.1325632	219.8713368	-31.1636322	188.7077046
2029	-4.3391941	194.7505989	36.3291150	231.0797139	-13.2688871	217.8108268	-30.9311341	186.8796927
2030	-4.3027615	194.7560606	36.3791595	231.1352201	-13.0302859	218.1049342	-31.0067954	187.0981388
2031	-4.4313808	193.5599383	36.6973981	230.2573364	-14.5869039	215.6704325	-30.7458081	184.9246244
2032	-4.2477977	193.9348219	35.6523608	229.5871827	-12.9528536	216.6343291	-30.4685433	186.1657858
2033	-4.4810022	211.9446984	40.1758734	252.1205718	-15.0246287	237.0959431	-31.4918741	205.6040690
2034	-4.2909125	197.3312352	36.5226066	233.8538418	-13.4121401	220.4417017	-30.3183707	190.1233310
2035	-4.5424013	217.4509562	38.2690743	255.7200305	-14.9137515	240.8062790	-32.0804016	208.7258774

TABLE B-17. Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 4 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 2B (EBX) Greenspot Pumping Plant		Reach 3A (EBX) Crafton Hills Pumping Plant		Reach 4B (EBX) Cherry Valley Pumping Plant		Reach 29A Oso Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	
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	1.4212193	14.7267951
1973	0	0	0	0	0	0	1.0210537	14.3184685
1974	0	0	0	0	0	0	0.9241725	13.2592150
1975	0	0	0	0	0	0	0.9362286	13.2311411
1976	0	0	0	0	0	0	0.8622774	14.7270292
1977	0	0	0	0	0	0	0.9076172	18.6917042
1978	0	0	0	0	0	0	0.7314697	13.9308334
1979	0	0	0	0	0	0	0.9509677	18.5545530
1980	0	0	0	0	0	0	1.4272378	20.7334037
1981	0	0	0	0	0	0	1.5690769	20.3323424
1982	0	0	0	0	0	0	1.4942990	19.8801030
1983	0	0	0	0	0	0	1.2824635	11.5222034
1984	0	0	0	0	0	0	1.7818310	16.8076287
1985	0	0	0	0	0	0	2.1691578	23.1431194
1986	0	0	0	0	0	0	3.2296473	39.7638638
1987	0	0	0	0	0	0	3.1281318	35.1670797
1988	0	0	0	0	0	0	2.9887414	33.0575622
1989	0	0	0	0	0	0	3.5266078	43.1281928
1990	0	0	0	0	0	0	3.6820302	56.6565483
1991	0	0	0	0	0	0	2.1966277	37.9032766
1992	0	0	0	0	0	0	1.9058052	24.0977892
1993	0	0	0	0	0	0	0.1578038	-3.9114887
1994	0	0	0	0	0	0	3.0574815	40.8158292
1995	0	0	0	0	0	0	1.5732257	21.2895851
1996	0	0	0	0	0	0	3.1318961	42.5378346
1997	0	0	0	0	0	0	2.7928728	41.5836063
1998	0	0	0	0	0	0	-0.3008626	-5.6968002
1999	0	0	0	0	0	0	1.8929287	24.2980904
2000	0	0	0	0	0	0	1.8205294	28.3156258
2001	0	0	0	0	0	0	13.5034055	191.4525183
2002	0	0	0	0	0	0	4.9201780	78.5800801
2003	0	0	0	0	0	0	6.1428628	95.2894565
2004	0	0	0	0	0	0	6.3357925	97.3588319
2005	0	0	0	0	0	0	7.1557832	110.4104269
2006	0	0	0	0	0	0	6.2183000	96.3759000
2007	21.2286516	127.8787226	26.7511980	154.6299206	2.8777313	157.5076520	8.9116499	135.1601192
2008	31.4917484	162.4919098	39.0496024	201.5415122	8.1319275	209.6734397	10.5667512	155.4904837
2009	39.1304784	210.3503410	48.5826673	258.9330083	10.0964229	269.0294312	13.0606293	192.0793747
2010	29.1300052	145.9646221	36.1021686	182.0667907	7.5245446	189.5913354	9.8002161	144.0576483
2011	31.8252601	181.4780281	39.7175723	221.1956004	8.1846821	229.3802825	15.6444980	180.8601282
2012	31.8252601	195.2020118	39.7175723	234.9195841	8.1846821	243.1042662	17.0081649	195.6864432
2013	31.8252601	219.5743859	39.7175723	259.2919582	8.1846821	267.4786403	17.7915738	218.4558057
2014	31.8252601	206.4589299	39.7175723	246.1765022	8.1846821	254.3611843	14.8951481	201.0985339
2015	31.8252601	210.8470312	39.7175723	250.5646035	8.1846821	258.7492856	15.0270023	205.2117230
2016	31.8252601	222.3781837	39.7175723	262.0957560	8.1846821	270.2804381	15.5946172	216.8831012
2017	31.8252601	211.3083880	39.7175723	251.0259603	8.1846821	259.2106424	15.0231192	205.8220965
2018	31.8252601	224.6640799	39.7175723	264.3816522	8.1846821	272.5663343	15.7629293	219.8540872
2019	31.8252601	233.9558172	39.7175723	273.6733895	8.1846821	281.8580716	16.9583523	228.4640436
2020	31.8252601	218.8988288	39.7175723	258.6164011	8.1846821	266.8010832	15.7330895	215.0530592
2021	31.8252601	218.8911025	39.7175723	258.6086748	8.1846821	266.7933569	15.7047590	214.7188717
2022	31.8252601	211.7755832	39.7175723	251.4931555	8.1846821	259.6778376	15.4668715	208.3510539
2023	31.8252601	214.9194387	39.7175723	254.6370110	8.1846821	262.8216931	15.5504881	211.9080330
2024	31.8252601	223.2750890	39.7175723	262.9926613	8.1846821	271.1773434	16.2775019	219.2987102
2025	31.8252601	220.5373798	39.7175723	260.2549521	8.1846821	268.4396342	16.0595448	216.3300261
2026	31.8252601	223.9902689	39.7175723	263.7078412	8.1846821	271.8925233	15.9768021	219.8563028
2027	31.8252601	221.4222229	39.7175723	261.1397952	8.1846821	269.3244773	16.1224651	217.6320990
2028	31.8252601	220.5329647	39.7175723	260.2505370	8.1846821	268.4352191	15.8662113	216.4742191
2029	31.8252601	218.7049528	39.7175723	258.4225251	8.1846821	266.6072072	15.9471226	215.0369156
2030	31.8252601	218.9233989	39.7175723	258.6409712	8.1846821	266.8256533	15.7555262	214.8143483
2031	31.8252601	216.7498845	39.7175723	256.4674568	8.1846821	264.6521389	15.8411257	213.8324448
2032	31.8252601	217.9910459	39.7175723	257.7086182	8.1846821	265.8933003	15.8997892	214.0824088
2033	31.8252601	237.4293291	39.7175723	277.1469014	8.1846821	285.3315835	17.0513237	233.4702043
2034	31.8252601	221.9485911	39.7175723	261.6661634	8.1846821	269.8508455	16.1106352	217.7327829
2035	31.8252601	240.5511375	39.7175723	280.2687098	8.1846821	288.4533919	19.7521390	241.7454965

TABLE B-17. Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 5 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 29G Warne Powerplant		Reach 29J Castaic Powerplant		Reach 31A Las Perillas & Badger Hill Pumping Plants		Reach 33A Devil's Den, Bluestone, and Polonio Pass Pumping Plants	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]
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	4.1196074	0	0
1969	0	0	0	0	1.2624065	3.0743046	0	0
1970	0	0	0	0	1.6309699	3.3613191	0	0
1971	0	0	0	0	1.4985537	2.7945171	0	0
1972	0	0	-2.9350830	11.7917121	1.9517720	3.4238559	0	0
1973	0	0	-6.8099448	7.5085237	1.5374531	3.0786506	0	0
1974	0	0	-7.4013274	5.8578876	1.5168982	2.9908236	0	0
1975	0	0	-6.5604921	6.6706490	1.1130304	2.8730490	0	0
1976	0	0	-6.7213324	8.0056968	1.5685447	3.2823187	0	0
1977	0	0	-30.4985994	-11.8068952	1.7573375	4.1425967	0	0
1978	0	0	-9.0130187	4.9178147	1.9429506	4.0166744	0	0
1979	0	0	-19.0478097	-0.4932567	1.5600341	4.3745892	0	0
1980	0	0	-7.4485479	13.2848558	1.5124754	3.6989191	0	0
1981	0	0	-10.0059379	10.3264045	1.5414199	4.7207919	0	0
1982	-2.1714430	17.7086600	-9.5987314	8.1099286	1.7581649	4.3684632	0	0
1983	-8.9130752	2.6091282	-39.8193120	-37.2101838	0.1783064	1.4038458	0	0
1984	-15.0246012	1.7830275	-17.3128964	-15.5296689	0.8560669	2.7050406	0	0
1985	-14.7115359	8.4315835	-38.9450653	-30.5134818	1.2075223	3.7042097	0	0
1986	-14.1893653	25.5744985	-28.1596224	-2.5851239	2.2635962	6.9940737	0	0
1987	-14.8696165	20.2974632	-27.0536484	-6.7561852	1.9135150	5.9684757	0	0
1988	-14.7032843	18.3542779	-25.6857024	-7.3142445	1.7733304	5.5885868	0	0
1989	-14.4231503	28.7050425	-25.3986130	3.3064295	2.4154074	7.4521721	0	0
1990	-14.1850383	42.4715100	-26.0776141	16.3938959	3.7962241	9.8455425	0	0
1991	-14.7813217	23.1219549	-25.1420394	-2.0200845	2.4124332	7.1956539	0	0
1992	-14.6199453	9.4778439	-25.1951380	-15.7172941	1.2766497	4.5348543	0	0
1993	-10.3386629	-14.2501516	-21.1218951	-35.3720467	-1.1726278	-0.7534306	0	0
1994	-14.7696788	26.0461504	-26.7435205	-0.6973701	2.3664953	7.1065726	0	0
1995	-12.2705911	9.0189940	-25.6908056	-16.6718116	2.5750190	5.4284909	0	0
1996	-14.8515762	27.6862584	-29.5639188	-1.8776604	2.5837041	7.6010922	0	0
1997	-14.9272063	26.6564000	-27.1541858	-0.4977858	2.7029648	6.9426653	24.4572499	31.3999152
1998	-8.6041243	-14.3009245	-22.2303491	-36.5312736	-0.4719744	-0.5255005	-3.9178748	-4.4433753
1999	-15.4517685	8.8463219	-27.8324731	-18.9861512	1.3273109	4.0324659	9.8021998	13.8346657
2000	-14.1657262	14.1498996	-26.9670098	-12.8171102	1.8861983	5.1297547	14.2513950	19.3811497
2001	-14.7349298	174.7175896	-29.2914155	145.4261731	12.3563556	31.1783420	92.6567653	123.8351073
2002	-13.2004532	65.3796269	-23.7780801	41.6015468	5.4664522	14.2471987	41.2910819	55.5382806
2003	-13.9757183	81.3137382	-23.6270529	57.6866853	6.3405497	16.2185594	47.1787976	63.3973570
2004	-14.1574752	83.2013568	-23.6679973	59.5333594	6.3551621	16.7949690	50.7286903	67.5216593
2005	-14.2938791	96.1165479	-23.7301832	72.3863646	8.0399019	19.7040785	60.5159993	80.2200777
2006	-14.2409000	82.1350000	-23.8088000	58.3262000	7.3739000	17.7396000	55.6538000	73.3934000
2007	-13.9431723	121.2169469	-25.3788169	95.8381300	9.9685265	24.4897619	67.8468111	92.3362431
2008	-14.1661152	141.3243686	-25.1899747	116.1343939	11.7050503	28.2969801	84.6367817	112.9337417
2009	-14.1553900	177.9239847	-25.3142244	152.6097603	14.1435919	34.4883037	102.7409227	137.2292265
2010	-14.1489215	129.9087269	-25.2020343	104.7066926	10.9024922	26.2806477	79.5433742	105.8240219
2011	-20.0168418	160.8432864	-34.1351054	126.7081810	13.3465965	30.8748633	88.2622281	119.1370914
2012	-20.9015535	174.7848897	-35.8848672	138.9000225	13.7701732	31.4128972	91.2995417	122.7124389
2013	-20.1769370	198.2788687	-34.5529922	163.7258765	15.4224755	36.6380199	100.2148434	136.8528833
2014	-15.8964059	185.2021280	-27.0386653	158.1634627	16.4844394	35.0080435	107.6279668	142.6360103
2015	-15.8125844	189.3991386	-26.8814298	162.5177088	16.7174154	36.7616957	109.2541656	146.0158613
2016	-16.2575317	200.6255695	-27.6614318	172.9641377	16.8781849	39.2035927	110.3765453	149.5801380
2017	-15.8721389	189.9499576	-27.0221000	162.9278576	16.6486534	36.9055711	108.7741803	145.6797514
2018	-16.1210825	203.7330047	-27.5179064	176.2150983	17.1016569	37.7570011	111.9364197	149.6934208
2019	-16.9945129	211.4695307	-29.1315713	182.3379594	17.4999183	40.4346031	114.7163852	155.1509883
2020	-16.6643335	198.3887257	-28.4505137	169.9382120	16.5949707	37.3773992	108.3994880	145.7768872
2021	-16.6567005	198.0621712	-28.4565385	169.6056327	16.5693583	37.0742377	108.2205862	145.2948239
2022	-16.9268847	191.4241692	-28.9260230	162.4981462	16.0642824	35.3582270	104.6949560	140.0531830
2023	-16.9225409	194.9854921	-28.9187849	166.0667072	16.1540259	36.5388975	105.3214801	141.8583776
2024	-17.0909893	202.2077209	-29.2107143	172.9970066	16.7395350	38.6738170	109.4085264	148.0823434
2025	-16.9375708	199.3924553	-28.9451980	170.4472573	16.6650766	36.1426588	108.8888229	145.0314817
2026	-16.7358458	203.1204570	-28.5962524	174.5242046	16.7780172	39.3555938	109.6772893	149.0328831
2027	-17.1503370	200.4817620	-29.3098576	171.1719044	16.5278916	37.4221347	107.9311720	145.3533067
2028	-16.7570505	199.7171686	-28.6308403	171.0863283	16.8412681	37.7869506	108.7226937	146.5096442
2029	-17.0592524	197.9776632	-29.1558839	168.8217793	16.4318767	36.8712536	107.2610116	144.1322652
2030	-16.7196752	198.0946731	-28.5683383	169.5263348	16.5627841	37.5844739	107.1848564	145.7593303
2031	-16.9450442	196.8874006	-28.9781630	167.9092376	16.3388945	35.9726726	106.6119268	142.5845994
2032	-16.7401196	197.3422982	-28.7060934	168.6361958	16.6606091	37.4901154	108.8576480	146.3477634
2033	-16.9689290	216.5080953	-29.1662830	187.3418120	17.4888827	39.7089426	114.6394099	154.3463525
2034	-16.7621290	200.9706539	-28.7524285	172.2182254	16.8535047	37.7142320	110.2041642	147.9183962
2035	-20.9639972	220.7814993	-36.0534430	184.7280563	16.5132481	38.5382770	107.8289485	146.3672255

Tables B-18 through B-31 Follow

TABLE B-18. Variable OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	121,141	192,606	0	0	0
1967	0	0	0	19,958	53,785	163,255	236,998	0	0	0
1968	6,989	0	6,989	29,899	120,985	341,768	492,652	0	0	0
1969	8,551	0	8,551	31,859	3,904	298,968	334,722	0	0	0
1970	13,598	0	13,598	49,687	0	431,443	481,130	0	0	0
1971	10,609	0	10,609	23,842	28,328	416,329	468,499	0	0	0
1972	14,434	0	14,434	54,838	144,669	524,208	723,715	0	0	0
1973	14,449	0	14,449	18,398	15,590	547,807	581,795	0	0	0
1974	17,473	0	17,473	9,499	29	636,186	645,714	0	0	0
1975	14,779	0	14,779	22,318	4,765	425,284	452,367	0	0	0
1976	20,856	0	20,856	97,874	121,693	502,769	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	652,860	767,757	0	0	0
1979	16,237	0	16,237	137,101	77,145	652,629	866,875	0	0	0
1980	19,945	0	19,945	98,743	64,891	517,531	681,165	0	0	0
1981	23,842	0	23,842	126,437	141,456	567,968	835,861	0	0	0
1982	12,157	0	12,157	97,117	46,742	651,246	795,105	0	0	0
1983	2,342	0	2,342	8,171	5,412	148,743	162,326	0	0	0
1984	4,822	0	4,822	26,707	13,141	349,314	389,162	0	0	0
1985	10,188	0	10,188	79,863	102,790	466,291	648,944	0	0	0
1986	15,501	0	15,501	112,370	131,118	932,090	1,175,578	0	0	0
1987	27,223	0	27,223	216,211	234,290	812,631	1,263,132	0	0	0
1988	31,265	11,533	42,798	229,578	297,129	779,537	1,306,244	0	0	0
1989	37,874	66,850	104,724	306,533	304,275	1,051,562	1,662,370	0	0	0
1990	54,736	105,421	160,157	524,114	502,545	1,456,008	2,482,667	0	0	0
1991	8,159	18,824	26,983	105,736	142,105	316,839	564,680		(2,636)	(2,636)
1992	12,515	23,808	36,323	93,772	122,436	273,849	490,057	0	0	0
1993	(7,223)	(17,293)	(24,516)	(36,162)	(12,912)	(78,024)	(127,098)	0	0	0
1994	39,106	77,257	116,363	231,800	257,533	642,006	1,131,339	0	0	0
1995	15,701	36,724	52,425	160,663	93,610	151,287	405,560	0	0	0
1996	31,526	96,570	128,096	214,883	186,694	735,431	1,137,008	502	0	502
1997	29,683	116,555	146,238	351,185	219,799	912,861	1,483,845	34,932	233,584	268,516
1998	(6,178)	(18,511)	(24,689)	(6,218)	(16,448)	(65,206)	(87,874)	(15,961)	(82,727)	(98,688)
1999	14,757	52,720	67,477	243,434	193,968	450,667	888,069	51,783	278,589	330,372
2000	22,022	94,310	116,332	378,285	239,317	755,432	1,373,030	76,788	440,747	517,535
2001	290,950	534,351	825,301	1,688,783	997,070	2,851,440	5,537,293	530,386	2,346,180	2,876,566
2002	90,998	268,287	359,285	1,074,401	642,200	1,461,863	3,178,464	241,869	1,541,397	1,783,266
2003	131,458	266,997	398,455	1,079,980	649,713	2,307,741	4,037,434	282,325	1,709,803	1,992,128
2004	144,247	343,537	487,784	1,301,725	613,444	1,584,553	3,499,722	281,237	2,005,796	2,287,033
2005	193,400	376,423	569,823	1,450,936	829,776	2,438,169	4,718,881	341,016	1,872,657	2,213,673
2006	175,202	322,087	497,289	1,317,036	752,486	2,200,051	4,269,573	308,913	1,708,232	2,017,145
2007	336,232	636,071	972,303	1,595,023	886,730	2,661,209	5,142,962	348,662	2,513,393	2,862,055
2008	542,971	389,723	932,694	2,424,293	1,423,249	3,481,822	7,329,364	2,823,344	3,452,272	6,275,616
2009	817,638	978,982	1,796,620	3,345,683	1,858,868	5,229,794	10,434,345	3,430,731	6,242,009	9,672,740
2010	648,204	894,394	1,542,598	2,552,891	1,516,609	3,992,303	8,061,803	2,645,601	4,813,511	7,459,112
2011	608,444	780,134	1,388,578	3,043,769	1,762,050	4,647,111	9,452,930	2,978,427	5,419,070	8,397,497
2012	641,467	806,068	1,447,535	3,123,718	1,785,731	4,712,683	9,622,132	3,067,811	5,581,698	8,649,509
2013	741,497	856,794	1,598,291	3,640,278	2,296,964	5,134,222	11,071,464	3,421,322	6,224,889	9,646,211
2014	811,730	920,001	1,731,731	3,946,006	2,237,982	4,980,911	11,164,899	3,565,900	6,487,942	10,053,842
2015	852,643	934,466	1,787,109	4,103,863	2,322,841	5,177,959	11,604,663	3,650,397	6,641,677	10,292,074
2016	888,283	944,431	1,832,714	4,300,031	2,425,956	5,421,731	12,147,718	3,739,503	6,803,802	10,543,305
2017	901,089	932,091	1,833,180	4,108,262	2,324,187	5,182,969	11,615,418	3,641,994	6,626,389	10,268,383
2018	956,846	958,738	1,915,584	4,132,205	2,387,527	5,322,682	11,842,414	3,742,336	6,808,955	10,551,291
2019	1,011,219	982,312	1,993,531	4,437,303	2,504,024	5,595,113	12,536,440	3,878,775	7,057,198	10,935,973
2020	976,974	934,463	1,911,437	4,127,625	2,332,573	5,206,194	11,666,392	3,644,422	6,630,807	10,275,229
2021	983,189	929,921	1,913,090	4,100,767	2,318,248	5,172,723	11,591,738	3,632,371	6,608,880	10,241,251
2022	949,705	900,884	1,850,589	3,925,753	2,221,321	4,952,913	11,099,987	3,501,330	6,370,459	9,871,789
2023	955,652	906,045	1,861,697	4,024,789	2,273,753	5,076,156	11,374,698	3,546,459	6,452,570	9,999,029
2024	994,444	939,706	1,934,150	4,240,468	2,392,847	5,346,871	11,980,186	3,702,059	6,735,673	10,437,732
2025	989,511	935,425	1,924,936	4,030,503	2,282,576	5,086,011	11,399,090	3,625,787	6,596,902	10,222,689
2026	996,996	941,918	1,938,914	4,298,363	2,423,456	5,418,896	12,140,715	3,725,822	6,778,910	10,504,732
2027	980,423	927,539	1,907,962	4,121,627	2,328,335	5,198,232	11,648,194	3,633,833	6,611,541	10,245,374
2028	987,934	934,055	1,921,989	4,163,011	2,351,462	5,250,304	11,764,777	3,662,741	6,664,138	10,326,879
2029	974,061	922,018	1,896,079	4,071,948	2,301,487	5,136,151	11,509,586	3,603,307	6,556,000	10,159,307
2030	982,736	929,546	1,912,282	4,142,054	2,339,729	5,223,921	11,705,704	3,643,983	6,630,009	10,273,992
2031	967,900	916,674	1,884,574	3,992,760	2,259,174	5,037,424	11,289,358	3,564,615	6,485,603	10,050,218
2032	989,217	935,168	1,924,385	4,143,826	2,341,934	5,226,725	11,712,485	3,658,694	6,656,774	10,315,468
2033	1,044,095	982,789	2,026,884	4,369,469	2,467,942	5,510,627	12,348,038	3,858,659	7,020,598	10,879,257
2034	1,001,996	946,258	1,948,254	4,173,369	2,359,334	5,264,322	11,797,025	3,697,960	6,728,216	10,426,176
2035	979,451	926,695	1,906,146	4,179,956	2,356,299	5,269,463	11,805,718	3,659,181	6,657,660	10,316,841
TOTAL	27,121,047	28,699,759	55,820,806	123,034,588	71,845,520	175,864,685	370,744,793	101,429,816	192,909,167	294,338,983

Note: B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-18. Variable OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	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	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[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	68,977	5,176	0	0	440,922	2,355	4,760	65,680	587,870
1969	56,774	101	0	0	321,387	181	0	17,956	399,737
1970	69,818	6,811	0	0	470,867	0	5,595	16,550	569,641
1971	53,097	7,747	0	0	769,054	4,785	6,353	158,419	999,455
1972	62,365	8,515	0	0	1,151,788	2,057	7,375	379,686	1,611,786
1973	33,931	4,615	0	0	770,121	2,307	3,017	77,630	891,621
1974	49,114	4,413	0	46,752	677,660	2,206	3,114	106,332	889,591
1975	63,140	4,671	0	34,580	848,249	2,491	3,920	134,295	1,091,346
1976	70,851	5,132	0	94,853	966,820	2,737	4,910	100,597	1,245,701
1977	26,565	1,758	0	84,875	498,624	3,644	2,602	43,067	661,135
1978	108,944	938	0	190,675	1,616,975	4,319	6,294	24,901	1,953,046
1979	107,956	4,871	0	194,048	2,371,175	5,602	13,172	434,472	3,131,297
1980	88,746	1,935	0	121,603	1,731,588	4,762	7,766	163,301	2,119,701
1981	129,687	18,533	0	263,077	2,398,339	7,275	8,904	263,922	3,089,737
1982	108,561	937	0	145,246	2,375,404	4,541	6,763	48,137	2,689,589
1983	61,443	0	0	13,954	929,183	5,662	3,232	1,218	1,014,692
1984	82,423	0	0	216,437	1,996,259	5,946	7,475	10,496	2,319,036
1985	114,571	12,938	0	242,645	2,567,184	8,422	8,815	271,970	3,226,545
1986	236,756	5,513	0	377,798	4,876,960	17,433	16,927	376,088	5,907,475
1987	187,090	10,273	0	504,168	4,230,949	16,140	15,529	375,604	5,339,753
1988	188,170	14,894	0	524,965	4,250,194	15,528	11,928	374,528	5,380,207
1989	285,261	15,450	0	661,238	6,158,648	20,063	21,693	649,804	7,831,957
1990	218,786	7,710	0	845,877	4,778,185	12,056	12,072	344,008	6,218,694
1991	4,393	1,047	0	185,013	47,869	0	521	10,331	249,174
1992	76,840	4,426	0	227,332	1,699,824	6,059	5,222	151,055	2,170,758
1993	20,064	4,843	0	78,585	340,588	2,090	1,467	123,913	571,550
1994	135,626	7,854	0	471,316	3,417,815	9,967	10,102	293,748	4,346,428
1995	181,772	4,611	0	409,656	3,437,735	11,619	10,492	288,010	4,343,895
1996	286,064	9,577	0	715,404	6,328,965	21,039	16,403	1,196,303	8,573,755
1997	308,515	0	0	650,416	5,627,735	0	15,559	94,838	6,697,063
1998	19,652	(28)	0	63,221	63,450	(1)	1,318	(1,107)	146,505
1999	161,490	8,592	0	470,360	3,349,552	10,821	9,074	790,700	4,800,590
2000	196,361	5,835	0	417,381	4,037,481	11,676	10,422	643,240	5,322,396
2001	782,016	25,598	0	445,105	11,597,942	29,363	45,628	1,121,076	14,046,728
2002	429,531	12,337	0	831,424	7,493,178	25,061	29,961	814,946	9,636,438
2003	455,198	14,185	0	1,094,200	9,535,804	36,469	28,732	1,045,499	12,210,087
2004	512,493	37,194	0	1,390,386	8,791,836	94,531	33,223	848,428	11,708,091
2005	954,623	44,720	0	1,081,626	16,970,523	231,021	33,230	1,633,007	20,948,750
2006	903,001	34,020	0	1,041,216	14,003,772	98,784	30,478	1,121,644	17,232,915
2007	616,652	30,262	0	1,438,396	12,038,200	83,927	35,798	1,264,552	15,507,787
2008	885,064	49,776	0	1,980,797	17,154,732	157,958	60,725	1,591,531	21,880,583
2009	1,166,627	61,034	0	2,596,745	21,019,345	193,622	79,973	1,951,506	27,068,852
2010	881,830	46,134	0	1,961,331	16,100,781	146,419	60,725	1,367,457	20,564,677
2011	1,005,123	52,585	0	2,243,330	18,356,279	167,171	67,997	1,558,649	23,451,134
2012	1,011,687	52,928	0	2,273,081	18,705,447	168,365	66,451	1,568,826	23,846,785
2013	1,216,563	63,647	0	4,195,533	22,249,148	202,115	83,761	1,886,529	29,897,296
2014	1,062,199	55,571	0	3,749,256	20,136,467	177,390	68,913	1,647,156	26,896,952
2015	1,149,399	60,133	0	3,972,397	21,510,569	191,611	77,014	1,782,378	28,743,501
2016	1,280,206	66,976	0	4,344,468	23,631,754	212,886	88,651	1,985,220	31,610,161
2017	1,161,592	60,771	0	4,003,886	21,693,944	193,568	78,205	1,801,286	28,993,252
2018	1,184,439	61,966	0	4,152,823	22,278,090	197,414	78,349	1,836,715	29,789,796
2019	1,315,144	68,804	0	4,498,159	24,365,293	218,745	90,132	2,039,398	32,595,675
2020	1,191,727	62,347	0	4,133,239	22,264,805	198,442	80,130	1,848,015	29,778,705
2021	1,175,811	61,515	0	4,095,646	22,022,132	195,852	78,562	1,823,335	29,452,853
2022	1,106,373	57,882	0	3,895,691	20,851,896	184,430	72,812	1,715,656	27,884,740
2023	1,168,815	61,149	0	4,059,901	21,837,818	194,590	78,612	1,812,486	29,213,371
2024	1,257,778	65,803	0	4,307,257	23,313,084	209,204	86,191	1,950,440	31,189,577
2025	1,116,903	58,433	0	3,974,273	21,178,364	186,322	72,317	1,731,986	28,318,598
2026	1,294,666	67,733	0	4,395,501	23,876,044	215,202	89,781	2,007,643	31,946,570
2027	1,198,139	62,683	0	4,163,425	22,386,579	199,462	80,539	1,857,958	29,948,785
2028	1,212,557	63,437	0	4,189,018	22,597,361	201,836	82,015	1,880,316	30,226,540
2029	1,172,055	61,318	0	4,087,623	21,954,331	195,200	78,302	1,817,510	29,366,339
2030	1,205,447	63,065	0	4,161,743	22,460,945	200,658	81,573	1,869,291	30,042,722
2031	1,125,860	58,901	0	3,976,757	21,244,131	187,676	73,923	1,745,875	28,413,123
2032	1,194,426	62,489	0	4,131,073	22,294,157	198,900	80,438	1,852,201	29,813,684
2033	1,274,050	66,654	0	4,442,872	23,829,998	212,073	85,397	1,975,674	31,886,718
2034	1,196,217	62,582	0	4,160,614	22,391,709	199,249	79,972	1,854,978	29,945,321
2035	1,262,981	66,075	0	4,457,122	23,654,512	209,979	84,548	1,958,510	31,693,727
TOTAL	40,990,995	2,090,395	0	122,197,189	761,338,519	6,239,277	2,689,192	66,597,169	1,002,142,737

TABLE B-18. Variable OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[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	39,430	0	0	0	0	0	0	0	0
1971	0	34,871	0	0	0	0	0	0	0	0
1972	780	47,571	0	12,785	0	4,496	1,515	0	32,107	0
1973	286	28,968	102,812	6,896	159,536	3,855	0	0	301,444	0
1974	15,558	28,982	100,955	9,890	157,742	4,932	221	0	177,173	5,961
1975	99,186	28,568	108,253	12,758	170,111	6,391	0	0	136,066	50,723
1976	385,090	38,365	135,276	17,835	213,594	8,164	0	0	139,354	65,476
1977	199,166	21,006	0	23,598	0	1,974	1,702	0	239,663	74,838
1978	581,729	45,550	174,116	20,875	264,178	2,731	0	0	37,043	67,462
1979	1,058,904	83,940	228,437	28,603	340,510	2,328	90,803	0	236	3,668
1980	1,390,117	51,143	256,759	29,229	401,038	3,667	94,362	0	0	16,504
1981	1,480,362	118,583	274,149	33,632	430,304	23,861	90,590	0	254,649	57,523
1982	923,973	132,575	292,674	27,190	461,216	0	230,608	0	126,461	189,895
1983	333,772	(335,712)	172,336	10,792	272,477	385	0	0	(71,602)	(8,768)
1984	485,847	(142,910)	273,597	19,572	433,785	15	0	0	(66,353)	(91,433)
1985	821,069	(335,343)	413,406	34,603	657,011	0	0	32,464	(47,544)	(32,348)
1986	1,109,047	54,812	728,808	60,274	1,160,650	5,548	0	105,375	69,170	101,843
1987	1,019,605	(40,745)	668,383	63,601	1,083,530	32,651	585	157,843	88,076	49,930
1988	1,019,793	(74,006)	688,891	66,914	1,134,141	11,991	300	50,654	92,465	38,688
1989	1,736,901	178,359	978,885	97,114	1,633,489	38,269	8,951	350,953	340,460	210,334
1990	2,442,558	422,502	1,402,619	110,934	2,313,410	90,472	0	446,408	599,573	530,099
1991	286,485	(3,054)	277,078	33,945	456,999	17,978	128,405	132,700	35,339	52,116
1992	587,340	(208,900)	240,119	11,952	396,022	4,871	241,338	78,306	(22,718)	(53,500)
1993	(190,611)	(491,161)	(809,033)	(2,389)	(1,334,429)	(3,246)	(61,112)	(29,466)	(157,452)	(519,798)
1994	1,841,902	66,338	189,616	34,480	312,714	41,201	731,185	315,446	122,829	204,783
1995	761,209	(247,735)	(251,547)	7,960	(414,889)	7,727	165,622	114,342	(7,579)	(140,714)
1996	1,883,530	72,171	508,274	18,313	838,330	16,510	289,044	385,745	49,537	133,848
1997	2,121,818	22,440	365,342	24,076	330,153	15,099	414,596	438,212	61,553	115,882
1998	(553,432)	(722,825)	(3,952,725)	(2,892)	(3,258,099)	(4,225)	(44,233)	(80,469)	(86,610)	(429,359)
1999	1,218,255	(530,571)	(679,666)	18,353	(782,262)	6,032	167,446	245,763	(173,336)	(242,474)
2000	1,764,776	(351,463)	(421,537)	24,501	(580,010)	0	286,563	191,307	(183,254)	(170,795)
2001	10,890,564	4,503,328	1,516,253	208,761	2,500,986	0	859,606	1,807,050	4,413,464	393,226
2002	3,973,403	2,000,325	749,672	163,867	1,236,702	0	335,275	1,261,314	3,200,111	1,111,913
2003	5,149,818	3,049,311	920,481	147,329	1,518,031	0	1,444,747	990,604	1,747,211	1,397,897
2004	5,109,028	3,228,755	985,382	188,423	1,350,162	0	1,316,069	1,039,446	3,577,705	799,074
2005	5,849,219	2,946,643	3,334,677	22,270	3,849,949	0	1,542,105	1,144,993	2,664,745	1,096,737
2006	6,102,493	2,589,877	6,837,659	34,725	2,823,146	0	3,109,990	948,353	2,128,056	763,604
2007	9,656,174	4,508,908	7,809,771	285,204	3,224,458	0	6,557,076	1,768,363	6,380,372	5,159,939
2008	9,880,493	3,537,148	11,104,884	502,219	4,565,006	321,430	6,916,126	2,697,221	13,457,374	1,965,002
2009	12,290,847	5,862,215	20,734,725	665,182	8,560,982	399,844	7,771,445	3,702,900	17,583,920	4,931,132
2010	9,032,451	4,215,813	16,164,069	500,885	5,841,731	293,842	5,728,631	2,721,233	12,003,990	3,364,837
2011	11,736,767	5,201,542	20,704,460	635,184	7,482,638	370,519	7,032,175	3,431,332	15,370,446	4,310,000
2012	13,025,020	5,932,600	22,603,174	710,151	8,168,838	400,845	7,631,149	3,712,173	16,778,969	4,705,250
2013	13,868,722	8,406,122	25,975,092	805,630	9,387,456	451,175	9,243,154	4,178,271	19,280,351	5,407,175
2014	25,738,998	14,318,229	24,160,568	1,182,946	8,731,683	418,668	16,331,372	3,877,232	17,935,008	5,029,450
2015	26,301,302	14,717,150	24,767,662	1,210,394	8,951,089	427,815	16,684,218	3,961,936	18,385,434	5,155,827
2016	27,845,799	15,663,623	26,362,997	1,281,110	9,527,646	452,937	17,691,529	4,194,593	19,568,927	5,487,924
2017	26,390,719	14,754,598	24,831,491	1,215,040	8,974,156	429,269	16,742,853	3,975,405	18,432,973	5,169,114
2018	28,226,818	15,944,929	26,679,251	1,297,354	9,841,941	459,135	18,007,510	4,251,989	19,903,769	5,553,758
2019	29,306,936	16,507,154	27,964,763	1,349,049	10,106,528	476,704	18,526,135	4,414,694	20,758,874	5,821,360
2020	27,571,876	15,382,753	25,881,628	1,266,948	9,353,678	448,482	17,513,623	4,153,331	19,212,568	5,387,719
2021	27,526,924	15,351,268	25,880,559	1,264,912	9,353,292	447,751	17,491,750	4,146,559	19,211,569	5,387,496
2022	26,656,276	14,706,984	24,896,127	1,221,396	8,997,516	433,589	16,927,587	4,015,408	18,481,284	5,182,569
2023	27,138,921	15,032,372	25,331,080	1,243,136	9,154,709	441,439	17,243,991	4,088,112	18,804,206	5,273,112
2024	28,101,537	15,663,376	26,487,084	1,290,129	9,572,491	457,097	17,788,690	4,233,117	19,661,344	5,513,755
2025	27,700,976	15,420,751	26,108,322	1,272,135	9,435,606	450,582	17,597,356	4,172,778	19,380,236	5,434,909
2026	28,215,709	15,803,693	26,586,029	1,296,665	9,608,250	458,954	17,898,117	4,250,315	19,734,969	5,534,352
2027	27,876,355	15,493,067	26,230,740	1,279,190	9,479,848	453,434	17,682,836	4,199,196	19,471,220	5,460,393
2028	27,755,601	15,487,622	26,107,711	1,275,254	9,435,385	451,470	17,616,356	4,181,006	19,380,109	5,434,782
2029	27,537,735	15,280,130	25,854,805	1,263,303	9,343,985	447,926	17,470,976	4,148,188	19,192,415	5,382,135
2030	27,538,507	15,347,256	25,885,028	1,265,009	9,354,907	447,939	17,475,121	4,148,304	19,214,873	5,388,426
2031	27,369,375	15,193,340	25,584,322	1,250,889	9,246,231	445,188	17,408,185	4,122,827	18,991,714	5,325,829
2032	27,422,384	15,267,289	25,756,036	1,256,479	9,308,289	446,050	17,358,678	4,130,812	19,118,891	5,361,575
2033	29,968,980	16,949,131	28,445,323	1,375,156	10,280,203	487,473	19,061,122	4,514,422	21,113,873	5,921,397
2034	27,902,637	15,588,151	26,303,563	1,278,562	9,506,167	453,862	17,681,016	4,203,155	19,524,845	5,475,552
2035	30,747,565	16,708,972	28,877,225	1,396,676	10,436,294	500,137	19,336,316	4,631,705	21,434,523	6,011,305
TOTAL	752,231,945	394,657,102	716,888,886	33,756,956	275,581,242	12,517,233	449,861,376	124,353,920	547,485,088	150,754,909

TABLE B-18. Variable OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
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	192,606
1967	0	0	0	0	0	0	0	0	0	236,998
1968	0	0	0	30,401	0	0	0	0	0	1,117,912
1969	0	0	0	30,627	0	0	0	0	0	773,646
1970	0	0	0	39,430	0	0	0	0	0	1,103,799
1971	0	0	0	34,871	0	0	0	0	0	1,513,434
1972	0	848,011	0	947,266	0	0	0	0	0	3,297,202
1973	0	1,083,328	0	1,687,126	0	0	0	0	0	3,174,991
1974	0	1,872,297	0	2,373,712	0	0	0	0	0	3,926,489
1975	0	3,887,152	0	4,499,209	0	0	0	0	0	6,057,701
1976	0	5,485,263	0	6,488,418	0	0	0	0	0	8,477,311
1977	0	(796,686)	0	(234,739)	0	0	0	0	0	1,152,444
1978	0	3,696,428	0	4,890,112	0	0	0	0	0	7,632,606
1979	0	4,021,960	0	5,859,389	0	0	0	0	0	9,873,798
1980	0	5,362,245	0	7,605,064	0	0	0	0	0	10,425,875
1981	0	10,862,932	0	13,626,585	0	0	0	0	0	17,576,025
1982	0	7,685,168	0	10,069,760	0	0	0	0	0	13,566,611
1983	0	(8,994,497)	0	(8,620,817)	0	0	0	0	0	(7,441,457)
1984	0	(7,633,741)	0	(6,721,621)	0	0	0	0	0	(4,008,601)
1985	0	(15,739,366)	0	(14,196,048)	0	0	0	0	0	(10,310,371)
1986	0	1,135,478	0	4,531,005	0	0	0	0	0	11,629,559
1987	0	(3,007,997)	0	116,362	0	0	0	0	0	6,746,470
1988	0	(3,407,929)	0	(378,098)	0	0	0	0	0	6,351,151
1989	0	9,488,536	0	15,062,251	0	0	0	0	0	24,661,302
1990	0	30,759,725	204,582	39,322,882	0	0	0	0	0	48,184,400
1991	0	184,870	22,623	1,625,484	0	0	0	0	0	2,463,685
1992	0	(9,471,028)	0	(8,196,198)	0	0	0	0	0	(5,499,060)
1993	0	(21,473,875)	0	(25,072,572)	0	0	0	0	0	(24,652,636)
1994	0	4,059,683	0	7,920,177	0	0	0	0	0	13,514,307
1995	0	(4,895,977)	0	(4,901,581)	0	0	0	0	0	(99,701)
1996	0	1,859,275	0	6,054,577	0	0	0	0	0	15,893,938
1997	0	2,428,729	(921)	6,336,979	0	0	0	0	0	14,932,641
1998	0	(14,440,371)	(67,583)	(23,842,827)	0	0	0	0	0	(23,707,573)
1999	0	(10,520,287)	(35,124)	(11,307,871)	0	0	0	0	0	(5,221,364)
2000	0	(14,676,247)	7,418	(14,088,741)	0	0	0	0	0	(6,759,448)
2001	0	160,070,513	269,038	187,432,789	0	0	0	0	0	210,718,677
2002	0	60,681,496	282,777	74,996,855	0	0	0	0	0	89,954,308
2003	7,393	94,646,001	362,859	111,381,682	0	0	0	0	0	130,019,786
2004	53,585	104,912,701	408,346	122,968,676	0	0	0	0	0	140,951,306
2005	54,272	110,580,524	120,524	133,206,658	0	0	0	0	0	161,657,785
2006	453,155	85,999,999	107,904	111,898,961	0	0	0	0	0	135,915,883
2007	631,448	146,465,016	335,480	188,138,109	0	0	0	0	0	212,623,216
2008	2,266,303	219,682,193	2,402,037	279,317,436	0	0	0	0	0	315,735,693
2009	4,654,209	255,745,196	3,131,935	346,034,543	0	0	0	0	0	395,007,100
2010	3,279,930	172,988,534	2,173,520	238,309,466	0	0	0	0	0	275,937,656
2011	3,968,279	216,198,704	2,641,689	299,083,735	0	0	0	0	0	341,773,874
2012	4,205,704	236,132,619	2,891,038	326,897,530	0	0	0	0	0	370,463,491
2013	4,627,346	263,569,899	3,383,359	368,583,752	0	0	0	0	0	420,797,014
2014	4,400,448	280,529,726	3,248,441	405,902,769	0	0	0	0	0	455,750,193
2015	4,476,363	288,177,326	3,335,031	416,551,547	0	0	0	0	0	468,978,894
2016	4,675,852	306,965,395	3,546,416	443,264,748	0	0	0	0	0	499,398,646
2017	4,484,344	288,952,161	3,343,677	417,695,800	0	0	0	0	0	470,406,033
2018	4,715,398	311,211,536	3,610,983	449,404,371	0	0	0	0	0	503,503,456
2019	4,876,145	324,423,552	3,738,524	468,268,418	0	0	0	0	0	526,330,037
2020	4,615,659	301,196,621	3,488,383	435,473,269	0	0	0	0	0	489,105,032
2021	4,615,525	300,826,723	3,481,751	434,986,079	0	0	0	0	0	488,185,011
2022	4,492,427	288,694,996	3,341,080	418,047,239	0	0	0	0	0	468,754,344
2023	4,546,815	294,572,422	3,412,428	426,282,743	0	0	0	0	0	478,731,538
2024	4,691,368	307,593,998	3,551,954	444,605,940	0	0	0	0	0	500,147,765
2025	4,644,006	302,597,278	3,500,123	437,715,058	0	0	0	0	0	489,580,371
2026	4,703,741	309,663,905	3,580,562	447,335,261	0	0	0	0	0	503,866,192
2027	4,659,313	304,278,207	3,515,764	440,079,563	0	0	0	0	0	493,829,878
2028	4,643,929	303,574,167	3,511,914	438,855,306	0	0	0	0	0	493,095,491
2029	4,612,305	299,970,333	3,468,277	433,972,513	0	0	0	0	0	486,903,824
2030	4,616,084	300,909,426	3,480,517	435,071,397	0	0	0	0	0	489,006,097
2031	4,578,482	297,443,139	3,449,466	430,408,987	0	0	0	0	0	482,046,260
2032	4,599,954	299,348,024	3,463,148	432,837,609	0	0	0	0	0	486,603,631
2033	4,936,236	331,383,486	3,838,710	478,275,512	0	0	0	0	0	535,416,409
2034	4,668,420	305,607,131	3,534,935	441,727,996	0	0	0	0	0	495,844,772
2035	4,990,244	331,439,633	3,808,129	480,318,724	0	0	0	0	0	536,041,156
TOTAL	126,444,682	8,786,696,560	95,891,714	12,467,121,615	0	0	0	0	0	14,190,168,933

TABLE B-19. Total Transportation Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	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	Total
				Municipal and Industrial	Agri- cultural				
				[11]	[12]				
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	2,724	0	0	0	0	0	2,724
1965	0	0	6,027	73,544	0	0	0	0	79,571
1966	0	0	12,035	137,284	0	0	0	0	149,319
1967	0	0	26,249	267,525	0	0	0	0	293,774
1968	184,386	8,896	54,573	445,315	1,543,736	13,767	11,578	208,761	2,471,011
1969	179,991	7,607	87,557	524,952	2,390,757	12,621	10,580	356,519	3,570,585
1970	201,987	14,374	94,656	573,846	2,913,269	12,786	13,117	293,326	4,117,361
1971	198,233	15,332	95,676	605,729	3,821,296	17,759	14,417	448,422	5,216,864
1972	220,766	16,200	98,769	631,452	4,990,931	15,216	20,699	1,080,426	7,074,460
1973	203,326	12,271	97,531	639,086	4,923,525	15,480	11,722	408,789	6,311,729
1974	283,131	12,240	98,440	698,081	5,225,917	15,586	12,804	597,402	6,943,602
1975	350,185	13,185	106,683	715,440	6,347,523	16,616	14,488	728,097	8,292,217
1976	305,156	13,731	108,064	774,124	6,701,414	16,990	16,161	564,425	8,500,065
1977	267,133	10,841	112,534	797,692	6,876,284	18,453	13,943	511,322	8,608,201
1978	356,002	4,441	115,500	890,777	8,329,709	18,918	17,984	504,976	10,238,306
1979	386,004	13,578	114,232	896,026	9,455,230	20,198	24,916	953,823	11,864,007
1980	407,141	11,928	125,929	888,723	10,013,184	20,745	24,302	738,196	12,230,148
1981	470,632	29,769	134,147	1,079,139	11,458,806	24,935	22,962	909,544	14,129,935
1982	465,141	12,919	135,036	1,004,492	12,291,750	22,951	22,428	746,950	14,701,667
1983	638,344	14,513	149,180	1,027,082	15,600,315	39,967	29,176	428,178	17,826,754
1984	910,916	14,927	164,483	2,063,001	23,627,468	54,424	59,672	784,710	27,679,601
1985	1,099,360	87,488	184,883	2,350,412	27,934,902	69,479	70,203	2,171,193	33,967,920
1986	1,263,495	33,944	180,423	2,364,977	30,514,419	80,765	76,064	2,183,508	36,697,594
1987	1,121,968	50,739	179,850	2,804,592	29,300,470	78,014	74,312	2,242,520	35,852,464
1988	1,107,473	61,534	193,712	2,750,239	29,213,755	74,164	60,188	2,200,163	35,661,228
1989	1,142,890	49,216	187,891	2,435,448	29,276,110	67,045	68,654	2,443,547	35,670,801
1990	865,780	34,378	221,368	2,541,123	27,392,065	51,053	49,083	1,870,432	33,025,282
1991	583,037	23,283	220,258	2,055,047	17,591,457	27,925	26,852	1,230,997	21,758,857
1992	952,483	39,119	241,431	2,369,575	25,889,578	55,791	50,906	1,908,137	31,507,020
1993	1,164,773	53,646	264,933	2,799,265	31,403,747	72,885	69,589	2,641,725	38,470,563
1994	1,019,863	43,772	306,333	2,808,608	29,279,558	60,455	57,356	2,117,655	35,693,601
1995	1,516,551	46,630	304,270	3,499,388	36,403,113	86,870	80,179	2,771,765	44,710,767
1996	1,346,233	48,262	389,175	3,559,914	36,387,911	86,087	73,827	4,317,656	46,209,065
1997	1,387,762	25,419	276,653	3,107,537	32,558,840	36,710	68,687	1,671,733	39,133,340
1998	1,234,298	34,400	381,817	2,733,766	29,279,331	41,831	60,129	1,802,965	35,568,538
1999	1,190,369	53,934	366,550	3,072,609	30,638,998	73,162	62,409	4,006,863	39,464,894
2000	1,063,321	37,957	303,252	2,632,323	26,185,844	61,865	54,722	2,785,797	33,125,080
2001	1,734,531	62,876	327,961	2,594,955	33,651,178	80,081	100,887	3,057,596	41,610,064
2002	1,320,711	43,716	321,473	3,058,991	28,390,394	73,590	78,090	2,523,656	35,810,621
2003	1,384,382	48,443	339,996	3,415,345	31,257,699	89,628	78,971	2,865,946	39,480,410
2004	1,444,014	77,806	343,920	3,800,078	30,377,799	233,344	81,702	2,385,062	38,743,724
2005	2,006,888	86,642	356,712	3,240,614	40,737,558	411,733	80,313	3,389,363	50,309,823
2006	1,989,620	77,070	301,410	3,373,504	38,152,126	257,952	79,980	2,858,291	47,089,952
2007	1,630,417	70,243	346,758	3,716,442	35,119,524	235,875	83,612	2,979,738	44,182,607
2008	2,116,485	99,116	389,021	4,885,443	44,615,890	348,684	120,210	3,560,580	56,135,429
2009	2,670,956	123,752	421,926	5,923,110	52,834,590	416,292	151,396	4,304,936	66,846,959
2010	2,307,720	105,031	412,792	5,017,821	46,497,660	359,030	127,857	3,555,736	58,383,647
2011	2,207,286	100,082	421,700	5,009,587	45,796,341	350,281	130,743	3,389,114	57,405,133
2012	2,213,938	100,428	422,239	5,043,069	46,147,955	351,564	129,199	3,399,421	57,807,813
2013	2,267,838	103,246	422,893	6,868,159	47,002,800	360,373	136,257	3,482,982	60,644,548
2014	1,962,566	87,273	420,461	5,904,050	42,172,796	310,672	111,159	3,009,574	53,978,552
2015	2,032,271	90,917	417,387	5,993,181	43,229,396	321,992	118,068	3,117,651	55,320,863
2016	2,158,775	97,539	411,000	6,287,347	45,267,196	342,563	129,428	3,313,853	58,007,702
2017	2,039,536	91,300	396,938	5,814,096	43,319,737	323,137	118,933	3,128,936	55,232,613
2018	2,050,421	91,867	374,457	5,804,196	43,686,925	315,588	118,247	3,145,787	55,587,488
2019	2,180,421	98,671	365,600	6,088,067	45,756,619	336,063	130,002	3,347,415	58,302,858
2020	2,058,004	92,265	364,069	5,693,509	43,677,984	315,634	120,063	3,157,565	55,479,094
2021	2,047,354	91,708	363,121	5,652,051	43,533,861	313,751	118,853	3,141,044	55,261,743
2022	1,977,251	88,039	362,400	5,439,503	42,349,632	302,130	113,045	3,032,328	53,664,329
2023	2,035,105	91,070	361,709	5,584,299	43,248,719	311,501	118,558	3,122,076	54,873,036
2024	2,121,655	95,596	361,294	5,820,885	44,680,870	325,676	125,963	3,256,276	56,788,215
2025	1,974,720	87,906	361,092	5,464,212	42,439,214	301,743	111,669	3,028,401	53,768,918
2026	2,152,049	97,189	360,212	5,882,620	45,121,718	330,518	129,119	3,303,426	57,376,851
2027	2,057,557	92,237	360,561	5,653,292	43,681,988	315,039	119,989	3,156,824	55,437,486
2028	2,069,989	92,895	357,101	5,671,235	43,843,389	316,993	121,353	3,176,174	55,649,129
2029	2,029,928	90,796	357,208	5,567,899	43,213,960	310,360	117,666	3,114,027	54,801,844
2030	2,061,780	92,465	356,632	5,634,143	43,688,931	315,500	120,846	3,163,445	55,433,743
2031	1,983,762	88,373	356,014	5,434,496	42,512,399	302,344	113,258	3,042,376	53,833,022
2032	2,050,532	91,879	354,729	5,586,787	43,513,724	313,307	119,691	3,146,016	55,176,665
2033	2,130,821	96,075	355,034	5,895,465	45,070,237	326,455	124,691	3,270,485	57,269,263
2034	2,053,185	92,012	354,456	5,607,254	43,635,722	313,509	119,269	3,150,083	55,325,490
2035	2,119,139	95,467	353,091	5,892,689	44,875,591	323,877	123,804	3,252,042	57,036,060
TOTAL	94,729,736	4,082,463	19,096,146	240,936,524	2,088,763,333	11,940,299	5,367,000	159,959,107	2,624,874,609

TABLE B-19. Total Transportation Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,539	0	776,021	0	0	0	0	12,626	1,626,150
1964	21,728	1,260,042	9,374	1,595,448	0	0	0	0	13,938	2,802,244
1965	21,859	2,179,810	17,760	2,706,589	0	0	405	405	28,937	4,801,023
1966	37,952	3,898,819	33,415	4,841,844	0	0	564	564	31,321	7,382,540
1967	71,260	7,691,085	68,133	9,511,856	0	0	562	562	47,718	12,793,177
1968	128,877	15,313,065	142,760	18,686,147	0	0	564	564	46,945	24,930,696
1969	198,704	23,145,744	215,144	28,195,999	0	0	3,190	3,190	52,963	36,030,360
1970	289,546	30,607,434	273,523	37,538,920	0	0	15,116	15,116	69,744	46,163,855
1971	409,205	39,946,463	342,325	49,174,713	0	0	15,996	15,996	55,532	58,794,979
1972	537,044	52,933,606	422,192	64,674,856	0	0	17,367	17,367	80,412	76,515,381
1973	587,814	57,257,279	435,541	70,262,374	0	0	17,328	17,328	54,219	81,189,340
1974	611,275	61,759,841	455,447	75,093,548	0	0	17,472	17,472	76,783	86,909,157
1975	644,464	66,739,819	478,284	80,838,899	0	0	18,400	18,400	84,547	94,056,827
1976	668,153	68,467,779	475,466	83,317,059	0	0	17,471	17,471	106,717	97,123,393
1977	696,350	66,216,668	506,941	81,275,903	0	0	18,227	18,227	98,618	95,159,583
1978	708,874	72,917,066	523,053	88,779,461	0	0	17,375	17,375	100,786	104,645,013
1979	712,699	72,648,617	526,278	89,325,037	0	0	20,573	20,573	119,352	106,991,314
1980	777,814	79,908,126	571,100	98,278,049	0	0	17,755	17,755	178,812	116,945,923
1981	805,858	91,241,966	636,261	111,146,892	0	0	21,188	21,188	185,347	131,717,455
1982	853,227	93,125,063	670,228	113,495,304	0	0	28,417	28,417	173,894	135,094,538
1983	951,954	101,767,502	803,439	126,187,520	0	0	19,271	19,271	220,926	151,584,878
1984	1,072,455	137,486,443	868,812	170,188,193	0	0	21,109	21,109	225,959	208,157,155
1985	1,120,667	172,895,309	908,613	211,008,681	0	0	20,233	20,233	340,322	257,868,645
1986	1,149,524	193,220,922	937,154	234,168,730	0	0	20,134	20,134	279,227	284,228,684
1987	1,171,823	178,743,184	907,876	220,793,074	0	0	19,736	19,736	345,116	272,463,293
1988	1,208,011	190,222,146	904,709	231,712,366	0	0	17,895	17,895	365,207	284,536,514
1989	1,194,715	193,213,771	932,440	234,256,749	0	0	19,153	19,153	422,329	287,610,923
1990	1,297,422	239,518,615	1,486,593	286,826,374	0	0	18,143	18,143	474,284	339,747,639
1991	1,354,718	179,928,886	1,140,954	217,191,766	0	0	21,012	21,012	214,683	255,485,479
1992	1,348,976	196,144,526	1,025,119	236,614,256	0	0	18,008	18,008	286,170	279,229,229
1993	1,507,337	169,470,518	1,067,967	212,087,647	0	0	20,993	20,993	599,571	270,962,112
1994	1,497,529	209,259,636	1,008,783	257,677,924	0	0	19,644	19,644	609,966	316,359,349
1995	1,520,392	173,396,660	1,061,154	221,469,384	0	0	20,272	20,272	534,971	290,081,441
1996	1,526,936	181,380,152	1,103,083	238,801,959	0	0	25,373	25,373	571,857	319,194,301
1997	1,731,237	186,712,246	1,216,389	242,222,755	0	0	24,815	24,815	428,638	323,446,047
1998	1,924,943	168,700,865	1,238,198	220,057,545	0	0	17,366	17,366	465,095	302,430,048
1999	2,167,880	189,824,243	1,251,210	244,727,225	0	0	17,366	17,366	559,471	335,401,734
2000	2,426,413	185,909,773	1,321,674	237,269,653	0	0	17,367	17,367	0	322,062,490
2001	3,389,196	377,136,900	1,618,687	457,687,152	0	0	17,368	17,368	0	560,514,119
2002	4,797,483	266,689,838	1,651,146	335,958,404	0	0	17,369	17,369	0	437,269,093
2003	5,898,251	294,190,020	1,671,283	366,788,629	0	0	20,763	20,763	0	467,712,251
2004	6,361,346	338,683,168	1,900,990	418,279,113	0	0	20,825	20,825	0	517,578,025
2005	6,703,598	312,968,157	1,417,670	409,749,355	0	0	20,822	20,822	0	520,733,039
2006	7,206,871	296,093,004	1,380,707	403,805,217	0	0	21,349	21,349	0	510,780,343
2007	8,119,305	380,923,033	1,879,193	507,686,986	0	0	21,325	21,325	0	618,002,562
2008	10,425,223	501,792,052	4,237,535	662,998,585	0	0	20,583	20,583	1	793,640,828
2009	13,670,178	541,646,130	5,837,209	744,507,788	0	0	19,206	19,206	2	896,598,531
2010	12,309,754	458,620,572	4,872,396	638,773,003	0	0	19,296	19,296	0	777,946,152
2011	12,674,023	486,892,135	5,178,407	679,579,581	0	0	22,074	22,074	0	819,164,184
2012	12,904,453	506,864,278	5,428,801	707,697,754	0	0	22,074	22,074	0	848,353,219
2013	12,584,183	491,059,134	5,426,949	691,537,491	0	0	22,074	22,074	0	834,785,774
2014	11,703,797	470,479,280	4,779,901	677,976,224	0	0	22,073	22,073	0	812,046,238
2015	11,632,472	470,849,870	4,798,145	678,324,854	0	0	21,671	21,671	0	813,577,896
2016	11,861,026	488,658,597	4,986,275	703,714,108	0	0	21,508	21,508	0	842,099,446
2017	11,591,883	466,180,092	4,744,540	672,228,636	0	0	21,511	21,511	0	806,690,178
2018	11,727,956	478,316,286	4,905,492	690,587,064	0	0	21,510	21,510	0	825,247,878
2019	11,849,763	485,939,596	4,967,964	702,332,855	0	0	18,878	18,878	0	840,499,099
2020	11,467,105	454,637,991	4,663,297	658,370,840	0	0	6,958	6,958	0	792,010,102
2021	11,347,792	446,709,110	4,607,309	647,880,219	0	0	6,135	6,135	0	781,277,194
2022	11,195,106	430,014,148	4,427,068	624,947,592	0	0	4,746	4,746	0	755,785,999
2023	11,240,651	433,616,492	4,484,305	629,284,188	0	0	4,745	4,745	0	761,610,277
2024	11,321,175	444,264,364	4,608,730	644,246,385	0	0	4,744	4,744	0	779,543,211
2025	11,237,424	434,208,275	4,513,522	630,894,796	0	0	4,746	4,746	0	762,230,980
2026	11,320,550	444,245,802	4,607,974	644,206,365	0	0	4,735	4,735	0	780,145,777
2027	11,225,819	432,051,543	4,503,474	628,691,505	0	0	4,750	4,750	0	761,948,745
2028	11,175,531	438,592,800	4,562,356	634,811,520	0	0	4,731	4,731	0	768,384,668
2029	11,208,029	429,567,577	4,455,657	624,894,621	0	0	4,736	4,736	0	757,161,582
2030	11,205,828	430,401,201	4,459,924	625,668,749	0	0	4,733	4,733	0	758,812,695
2031	11,064,832	419,369,672	4,367,752	611,950,707	0	0	4,743	4,743	0	742,775,699
2032	11,169,196	429,115,337	4,438,920	622,884,154	0	0	4,722	4,722	0	755,695,655
2033	11,449,895	453,556,283	4,747,931	659,871,905	0	0	4,732	4,732	0	796,033,654
2034	11,157,720	427,436,998	4,444,911	622,328,492	0	0	4,730	4,730	0	755,271,093
2035	11,567,073	456,320,769	4,721,097	665,162,086	0	0	4,719	4,719	0	799,298,084
TOTAL	402,720,120	19,273,834,731	170,284,913	26,479,083,643	0	0	1,077,546	1,077,546	8,723,731	32,280,768,071

TABLE B-20A: CALCULATION OF DELTA WATER RATES

Calculation in accordance with Article 53(i) of the Monterey Amendment

(Values in millions of dollars [\$] or millions of acre-feet [AF] discounted to 2008 at 4.608 percent per annum)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[1]		[2]		[3]	
Commencing in 2009						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Entitlements during the Project Repayment Period.	\$5,442.95 (b)	324.95 AF	\$3,921.62 (c)	324.95 AF	\$9,364.57	324.95 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(1,913.37)		(782.17)		(\$2,695.53)	
Less, Delta Water Charges Paid and Project Water Entitlements, Prior to 2009	(2,541.45) (d)	(261.26) AF	(1,900.33)	(261.26) AF	(\$4,441.78)	(261.26) AF
TOTAL	\$988.14	63.68 AF	\$1,239.12	63.68 AF	\$2,227.26	63.68 AF
Rate Applicable in 2009	\$15.52 per acre-foot		\$19.46 per acre-foot		\$34.97 per acre-foot	

Calculation under original provisions, without the Monterey Amendment

(for Plumas County, and Empire)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[4]		[5]		[6]	
Commencing in 2009						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Entitlements during the Project Repayment Period.	\$5,429.89 (b)	324.95 AF	\$3,905.29 (c)	324.95 AF	\$9,335.18	324.95 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(1,913.37)		(782.17)		(\$2,695.53)	
Less, Delta Water Charges Paid and Project Water Entitlements, Prior to 2009	(2,541.45) (d)	(261.26) AF	(1,900.33)	(261.26) AF	(\$4,441.78)	(261.26) AF
TOTAL	\$975.07	63.68 AF	\$1,222.80	63.68 AF	\$2,197.87	63.68 AF
Rate Applicable in 2009	\$15.31 per acre-foot		\$19.20 per acre-foot		\$34.51 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. OMP&R costs exclude amounts for Conservaton RAS.

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 during the 1961 through 1978 period.

c) Includes 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

(in dollars per acre-foot)

Item	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component	Total Delta Water Rate
	[1]	[2]	[3]
Initial Conservation Facilities			
Oroville Division			
Water Supply and power costs (a)	50.52	28.52	79.04
Less, Oroville Power Revenues	<u>-30.04</u>	<u>-12.28</u>	<u>-42.33</u>
Subtotal	20.48	16.24	36.72
Delta Facilities (b)			
California Aqueduct, portion	16.94	18.21	35.15
Reach 1	3.20	5.14	8.34
Reach 2A	1.91	0.84	2.74
Reach 2B	0.99	0.48	1.47
Reach 3	<u>0.68</u>	<u>0.27</u>	<u>0.95</u>
Subtotal	6.78	6.73	13.51
San Luis Facilities	9.59	7.86	17.45
Planning and preoperating costs through 2007	2.77	0.00	2.77
45,000 AF relinquished costs	0.21	0.26	0.46
Less, Capital Cost Credits	-1.34	0.00	-1.34
Less, Delta Water Charges paid prior to 2009	<u>-39.91</u>	<u>-29.84</u>	<u>-69.75</u>
Rate applicable in 2009	15.52	19.46	34.97

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

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[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	177,824	546,610	724,434	778,647	817,579	1,946,615	3,542,841	486,654	885,437	1,372,091
1995	203,738	713,497	917,235	874,946	874,946	2,083,205	3,833,097	520,801	947,567	1,468,368
1996	213,506	774,152	987,658	901,129	860,168	2,048,020	3,809,317	512,005	931,562	1,443,567
1997	250,558	866,141	1,116,699	1,041,633	951,056	2,264,420	4,257,109	566,105	1,029,994	1,596,099
1998	266,952	882,469	1,149,421	1,048,658	957,470	2,279,691	4,285,819	141,683	888,760	1,030,443
1999	290,688	923,459	1,214,147	1,084,480	990,178	2,357,566	4,432,224	589,391	1,072,362	1,661,753
2000	390,936	948,784	1,339,720	1,628,402	1,005,778	2,394,709	5,028,889	598,677	1,089,257	1,687,934
2001	496,412	1,097,880	1,594,292	1,868,283	1,005,998	2,395,234	5,269,515	598,809	1,089,496	1,688,305
2002	512,928	1,125,429	1,638,357	1,896,134	1,020,996	2,430,942	5,348,072	607,736	1,105,738	1,713,474
2003	511,059	1,112,692	1,623,751	1,856,232	999,510	2,379,785	5,235,527	594,946	1,082,469	1,677,415
2004	515,037	1,323,518	1,838,555	1,848,004	990,002	2,357,148	5,195,154	589,286	1,072,172	1,661,458
2005	544,123	1,156,941	1,701,064	1,973,748	1,028,262	2,448,242	5,450,252	612,060	1,113,607	1,725,667
2006	559,368	1,173,458	1,732,826	1,999,809	1,041,839	2,480,569	5,522,217	620,142	1,128,312	1,748,454
2007	623,728	1,291,247	1,914,975	2,198,222	1,145,206	2,726,679	6,070,107	681,671	1,240,257	1,921,928
2008	647,090	1,322,240	1,969,330	2,248,611	1,171,457	2,789,182	6,209,250	697,296	1,268,687	1,965,983
2009	822,753	1,659,706	2,482,459	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2010	834,120	1,661,455	2,495,575	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2011	845,486	1,663,203	2,508,689	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2012	856,853	1,664,952	2,521,805	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2013	866,470	1,666,701	2,533,171	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2014	879,585	1,668,450	2,548,035	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2015	903,193	1,670,198	2,573,391	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2016	925,051	1,670,198	2,595,249	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2017	946,910	1,670,198	2,617,108	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2018	968,768	1,670,198	2,638,966	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2019	990,627	1,670,198	2,660,825	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2020	1,011,611	1,670,198	2,685,809	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2021	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2022	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2023	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2024	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2025	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2026	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2027	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2028	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2029	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2030	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2031	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2032	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2033	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2034	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
2035	1,015,108	1,670,198	2,685,306	2,819,535	1,468,890	3,497,358	7,785,783	874,339	1,590,808	2,465,147
TOTAL	33,082,273	62,724,091	95,806,364	107,516,248	64,014,100	158,834,652	330,365,000	35,078,590	64,442,179	99,520,769

TABLE B-21. Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	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	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	40,695	10,469	0	0	165,522	3,177	8,073	98,608	326,544
1969	61,267	3,281	0	0	337,686	4,200	8,805	102,478	517,717
1970	104,405	19,950	0	0	964,915	8,645	17,290	228,095	1,343,300
1971	129,596	21,720	0	0	1,377,772	9,412	20,272	264,260	1,823,032
1972	160,756	24,113	0	0	2,175,835	11,253	43,131	905,057	3,320,145
1973	195,541	26,664	0	386,638	2,373,167	13,333	27,553	373,307	3,396,203
1974	224,202	27,909	0	446,545	2,781,595	13,954	29,770	445,138	3,969,113
1975	329,688	27,413	0	481,560	3,041,048	14,620	33,702	827,591	4,755,622
1976	414,245	29,388	0	549,549	3,931,785	15,673	35,966	877,151	5,853,757
1977	312,532	28,195	0	569,545	4,071,218	15,977	40,289	626,210	5,663,966
1978	342,208	31,588	0	674,939	4,950,959	20,006	41,065	666,516	6,727,281
1979	395,523	34,294	0	772,757	5,901,986	22,863	45,725	771,613	7,944,761
1980	555,341	37,679	0	881,371	6,984,026	27,272	70,658	933,481	9,489,828
1981	740,789	54,204	0	1,351,487	11,140,730	41,556	77,692	1,373,168	14,779,626
1982	782,396	57,248	0	1,518,993	12,703,436	47,707	85,873	1,530,443	16,726,096
1983	543,462	38,004	0	1,057,789	9,141,315	35,471	58,273	78,506	10,952,820
1984	580,379	13,572	0	1,333,200	9,741,623	39,893	61,770	756,132	12,526,569
1985	667,740	42,441	0	1,540,611	11,403,920	48,100	69,320	644,383	14,416,515
1986	745,447	45,362	0	1,714,679	12,925,113	55,946	77,115	1,469,725	17,033,387
1987	762,180	44,485	0	1,766,065	13,410,817	59,314	77,108	1,503,601	17,623,570
1988	827,669	46,411	0	1,916,790	14,707,763	61,882	83,540	1,633,680	19,277,735
1989	921,621	49,728	0	2,125,033	16,312,361	66,304	92,825	1,821,693	21,369,565
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	1,123,198	58,398	0	2,156,809	20,295,455	77,865	110,957	2,306,739	26,129,421
1995	1,202,009	62,497	0	2,803,995	21,223,694	83,328	118,743	2,468,598	27,962,864
1996	534,818	69,191	0	2,756,635	19,492,814	81,921	102,219	2,426,904	25,464,502
1997	1,208,521	67,162	0	3,047,908	22,148,973	90,576	129,072	2,683,338	29,375,550
1998	1,216,671	77,807	0	2,726,511	22,070,376	91,188	129,942	2,820,148	29,132,643
1999	1,258,233	69,974	0	2,819,648	22,824,299	94,303	134,381	2,793,715	29,994,553
2000	1,278,056	70,943	0	3,223,279	21,220,235	95,788	136,498	2,837,730	28,862,529
2001	1,278,336	71,058	0	2,864,700	21,110,372	95,809	136,528	2,838,352	28,395,155
2002	1,393,975	72,121	0	3,272,056	21,060,431	97,237	138,564	2,711,156	28,745,540
2003	1,364,640	70,550	0	3,203,191	20,617,243	95,192	135,648	2,654,103	28,140,567
2004	1,351,659	70,317	0	3,508,929	20,084,922	94,286	134,357	2,619,428	27,863,898
2005	1,403,895	73,157	0	3,474,639	20,976,687	220,342	139,550	2,598,245	28,886,515
2006	1,422,433	74,130	0	3,338,845	21,435,340	223,252	141,392	2,386,977	29,022,369
2007	1,563,559	81,479	0	3,670,110	23,562,051	253,717	155,421	2,615,486	31,901,823
2008	1,599,401	83,191	0	3,754,239	24,102,160	259,533	158,983	2,675,439	32,632,946
2009	2,005,490	104,350	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2010	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2011	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2012	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2013	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2014	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2015	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2016	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2017	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2018	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2019	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2020	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2021	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2022	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2023	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2024	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2025	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2026	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2027	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2028	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2029	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2030	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2031	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2032	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2033	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2034	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
2035	2,005,490	103,536	0	4,707,444	30,221,718	325,429	199,349	3,354,736	40,917,702
TOTAL	87,514,337	4,807,457	0	202,391,855	1,365,709,578	11,677,583	8,918,143	156,835,686	1,837,854,639

TABLE B-21. Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[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	189,700
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	2,694,116	1,055,065	449,668	112,905	741,661	44,772	988,880	336,766	1,997,227	560,625
1995	2,883,156	1,129,097	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963
1996	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1997	3,133,957	1,227,316	523,081	131,336	862,744	52,082	1,150,325	391,745	2,323,295	652,153
1998	3,155,093	1,235,593	526,609	132,222	868,562	52,433	1,126,006	394,387	2,338,963	656,551
1999	3,262,870	1,277,800	544,598	136,739	898,233	54,224	1,187,034	407,859	2,418,863	678,979
2000	3,314,278	1,279,763	553,178	138,893	912,384	55,078	1,815,190	510,073	2,456,972	689,676
2001	3,315,004	2,280,263	553,299	138,924	912,584	55,090	1,815,587	510,185	2,457,510	689,827
2002	3,437,351	2,314,256	561,548	140,995	926,188	55,912	1,842,654	517,791	2,494,146	700,112
2003	3,365,016	2,265,555	549,731	138,028	906,698	54,735	1,803,877	506,894	2,441,659	685,379
2004	3,333,008	2,244,004	544,501	136,715	898,074	54,215	1,786,717	502,073	2,418,434	678,859
2005	3,461,814	2,330,727	565,544	141,999	932,780	56,310	1,917,073	521,475	2,511,896	705,093
2006	3,507,524	2,361,502	3,003,969	143,873	1,240,285	57,053	1,880,272	528,361	2,545,064	714,404
2007	3,855,524	2,595,798	3,302,008	158,148	1,363,339	62,714	2,066,822	580,783	2,797,573	785,284
2008	3,943,904	2,655,301	3,377,700	161,773	1,394,591	64,151	2,114,200	594,096	2,861,701	803,284
2009	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2010	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2011	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2012	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2013	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2014	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2015	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2016	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2017	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2018	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2019	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2020	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2021	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2022	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2023	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2024	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2025	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2026	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2027	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2028	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2029	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2030	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2031	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2032	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2033	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2034	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
2035	4,945,264	3,329,485	4,235,300	202,847	1,748,679	80,439	2,650,997	744,937	3,588,289	1,007,239
TOTAL	206,475,111	130,041,156	135,159,757	8,727,445	69,387,845	3,458,267	106,927,685	31,019,548	156,803,648	43,820,908

TABLE B-21. Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
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	336,766	39,156,173	389,323	48,863,947	186,875	23,360	23,360	233,595	0	80,866,329
1995	360,394	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	0	41,195,923	409,604	51,055,092	196,610	24,576	26,624	247,810	0	83,007,946
1997	0	45,548,610	447,746	56,444,590	214,918	27,173	30,223	272,314	0	93,062,361
1998	0	45,855,992	450,529	57,394,940	107,459	27,356	31,537	166,352	0	93,159,618
1999	47,152	47,422,430	466,491	59,403,272	226,327	28,291	33,820	288,438	0	96,994,387
2000	71,841	48,169,576	478,942	61,445,844	229,892	69,207	35,708	334,807	0	98,699,723
2001	95,809	48,180,135	479,047	61,483,264	229,942	83,833	37,187	350,962	0	98,781,493
2002	97,237	48,898,394	486,188	62,472,772	233,371	85,083	39,185	357,639	0	100,275,854
2003	118,989	47,869,376	475,957	61,181,894	228,460	83,293	39,743	351,496	0	98,210,650
2004	141,429	47,414,032	471,429	60,623,490	226,287	83,306	0	309,593	0	97,492,148
2005	159,136	49,246,383	489,648	63,039,878	235,031	29,701	0	264,732	0	101,068,108
2006	173,640	47,416,073	496,113	64,068,133	238,135	30,107	49,810	318,052	0	102,412,051
2007	204,501	52,120,469	545,336	70,438,299	268,738	33,950	19,600	322,288	0	112,569,420
2008	334,702	53,315,217	557,836	72,178,456	274,736	794,785	56,138	1,125,659	0	116,081,624
2009	605,043	66,851,995	699,472	90,689,986	335,746	968,363	72,825	1,376,934	0	145,718,825
2010	605,043	66,851,995	699,472	90,689,986	335,746	961,773	74,546	1,372,065	0	145,726,258
2011	605,043	66,851,995	699,472	90,689,986	335,746	961,773	77,307	1,374,826	0	145,742,133
2012	605,043	66,851,995	699,472	90,689,986	335,746	961,773	80,068	1,377,587	0	145,758,010
2013	605,043	66,851,995	699,472	90,689,986	335,746	961,773	83,174	1,380,693	0	145,772,482
2014	605,043	66,851,995	699,472	90,689,986	335,746	961,773	86,280	1,383,799	0	145,790,452
2015	605,043	66,851,995	699,472	90,689,986	335,746	961,773	89,731	1,387,250	0	145,819,259
2016	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,844,569
2017	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,866,428
2018	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,888,286
2019	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,910,145
2020	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,931,129
2021	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2022	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2023	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2024	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2025	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2026	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2027	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2028	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2029	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2030	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2031	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2032	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2033	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2034	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
2035	605,043	66,851,995	699,472	90,689,986	335,746	961,773	93,183	1,390,702	0	145,934,626
TOTAL	21,503,719	2,935,279,842	28,488,359	3,877,093,290	13,206,603	27,786,701	3,139,214	44,132,518	0	6,284,772,580

TABLE B-22. Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County	Santa Barbara County	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	29,131	40,505	69,636	25,436	30,176	100,035	155,647	13,126	24,392	37,518
1989	48,804	69,621	118,425	43,343	51,681	170,303	265,327	26,828	49,634	76,462
1990	41,166	60,482	101,648	38,407	51,185	149,440	239,032	27,956	51,795	79,751
1991	63,389	92,401	155,790	62,470	81,991	235,712	380,173	44,887	83,709	128,596
1992	84,320	126,227	210,547	89,247	115,208	325,629	530,084	61,137	113,925	175,062
1993	90,152	137,473	227,625	98,432	125,174	347,457	571,063	67,725	126,662	194,387
1994	91,785	141,222	233,007	102,021	126,216	352,415	580,652	81,420	159,156	240,576
1995	108,311	181,787	290,098	126,000	149,378	416,955	692,333	131,674	270,727	402,401
1996	132,304	232,343	364,647	158,514	180,787	505,043	844,344	242,654	534,448	777,102
1997	135,556	237,492	373,048	171,263	187,162	522,127	880,552	141,810	846,616	988,426
1998	130,346	228,366	358,712	164,682	179,971	502,065	846,718	136,361	814,087	950,448
1999	182,507	316,416	498,923	227,072	248,031	691,830	1,166,933	188,835	1,124,110	1,312,945
2000	238,571	364,418	602,989	260,766	284,875	794,730	1,340,371	218,359	1,364,019	1,582,378
2001	234,773	358,616	593,389	561,965	280,341	782,078	1,624,384	214,883	1,342,304	1,557,187
2002	257,520	391,851	649,371	610,230	288,977	806,174	1,705,381	221,503	1,383,661	1,605,164
2003	268,151	408,027	676,178	635,422	300,907	839,455	1,775,784	230,647	1,440,782	1,671,429
2004	268,425	408,444	676,869	636,070	301,214	840,312	1,777,596	230,883	1,442,252	1,673,135
2005	253,413	385,602	639,015	610,756	284,369	793,318	1,688,443	217,970	1,361,594	1,579,564
2006	274,219	417,261	691,480	660,900	307,716	858,451	1,827,067	235,866	1,473,385	1,709,251
2007	261,107	397,309	658,416	629,298	293,003	817,402	1,739,703	224,589	1,402,932	1,627,521
2008	425,866	648,010	1,073,876	1,026,385	477,887	1,333,184	2,837,456	366,303	2,288,183	2,654,486
2009	492,265	749,046	1,241,311	1,186,417	552,398	1,541,052	3,279,867	423,416	2,644,951	3,068,367
2010	473,014	719,753	1,192,767	1,140,019	530,795	1,480,784	3,151,598	406,858	2,541,514	2,948,372
2011	505,729	769,533	1,275,262	1,218,866	567,506	1,583,199	3,369,571	434,997	2,717,292	3,152,289
2012	506,244	770,316	1,276,560	1,220,106	568,084	1,584,810	3,373,000	435,439	2,720,056	3,155,495
2013	531,126	808,178	1,339,304	1,280,076	596,006	1,662,706	3,538,788	456,842	2,853,751	3,310,593
2014	549,067	835,478	1,384,545	1,323,315	616,138	1,718,870	3,658,323	472,274	2,950,147	3,422,421
2015	575,109	875,103	1,450,212	1,386,079	645,361	1,800,394	3,831,834	494,673	3,090,069	3,584,742
2016	580,457	883,241	1,463,698	1,398,968	651,362	1,817,136	3,867,466	499,273	3,118,804	3,618,077
2017	572,611	871,303	1,443,914	1,380,058	642,558	1,792,574	3,815,190	492,524	3,076,648	3,569,172
2018	510,350	776,564	1,286,914	1,230,002	572,691	1,597,664	3,400,357	438,971	2,742,118	3,181,089
2019	546,783	832,002	1,378,785	1,317,810	613,575	1,711,720	3,643,105	470,309	2,937,874	3,408,183
2020	507,100	771,620	1,278,720	1,222,171	569,045	1,587,492	3,378,708	436,176	2,724,659	3,160,835
2021	512,108	779,240	1,291,348	1,234,240	574,665	1,603,169	3,412,074	440,484	2,751,567	3,192,051
2022	496,316	755,210	1,251,526	1,196,179	556,943	1,553,732	3,306,854	426,900	2,666,715	3,093,615
2023	495,956	754,662	1,250,618	1,195,311	556,539	1,552,603	3,304,453	426,590	2,664,779	3,091,369
2024	478,163	727,588	1,205,751	1,152,428	536,573	1,496,903	3,185,904	411,286	2,569,178	2,980,464
2025	435,528	662,712	1,098,240	1,049,672	488,729	1,363,431	2,901,832	374,614	2,340,097	2,714,711
2026	396,111	602,735	998,846	954,674	444,498	1,240,038	2,639,210	340,710	2,128,313	2,469,023
2027	434,905	661,765	1,096,670	1,048,171	488,030	1,361,481	2,897,682	374,078	2,336,750	2,710,828
2028	333,680	507,738	841,418	804,208	374,441	1,044,595	2,223,244	287,011	1,792,869	2,079,880
2029	363,402	552,963	916,365	875,840	407,793	1,137,639	2,421,272	312,576	1,952,564	2,265,140
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	13,915,840	21,310,623	35,226,463	31,753,289	15,899,979	44,416,107	92,069,375	12,181,417	73,019,088	85,200,505

TABLE B-22. Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	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	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	33,986	1,657	0	67,288	726,501	2,228	2,851	66,748	901,259
1989	59,273	2,785	0	116,689	1,251,452	3,733	4,927	116,736	1,555,595
1990	53,349	2,419	0	287,811	947,351	3,248	4,367	109,118	1,407,663
1991	82,252	3,731	0	359,380	1,564,983	5,035	6,771	168,217	2,190,369
1992	112,566	5,127	0	452,691	2,153,423	6,927	9,285	230,217	2,970,236
1993	119,670	5,459	0	272,449	2,491,672	7,381	9,894	244,813	3,151,338
1994	118,265	5,379	0	244,671	2,485,820	7,300	9,766	241,933	3,113,134
1995	139,227	6,339	0	317,885	2,894,182	8,598	11,490	284,798	3,662,519
1996	169,333	7,703	0	354,341	2,722,241	10,460	13,978	346,366	3,624,422
1997	165,364	7,980	0	366,285	2,673,847	10,826	14,465	357,986	3,596,753
1998	159,011	7,672	0	352,211	2,571,110	10,410	13,909	344,232	3,458,555
1999	218,784	10,373	0	485,897	3,371,115	14,376	19,166	476,017	4,595,728
2000	251,339	11,735	0	557,296	3,620,348	16,500	21,990	546,406	5,025,614
2001	247,338	11,547	0	548,424	3,461,158	16,238	21,640	537,707	4,844,052
2002	273,542	11,904	0	565,321	3,496,023	16,737	22,306	521,659	4,907,492
2003	284,834	12,395	0	588,659	3,640,346	17,428	23,227	543,193	5,110,082
2004	285,125	12,408	0	589,259	3,644,059	17,446	23,251	543,748	5,115,296
2005	269,179	11,714	0	556,305	3,431,851	39,485	21,951	488,483	4,818,968
2006	291,279	12,676	0	601,979	3,713,614	42,726	23,753	528,589	5,214,616
2007	277,351	12,070	0	573,194	3,536,041	42,130	22,617	454,916	4,918,319
2008	452,361	19,685	0	934,881	5,767,286	68,714	36,888	741,968	8,021,783
2009	522,891	22,755	0	1,080,645	6,666,506	79,427	42,640	857,653	9,272,517
2010	502,443	21,865	0	1,038,384	6,405,798	76,321	40,972	824,113	8,909,896
2011	537,193	23,377	0	1,110,201	6,848,840	81,600	43,806	881,111	9,526,128
2012	537,739	23,401	0	1,111,331	6,855,807	81,683	43,851	882,007	9,535,819
2013	564,170	24,551	0	1,165,954	7,192,781	85,698	46,006	925,359	10,004,519
2014	583,227	25,380	0	1,205,339	7,435,745	88,592	47,560	956,617	10,342,460
2015	610,889	26,584	0	1,262,506	7,788,412	92,794	49,816	1,001,988	10,832,989
2016	616,569	26,831	0	1,274,246	7,860,837	93,657	50,279	1,011,305	10,933,724
2017	608,236	26,469	0	1,257,023	7,754,585	92,391	49,599	997,636	10,785,939
2018	542,101	23,591	0	1,120,344	6,911,414	82,345	44,206	889,161	9,613,162
2019	580,801	25,275	0	1,200,324	7,404,811	88,224	47,362	952,637	10,299,434
2020	538,649	23,440	0	1,113,211	6,867,409	81,821	43,925	883,500	9,551,955
2021	543,969	23,672	0	1,124,205	6,935,229	82,629	44,359	892,225	9,646,288
2022	527,194	22,942	0	1,089,537	6,721,363	80,081	42,991	864,711	9,348,819
2023	526,811	22,925	0	1,088,746	6,716,482	80,023	42,959	864,083	9,342,029
2024	507,912	22,103	0	1,049,686	6,475,524	77,152	41,418	833,083	9,006,878
2025	462,624	20,132	0	956,091	5,898,134	70,273	37,725	758,802	8,203,781
2026	420,755	18,310	0	869,563	5,364,340	63,913	34,311	690,128	7,461,320
2027	461,962	20,103	0	954,724	5,889,698	70,172	37,671	757,716	8,192,046
2028	354,440	15,424	0	732,511	4,518,865	53,840	28,903	581,357	6,285,340
2029	386,011	16,798	0	797,757	4,921,370	58,635	31,478	633,140	6,845,189
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	15,000,014	658,686	0	31,795,244	199,598,373	2,029,197	1,230,329	25,832,182	276,144,025

TABLE B-22. Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	64,266	57,111	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907
1989	205,668	98,720	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104
1990	185,010	87,808	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851
1991	296,854	140,371	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172
1992	402,015	234,421	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372
1993	424,871	247,076	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298
1994	424,023	247,222	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422
1995	500,083	290,999	111,729	31,823	184,169	8,769	229,530	64,852	623,848	165,594
1996	606,387	353,131	135,428	38,635	223,236	10,640	278,178	78,696	760,333	201,821
1997	626,151	362,776	139,565	39,802	230,058	10,972	286,779	81,146	808,482	207,472
1998	602,091	348,838	134,202	38,273	221,218	10,550	275,761	78,028	777,418	199,501
1999	826,108	479,470	184,524	52,650	304,166	14,475	642,815	107,060	1,041,566	277,200
2000	940,325	1,150,965	210,453	60,212	346,906	16,486	736,157	121,898	1,191,538	316,860
2001	925,355	1,132,642	207,102	59,254	341,384	16,224	724,438	135,581	1,172,568	311,816
2002	974,814	1,167,539	213,483	61,079	351,902	16,724	746,758	139,071	1,208,696	321,423
2003	1,015,056	1,215,738	222,296	63,601	366,429	17,415	777,586	144,812	1,258,593	334,692
2004	1,016,092	1,216,978	222,523	63,666	366,803	17,432	778,379	144,960	1,259,877	335,033
2005	959,268	1,148,920	210,078	60,105	346,290	16,457	734,849	136,853	1,189,420	316,297
2006	1,038,026	1,243,248	213,645	65,040	501,286	17,809	795,182	148,089	1,287,074	342,266
2007	988,391	1,183,800	1,155,613	61,931	477,316	16,957	757,159	141,008	1,225,529	325,900
2008	1,612,066	1,930,779	1,884,805	101,008	778,503	27,657	1,234,926	229,984	1,998,840	531,542
2009	1,863,416	2,231,821	2,178,679	116,757	899,885	31,969	1,427,473	265,842	2,310,494	614,419
2010	1,790,542	2,144,540	2,093,477	112,191	864,693	30,719	1,371,648	255,446	2,220,137	590,391
2011	1,914,381	2,292,862	2,238,267	119,950	924,497	32,843	1,466,515	273,113	2,373,688	631,224
2012	1,916,328	2,295,195	2,240,544	120,072	925,438	32,877	1,468,007	273,391	2,376,102	631,866
2013	2,010,519	2,408,008	2,350,670	125,974	970,925	34,493	1,540,162	286,829	2,492,892	662,923
2014	2,078,432	2,489,347	2,430,073	130,229	1,003,721	35,658	1,592,187	296,518	2,577,098	685,316
2015	2,177,009	2,607,414	2,545,328	136,406	1,051,326	37,349	1,667,702	310,581	2,699,327	717,819
2016	2,197,253	2,631,660	2,568,997	137,674	1,061,103	37,696	1,683,210	313,469	2,724,428	724,494
2017	2,167,554	2,596,089	2,534,273	135,814	1,046,760	37,187	1,660,459	309,232	2,687,603	714,702
2018	1,931,871	2,313,811	2,258,717	121,046	932,944	33,143	1,479,914	275,609	2,395,375	636,991
2019	2,069,785	2,478,991	2,419,964	129,688	999,546	35,509	1,585,563	295,284	2,566,377	682,465
2020	1,919,571	2,299,079	2,244,335	120,276	927,004	32,932	1,470,491	273,854	2,380,123	632,935
2021	1,938,528	2,321,784	2,266,500	121,463	936,159	33,257	1,485,013	276,558	2,403,629	639,186
2022	1,878,748	2,250,186	2,196,606	117,718	907,290	32,232	1,439,219	268,030	2,329,506	619,475
2023	1,877,384	2,248,552	2,195,011	117,632	906,631	32,208	1,438,174	267,835	2,327,815	619,025
2024	1,810,032	2,167,883	2,116,264	113,412	874,105	31,053	1,386,578	258,226	2,244,303	596,817
2025	1,648,640	1,974,584	1,927,567	103,300	796,165	28,284	1,262,944	235,202	2,044,190	543,602
2026	1,499,435	1,795,880	1,753,118	93,951	724,111	25,724	1,148,645	213,915	1,859,186	494,405
2027	1,646,282	1,971,760	1,924,810	103,152	795,027	28,244	1,261,138	234,865	2,041,266	542,824
2028	1,263,109	1,512,831	1,476,809	79,143	609,983	21,670	967,607	180,200	1,566,159	416,481
2029	1,375,616	1,647,582	1,608,351	86,193	664,316	23,600	1,053,793	196,251	1,705,660	453,578
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	53,607,355	61,018,411	52,274,068	3,369,115	24,620,557	923,673	39,802,388	7,582,279	66,669,452	17,712,481

TABLE B-22. Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	24,019	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	42,040	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	38,023	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	59,122	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	80,131	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	84,371	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	85,698	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	101,792	10,539,433	90,436	12,943,057	16,957	2,119	3,704	22,820	0	18,013,188
1996	124,074	12,810,361	109,783	15,730,703	20,640	2,580	4,621	27,841	0	21,369,059
1997	28,259	13,168,230	112,960	16,102,652	21,382	2,674	4,872	28,928	0	21,970,359
1998	27,174	12,662,268	108,619	15,483,941	20,562	2,571	4,685	27,818	0	21,126,192
1999	53,545	17,454,651	149,123	21,587,353	28,348	3,543	6,765	38,656	0	29,200,538
2000	70,117	19,805,800	168,259	25,135,976	32,271	9,794	7,996	50,061	0	33,737,389
2001	69,001	19,490,499	165,580	24,751,444	31,757	9,638	7,869	49,264	0	33,419,720
2002	71,126	20,091,004	170,682	25,534,301	32,736	9,935	8,112	50,783	0	34,452,492
2003	74,063	20,920,403	177,728	26,588,412	34,087	10,345	8,446	52,878	0	35,874,763
2004	74,138	20,941,743	177,910	26,615,534	34,121	10,356	8,456	52,933	0	35,911,363
2005	69,992	19,770,593	167,960	25,127,082	32,213	9,776	7,983	49,972	0	33,903,044
2006	75,738	20,330,228	181,750	27,239,381	34,858	10,579	8,638	54,075	0	36,735,870
2007	72,116	19,358,097	173,060	25,936,877	33,191	10,073	8,225	51,489	0	34,932,325
2008	117,622	31,573,085	282,260	42,303,077	54,135	16,429	13,415	83,979	0	56,974,657
2009	135,962	36,495,872	326,269	48,898,858	62,576	18,991	15,506	97,073	0	65,857,993
2010	130,645	35,068,622	313,510	46,986,561	60,128	18,248	14,900	93,276	0	63,282,470
2011	139,680	37,494,062	335,193	50,236,275	64,287	19,510	15,930	99,727	0	67,659,252
2012	139,823	37,532,206	335,534	50,287,383	64,353	19,530	15,947	99,830	0	67,728,087
2013	146,695	39,376,973	352,026	52,759,089	67,516	20,490	16,730	104,736	0	71,057,029
2014	151,650	40,707,081	363,917	54,541,227	69,796	21,182	17,296	108,274	0	73,457,250
2015	158,843	42,637,764	381,177	57,128,045	73,106	22,187	18,116	113,409	0	76,941,231
2016	160,320	43,034,253	384,721	57,659,278	73,786	22,393	18,284	114,463	0	77,656,706
2017	158,153	42,452,578	379,521	56,879,925	72,789	22,090	18,037	112,916	0	76,607,056
2018	140,957	37,836,624	338,255	50,695,257	64,874	19,688	16,076	100,638	0	68,277,417
2019	151,019	40,537,733	362,403	54,314,327	69,506	21,094	17,224	107,824	0	73,151,658
2020	140,059	37,595,718	336,102	50,372,479	64,461	19,563	15,974	99,998	0	67,842,695
2021	141,442	37,967,001	339,421	50,869,941	65,098	19,756	16,131	100,985	0	68,512,687
2022	137,081	36,796,187	328,954	49,301,232	63,091	19,147	15,634	97,872	0	66,399,918
2023	136,981	36,769,468	328,715	49,265,431	63,045	19,133	15,623	97,801	0	66,351,701
2024	132,067	35,450,336	316,922	47,497,998	60,783	18,447	15,062	94,292	0	63,971,287
2025	120,291	32,289,410	288,664	43,262,843	55,363	16,802	13,719	85,884	0	58,267,291
2026	109,404	29,367,148	262,539	39,347,461	50,353	15,281	12,477	78,111	0	52,993,971
2027	120,119	32,243,230	288,251	43,200,968	55,284	16,778	13,699	85,761	0	58,183,955
2028	92,161	24,738,585	221,160	33,145,898	42,417	12,873	10,511	65,801	0	44,641,581
2029	100,370	26,942,103	240,859	36,098,272	46,195	14,019	11,447	71,661	0	48,617,899
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	4,285,883	1,066,024,557	9,428,559	1,407,318,778	1,792,569	516,465	442,629	2,751,663	0	1,898,710,809

TABLE B-23. Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,673	190,236	447,594	837,503	0	0	0
1964	0	0	0	263,210	277,398	621,174	1,161,782	6,694	21,659	28,353
1965	0	0	0	373,722	404,239	1,157,791	1,935,753	13,751	36,017	49,768
1966	18,057	0	18,057	419,362	421,628	1,412,600	2,253,589	26,516	61,329	87,845
1967	41,560	0	41,560	552,988	548,387	1,862,808	2,964,183	56,451	118,225	174,675
1968	128,588	0	128,588	682,772	633,066	2,178,036	3,493,875	115,927	229,740	345,667
1969	254,662	0	254,662	817,381	583,307	2,298,275	3,698,964	185,118	358,783	543,901
1970	277,493	0	277,493	903,698	640,164	2,787,493	4,331,355	200,110	387,595	587,705
1971	227,419	0	227,419	845,172	675,059	2,806,541	4,326,773	202,373	392,830	595,203
1972	224,922	0	224,922	929,182	822,262	3,027,272	4,778,716	209,016	406,506	615,521
1973	221,035	31,353	252,388	915,628	716,357	3,120,308	4,752,294	206,516	402,639	609,155
1974	240,442	32,924	273,366	956,223	746,798	3,324,543	5,027,565	208,503	407,005	615,508
1975	237,400	36,276	273,676	1,014,614	792,919	3,213,566	5,021,099	225,853	439,787	665,639
1976	271,231	40,819	312,050	1,127,672	943,328	3,362,062	5,433,062	228,933	447,212	676,146
1977	293,565	45,078	338,643	1,096,296	922,067	3,302,979	5,321,342	238,656	468,632	707,288
1978	273,807	49,159	322,966	1,185,091	935,682	3,712,097	5,832,870	245,286	484,166	729,452
1979	289,415	53,320	342,735	1,281,664	1,009,429	3,819,046	6,110,139	243,065	483,342	726,406
1980	310,779	86,049	396,827	1,434,637	1,173,659	4,118,582	6,726,878	282,209	540,456	822,665
1981	347,710	112,817	460,527	1,543,165	1,348,984	4,507,072	7,399,221	307,018	596,566	903,584
1982	438,260	141,798	580,058	1,623,491	1,369,396	4,940,900	7,933,788	328,168	682,443	1,010,611
1983	354,703	163,242	517,946	1,493,777	1,259,998	4,909,747	7,663,523	357,171	701,981	1,059,152
1984	467,232	246,623	713,856	1,803,809	1,478,252	6,869,751	10,151,811	409,482	800,953	1,210,435
1985	735,929	386,187	1,122,116	2,301,644	2,224,952	7,795,980	12,322,577	500,648	969,826	1,470,474
1986	1,119,826	714,023	1,833,849	2,170,269	2,013,959	8,193,339	12,377,567	536,703	1,037,924	1,574,627
1987	1,773,371	1,581,733	3,355,104	2,666,788	2,505,517	7,979,748	13,152,053	570,595	1,148,863	1,719,458
1988	2,349,015	2,524,068	4,873,083	2,727,958	2,774,284	7,829,776	13,332,017	673,020	1,439,487	2,112,507
1989	2,548,170	3,700,620	6,248,790	2,711,919	2,515,323	7,188,335	12,805,577	772,517	1,814,603	2,587,120
1990	2,899,410	3,848,146	6,747,556	3,147,224	2,929,625	8,354,874	14,431,724	933,311	2,046,195	2,979,506
1991	2,940,701	4,169,425	7,110,126	2,419,152	2,384,093	6,430,306	11,233,550	979,649	2,366,642	3,346,291
1992	2,797,105	4,144,190	6,941,295	2,893,617	2,926,955	7,656,397	13,476,970	1,118,743	2,526,627	3,645,370
1993	2,854,875	4,171,687	7,026,562	3,750,390	2,977,192	8,849,446	15,577,028	1,185,596	2,725,769	3,911,365
1994	2,987,314	4,224,485	7,211,799	3,787,480	3,586,091	9,162,990	16,986,561	1,335,886	3,517,570	4,853,456
1995	2,960,697	4,404,411	7,365,108	4,036,117	3,313,187	8,393,269	15,742,573	1,647,663	6,194,234	7,841,898
1996	3,044,394	4,897,402	7,941,796	3,643,954	3,178,232	9,227,992	16,050,178	2,591,704	15,229,004	17,820,707
1997	4,337,378	4,733,999	9,071,377	3,870,462	3,145,383	9,337,451	16,353,296	3,002,323	23,731,434	26,733,758
1998	2,935,879	4,589,402	7,525,281	4,379,860	3,203,980	9,084,489	15,768,329	3,255,634	28,393,820	31,649,454
1999	3,156,996	5,075,250	8,232,245	4,173,375	3,677,678	11,396,077	19,247,130	3,803,893	29,636,434	33,440,327
2000	3,467,748	5,635,248	9,102,996	5,821,231	3,611,498	10,262,277	19,695,007	3,787,594	30,647,075	34,434,669
2001	4,088,267	6,392,286	10,480,553	9,864,297	4,111,332	12,079,508	26,055,137	4,340,425	32,650,491	36,990,916
2002	4,337,473	6,594,347	10,931,820	13,408,474	4,116,491	13,231,736	30,756,700	4,068,070	32,385,927	36,453,998
2003	4,455,764	6,938,251	11,394,015	10,039,350	3,833,341	12,012,443	25,885,134	4,142,162	32,661,222	36,803,384
2004	4,939,165	7,360,960	12,300,125	8,215,874	4,117,563	11,429,537	23,762,974	4,152,816	33,141,215	37,294,031
2005	4,310,493	6,673,880	10,984,374	8,314,558	4,283,178	12,218,243	24,815,979	4,285,278	33,351,415	37,636,692
2006	4,223,437	6,218,539	10,441,977	8,349,015	4,300,666	12,411,926	25,061,607	4,200,800	33,390,736	37,591,536
2007	4,718,984	7,443,233	12,162,217	9,449,002	4,855,053	13,753,219	28,057,275	4,484,531	35,340,271	39,824,803
2008	5,503,929	7,457,378	12,961,307	11,538,462	6,134,512	16,114,886	33,787,860	7,408,817	37,038,627	44,447,444
2009	6,436,977	8,394,366	14,831,343	13,566,826	6,997,635	19,465,868	40,030,330	8,958,259	41,727,578	50,685,837
2010	6,382,237	8,372,559	14,754,796	12,771,958	6,720,042	18,377,853	37,869,852	8,115,252	40,069,548	48,184,800
2011	6,418,355	8,132,104	14,550,459	13,461,841	7,122,152	19,517,870	40,101,864	8,365,748	39,696,066	48,061,814
2012	6,480,479	8,175,021	14,655,500	13,559,555	7,151,231	19,601,736	40,312,523	8,465,865	39,969,481	48,435,346
2013	6,562,796	8,128,700	14,691,496	13,665,006	7,450,298	19,251,883	40,367,187	8,421,872	40,075,892	48,497,764
2014	6,550,668	8,072,200	14,622,868	13,493,118	7,050,673	18,332,417	38,876,209	8,150,718	39,683,848	47,834,566
2015	6,628,386	8,111,120	14,739,506	13,578,869	7,041,947	18,166,972	38,787,788	8,200,668	39,873,656	48,074,324
2016	6,666,823	8,123,265	14,790,088	13,732,055	7,111,139	18,232,453	39,075,647	8,269,988	40,015,825	48,285,814
2017	6,667,123	8,098,992	14,766,115	13,445,207	6,989,337	17,852,802	38,267,347	8,133,737	39,736,533	47,870,270
2018	6,581,953	8,019,701	14,601,654	13,157,182	6,897,969	17,622,117	37,677,268	8,098,096	39,433,054	47,531,150
2019	6,643,713	8,096,322	14,740,035	13,441,311	7,018,132	17,902,051	38,361,494	8,246,763	39,838,043	48,084,806
2020	6,587,926	7,990,144	14,578,070	13,005,489	6,790,042	17,357,155	37,152,687	7,977,042	39,196,413	47,173,455
2021	6,605,497	7,999,118	14,604,615	13,003,185	6,789,320	17,357,862	37,150,367	7,981,895	39,223,928	47,205,824
2022	6,553,716	7,945,217	14,498,933	12,784,484	6,671,165	17,077,766	36,533,416	7,833,358	38,891,857	46,725,215
2023	6,553,741	7,910,319	14,463,892	12,865,180	6,713,930	17,177,172	36,756,283	7,865,137	38,945,671	46,810,808
2024	6,569,216	7,913,347	14,482,564	13,028,422	6,807,429	17,379,045	37,214,897	7,996,962	39,117,800	47,114,762
2025	6,507,136	7,835,652	14,342,788	12,694,237	6,637,405	16,957,370	36,288,652	7,865,284	38,716,816	46,582,100
2026	6,468,296	7,774,771	14,243,067	12,860,669	6,730,480	17,157,626	36,748,776	7,929,910	38,679,388	46,609,297
2027	6,491,023	7,820,879	14,311,902	12,787,409	6,683,762	17,070,636	36,541,807	7,874,492	38,728,219	46,602,714
2028	6,389,641	7,663,188	14,052,829	12,567,556	6,584,170	16,780,578	35,932,303	7,805,938	38,208,997	46,014,934
2029	6,402,773	7,693,963	14,096,735	12,546,763	6,566,627	16,757,510	35,870,900	7,772,167	38,259,590	46,031,757
2030	6,034,954	7,130,303	13,165,257	11,730,252	6,191,460	15,693,665	33,615,377	7,495,213	36,365,858	43,861,072
2031	6,007,922	7,102,031	13,109,953	11,578,951	6,108,920	15,503,632	33,191,503	7,413,331	36,208,676	43,622,008
2032	6,011,783	7,092,724	13,104,506	11,719,362	6,186,770	15,678,314	33,584,446	7,504,532	36,372,866	43,877,398
2033	6,036,640	7,095,845	13,132,485	11,950,993	6,316,204	15,971,784	34,238,980	7,706,174	36,746,351	44,452,525
2034	5,921,632	6,983,240	12,904,871	11,742,515	6,200,729	15,707,612	33,650,856	7,543,922	36,448,967	43,992,889
2035	5,748,936	6,814,178	12,563,114	11,728,468	6,187,085	15,685,182	33,600,735	7,501,493	36,366,112	43,867,605
TOTAL	256,004,775	325,405,879	581,410,654	500,722,316	282,352,182	778,692,547	1,561,767,045	283,569,011	1,478,450,308	1,762,019,319

TABLE B-23. Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 2 of 4

SAN JOAQUIN VALLEY AREA									
Calendar Year	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	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[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	2,724	0	0	0	0	0	2,724
1965	0	0	6,027	73,544	0	0	0	0	79,571
1966	0	0	12,035	137,284	0	0	0	0	149,319
1967	0	0	26,249	267,525	0	0	0	0	293,774
1968	225,081	19,365	54,573	445,315	1,709,258	16,944	19,651	307,369	2,797,555
1969	241,258	10,888	87,557	524,952	2,728,443	16,821	19,385	458,997	4,088,302
1970	306,392	34,324	94,656	573,846	3,878,184	21,431	30,407	521,421	5,460,661
1971	327,829	37,052	95,676	605,729	5,199,068	27,171	34,689	712,682	7,039,896
1972	381,522	40,313	98,769	631,452	7,168,766	28,469	63,830	1,985,483	10,394,605
1973	398,867	38,935	97,531	1,025,724	7,296,692	28,813	39,275	782,096	9,707,932
1974	507,333	40,149	98,440	1,144,626	8,007,512	29,540	42,574	1,042,540	10,912,715
1975	679,873	40,598	106,683	1,197,000	9,388,571	31,236	48,190	1,555,688	13,047,839
1976	719,401	43,119	108,064	1,323,673	10,633,199	32,663	52,127	1,441,576	14,353,822
1977	579,665	39,036	112,534	1,367,237	10,947,502	34,430	54,232	1,137,532	14,272,167
1978	698,210	36,029	115,500	1,565,716	13,280,668	38,924	59,049	1,171,492	16,965,587
1979	781,527	47,872	114,232	1,668,783	15,357,216	43,061	70,641	1,725,436	19,808,768
1980	962,482	49,607	125,929	1,770,094	16,997,210	48,017	94,960	1,671,677	21,719,976
1981	1,211,421	83,973	134,147	2,430,626	22,599,536	66,491	100,654	2,282,712	28,909,561
1982	1,247,537	70,167	135,036	2,523,485	24,995,186	70,658	108,301	2,277,393	31,427,763
1983	1,181,806	52,517	149,180	2,084,871	24,641,630	75,438	87,449	506,684	28,779,574
1984	1,491,295	28,499	164,483	3,396,201	33,369,091	94,317	121,442	1,540,842	40,206,170
1985	1,767,100	129,929	184,883	3,891,023	39,338,822	117,579	139,523	2,815,576	48,384,435
1986	2,008,942	79,306	180,423	4,079,656	43,439,532	136,711	153,179	3,653,233	53,730,981
1987	1,884,148	95,224	179,850	4,570,657	42,711,287	137,328	151,420	3,746,121	53,476,034
1988	1,969,128	109,602	193,712	4,734,317	44,648,019	138,274	146,579	3,900,591	55,840,222
1989	2,123,784	101,729	187,891	4,677,170	46,839,923	137,082	166,406	4,381,976	58,615,961
1990	1,883,417	86,933	221,368	4,827,700	45,616,375	121,149	148,709	3,959,933	56,865,584
1991	1,688,663	80,222	220,258	4,535,666	37,492,030	103,904	134,719	3,500,943	47,756,406
1992	2,234,348	105,041	241,431	5,549,954	48,689,126	143,779	175,702	4,539,773	61,679,154
1993	2,456,503	120,044	264,933	5,805,843	54,590,293	161,518	195,267	5,293,627	68,888,028
1994	2,261,326	107,549	306,333	5,210,088	52,060,833	145,620	178,079	4,666,327	64,936,156
1995	2,857,787	115,466	304,270	6,621,268	60,520,989	180,796	210,412	5,525,161	76,336,150
1996	2,050,384	125,156	389,175	6,670,890	58,602,966	178,468	190,224	7,090,926	75,297,989
1997	2,671,647	100,561	276,653	6,521,730	62,217,616	138,112	212,224	4,713,057	82,105,643
1998	2,609,980	119,879	381,817	5,812,488	53,920,817	143,429	203,980	4,967,345	68,159,736
1999	2,667,386	134,281	366,550	6,378,154	56,834,412	181,841	215,956	7,276,595	74,055,175
2000	2,592,716	120,635	303,252	6,412,898	51,026,427	174,153	213,210	6,169,933	67,013,223
2001	3,260,205	145,481	327,961	6,008,079	58,222,708	192,128	259,055	6,433,655	74,849,271
2002	2,988,228	127,741	321,473	6,896,368	52,946,848	187,564	238,960	5,756,471	69,463,653
2003	3,033,856	131,388	339,996	7,207,195	55,515,288	202,248	237,846	6,063,242	72,731,059
2004	3,080,798	160,531	343,920	7,898,266	54,106,780	345,076	239,310	5,548,238	71,722,918
2005	3,679,962	171,513	356,712	7,271,558	65,146,096	671,560	241,814	6,476,091	84,015,306
2006	3,703,332	163,876	301,410	7,314,328	63,301,080	523,930	245,125	5,773,857	81,326,937
2007	3,471,327	163,792	346,758	7,959,746	62,217,616	631,722	261,650	6,050,140	81,002,749
2008	4,168,247	201,992	389,021	9,574,563	74,485,336	676,931	316,081	6,977,987	96,790,158
2009	5,199,337	250,857	421,926	11,711,199	89,722,814	821,148	393,385	8,517,325	117,037,992
2010	4,815,653	230,432	412,792	10,763,649	83,125,176	760,780	368,178	7,734,585	108,211,245
2011	4,749,969	226,995	421,700	10,827,232	82,866,899	757,310	373,898	7,624,961	107,848,963
2012	4,757,167	227,365	422,239	10,861,844	83,225,480	758,676	372,399	7,636,164	108,261,334
2013	4,837,498	231,333	422,893	12,741,557	84,417,299	771,500	381,812	7,763,077	111,566,789
2014	4,551,283	216,189	420,461	11,816,833	79,830,259	724,693	358,068	7,320,927	105,238,714
2015	4,648,650	221,037	417,387	11,963,131	81,239,526	740,215	367,233	7,474,375	107,071,554
2016	4,780,834	227,906	411,000	12,269,037	83,349,751	761,649	379,056	7,679,894	109,859,128
2017	4,653,262	221,305	396,938	11,778,563	81,296,040	740,957	367,881	7,481,308	106,936,254
2018	4,598,012	218,994	374,457	11,631,984	80,820,057	723,362	361,802	7,389,684	106,118,352
2019	4,766,712	227,482	365,600	11,995,835	83,383,148	749,716	376,713	7,654,768	109,519,994
2020	4,602,143	219,241	364,069	11,514,164	80,767,111	722,884	363,337	7,395,801	105,948,751
2021	4,596,813	218,916	363,121	11,483,700	80,690,808	721,809	362,561	7,388,005	105,825,733
2022	4,509,935	214,517	362,400	11,236,484	79,292,713	707,640	355,385	7,251,775	103,930,850
2023	4,567,406	217,531	361,709	11,380,489	80,186,919	716,953	360,866	7,340,895	105,132,767
2024	4,635,057	221,235	361,294	11,578,015	81,378,112	728,257	366,730	7,444,095	106,712,995
2025	4,442,834	211,574	361,052	11,127,747	78,559,066	697,445	348,743	7,141,939	102,890,401
2026	4,578,294	219,035	360,212	11,459,627	80,707,776	719,860	362,779	7,348,290	105,755,873
2027	4,525,009	215,876	360,561	11,315,460	79,793,404	710,640	357,009	7,269,276	104,547,234
2028	4,429,919	211,855	357,101	11,111,190	78,583,972	696,262	349,605	7,112,267	102,852,171
2029	4,421,429	211,130	357,208	11,073,100	78,357,048	694,424	348,493	7,101,903	102,564,735
2030	4,067,270	196,001	356,632	10,341,587	73,910,649	640,929	320,195	6,518,181	96,351,445
2031	3,989,252	191,909	356,014	10,141,940	72,734,117	627,773	312,607	6,397,112	94,750,724
2032	4,056,022	195,415	354,729	10,294,231	73,735,442	638,736	319,040	6,500,752	96,094,367
2033	4,136,311	199,611	355,034	10,602,909	75,291,955	651,884	324,040	6,625,221	98,186,965
2034	4,058,675	195,548	354,456	10,314,698	73,857,440	638,938	318,618	6,504,819	96,243,192
2035	4,124,629	199,003	353,091	10,600,133	75,097,309	649,306	323,153	6,607,138	97,953,762
TOTAL	197,244,087	9,548,606	19,096,146	475,123,623	3,654,071,284	25,647,079	15,515,472	342,626,975	4,738,873,273

TABLE B-23. Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	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	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,772	0	0	0	0	0	0	0	51,711	0
1964	63,539	27,438	16,286	4,368	37,145	1,142	28,427	8,202	82,782	34,973
1965	119,810	52,989	28,459	7,191	40,756	2,081	50,300	15,217	135,023	35,333
1966	217,978	101,232	51,184	12,474	73,129	3,752	90,369	27,670	232,426	61,445
1967	421,745	210,746	98,904	23,464	141,365	7,282	175,119	54,006	433,210	115,536
1968	743,770	491,202	176,688	41,496	251,125	12,866	311,125	95,438	781,930	208,864
1969	1,072,210	742,174	264,900	61,208	370,850	18,688	459,029	138,023	1,205,471	321,659
1970	1,395,411	942,159	371,728	89,673	519,163	25,223	633,101	184,783	1,777,649	467,431
1971	1,727,337	1,136,599	503,422	128,321	712,537	31,827	857,295	231,214	2,537,458	659,218
1972	2,207,351	1,381,721	682,096	185,824	989,700	43,760	1,179,479	287,548	3,757,581	950,089
1973	2,359,904	1,430,196	829,097	190,946	1,216,863	46,049	1,270,266	313,372	4,025,516	960,784
1974	2,480,655	1,525,719	853,731	204,028	1,256,738	48,922	1,329,140	331,627	4,462,696	1,104,245
1975	2,698,360	1,616,790	900,445	219,242	1,332,005	53,231	1,415,196	355,193	4,637,837	1,207,793
1976	3,162,808	1,653,503	958,179	232,081	1,424,703	57,721	1,491,513	381,199	4,837,349	1,278,480
1977	3,144,576	1,741,404	859,286	245,063	1,267,009	54,199	1,578,902	406,543	5,093,211	1,336,049
1978	3,592,565	1,874,512	1,058,836	255,418	1,567,751	56,795	1,626,161	419,949	5,090,895	1,373,766
1979	4,266,157	1,954,357	1,144,724	267,741	1,689,966	60,273	1,801,508	449,679	5,135,792	1,341,866
1980	4,950,456	2,092,773	1,254,546	295,300	1,890,349	67,594	1,973,536	498,972	5,646,551	1,484,871
1981	5,778,188	2,562,158	1,413,847	328,765	2,140,325	100,740	2,291,633	603,182	6,460,754	1,688,045
1982	5,537,026	2,725,248	1,499,972	346,669	2,284,051	82,284	2,266,386	641,909	6,751,715	1,929,385
1983	6,287,405	2,795,886	2,021,337	380,786	3,118,525	88,372	2,461,965	658,528	6,963,597	1,808,463
1984	7,662,769	3,874,645	3,123,607	497,530	4,874,874	96,480	2,727,369	727,732	8,052,068	2,597,938
1985	9,493,745	4,340,763	3,957,883	601,871	6,209,843	103,693	2,917,337	959,565	8,892,175	2,686,498
1986	9,461,919	4,976,242	4,418,531	647,576	6,954,134	130,208	3,100,878	1,223,753	9,141,638	3,398,233
1987	9,496,029	4,833,777	4,286,505	678,027	6,830,144	240,859	3,155,331	1,254,957	10,543,136	3,998,610
1988	9,094,367	5,020,573	4,343,583	704,352	6,996,687	158,832	3,329,497	1,044,110	11,093,980	3,270,823
1989	10,984,769	5,029,933	4,050,973	691,132	6,579,291	210,621	3,410,296	1,746,666	10,810,769	3,453,364
1990	12,376,227	5,497,992	4,745,014	729,168	7,663,400	331,158	3,641,164	1,953,805	11,721,704	4,220,945
1991	9,235,841	4,611,750	3,298,997	688,804	5,277,044	221,152	4,500,593	1,639,984	11,103,608	3,642,283
1992	11,791,946	5,800,432	3,452,415	612,831	5,529,109	174,984	5,478,681	1,532,224	11,142,805	3,993,763
1993	12,205,052	5,447,090	3,656,000	617,132	5,863,795	211,890	5,369,519	1,753,869	12,105,846	4,041,979
1994	14,273,855	6,013,545	3,681,573	694,352	5,904,427	277,998	6,320,377	2,090,620	12,730,316	4,776,992
1995	14,140,141	6,389,190	4,503,309	661,742	7,259,099	212,229	5,512,802	1,952,389	12,203,021	4,480,563
1996	14,566,548	6,620,327	7,455,778	710,580	12,127,573	208,342	5,610,423	2,300,101	12,729,472	4,598,694
1997	15,136,098	6,513,979	7,071,320	750,347	8,455,419	207,872	6,032,398	2,342,092	14,397,503	4,897,093
1998	13,675,269	6,147,343	6,170,078	717,166	6,979,253	209,222	7,636,684	1,950,236	14,302,951	4,179,636
1999	15,414,845	6,655,783	5,183,636	824,087	7,122,924	213,822	8,256,243	2,353,660	15,736,666	5,119,459
2000	14,840,895	10,291,031	3,644,461	795,374	5,564,450	186,799	8,219,101	2,086,398	15,534,114	4,266,456
2001	24,997,745	15,961,563	4,696,893	1,000,638	7,573,227	199,053	8,923,127	4,015,713	21,514,212	4,414,836
2002	16,463,221	13,234,778	3,965,191	966,628	6,366,369	182,322	8,104,437	3,419,582	22,466,211	5,843,641
2003	17,806,850	14,145,518	4,079,902	936,060	6,554,449	187,286	9,761,825	2,948,806	20,753,070	5,989,099
2004	18,491,080	15,280,708	4,662,074	1,028,599	6,523,155	195,699	9,821,287	3,153,599	24,819,674	5,376,077
2005	19,251,803	14,367,672	18,620,948	806,044	11,514,101	193,041	9,808,840	3,245,685	23,399,033	5,716,010
2006	20,160,336	14,068,306	30,880,089	831,299	11,454,222	192,575	12,382,080	3,093,669	23,097,397	5,598,635
2007	24,197,562	17,391,986	30,384,997	1,161,067	11,212,705	196,655	16,673,362	4,220,402	30,170,479	5,058,196
2008	28,167,122	20,061,165	38,627,191	1,738,559	14,152,021	592,588	18,013,272	5,398,550	40,300,059	7,704,059
2009	31,379,339	21,725,938	52,865,376	1,885,606	20,248,623	752,880	20,726,448	7,156,937	48,860,823	12,196,731
2010	27,713,157	19,861,893	50,921,038	1,722,191	17,730,842	673,600	18,484,055	6,117,841	43,112,964	10,639,960
2011	29,899,991	20,371,018	55,896,913	1,786,574	19,028,318	737,705	19,294,511	6,721,088	44,784,007	11,115,706
2012	31,304,291	21,212,737	57,891,397	1,865,578	19,727,825	768,306	19,904,207	7,004,158	46,133,655	11,501,363
2013	30,355,520	23,034,558	57,599,051	1,952,040	19,593,645	766,771	20,655,835	6,988,002	45,652,673	11,386,000
2014	41,098,389	27,994,393	51,899,801	2,168,671	17,598,045	680,729	26,935,164	6,191,401	41,981,645	10,317,063
2015	41,317,105	28,211,580	52,165,620	2,156,141	17,656,152	684,354	27,094,441	6,224,452	41,734,383	10,283,878
2016	42,696,456	29,086,034	53,511,564	2,246,675	18,187,315	706,717	28,013,266	6,433,231	43,268,151	10,672,261
2017	40,991,406	27,989,864	51,903,133	2,149,012	17,525,906	678,751	26,932,601	6,178,912	41,562,051	10,223,634
2018	42,068,125	28,425,045	52,676,502	2,193,377	17,828,087	695,769	27,712,459	6,344,567	42,201,626	10,404,668
2019	42,971,168	28,870,817	53,904,522	2,247,617	18,240,520	710,088	28,152,706	6,479,615	43,142,840	10,652,286
2020	40,802,057	27,341,197	50,818,444	2,112,746	17,159,383	673,403	26,829,674	6,148,596	40,576,372	9,974,652
2021	40,628,613	27,132,598	50,414,545	2,067,267	16,965,734	669,417	26,661,384	6,118,215	39,732,786	9,781,001
2022	39,549,236	26,247,755	48,806,622	2,018,172	16,442,114	651,553	25,918,028	5,955,491	38,787,101	9,507,683
2023	39,886,435	26,512,544	48,115,449	2,045,234	16,413,345	656,844	26,130,548	6,005,763	39,150,540	9,589,781
2024	40,707,723	26,996,867	49,104,492	2,063,945	16,739,640	670,139	26,574,728	6,130,026	39,481,699	9,715,008
2025	39,985,044	26,380,975	48,020,698	2,028,278	16,403,143	658,210	26,143,638	6,022,406	38,852,625	9,538,510
2026	40,336,757	26,634,959	48,691,901	2,056,739	16,557,750	663,753	26,307,002	6,076,529	39,225,846	9,622,650
2027	40,161,115	26,352,863	47,881,560	2,026,734	16,387,419	661,022	26,208,849	6,048,955	38,746,408	9,518,837
2028	39,618,795	26,114,687	47,540,365	1,985,475	16,160,671	651,832	25,819,284	5,970,360	37,932,898	9,313,935
2029	39,502,036	25,799,612	47,405,720	2,009,052	16,153,201	650,012	25,753,244	5,951,985	38,390,891	9,396,020
2030	38,080,259	24,174,357	45,795,147	1,923,594	15,482,837	625,644	24,674,463	5,749,021	36,688,766	8,941,184
2031	37,830,687	23,773,257	45,599,710	1,865,115	15,314,619	621,558	24,566,506	5,711,975	35,678,914	8,719,586
2032	37,873,487	24,052,330	45,309,677	1,907,790	15,357,424	622,222	24,511,160	5,718,747	36,459,772	8,881,567
2033	40,345,873	25,472,495	48,187,278	2,003,078	16,308,756	662,398	26,182,404	6,092,631	38,040,919	9,355,437
2034	38,174,604	24,108,533	45,847,027	1,897,801	15,475,567	627,076	24,759,415	5,767,761	36,293,859	8,870,696
2035	40,932,620	25,236,525	48,699,380	2,056,261	16,473,841	671,827	26,376,015	6,185,186	38,916,433	9,538,531
TOTAL	1,461,857,347	938,750,326	1,585,421,548	77,951,791	677,026,493	24,520,562	879,319,406	232,003,909	1,574,343,712	400,449,935

TABLE B-23. Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City Yuba City	County of Butte	Plumas of FC&WCD	Total County		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,539	0	776,021	0	0	0	0	12,626	1,626,150
1964	21,728	1,260,042	9,374	1,595,448	0	0	0	0	13,938	2,802,244
1965	21,859	2,179,810	17,760	2,706,589	0	0	405	405	28,937	4,801,023
1966	37,952	3,898,819	33,415	4,841,844	0	0	564	564	31,321	7,382,540
1967	17,260	7,691,085	68,133	9,511,856	0	0	562	562	47,718	13,034,327
1968	128,877	15,313,065	142,760	18,699,207	0	1,050	1,439	2,489	46,945	25,514,327
1969	198,704	23,145,744	215,144	28,213,803	0	1,225	4,119	5,344	52,963	36,857,938
1970	289,546	30,607,434	273,523	37,576,825	0	3,848	17,111	20,959	69,744	48,324,741
1971	409,205	39,946,463	342,325	49,223,221	0	4,546	19,182	23,728	55,532	61,491,771
1972	537,044	54,976,817	422,192	67,601,183	0	4,929	21,145	26,074	80,412	83,721,433
1973	587,814	59,575,172	435,541	73,241,520	0	7,059	21,772	28,831	54,219	88,646,338
1974	611,275	65,991,774	455,447	80,655,995	0	8,336	22,403	30,739	76,783	97,592,671
1975	644,464	71,813,105	478,284	87,371,944	0	9,416	23,517	32,933	84,547	106,497,678
1976	668,153	74,889,946	475,466	91,511,101	0	7,004	23,251	30,255	106,717	112,423,153
1977	696,350	73,320,946	506,941	90,250,479	0	16,917	24,054	40,971	98,618	111,029,507
1978	708,874	81,933,455	523,053	100,082,029	0	12,635	24,219	36,854	100,786	124,070,544
1979	712,699	83,583,809	526,278	102,934,849	0	16,575	28,346	44,921	119,352	130,887,169
1980	862,108	93,010,922	583,496	114,611,472	0	19,834	26,556	46,390	178,812	144,503,019
1981	946,788	112,152,065	672,397	137,138,887	0	21,682	34,558	56,240	185,347	175,053,366
1982	1,021,156	117,123,623	727,476	142,936,899	0	16,117	43,111	59,228	173,894	184,122,241
1983	1,076,102	118,970,809	854,111	147,485,886	0	15,202	29,405	44,607	220,926	185,771,614
1984	1,211,437	156,252,901	933,156	192,632,507	20,590	15,442	31,790	67,822	225,959	245,208,560
1985	1,287,602	194,946,283	993,495	237,390,754	24,050	16,976	32,399	73,425	340,322	301,104,103
1986	1,344,580	218,310,580	1,058,119	264,166,392	31,753	18,145	33,591	83,489	279,227	334,046,131
1987	1,379,421	204,838,227	1,056,160	251,991,183	37,071	17,794	33,378	88,243	345,116	324,127,192
1988	1,465,634	221,645,738	1,123,943	269,292,117	48,058	19,117	33,600	100,775	365,207	345,915,928
1989	1,505,285	230,306,788	1,232,220	280,102,107	61,184	20,809	37,183	119,176	422,329	360,811,060
1990	1,624,564	277,172,964	1,855,829	333,533,934	66,041	20,855	36,807	123,703	474,284	415,156,290
1991	1,720,675	221,864,964	1,549,791	269,355,486	180,212	22,526	42,194	244,932	214,683	339,261,475
1992	1,779,694	245,343,167	1,503,314	297,835,364	208,216	26,028	43,511	277,755	443,676	384,299,583
1993	1,943,123	219,215,370	1,551,085	273,981,750	209,613	26,203	47,582	283,398	599,571	370,267,702
1994	1,919,993	257,342,564	1,474,900	317,500,912	201,284	25,161	46,074	272,519	609,966	412,371,368
1995	1,982,578	225,839,767	1,568,231	286,705,060	216,944	27,118	50,016	294,078	534,971	394,819,838
1996	1,651,010	235,386,436	1,622,470	305,587,754	217,250	27,156	56,618	301,024	571,857	423,571,306
1997	1,759,496	245,429,286	1,777,095	314,769,997	236,300	29,847	59,910	326,057	428,638	438,478,767
1998	1,952,117	227,219,125	1,797,346	292,936,426	128,021	29,927	53,588	211,536	465,095	416,715,858
1999	2,268,577	254,701,324	1,866,824	325,717,850	254,675	31,834	57,951	344,460	559,471	461,596,659
2000	2,568,371	253,885,149	1,968,875	323,851,473	262,163	79,001	61,071	402,235	0	454,499,602
2001	3,554,006	444,807,534	2,263,314	543,921,860	261,699	93,471	62,424	417,594	0	692,715,332
2002	4,965,846	335,679,236	2,308,016	623,965,477	266,107	95,018	64,666	425,791	0	571,997,439
2003	6,091,303	362,979,799	2,324,968	454,558,935	262,547	93,638	68,952	425,137	0	601,797,664
2004	6,576,913	407,038,943	2,550,329	505,518,137	260,408	93,662	29,281	383,351	0	650,981,536
2005	6,932,726	381,985,133	2,075,278	497,916,315	267,244	39,477	28,805	335,526	0	655,704,191
2006	7,456,249	363,839,305	2,058,570	495,112,731	272,993	40,686	79,797	393,476	0	649,928,264
2007	8,395,922	452,401,599	2,597,589	604,062,162	301,929	44,023	49,150	395,102	0	765,504,307
2008	10,877,547	586,680,354	5,077,631	777,480,118	328,871	811,214	90,136	1,230,221	1	966,697,109
2009	14,411,183	644,993,997	6,862,950	884,096,632	398,322	987,354	107,537	1,493,213	2	1,108,175,349
2010	13,045,442	560,541,189	5,885,378	776,449,550	395,874	980,021	108,742	1,484,637	0	986,954,880
2011	13,418,746	591,238,192	6,213,072	820,505,842	400,033	981,283	115,311	1,496,627	0	1,032,565,569
2012	13,649,319	611,248,479	6,463,807	848,675,123	400,099	981,303	118,089	1,499,491	0	1,061,839,316
2013	13,335,921	597,288,102	6,478,447	834,986,566	403,262	982,263	121,978	1,507,503	0	1,051,615,285
2014	12,460,490	578,038,356	5,843,290	823,207,437	405,542	982,955	125,649	1,514,146	0	1,031,293,940
2015	12,396,358	580,339,629	5,878,794	826,142,885	408,852	983,960	129,518	1,522,330	0	1,036,338,386
2016	12,626,389	598,544,845	6,070,468	852,063,372	409,532	984,166	132,975	1,526,673	0	1,065,600,721
2017	12,355,079	575,484,665	5,823,533	819,798,547	408,535	983,863	132,731	1,525,129	0	1,029,163,662
2018	12,473,956	583,004,905	5,943,219	831,972,307	400,620	981,461	130,769	1,512,850	0	1,039,413,581
2019	12,605,825	593,329,324	6,029,839	847,337,168	405,252	982,867	129,285	1,517,404	0	1,059,560,902
2020	12,212,207	559,085,704	5,698,871	799,433,305	400,207	981,336	116,115	1,497,658	0	1,005,783,926
2021	12,094,277	551,528,106	5,646,202	789,440,146	400,844	981,529	115,449	1,497,822	0	995,724,507
2022	11,937,230	533,662,330	5,455,494	764,938,810	398,837	980,920	113,563	1,493,320	0	968,120,543
2023	11,982,675	537,237,955	5,512,492	769,239,605	398,791	980,906	113,551	1,493,248	0	973,896,604
2024	12,058,285	546,566,695	5,625,124	782,434,369	396,529	980,220	112,989	1,489,738	0	989,449,124
2025	11,962,758	533,349,680	5,501,658	764,847,625	391,109	978,575	111,648	1,481,332	0	966,432,897
2026	12,034,997	540,464,945	5,569,985	774,243,812	386,099	977,054	110,395	1,473,548	0	979,074,374
2027	11,950,981	531,146,768	5,491,197	762,582,459	391,030	978,551	111,632	1,481,213	0	966,067,326
2028	11,872,735	530,183,380	5,482,988	758,647,404	378,163	974,646	108,425	1,461,234	0	958,960,875
2029	11,913,442	523,361,675	5,395,988	751,682,879	381,941	975,792	109,366	1,467,099	0	951,714,107
2030	11,810,871	497,253,196	5,159,396	716,358,735	335,746	961,773	97,916	1,395,435	0	904,747,321
2031	11,669,875	486,221,667	5,067,224	702,640,693	335,746	961,773	97,926	1,395,445	0	888,710,325
2032	11,774,239	495,967,332	5,138,392	713,574,140	335,746	961,773	97,905	1,395,424	0	901,630,281
2033	12,054,938	520,408,278	5,447,403	750,561,891	335,746	961,773	97,915	1,395,434	0	941,968,280
2034	11,762,763	494,288,993	5,144,383	713,018,478	335,746	961,773	97,913	1,395,432	0	901,205,719
2035	12,172,116	523,172,764	5,420,569	755,852,072	335,746	961,773	97,902	1,395,421	0	945,232,710
TOTAL	428,509,722	23,275,139,130	208,201,831	31,763,495,711	14,999,172	28,303,166	4,659,389	47,961,727	8,723,731	40,464,251,460

TABLE B-24. Equivalent Unit Charge for Water Supply for Each Contractor (a)

(in dollars per acre-foot)

Project Service Area and Water Supply Contractor	Transportation Charge					Delta Water Charge	Water System Revenue Bond Surcharge	Total Equivalent Unit Charge
	Capital Cost Component	Minimum OMP&R Component	Off-Aqueduct Component	Variable OMP&R Component	Total			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
FEATHER RIVER AREA								
City of Yuba City	0.00	0.00	0.00	0.00	0.00	74.62	9.84	84.45
County of Butte	0.00	0.00	0.00	0.00	0.00	38.50	0.91	39.41
Plumas County Flood Control and Water Conservation District	26.54	3.53	0.00	0.00	30.07	36.98	5.05	72.11
Feather River Area	2.88	0.38	0.00	0.00	3.26	46.49	3.37	53.12
NORTH BAY AREA								
Napa County Flood Control and Water Conservation District	142.85	46.23	4.34	17.62	211.04	24.68	11.88	247.61
Solano County Water Agency	86.94	37.02	4.85	11.36	140.17	31.06	10.88	182.12
North Bay Area	107.79	40.45	4.66	13.70	166.60	28.69	11.25	206.53
SOUTH BAY AREA								
Alameda County Flood Control and Water Conservation District, Zone 7	37.69	42.20	7.96	25.79	113.64	29.98	7.70	151.33
Alameda County Water District	25.22	27.64	7.05	18.12	78.02	23.76	4.54	106.33
Santa Clara Valley Water District	22.35	20.39	6.41	13.55	62.71	16.77	3.27	82.75
South Bay Area	25.62	25.56	6.80	16.54	74.52	20.34	4.29	99.15
SAN JOAQUIN VALLEY AREA								
County of Kings	5.16	5.94	3.38	10.22	24.70	23.66	3.61	51.97
Dudley Ridge Water District	5.13	5.04	3.16	6.23	19.56	17.60	2.29	39.45
Empire West Side Irrigation District	2.02	4.33	2.40	5.59	14.34	18.83	1.76	34.93
Kern County Water Agency	9.30	9.73	4.83	8.48	32.34	20.63	2.42	55.39
Oak Flat Water District	2.02	2.42	1.95	3.83	10.22	17.33	1.75	29.30
Tulare Lake Basin Water Storage District	5.26	5.02	3.10	5.74	19.12	17.98	2.21	39.31
San Joaquin Valley Area	8.58	8.92	4.54	5.81	27.85	18.16	2.24	48.25
CENTRAL COASTAL AREA								
San Luis Obispo County Flood Control and Water Conservation District	178.31	91.08	13.70	128.27	411.36	69.00	22.40	502.76
Santa Barbara County Flood Control and Water Conservation District	774.86	132.53	17.68	113.08	1,038.15	56.34	56.26	1,150.75
Central Coastal Area	592.12	119.83	16.46	117.73	846.15	60.22	45.89	952.25
SOUTHERN CALIFORNIA AREA								
Antelope Valley-East Kern Water Agency	48.29	45.49	28.67	89.53	211.97	38.50	8.49	258.96
Castaic Lake Water Agency	53.05	47.73	22.46	61.56	184.80	33.32	13.48	231.60
Coachella Valley Water District	63.13	53.62	36.04	110.91	263.70	25.17	9.74	298.60
Crestline-Lake Arrowhead Water Agency	121.20	101.86	31.95	115.85	370.86	50.77	16.00	437.62
Desert Water Agency	46.24	42.46	48.20	62.47	199.38	22.38	6.72	228.47
Little Rock Creek Irrigation District	62.70	58.25	27.35	104.57	252.87	48.45	10.61	311.93
Mojave Water Agency	110.87	119.34	23.97	182.21	436.39	73.40	23.40	533.18
Palmdale Water District	52.55	51.48	35.95	119.14	259.11	46.65	9.47	315.23
San Bernardino Valley Municipal Water District	179.78	134.09	26.48	112.45	452.81	57.74	19.22	529.77
San Gabriel Valley Municipal Water District	99.65	85.83	41.07	77.04	303.59	40.13	12.83	356.55
San Geronio Pass Water Agency	605.10	253.93	30.02	248.29	1,137.34	67.60	13.99	1,218.93
The Metropolitan Water District of Southern California	79.17	60.15	35.18	61.52	236.02	35.17	10.30	281.49
Ventura County Watershed Protection District	144.59	112.58	21.04	147.08	425.29	68.88	21.18	515.35
Southern California Area	73.87	57.21	31.82	63.52	226.42	34.49	9.97	270.88
ALL AREAS	48.52	36.32	18.93	38.19	141.96	28.11	6.83	176.90

a) Hypothetical charges, which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water 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, 4.608 percent per annum.

TABLE B-25. Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach (a)

(in dollars per acre-foot)

Aqueduct Reach	Unit Costs of Reach (b)						Cumulative Unit Costs from the Delta					
	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
NBA												
1	39.57	14.04	13.11	2.00	2.00	70.72	39.57	14.04	13.11	2.00	2.00	70.72
2	42.12	14.94	5.73	0.00	0.00	62.79	81.69	28.98	18.84	2.00	2.00	133.51
3A	7.51	2.66	11.39	3.84	3.24	28.64	89.20	31.64	30.23	5.84	5.24	162.15
3B	48.29	17.13	25.76	3.20	7.19	101.57	129.98	46.11	44.60	5.20	9.19	235.08
SBA												
1	6.92	2.45	15.36	5.20	7.50	37.43	8.85	3.13	18.38	7.68	11.00	49.04
2	0.65	0.23	1.74	0.00	0.00	2.62	9.50	3.36	20.12	7.68	11.00	51.66
4	2.18	0.77	2.96	0.00	0.00	5.91	11.68	4.13	23.08	7.68	11.00	57.57
5	4.57	1.62	2.32	0.00	0.00	8.51	16.25	5.75	25.40	7.68	11.00	66.08
6	0.26	0.09	0.24	0.00	0.00	0.59	16.51	5.84	25.64	7.68	11.00	66.67
7	2.02	0.72	0.45	0.00	0.00	3.19	18.53	6.56	26.09	7.68	11.00	69.86
8	2.75	0.98	0.75	0.00	0.00	4.48	21.28	7.54	26.84	7.68	11.00	74.34
9	5.68	2.02	2.79	0.00	0.00	10.49	26.96	9.56	29.63	7.68	11.00	84.83
CA												
1	1.93	0.68	3.02	2.48	3.50	11.61	1.93	0.68	3.02	2.48	3.50	11.61
2A	1.23	0.44	0.60	0.00	0.00	2.27	3.16	1.12	3.62	2.48	3.50	13.88
2B	0.63	0.22	0.30	0.00	0.00	1.15	3.79	1.34	3.92	2.48	3.50	15.03
3	0.55	0.20	0.22	0.00	0.00	0.97	4.34	1.54	4.14	2.48	3.50	16.00
4	0.87	0.31	1.50	1.18	1.58	5.44	5.21	1.85	5.64	3.66	5.08	21.44
5	0.67	0.24	0.30	0.00	0.00	1.21	5.88	2.09	5.94	3.66	5.08	22.65
6	0.17	0.06	0.15	0.00	0.00	0.38	6.05	2.15	6.09	3.66	5.08	23.03
7	1.01	0.36	0.36	0.00	0.00	1.73	7.06	2.51	6.45	3.66	5.08	24.76
8C	0.02	0.01	0.06	0.00	0.00	0.09	7.08	2.52	6.51	3.66	5.08	24.85
8D	0.39	0.14	0.29	0.00	0.00	0.82	7.47	2.66	6.80	3.66	5.08	25.67
9	0.33	0.12	0.27	0.00	0.00	0.72	7.80	2.78	7.07	3.66	5.08	26.39
10A	0.35	0.12	0.35	0.00	0.00	0.82	8.15	2.90	7.42	3.66	5.08	27.21
11B	0.51	0.18	0.22	0.00	0.00	0.91	8.66	3.08	7.64	3.66	5.08	28.12
12D	0.48	0.17	0.20	0.00	0.00	0.85	9.14	3.25	7.84	3.66	5.08	28.97
12E	0.34	0.12	0.34	0.00	0.00	0.80	9.48	3.37	8.18	3.66	5.08	29.77
13B	0.72	0.26	0.39	0.00	0.00	1.37	10.20	3.63	8.57	3.66	5.08	31.14
14A	2.79	0.99	3.03	2.05	2.98	11.84	12.99	4.62	11.60	5.71	8.06	42.98
14B	0.44	0.16	0.37	0.00	0.00	0.97	13.43	4.78	11.97	5.71	8.06	43.95
5	0.37	0.13	0.28	0.00	0.00	0.78	13.80	4.91	12.25	5.71	8.06	44.73
15A	2.06	0.73	3.16	2.48	3.24	11.67	15.86	5.64	15.41	8.19	11.30	56.40
16A	3.42	1.21	4.90	5.38	7.56	22.47	19.28	6.85	20.31	13.57	18.86	78.87
17E	11.53	4.09	13.76	18.81	27.90	76.09	30.81	10.94	34.07	32.38	46.76	154.96
17F	2.99	1.06	0.17	0.00	0.00	4.22	33.80	12.00	34.24	32.38	46.76	159.18
18A	2.68	0.95	1.65	0.00	-2.93	2.35	36.48	12.95	35.89	32.38	43.83	161.53
19	1.98	0.70	1.00	0.00	0.00	3.68	38.46	13.65	36.89	32.38	43.83	165.21
19C	2.16	0.77	0.00	0.00	0.00	2.93	40.62	14.42	36.89	32.38	43.83	168.14
20A	1.58	0.56	1.65	0.00	0.00	3.79	42.20	14.98	38.54	32.38	43.83	171.93
20B	1.91	0.68	1.09	0.00	0.00	3.68	44.11	15.66	39.63	32.38	43.83	175.61
21	0.97	0.34	0.76	0.00	0.00	2.07	45.08	16.00	40.39	32.38	43.83	177.68
22A	1.01	0.36	0.39	0.00	0.00	1.76	46.09	16.36	40.78	32.38	43.83	179.44
22B	9.89	3.51	10.65	5.83	9.20	39.08	55.98	19.87	51.43	38.21	53.03	218.52
23	2.72	0.96	0.73	0.00	-3.74	0.67	58.70	20.83	52.16	38.21	49.29	219.19
24	5.27	1.87	2.07	0.00	0.00	9.21	63.97	22.70	54.23	38.21	49.29	228.40
25	3.84	1.36	0.12	0.00	0.00	5.32	67.81	24.06	54.35	38.21	49.29	233.72
26A	4.20	1.49	6.90	0.00	-25.51	(12.92)	72.01	25.55	61.25	38.21	43.78	220.80
28G	7.82	2.77	2.61	0.00	0.00	13.20	79.83	28.32	63.86	38.21	23.78	234.00
28H	7.53	2.67	2.74	0.00	0.00	12.94	87.36	30.99	66.60	38.21	23.78	246.94
28J	84.42	29.95	38.05	0.00	0.00	152.42	171.78	60.94	104.65	38.21	23.78	399.36
EBX												
1	N/A	0.00	0.04	0.00	0.00	0.04	N/A	25.55	61.29	38.21	23.78	148.83
2A	N/A	0.00	0.21	4.22	0.00	4.43	N/A	25.55	61.51	42.43	23.78	153.27
2B	N/A	0.00	43.67	0.00	30.18	73.85	N/A	25.55	105.18	42.43	53.96	227.12
2C	N/A	0.00	0.34	0.00	0.00	0.34	N/A	25.55	105.52	42.43	53.96	227.46
2D	N/A	0.00	0.11	0.00	0.00	0.11	N/A	25.55	105.63	42.43	53.96	227.57
2E	N/A	0.00	0.00	0.00	0.00	0.00	N/A	25.55	105.63	42.43	53.96	227.57
3A	N/A	0.00	37.11	5.19	38.93	81.23	N/A	25.55	142.74	47.62	92.89	308.80
3B	N/A	0.00	1.50	0.00	0.00	1.50	N/A	25.55	144.24	47.62	92.89	310.30
4A	N/A	0.00	0.83	0.00	0.00	0.83	N/A	25.55	145.07	47.62	92.89	311.13
4B	N/A	0.00	10.60	1.05	8.04	19.69	N/A	25.55	155.66	48.67	100.93	330.82
WB												
29A	3.92	1.39	7.90	2.42	3.28	18.91	37.72	13.39	42.14	34.80	50.04	178.09
29F	2.86	1.01	0.95	0.00	0.00	4.82	40.58	14.40	43.09	34.80	50.04	182.91
29G	9.49	3.37	4.49	0.00	-11.79	5.56	50.07	17.77	47.58	34.80	38.25	188.47
29H	5.91	2.10	4.26	0.00	0.00	12.27	55.98	19.87	51.84	34.80	38.25	200.74
29J	9.91	3.52	1.22	0.00	-22.06	(7.41)	65.89	23.39	53.06	34.80	16.19	193.33
30	15.90	5.64	3.82	0.00	0.00	25.36	81.79	29.03	56.88	34.80	16.19	218.69
CB												
31A	7.19	2.55	18.04	1.96	2.82	32.56	14.66	5.21	24.84	5.62	7.90	58.23
33A	268.68	95.32	34.02	12.39	36.84	447.25	283.34	100.53	58.86	18.01	44.74	505.48
34	191.96	68.10	0.95	0.00	0.00	261.01	475.30	168.63	59.81	18.01	44.74	766.49
35	0.00	0.00	0.00	0.00	0.00	0.00	475.30	168.63	59.81	18.01	44.74	766.49

a) Representative of transportation unit costs only; does not include a unit cost of conservation. The Delta Water Rate should be added to these values in order to approximate unit costs at canal-side.

Includes surplus water prior to May 1, 1973.

b) Hypothetical charges which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water 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 4.608 percent per annum.

c) The Water System Revenue Bond Surcharge equivalent unit rate is calculated by multiplying Column 1 by the ratio of the 2009 WSRB surcharge to the sum of the Transportation Capital and the Capital component of the Delta Water Charge.

TABLE B-26. Capital Costs of Each Aqueduct Reach to Be Reimbursed through the Capital Cost Component of the East Branch Enlargement Transportation Charge

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[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	970,000	146,000
1986	784,000	4,477,000	3,144,000	2,234,000	1,569,000	1,203,000	1,808,000	34,000
1987	11,000	951,000	1,076,000	666,000	399,000	47,000	16,421,000	43,000
1988	1,000	125,000	1,681,000	1,730,000	2,024,000	40,000	13,326,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,242,000	229,000
1990	1,000	577,000	903,000	735,000	928,000	194,000	20,131,000	887,000
1991	1,000	280,000	413,000	333,000	422,000	93,000	20,702,000	1,215,000
1992	0	40,000	41,000	39,000	35,000	13,000	9,599,000	3,719,000
1993	0	19,000	16,000	19,000	12,000	6,000	2,319,000	19,654,000
1994	0	2,000	3,000	2,000	4,000	3,000	803,000	3,173,000
1995	0	0	0	0	0	0	223,000	1,465,000
1996	0	0	0	0	0	0	6,014,000	478,000
1997	0	0	0	0	0	0	404,000	1,327,000
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	5,841,000	7,112,000	9,441,000	8,476,000	8,762,000	2,363,000	104,758,000	38,830,000

**TABLE B-26. Capital Costs of Each Aqueduct Reach
to Be Reimbursed through the Capital Cost Component
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							GRAND TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Total	Reach 25	Reach 26A	Reach 26B	Total	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
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	3,825,000	0	528,000	89,000	617,000	4,442,000
1986	25,000	0	15,278,000	0	1,926,000	154,000	2,080,000	17,358,000
1987	178,000	0	19,792,000	0	3,699,000	437,000	4,136,000	23,928,000
1988	632,000	0	19,629,000	0	5,667,000	3,329,000	8,996,000	28,625,000
1989	1,130,000	0	19,641,000	0	40,879,000	1,650,000	42,529,000	62,170,000
1990	2,066,000	0	26,422,000	0	29,853,000	1,650,000	31,503,000	57,925,000
1991	4,980,000	0	28,439,000	0	26,027,000	999,000	27,026,000	55,465,000
1992	11,920,000	0	25,406,000	0	15,317,000	299,000	15,616,000	41,022,000
1993	16,303,000	0	38,348,000	0	4,878,000	0	4,878,000	43,226,000
1994	7,081,000	0	11,071,000	0	3,151,000	0	3,151,000	14,222,000
1995	5,350,000	0	7,038,000	0	2,137,000	0	2,137,000	9,175,000
1996	1,706,000	0	8,198,000	0	9,181,000	0	9,181,000	17,379,000
1997	1,905,000	0	3,636,000	0	175,000	0	175,000	3,811,000
1998	28,000	0	28,000	0	0	0	0	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	53,304,000	0	238,887,000	0	143,418,000	8,607,000	152,025,000	390,912,000

TABLE B-27. Minimum OMP&R Costs of Each Aqueduct Reach to Be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[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	1,048,625	0
1995	0	0	0	0	0	0	953,814	0
1996	0	0	0	0	0	0	1,171,411	0
1997	0	0	0	0	0	0	1,110,038	0
1998	0	0	0	0	0	0	1,213,002	0
1999	1,229	517	646	409	383	169	668,466	0
2000	4,452	1,875	2,340	1,484	1,386	614	1,315,920	0
2001	347	146	183	116	108	48	1,045,627	0
2002	1,639	690	861	546	510	226	1,539,859	0
2003	0	0	0	0	0	0	1,813,951	0
2004	2,132	27,868	18,579	18,731	10,355	8,528	1,485,104	0
2005	1,243	16,250	10,833	10,922	6,038	4,973	1,046,391	0
2006	4,629	60,508	40,339	40,669	22,484	18,516	1,724,957	0
2007	13,120	171,503	114,335	115,273	63,728	52,482	2,012,220	0
2008	0	0	0	0	0	0	1,849,286	0
2009	0	0	0	0	0	0	2,033,862	0
2010	0	0	0	0	0	0	2,095,051	0
2011	0	0	0	0	0	0	2,095,051	0
2012	0	0	0	0	0	0	2,095,051	0
2013	0	0	0	0	0	0	2,095,051	0
2014	0	0	0	0	0	0	2,095,051	0
2015	0	0	0	0	0	0	2,095,051	0
2016	0	0	0	0	0	0	2,095,051	0
2017	0	0	0	0	0	0	2,095,051	0
2018	0	0	0	0	0	0	2,095,051	0
2019	0	0	0	0	0	0	2,095,051	0
2020	0	0	0	0	0	0	2,095,051	0
2021	0	0	0	0	0	0	2,095,051	0
2022	0	0	0	0	0	0	2,095,051	0
2023	0	0	0	0	0	0	2,095,051	0
2024	0	0	0	0	0	0	2,095,051	0
2025	0	0	0	0	0	0	2,095,051	0
2026	0	0	0	0	0	0	2,095,051	0
2027	0	0	0	0	0	0	2,095,051	0
2028	0	0	0	0	0	0	2,095,051	0
2029	0	0	0	0	0	0	2,095,051	0
2030	0	0	0	0	0	0	2,095,051	0
2031	0	0	0	0	0	0	2,095,051	0
2032	0	0	0	0	0	0	2,095,051	0
2033	0	0	0	0	0	0	2,095,051	0
2034	0	0	0	0	0	0	2,095,051	0
2035	0	0	0	0	0	0	2,095,051	0
TOTAL	28,791	279,357	188,116	188,150	104,992	85,556	76,503,859	0

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

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Subtotal	Reach 25	Reach 26A (a)	Reach 26B	Subtotal	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
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	1,048,625	0	1,713,260	0	1,713,260	2,761,885
1995	0	0	953,814	0	1,452,549	0	1,452,549	2,406,363
1996	0	0	1,171,411	0	1,350,581	0	1,350,581	2,521,992
1997	679,826	0	1,789,864	0	1,528,509	0	1,528,509	3,318,373
1998	825,038	0	2,038,040	0	1,619,068	0	1,619,068	3,657,108
1999	382,178	0	1,053,997	0	956,229	0	956,229	2,010,226
2000	735,803	0	2,063,874	0	1,409,109	0	1,409,109	3,472,983
2001	812,634	0	1,859,209	0	811,400	0	811,400	2,670,609
2002	727,751	0	2,272,082	0	1,143,205	0	1,143,205	3,415,287
2003	899,739	0	2,713,690	0	1,248,051	0	1,248,051	3,961,741
2004	913,701	0	2,484,998	0	1,815,458	0	1,815,458	4,300,456
2005	1,036,778	0	2,133,428	0	1,863,002	0	1,863,002	3,996,430
2006	827,315	0	2,739,417	0	1,871,748	0	1,871,748	4,611,165
2007	1,366,626	0	3,909,287	0	2,628,721	0	2,628,721	6,538,008
2008	1,158,641	0	3,007,927	0	2,428,184	0	2,428,184	5,436,111
2009	1,213,983	0	3,247,845	0	2,868,402	0	2,868,402	6,116,247
2010	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2011	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2012	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2013	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2014	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2015	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2016	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2017	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2018	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2019	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2020	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2021	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2022	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2023	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2024	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2025	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2026	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2027	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2028	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2029	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2030	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2031	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2032	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2033	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2034	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
2035	1,267,105	0	3,362,156	0	2,905,697	0	2,905,697	6,267,853
TOTAL	44,524,743	0	121,903,564	0	102,255,601	0	102,255,601	224,159,165

a) Units 3 and 4 at Devil Canyon Powerplant were operational in 1993.

**TABLE B-28. Capital Costs of East Branch Enlargement
Transportation Facilities Allocated to Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	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	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	11,731	1,010	10,566	466	0	93,227	117,000
1980	0	28,241	4,708	27,495	797	0	212,759	274,000
1981	0	56,134	16,676	61,271	538	0	385,381	520,000
1982	0	326,180	76,872	337,913	5,988	0	2,342,047	3,089,000
1983	0	554,658	138,964	582,070	9,004	0	3,940,304	5,225,000
1984	0	306,514	68,842	314,468	2,928	0	2,218,248	2,911,000
1985	49,675	447,266	65,773	347,262	4,514	21,614	3,505,896	4,442,000
1986	185,353	1,757,633	236,324	1,363,586	41,900	78,842	13,694,362	17,358,000
1987	49,735	2,455,279	378,535	1,774,447	10,615	151,421	19,107,968	23,928,000
1988	124,534	2,689,959	500,466	1,712,431	13,783	231,982	23,351,845	28,625,000
1989	155,446	7,118,094	2,423,000	1,671,088	17,419	1,673,409	49,111,544	62,170,000
1990	62,786	6,459,229	1,943,918	2,234,452	8,680	1,222,053	45,993,882	57,925,000
1991	28,686	6,265,822	1,875,066	2,168,712	4,024	1,065,433	44,057,257	55,465,000
1992	2,911	4,826,764	1,610,921	1,359,335	471	627,012	32,594,586	41,022,000
1993	1,205	5,094,237	1,828,410	2,722,156	212	199,684	33,380,096	43,226,000
1994	273	1,726,376	631,816	478,543	27	128,988	11,255,977	14,222,000
1995	0	1,130,963	423,243	206,978	0	87,480	7,326,336	9,175,000
1996	0	2,025,987	645,296	606,205	0	375,830	13,725,682	17,379,000
1997	0	451,011	154,366	205,796	0	7,164	2,992,663	3,811,000
1998	0	3,551	1,293	0	0	0	23,156	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
TOTAL	660,604	43,735,629	13,025,499	18,184,774	121,366	5,870,912	309,313,216	390,912,000

TABLE B-29. Capital Cost Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	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 (a)	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[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	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,628,706	782,890	1,092,986	7,295	0	18,591,099	23,142,681
1995	39,632	2,623,828	781,438	1,090,958	7,281	0	18,556,603	23,099,740
1996	39,825	2,636,667	785,261	1,096,296	7,317	0	18,647,406	23,212,772
1997	41,743	2,763,629	823,074	1,149,085	7,669	0	19,545,322	24,330,522
1998	42,642	2,823,126	840,793	1,173,823	7,834	0	19,966,108	24,854,326
1999	44,738	2,961,887	882,120	1,231,519	8,219	0	20,947,475	26,075,958
2000	49,031	3,246,109	966,768	1,349,695	9,008	0	22,957,586	28,578,197
2001	49,048	3,247,263	967,111	1,350,175	9,011	0	22,965,748	28,588,356
2002	47,894	3,170,848	944,353	1,318,402	8,799	0	22,425,319	27,915,615
2003	40,711	2,695,262	802,713	1,120,659	7,479	0	19,061,812	23,728,636
2004	44,352	2,936,320	874,505	1,220,888	8,148	0	20,766,652	25,850,865
2005	32,790	2,170,883	646,540	902,628	6,024	0	15,353,227	19,112,092
2006	47,064	3,115,874	927,980	1,295,545	8,647	0	22,036,516	27,431,626
2007	45,335	3,001,432	893,897	1,247,961	8,329	0	21,227,145	26,424,099
2008	63,563	4,292,843	1,289,700	1,749,726	11,678	0	30,288,105	37,695,615
2009	65,062	4,400,605	1,322,926	1,790,974	11,953	0	31,042,926	38,634,446
2010	64,751	4,368,248	1,311,729	1,782,426	11,896	0	30,824,165	38,363,215
2011	66,373	4,493,956	1,351,588	1,827,084	12,195	0	31,697,562	39,448,758
2012	66,477	4,501,097	1,353,745	1,829,959	12,214	0	31,747,883	39,511,375
2013	65,782	4,445,918	1,336,098	1,810,833	12,086	0	31,365,493	39,036,210
2014	66,255	4,465,953	1,340,586	1,823,812	12,172	0	31,516,732	39,225,510
2015	67,997	4,584,371	1,376,254	1,871,791	12,493	0	32,351,650	40,264,556
2016	68,184	4,596,752	1,379,948	1,876,918	12,527	0	32,439,162	40,373,491
2017	69,918	4,709,272	1,413,155	1,924,657	12,845	0	33,236,915	41,366,762
2018	68,375	4,597,514	1,378,605	1,882,171	12,562	0	32,454,702	40,393,929
2019	70,260	4,730,131	1,419,127	1,934,088	12,908	0	33,385,981	41,552,495
2020	67,268	4,530,416	1,359,436	1,851,713	12,358	0	31,974,900	39,796,091
2021	68,757	4,635,301	1,391,510	1,892,690	12,632	0	32,711,268	40,712,158
2022	68,021	4,595,620	1,380,887	1,872,435	12,497	0	32,422,911	40,352,371
2023	56,501	3,833,688	1,154,059	1,555,336	10,381	0	27,033,659	33,643,624
2024	58,474	3,965,026	1,193,268	1,609,651	10,743	0	27,961,917	34,799,079
2025	66,925	4,524,020	1,359,688	1,842,270	12,296	0	31,915,717	39,720,916
2026	24,555	1,703,468	517,616	675,948	4,511	0	11,981,032	14,907,130
2027	25,018	1,730,989	525,400	688,686	4,596	0	12,178,340	15,153,029
2028	16,326	1,120,244	338,841	449,412	3,000	0	7,889,091	9,816,914
2029	17,026	1,166,423	352,574	468,679	3,128	0	8,215,818	10,223,648
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
TOTAL	2,030,642	136,226,766	40,807,878	55,898,359	373,073	0	961,914,291	1,197,251,009

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 June 1999, \$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

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	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	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[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	320,415	101,486	95,075	0	70,133	2,174,776	2,761,885
1995	0	278,176	86,604	86,479	0	59,461	1,895,643	2,406,363
1996	0	287,293	82,991	106,208	0	55,287	1,990,213	2,521,992
1997	0	389,636	123,446	100,643	0	62,571	2,642,077	3,318,373
1998	0	429,772	135,927	109,979	0	66,278	2,915,152	3,657,108
1999	37	236,006	75,040	60,907	11	39,144	1,599,081	2,010,226
2000	132	403,693	121,479	120,396	40	57,683	2,769,560	3,472,983
2001	10	310,158	90,353	94,888	3	33,215	2,141,982	2,670,609
2002	49	391,107	108,642	140,014	15	46,798	2,728,662	3,415,287
2003	0	453,213	124,575	164,465	0	51,090	3,168,398	3,961,741
2004	1,278	501,557	153,704	142,324	265	74,317	3,427,011	4,300,456
2005	745	475,410	157,844	99,348	154	76,263	3,186,666	3,996,430
2006	2,775	531,787	155,689	173,060	575	76,621	3,670,658	4,611,165
2007	7,865	757,964	226,828	229,674	1,630	107,608	5,206,439	6,538,008
2008	0	637,597	200,482	167,669	0	99,399	4,330,964	5,436,111
2009	0	718,401	228,379	184,403	0	117,420	4,867,644	6,116,247
2010	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2011	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2012	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2013	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2014	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2015	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2016	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2017	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2018	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2019	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2020	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2021	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2022	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2023	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2024	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2025	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2026	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2027	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2028	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2029	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2030	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2031	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2032	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2033	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2034	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2035	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
TOTAL	12,891	26,257,509	8,241,167	7,014,258	2,693	4,185,910	178,444,734	224,159,162

**TABLE B-31. Total East Branch Enlargement Facilities
Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	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	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[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	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,949,121	884,376	1,188,061	7,295	70,133	20,765,875	25,904,566
1995	39,632	2,902,004	868,042	1,177,437	7,281	59,461	20,452,246	25,506,103
1996	39,825	2,923,960	868,252	1,202,504	7,317	55,287	20,637,619	25,734,764
1997	41,743	3,153,265	946,520	1,249,728	7,669	62,571	22,187,399	27,648,895
1998	42,642	3,252,898	976,720	1,283,802	7,834	66,278	22,881,260	28,511,434
1999	44,775	3,197,893	957,160	1,292,426	8,230	39,144	22,546,556	28,086,184
2000	49,163	3,649,802	1,088,247	1,470,091	9,048	57,683	25,727,146	32,051,180
2001	49,058	3,557,421	1,057,464	1,445,063	9,014	33,215	25,107,730	31,258,965
2002	47,943	3,561,955	1,052,995	1,458,416	8,814	46,798	25,153,981	31,330,902
2003	40,711	3,148,475	927,288	1,285,124	7,479	51,090	22,230,210	27,690,377
2004	45,630	3,437,877	1,028,209	1,363,212	8,413	74,317	24,193,663	30,151,321
2005	33,535	2,646,293	804,384	1,001,976	6,178	76,263	18,539,893	23,108,522
2006	49,839	3,647,661	1,083,669	1,468,605	9,222	76,621	25,707,174	32,042,791
2007	53,200	3,759,396	1,120,725	1,477,635	9,959	107,608	26,433,584	32,962,107
2008	63,563	4,930,440	1,490,182	1,917,395	11,678	99,399	34,619,069	43,131,726
2009	65,062	5,119,006	1,551,305	1,975,377	11,953	117,420	35,910,570	44,750,693
2010	64,751	5,104,222	1,545,102	1,972,377	11,896	118,947	35,813,773	44,631,068
2011	66,373	5,229,930	1,584,961	2,017,035	12,195	118,947	36,687,170	45,716,611
2012	66,477	5,237,071	1,587,118	2,019,910	12,214	118,947	36,737,491	45,779,228
2013	65,782	5,181,892	1,569,471	2,000,784	12,086	118,947	36,355,101	45,304,063
2014	66,255	5,201,927	1,573,959	2,013,763	12,172	118,947	36,506,340	45,493,363
2015	67,997	5,320,345	1,609,627	2,061,742	12,493	118,947	37,341,258	46,532,409
2016	68,184	5,332,726	1,613,321	2,066,869	12,527	118,947	37,428,770	46,641,344
2017	69,918	5,445,246	1,646,528	2,114,608	12,845	118,947	38,226,523	47,634,615
2018	68,375	5,333,488	1,611,978	2,072,122	12,562	118,947	37,444,310	46,661,782
2019	70,260	5,466,105	1,652,500	2,124,039	12,908	118,947	38,375,589	47,820,348
2020	67,268	5,266,390	1,592,809	2,041,664	12,358	118,947	36,964,508	46,063,944
2021	68,757	5,371,275	1,624,883	2,082,641	12,632	118,947	37,700,876	46,980,011
2022	68,021	5,331,594	1,614,260	2,062,386	12,497	118,947	37,412,519	46,620,224
2023	56,501	4,569,662	1,387,432	1,745,287	10,381	118,947	32,023,267	39,911,477
2024	58,474	4,701,000	1,426,641	1,799,602	10,743	118,947	32,951,525	41,066,932
2025	66,925	5,259,994	1,593,061	2,032,221	12,296	118,947	36,905,325	45,988,769
2026	24,555	2,439,442	750,989	865,899	4,511	118,947	16,970,640	21,174,983
2027	25,018	2,466,963	758,773	878,637	4,596	118,947	17,167,948	21,420,882
2028	16,326	1,856,218	572,214	639,363	3,000	118,947	12,878,699	16,084,767
2029	17,026	1,902,397	585,947	658,630	3,128	118,947	13,205,426	16,491,501
2030	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2031	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2032	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2033	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2034	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
2035	0	735,974	233,373	189,951	0	118,947	4,989,608	6,267,853
TOTAL	2,043,533	162,484,275	49,049,045	62,912,617	375,766	4,185,910	1,140,359,025	1,421,410,171

CONVERSION FACTORS

Quantity	To convert from customary unit	To metric units	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 (106 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 (af)	thousand cubic meters (m ³ x 10 ³)	1.2335	0.8107
	acre-feet (af)	hectare-meters (ha - m)■	0.1234	8.107
	thousand acre-feet (taf)	million cubic meters (m ³ x 106)	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 x 109)◆	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 (af/day)	thousand cubic meters per day (m ³ x 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	0.32456
Specific capacity	gallons per minute per foot of drawdown	liters per minute per meter of drawdown	12.419	0.08052
Concentration	parts per million (ppm)	milligrams per liter (mg/L)	1.0	1.0
Electrical conductivity	micromhos per centimeter (μmhos/cm)	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).

OTHER COMMON CONVERSION FACTORS

1 cubic foot=7.48 gallons=62.4 pounds of water

1 cubic foot per second (cfs)=450 gallons per minute (gpm)

1 cfs=646,320 gallons per day=1.98 af a day

1 acre-foot=approximately 325,851 gallons=43,560 cubic feet

1 million gallons=3.07 acre-feet

1 million gallons per day (mgd)=1,120 af a year