



State of California
The Resources Agency

Department of
Water Resources



The California State Water Project— Appendix D Costs of Recreation and Fish and Wildlife Enhancement

Bulletin 132-80
April 1980



ON THE COVER: Bike riders looking downstream on the California Aqueduct in the Antelope Valley

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Water Resources**

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Water Project—
Appendix D
Costs of Recreation and Fish
and Wildlife Enhancement**

April 1980

Huey D. Johnson
Secretary for Resources

Edmund G. Brown Jr.
Governor

Ronald B. Robie
Director

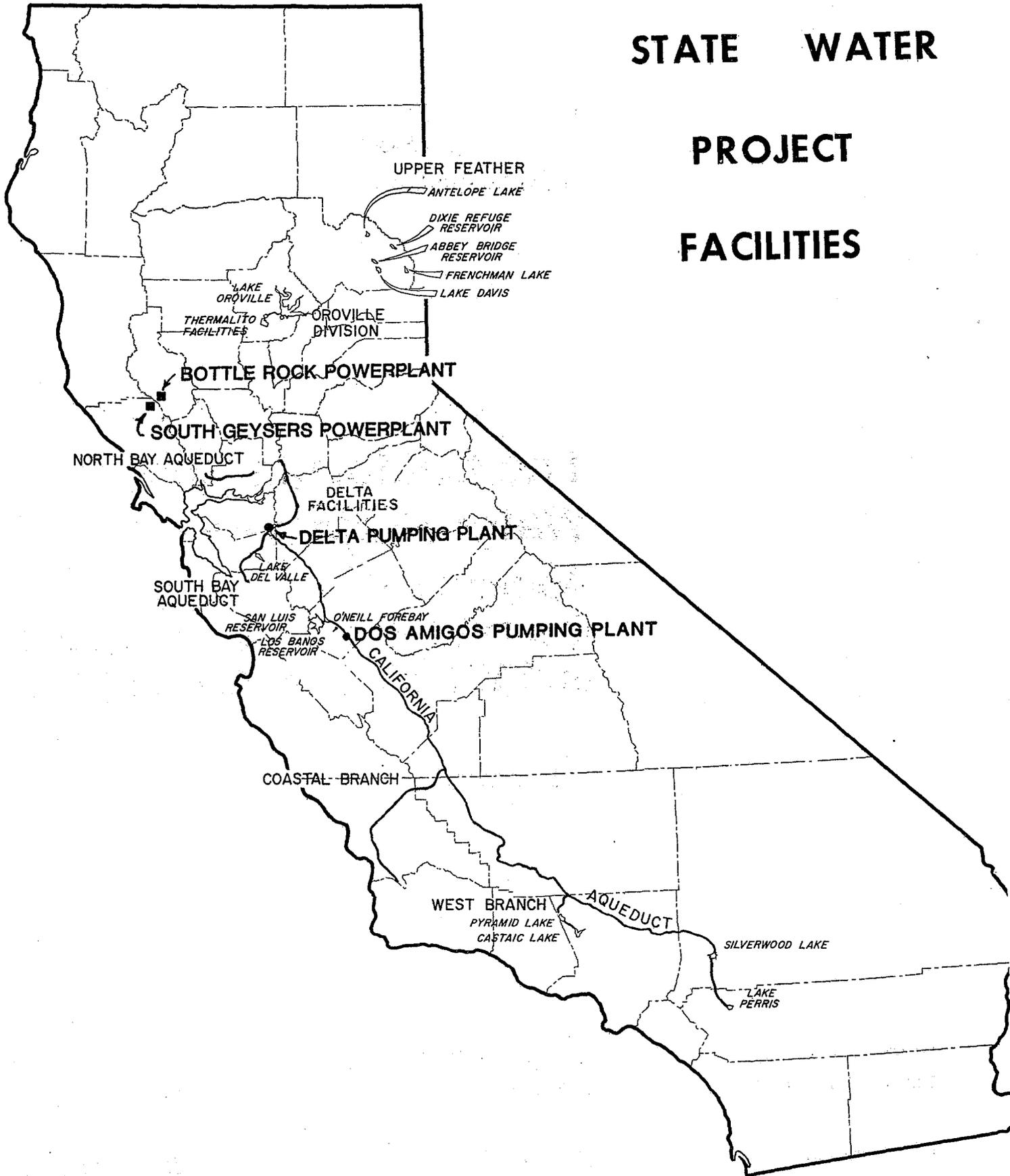
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STATE WATER

PROJECT FACILITIES

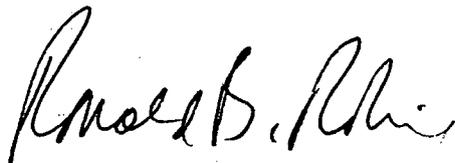


FOREWORD

The Davis-Dolwig Act (Sections 11900-11925 of the California Water Code) declares that recreation and fish and wildlife enhancement costs of State water projects benefit all of the people of California and are to be borne by them. The Act also provides a procedure through which the Department of Water Resources will be reimbursed for those recreation and fish and wildlife enhancement expenditures that are financed by project funds. The Department is to annually report such expenditures to the Legislature. If the Legislature approves the reported costs, a like amount of the State's tideland gas and oil revenues will be released to the Department from a continuing \$5,000,000 annual appropriation of tideland revenues which has been authorized specifically for that purpose (Public Resources Code Section 6217).

This constitutes the Department's 1980 report to the Legislature in compliance with the above requirement. An additional \$108,251,992 for recreation and fish and wildlife enhancement is reported herein. This amount consists of \$107,774,968 for joint capital costs of the State Water Project which are allocated to recreation and fish and wildlife enhancement, plus \$477,024 for specific recreation land costs. The additional amount is mostly due to the initial reporting of joint capital costs of the California Aqueduct, Dos Amigos Pumping Plant to termini, which are allocated to recreation and fish and wildlife enhancement. The Department requests that the additional amount be approved.

Included in this report is the initial derivation of project purpose cost allocation percentages for the California Aqueduct, Dos Amigos Pumping Plant to the terminal facilities. The cost allocation reported herein results in the minimum level of costs being allocated to recreation and fish and wildlife enhancement of the allocations considered. However, the Department's cost allocation studies are continuing and the Department of Finance has issued a report on State Water Project cost allocation methodology. Once the Department has completed its cost allocation studies and review of the Department of Finance report, the cost allocation reported herein may be revised.



Ronald B. Robie, Director
Department of Water Resources
The Resources Agency
State of California

State of California
EDMUND G. BROWN JR., Governor

The Resources Agency
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Executive Officer and Chief Engineer

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The California Water Commission serves as a policy advisory body to the Director of Water Resources on all California water resources matters. The nine-member citizen Commission provides a water resources forum for the people of the State, acts as a liaison between the legislative and executive branches of State Government and coordinates Federal, State, and local water resources efforts.

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REPORTING OF RECREATION AND FISH AND WILDLIFE ENHANCEMENT COSTS

Section 11912 of the California Water Code assigns to the Department of Water Resources the following responsibilities:

It shall be the duty of the Department to report annually to the Legislature the costs, if any, which the department has allocated to recreation and fish and wildlife enhancement for each facility of any state water project. The department shall also report to the Legislature any revisions which the Department makes in such allocations.

The department shall submit each such cost allocation to the Department of Navigation and Ocean Development [Department of Boating and Waterways], to the Department of Parks and Recreation, and to the Department of Fish and Game. The Department of Navigation and Ocean Development, the Department of Parks and Recreation, and the Department of Fish and Game shall file with the Department of Water Resources their written comments with respect to each such cost allocation, which written comments shall be included in the report required by this section.

It shall also be the duty of the department to report to the Legislature on any expenditure of funds for acquiring rights-of-way, easements and property pursuant to Section 346 for recreation development associated with such facilities . . .

This appendix constitutes the Department's 1980 report as required by Section 11912 of the California Water Code.

For brevity, "fish and wildlife enhancement" is hereafter referred to as "enhancement". The Department's cost allocations treat recreation and enhancement as one combined purpose of the State Water Project.

Organization of Report

The costs of State Water Project facilities which the Department has allocated to recreation and enhancement through December 31, 1979, are shown in Table 1, pages 6 and 7, together with expenditures for acquiring rights of way, easements, and property for recreation development associated with such facilities. Table 2, on pages 12 and 13, details the accrued interest charges that are included in the costs shown in Table 1.

The notes to Table 1, on pages 8 through 11, contain an explanation of the Department's procedures for reporting recreation and enhancement costs, a description of how the amounts shown in the

Table are calculated, and a reconciliation of significant changes from costs shown in previous reports.

The derivation of project purpose cost allocation percentages for the California Aqueduct, Dos Amigos Pumping Plant to termini, is included in this report. The derivation of allocation percentages indicated for joint capital costs of those multipurpose facilities listed in the upper portion of Table 1; except the California Aqueduct, Dos Amigos to termini, have been described in previous reports. Copies of those descriptions are available on request to the Department.

TABLE 1: RECREATION AND ENHANCEMENT
(Reported to the California Legislature in

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TYPE OF COSTS, PROJECT FACILITY, AND SOURCE OF FUNDS	DISBURSMENTS:						
	1952- 1966	1967	1968	1969	1970	1971	1972
JOINT CAPITAL COSTS ALLOCATED TO RECREATION AND ENHANCEMENT: (b)							
Frenchman Dam and Lake (78.5%)							
California Water Resources Development Bond Fund	25,876	65,092	2,258	46	1,291	7,199	1,235
All other funds	2,428,839		515	1,193	260	226	1,600
Subtotal	2,454,715	65,092	2,773	1,239	1,551	7,425	2,835
Antelope Dam and Lake (100%)							
California Water Resources Development Bond Fund	811,601	151,356	18,566	9,831	19,119	24,350	1,605
All other funds	3,701,660	2	21,504	207,412	5,003	3,028	2,096
Subtotal	4,513,261	151,358	40,070	217,243	24,122	27,378	3,701
Grizzly Valley Dam and Lake Davis (94.9%)							
California Water Resources Development Bond Fund	3,134,963	488,205	173,666	23,497	5,707	9,610	1,662
All other funds	257,398	12,395	13,025	157,200	62,211	738	2,617
Subtotal	3,392,361	500,600	186,691	180,697	67,918	10,348	4,279
San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir (3.4%)							
California Water Resources Development Bond Fund	1,866,618	120,429	17,667	-1,650	6,390	4,940	18,607
All other funds	1,264,977	4,040	45,776	30,493	307	1,418	5,553
Subtotal	3,131,595	124,469	63,443	36,843	6,697	6,358	24,160
California Aqueduct, Delta to Dos Amigos P. P. (3.4%)							
California Water Resources Development Bond Fund	2,690,272	1,355,722	244,037	76,998	80,280	16,389	4,025
All other funds	282,364	20,540	194,010	166,775	47,341	3,146	6,736
Subtotal	2,972,636	1,376,262	438,047	243,773	127,621	19,535	10,761
Oroville Division (2.9%)							
California Water Resources Development Bond Fund	4,390,660	1,335,209	87,514	26,289	7,453	7,843	4,655
All other funds	2,825,113	37,774	321,811	87,590	17,840	5,329	10,773
Subtotal	7,215,773	1,372,983	409,325	113,879	25,293	13,172	15,428
Del Valle Dam and Lake Del Valle (48.0%)							
California Water Resources Development Bond Fund	4,088,459	5,529,695	841,108	3,894	19,510	23,848	40,248
All other funds	596,922	387,848	1,026,256	84,929	45,203	2,700	6,681
Subtotal	4,685,381	5,917,543	1,867,364	88,823	64,713	26,548	46,929
California Aqueduct, Dos Amigos P.P. to Termini (5.7%)							
California Water Resources Development Bond Fund	8,680,368	8,938,043	6,883,238	4,440,998	9,088,748	7,815,441	2,935,040
All other funds	1,938,069	473,904	4,236,374	6,442,548	3,369,973	1,848,336	1,313,741
Subtotal	10,618,437	9,411,947	11,119,612	10,883,546	12,458,721	9,663,777	4,248,781
TOTAL	38,984,159	18,920,254	14,126,325	11,766,043	12,776,636	9,774,541	4,356,876
SPECIFIC COSTS OF ACQUIRING LAND FOR RECREATION DEVELOPMENT: (c)							
Frenchman Dam and Lake							
California Water Resources Development Bond Fund	2,378	521	162	28	182	108	
All other funds	49,843		223	74		7	
Subtotal	52,221	521	385	102	182	115	
Grizzly Valley Dam and Lake Davis							
California Water Resources Development Bond Fund	51,749	164,798	-13,724	324	625	343	
All other funds	5,246						
Subtotal	56,995	164,798	-13,724	324	625	343	
Abbey Bridge Dam and Reservoir							
California Water Resources Development Bond Fund	9						
All other funds	9,921						
Subtotal	9,930						
San Luis Dam and Reservoir, O'Neill Forebay and Los Banos Reservoir							
California Water Resources Development Bond Fund	217,031	6,211	2,423	1,345	47,114	1,965	116,692
All other funds	230,651	-1,068	2,681	1,132	-272	462	-42,536
Subtotal	447,682	5,143	5,104	2,477	46,842	2,427	74,156
California Aqueduct, Delta to Dos Amigos P.P.							
California Water Resources Development Bond Fund	427,794	27,620	5,102	4,299	5,115	-9,735	891
All other funds	90,294	-80	3,796	11,337	1,343	1,117	180
Subtotal	518,088	27,540	8,898	15,636	6,458	-8,618	1,071
Oroville Division							
California Water Resources Development Bond Fund	1,840,654	34,028	-1,483	-6,886	4,160	10,135	-510
All other funds	233,832	-34,911	80,622	34,685	4,227	4,437	3,347
Subtotal	2,074,486	-883	79,139	27,799	9,087	14,572	2,837
Del Valle Dam and Lake Del Valle							
California Water Resources Development Bond Fund	104,047	489,258	-74,657	-1,491	1,629	600	39
All other funds	30,029		-72,983	960	190	159	728
Subtotal	134,076	489,258	-147,640	-531	1,819	759	797
California Aqueduct, Dos Amigos P. P. to Termini							
California Water Resources Development Bond Fund	159,255	171,863	65,934	53,071	470,679	30	-161,198
All other funds	16,969	5,225	5,225	6,171	1,638	2,960	145,563
Subtotal	176,224	177,088	71,159	59,242	472,317	2,990	-15,635
Castaic Dam and Lake							
California Water Resources Development Bond Fund	921,320	915,110	-18,074	-44,600	22,812	17,483	32,059
All other funds	10,510	-75	44,752	7,038	1,028	7,810	23,411
Subtotal	931,830	915,035	26,678	-37,562	23,840	25,293	55,470
Cedar Springs Dam and Silverwood Lake							
California Water Resources Development Bond Fund	201,553	64,091	43,780	32,470	36,167	19,633	24,038
All other funds	41,123		-211,153	322,522	27,054	-12,301	24,388
Subtotal	242,676	64,091	-167,373	354,992	63,221	7,332	48,426
Ferris Dam and Lake Ferris							
California Water Resources Development Bond Fund	338,612	20,994	492,881	-1,943	4,195	2,600	-1,300
All other funds	234,997		3,721,737	-333,922			
Subtotal	573,609	20,994	4,214,618	-335,865	4,195	2,600	-1,300
TOTAL	5,237,617	1,858,360	4,077,244	86,614	628,586	47,820	165,762
TOTAL RECREATION AND ENHANCEMENT COSTS							
California Water Resources Development Bond Fund	29,953,219	19,878,245	8,770,390	4,616,520	9,821,176	7,952,782	3,017,788
All other funds	14,248,557	900,369	9,433,171	7,236,137	3,534,046	1,869,579	1,504,850
GRAND TOTAL	44,201,776	20,778,614	18,203,569	11,852,657	13,405,222	9,822,361	4,522,638

Footnotes a-g are presented on pages 8 through 11.

COSTS OF THE STATE WATER PROJECT (a)
Response to Water Code Section 11912)

(dollars)

BY CALENDAR YEAR							TOTAL DISBURSEMENTS THRU 1979	ADD: INTEREST ACCRUALS THRU 1979	TOTAL COSTS REPORTED THRU 1979	COMPARISON WITH COSTS PREVIOUSLY REPORTED	
1973	1974	1975	1976	1977	1978	1979				THRU 1978	INCREASE
972	1,244	375	216	693	10,504	9,271	102,997	1,803	104,800	104,800	
972	1,244	375	216	693	10,504	9,271	2,456,608	1,803	2,456,608	2,448,867	7,741
							2,559,605		2,561,408	2,553,667	7,741
1,414	1,903	535	1,731	1,339	18,465	16,086	1,036,428	98,396	1,134,824	1,139,044	-4,220
1,414	1,903	535	1,731	1,339	18,465	16,086	3,982,178	98,396	3,982,178	4,007,885	-25,707
							5,018,606		5,117,002	5,146,929	-29,927
24,149	45,659	84,623	21,198	7,849	74,856	40,277	3,837,310	400,616	4,237,926	4,237,926	
24,149	45,659	84,623	21,198	7,849	74,856	40,277	804,195	400,616	804,195	766,639	37,556
							4,641,505		5,042,121	5,004,565	37,556
-267	-376	-251	-131	-118	-55	-2,306	2,031,803	285,621	2,317,424	2,279,894	37,530
9,348	12,632	11,680	4,932	5,811	-22,670	-2,306	1,372,921	285,621	1,379,921	1,441,122	-61,131
9,081	12,256	11,429	4,801	5,693	-22,725	-2,306	3,411,794		3,697,415	3,721,016	-23,601
-30							4,467,693	731,488	5,199,181	5,196,269	2,912
7,861	12,268	21,607	38,387	15,395	20,142	38,479	875,053	731,488	875,053	807,068	67,985
7,831	12,268	21,607	38,387	15,395	20,142	38,479	5,342,746		6,074,234	6,003,337	70,897
-37	-42	-18	-15	-15	-19	-22	5,859,455	1,754,946	7,614,401	7,616,374	-1,973
23,774	26,330	28,463	26,086	515,000	85,309	52,022	4,065,214		4,065,214	4,019,636	45,578
23,737	26,288	28,445	26,071	514,985	85,290	52,000	9,924,669	1,754,946	11,679,615	11,636,010	43,605
9,614	115,618	7,829	9,976	3,656	9,290	32,499	10,546,762	4,264,691	14,811,453	14,817,502	-6,049
9,614	115,618	7,829	9,976	3,656	9,290	32,499	2,339,021		2,339,021	2,308,485	30,536
							12,885,783	4,264,691	17,150,474	17,125,987	24,487
-3,516	-38,903	124	57	56	-1,487	-6	48,738,199	29,468,927	78,207,126	78,207,126	
2,722,501	1,471,594	1,239,419	974,368	830,051	880,197	1,697,009	29,437,084		29,437,084	29,437,084	
2,718,985	1,432,691	1,239,543	974,425	830,107	878,710	1,697,001	78,175,283	29,468,927	107,644,210	107,644,210	
2,795,783	1,647,927	1,394,386	1,079,505	1,379,717	1,074,532	1,863,307	122,959,991	37,006,488	158,966,479	51,191,511	107,774,968
							3,379	134	3,513	3,513	
							49,917	134	49,917	49,917	
							53,326		53,460	53,460	
							204,115	15,099	219,214	219,215	-1
							5,246		5,246	5,246	
							209,361	15,099	224,460	224,461	-1
							9		9	9	
							9,921		9,921	9,921	
							9,930		9,930	9,930	
19,102	118	508	692	729	1,076	270	392,781	28,083	420,864	443,721	-22,857
19,102	118	508	692	729	1,076	270	213,532	28,083	213,532	212,739	833
							606,333		634,416	636,440	-22,024
83	113	349	888	617	978	9,284	461,086	134,710	595,796	606,603	-10,807
83	113	349	888	617	978	9,284	180,299	134,710	120,299	110,774	9,525
							981,395		716,095	717,377	-1,282
-74	-87	-53	-45	-45	-56	-33	1,879,705	688,537	2,568,242	2,570,137	-1,895
1,452	1,203	-1,751	1,860	1,637	1,284	1,087	333,711		333,711	332,435	1,276
1,378	1,116	-1,804	1,835	1,592	1,228	1,034	2,213,416	688,537	2,901,953	2,902,572	-619
2,017	820	403	44	88	708	178	519,425	292,422	811,847	815,921	-4,074
2,017	820	403	44	88	708	178	-36,629	292,422	-36,629	-36,739	90
							482,796		775,218	779,202	-3,984
-8,966							750,668	370,748	1,121,416	1,113,876	-7,540
32,278	17,956	63,494	149	561	167,477	340,266	803,707	370,748	803,707	101,610	502,097
26,312	17,956	63,494	149	561	167,477	340,266	1,554,375		1,925,123	1,425,486	499,637
-233	-232	-109					1,845,336	1,094,435	2,939,771	2,942,660	-2,889
17,485	1,127	72,391	10,833	18,590	4,860	3,119	229,379		229,379	219,242	1,137
17,252	895	72,282	10,833	18,590	4,860	3,119	2,068,415	1,094,435	3,162,850	3,161,802	948
12,216	28,346	9,801	5,739	2,528	3,104	2,415	421,732	264,762	686,494	686,173	321
12,236	28,346	9,801	5,739	2,528	3,104	2,415	255,742	264,762	255,742	252,394	3,348
							677,474		942,236	935,567	6,669
130	-1,300						856,039	592,125	1,448,164	1,447,484	680
130	-1,300						3,621,642	592,125	3,621,642	3,621,642	
							4,477,681		5,059,806	5,059,126	680
78,510	48,064	145,033	20,180	24,705	179,431	356,566	12,934,492	3,481,055	16,415,547	15,938,523	477,024
-13,123	-39,640	-307	-134	-122	-1,617	-63	83,955,122	40,487,543	124,442,665	46,251,121	78,191,544
2,887,416	1,735,831	1,539,726	1,099,819	1,404,544	1,255,580	2,239,936	50,939,361		50,939,361	20,878,913	30,060,448
2,874,293	1,695,991	1,539,419	1,099,685	1,404,422	1,253,963	2,239,873	134,894,483	40,487,543	175,382,026	67,130,034	108,251,992 ^(d)

A summary of capital cost allocation percentages is shown on page 14, including, illustrative allocation percentages for facilities which have not yet been reported.

Included at the end of this report, are comments by the Department of Boating and Waterways, the Department of Parks and Recreation and the Department of Fish and Game.

Notes to Table 1, Pages 6 and 7

a) Recreation and enhancement costs herein refer only to those capital costs of multipurpose facilities of the State Water Project that are allocated to recreation and enhancement and/or of lands that are acquired for associated recreation development. These costs are budgeted by the Department of Water Resources from funds that are available to the Department for financing

construction costs of the Project.

The remaining recreation and enhancement costs of types not reported herein are budgeted by the Departments of Water Resources, Parks and Recreation, Fish and Game, and Boating and Waterways and are financed by appropriations from a variety of funds. These costs and appropriations are summarized below:

Type of Recreation and Enhancement Costs Not Reported in Table 1	General Fund Appropriations, unless otherwise noted		
	1980-81(a)	1979-80(b)	Total 1962-63 thru 1980-81(c)
Allocated operation, maintenance, and replacement costs of multipurpose facilities.	\$2,166,000	\$2,025,000	\$16,734,000
Capital costs of recreation developments other than for land acquisition	5,536,000 ^(d)	1,675,000 ^(d)	88,643,000 ^(e)
Operation, maintenance, and replacement costs of recreation developments	5,195,000	4,855,000	31,092,000

a) *Proposed amounts in Governor's budget.*
b) *1979-80 budgeted amount*
c) *Actual thru 1978-79 plus a) and b).*
d) *Amounts from State recreation bond funds and other State and Federal recreation funds.*
e) *Includes \$1,236,000 from the Harbors and Watercraft Revolving Fund, and \$200,000 directly from the Highway Users Tax Fund.*

Operation, maintenance, power, and replacement costs of multipurpose facilities allocated to recreation and enhancement are budgeted by the Department of Water Resources and have been financed by annual appropriations from the General Fund. Capital costs (other than land acquisition costs) and operation, maintenance, and replacement costs of

recreation developments are budgeted by the Department of Parks and Recreation -- except that the costs of boating facilities are budgeted by the Department of Boating and Waterways. Costs of enhancement developments are budgeted by the Department of Fish and Game.

b) Joint capital costs allocated to recreation and enhancement are based on the Department's derivation, for each multipurpose facility, of the percentages of the total joint costs that are attributable to the project purpose of recreation and enhancement. These derivations are based on the application of conventional project purpose cost allocation methods which weight the estimated costs to be incurred and benefits to be realized during a 50-year period of analysis. Allocated capital costs reported herein reflect the application of these percentages to the

actual capital costs incurred for the facility as accounted by the Department.

Costs allocated to recreation and enhancement generally are first reported in the year following the year construction of a facility is complete. However, these allocated costs may be subsequently changed due to either the adjustment of accounted capital costs or the revision of allocation percentages.

The allocation percentages of a facility may be revised if it can be formally demonstrated that such revision is

TENTATIVE SCHEDULE FOR REPORTING AND REVIEW
OF COST ALLOCATIONS

Project Facility	Year Allocation to be Initially Reported	Year Supporting Factors are to be Reviewed For Substantial Changes										
		81	82	83	84	85	86	87	88	89	90	91(a)
Frenchman Lake	1965					x						x
Antelope Lake	1966					x						x
Lake Davis	1968		x					x				x
Abbey Bridge Reservoir	(b)											
Dixie Refuge Reservoir	(b)											
Oroville Division (d)	1971				x					x		
Delta Facilities	1993 (c)											
South Bay Aqueduct (Lake Del Valle)	1973		x					x				x
California Aqueduct, Delta to Dos Amigos Pumping Plant: (d)	1970											
Bethany Reservoir					x					x		
San Luis Reservoir					x					x		
O'Neill Forebay					x					x		
Los Banos Reservoir					x					x		
Aqueduct Developments					x					x		
California Aqueduct, Dos Amigos Pumping Plant to termini:	1980 (e)											
Pyramid Lake												
Castaic Lake												
Silverwood Lake												
Lake Perris												
Aqueduct Developments												

a) Reviews would continue in the pattern indicated.
b) Delayed indefinitely.
c) Construction schedule tentative and subject to revision.
d) Will include an evaluation of an allocation of conservation facility costs to recreation and other purposes in Sacramento-San Joaquin Delta.
e) First review will be scheduled after completion of the Department's review of the Department of Finance's report on Davis-Dolwig Allocation Methodology.

warranted due to substantial changes in the supporting factors to the previous derivation. Such demonstration could include the finding that (1) funds are not forthcoming for financing the costs of planned recreation developments, with resultant decreases in projected recreation benefits and costs, (2) a change in cost allocation method would produce more equitable results or (3) actual visitor days of use had substantially increased or decreased from the previous projections resulting in a change in projected benefits.

The tentative schedule shown above indicates the years when allocated costs of each State Water Project facility will

be first reported and when the factors which support the derivation of allocation percentages will be periodically reviewed for substantial changes.

c) Specific costs of acquiring land for recreation developments are incurred by the Department under the authority of California Water Code Section 346. The Department purchases recreation lands concurrently with lands needed for multipurpose facilities in order to decrease the total land costs of the Project and to acquire property in an orderly manner. Recreation lands acquired for each project facility through December 31, 1979, are summarized below.

SUMMARY OF RECREATION LAND ACQUISITIONS^(a)
(in acres)
(metric conversion: acres x 0.40469 = hectares)

Project Facility	Acquired (b)	To be Acquired	Federal Lands(c)	Total
Frenchman Lake	719	0	0	719
Antelope Lake	1,342	0	0	1,342
Lake Davis	733	0	0	733
San Luis Reservoir and O'Neill Forebay	2,518	0	0	2,518
Oroville Division	2,599	0	212	2,811
Lake Del Valle	1,206	0	0	1,206
California Aqueduct (excluding reservoirs)	1,760	(d)	0	1,760
Castaic Lake	1,915	0	577	2,492
Silverwood Lake	304	0	2,919	3,223
Lake Perris	4,343	123	0	4,466

- a) Includes recreation lands for only those project facilities with an established recreation land use and acquisition plan.
 b) Costs of acquiring these lands are shown in Table 1.
 c) These lands are presently being leased from the Federal Government at a nominal cost to the State.
 d) Additional land needs are to be identified by future studies.

The Department reports the annual expenditure of project funds for acquiring all recreation land in the year following the expenditure. The costs of such lands generally are established when acquired and are not affected by allocation percentages for the associated multipurpose project facility. However, the reported costs of certain lands may be subsequently

revised due to receipt of certain revenues (such as federal grants and miscellaneous income from right-of-way sales) or due to modification of the recreation land use plan.

The amounts to be reported in future years will include credits for any reduction in previously reported costs, together with

appropriate interest income thereon. If recreation land is sold or if grants are received, the amount of the receipt will be reported as a negative cost of the facility the year received. If recreation land is reclassified as multipurpose project land, the original purchase price, together with appropriate interest income thereon, will be reported as a negative expenditure for specific land costs and an appropriate amount will be added to the joint capital costs allocated to recreation and enhancement for the associated facility.

The costs of acquiring recreation land include the salaries of department personnel who are engaged in recreation land acquisition activities, together with indirect costs that are distributed on the basis of direct salaries.

d) Interest accruals are calculated as shown in Table 2. Interest charges are accrued only on the portion of annual disbursements financed by the California Water Resources Development Bond Fund (proceeds from the sale of Burns-Porter Bonds) and cease when such disbursements, together with cumulative interest accruals thereon, have been reimbursed. Calculations are based on the weighted average interest costs of Burns-Porter Bonds sold to date (4.378 percent for the \$1,570,000,000 in bonds outstanding as of December 31, 1979). This rate differs from the "project interest rate" under the Project's water supply contracts in that interest costs on revenue bond sales are not included.

As of December 31, 1979, a total of \$70,000,000 had been reimbursed to the Department under the continuing annual \$5,000,000 appropriation (thru fiscal year 1979-80) of state tideland oil and gas revenues, authorized by California Statutes of 1966, First Extraordinary Session, Chapter 27. With no allowance for future interest, reimbursement of the increased amount of costs reported herein would cover the annual appropriations in the full amounts for each fiscal

year through 2000-01, together with \$382,026 of the appropriation for 2001-02.

The initial cost allocation for the California Aqueduct is reported herein and results in joint capital costs allocated to recreation and enhancement including interest of \$107,644,210.

e) The Department requests that this total increased amount of reported costs be approved by the Legislature.

f) Costs previously reported are as shown in Table 1 (pages 4 and 5) of Appendix D to Bulletin 132-79. Such costs were based on the Department's accounting records as of December 31, 1978. The average interest cost on Burns-Porter Bond sales was then 4.378 percent.

g) Reasons for cost increase are outlined below:

Additional disbursements during 1979 for recreation lands and for joint capital costs allocated to recreation and enhancement.	\$543,000
Additional accrued interest on recreation costs not yet reimbursed by the continuing \$5,000,000 annual appropriation due to changes in bond fund expenditures and an additional year of accrual (1979).	\$29,464,000
Additional costs due to initial reporting of joint capital costs allocated to recreation and enhancement for the California Aqueduct, Dos Amigos Pumping Plant to termini	\$78,175,000
Adjustment in costs of Antelope Dam and Lake resulting from redetermination of costs associated with specific recreation land	-\$43,000
Adjustment in allocated costs of San Luis Dam and Reservoir due to sale of excess land	-\$24,000
Increase in specific recreation land costs for the California Aqueduct, Dos Amigos to termini due to late reporting of costs	\$162,000
Adjustment due to updating allocation of general state operations costs based on estimated total construction costs as of 1979.	-\$18,000
Net retroactive accounting adjustments on costs reported prior to 1979.	-\$7,000
TOTAL INCREASE	\$108,252,000

TABLE 2: CALCULATION OF INTEREST ACCRUALS ON CALIFORNIA

(in dollars)

YEAR	ITEM	JOINT CAPITAL COSTS ALLOCATED TO RECREATION AND ENHANCEMENT								Total
		Frenchman Dam and Lake	Antelope Dam and Lake	Grizzly Valley Dam and Lake Davis	San Luis Dam and Reservoir, O'Neill Forebay and Los Banos Reservoir	California Aqueduct Delta to Dos Amigos P.F.	Oroville Division	Del Valle Dam and Lake Del Valle	California Aqueduct, Dos Amigos P.P. to Termini	
1952-75	a. Disbursements									
	1. Calif. Water Resources Development Bond Fund	102,997	1,036,428	3,837,310	2,032,107	4,467,693	5,859,526	10,546,762	48,739,581	76,622,
	2. All other funds	2,435,224	3,944,557	660,015	1,394,224	762,650	3,384,797	2,283,600	25,055,459	39,920,
b.	Reimbursement 1967 thru 1975 applied to:									
	1. Calif. Water Resources Development Bond Fund	104,800	1,134,824	4,237,926	2,317,728	5,199,181	7,614,471	12,289,532		32,898,
2. All other funds	2,435,224	3,944,557	660,015	1,394,224	762,650	3,384,797			12,581,	
c.	Interest accrued to end of 1975	1,803	98,396	400,616	285,621	731,488	1,754,946	4,209,486	17,192,021	24,674,
1976	d. Beginning-of-year balance to be reimbursed:									
	1. Calif. Water Resources Development Bond Fund							1	2,466,716	68,398,
	2. All other funds								2,283,600	27,339,
	e. Disbursements during year:									
	1. Calif. Water Resources Development Bond Fund	916	1,731	21,198	-131	38,387	-15	9,976	57	1,079,
	2. All other funds				4,932		28,086		974,368	
	f. Reimbursements during year applied to:									
	1. Calif. Water Resources Development Bond Fund	916	1,731	21,198	-131	38,387	-14	2,466,716		2,466,
2. All other funds				4,932		28,086	2,293,576		2,388,	
g. End-of-year balance, without interest for:										
1. Calif. Water Resources Development Bond Fund								65,931,659	65,931,	
2. All other funds								26,029,827	26,029,	
h.	Interest accrual on average balance of d(1) and g(1)							53,996	2,886,487	2,940,
1977	i. Beginning-of-year balance to be reimbursed:									
	1. Calif. Water Resources Development Bond Fund							53,996	68,818,146	68,872,
	2. All other funds								26,029,827	26,029,
	j. Disbursements during year:									
	1. Calif. Water Resources Development Bond Fund	693	1,339	7,849	-118	15,395	-15	3,656	56	1,379,
	2. All other funds				5,811		515,000		830,051	
k. Reimbursements during year applied to:										
1. Calif. Water Resources Development Bond Fund	693	1,339	7,849	-118	15,395	-15	53,996		53,	
2. All other funds				5,811		515,000	3,656		549,	
l. End of year balance without interest for:										
1. Calif. Water Resources Development Bond Fund								68,818,202	68,818,	
2. All other funds								26,859,878	26,859,	
m.	Interest accrual on average balance of i(1) and l(1)							1,182	3,012,860	3,014,
1978	n. Beginning-of-year balance to be reimbursed:									
	1. Calif. Water Resources Development Bond Fund							1,182	71,831,062	71,832,
	2. All other funds								26,859,878	26,859,
	o. Disbursements during year:									
	1. Calif. Water Resources Development Bond Fund	10,504	18,465	74,856	-55	20,142	-19	9,290	-1,487	-1,
	2. All other funds				-22,670		85,309		880,197	1,076,
p. Reimbursements during year applied to:										
1. Calif. Water Resources Development Bond Fund	10,504	18,465	74,856	-55	20,142	-19	1,182		1,	
2. All other funds				-22,670		85,309	9,290		195,	
q. End-of-year balance without interest for:										
1. Calif. Water Resources Development Bond Fund								71,829,575	71,829,	
2. All other funds								27,740,075	27,740,	
r.	Interest accrual on average balance of n(1) and q(1)							26	3,144,731	3,144,
1979	s. Beginning-of-year balance to be reimbursed:									
	1. Calif. Water Resources Development Bond Fund							26	74,974,306	74,974,
	2. All other funds								27,740,075	27,740,
	t. Disbursements during year:									
	1. Calif. Water Resources Development Bond Fund	9,271	16,086	40,277	-2,306	38,479	-22	32,499	-8	1,883,
	2. All other funds						52,022		1,697,009	
u. Reimbursements during year applied to:										
1. Calif. Water Resources Development Bond Fund	9,271	16,086	40,277	-2,306	38,479	-22	26	2,263,466	2,263,	
2. All other funds						52,022	32,499		186,	
v. End-of-year balance without interest for:										
1. Calif. Water Resources Development Bond Fund								72,710,832	72,710,	
2. All other funds								29,437,084	29,437,	
w.	Interest accrual on average balance of s(1) and v(1)							1	3,232,828	3,232,
Summary: 1952 thru 1979	x. Beginning of 1980 balance to be reimbursed:									
	1. Calif. Water Resources Development Bond Fund							1	75,943,660	75,943,
	2. All other funds								29,437,084	29,437,
	Total							1	105,380,744	105,380,
	y. Disbursements, 1952 thru 1979									
	1. Calif. Water Resources Development Bond Fund	102,997	1,036,428	3,837,310	2,031,803	4,467,693	5,859,455	10,546,762	48,738,199	76,620,
	2. All other funds	2,456,608	3,982,178	804,195	1,379,991	875,053	4,065,214	2,339,021	29,437,084	45,339,
	Total	2,559,605	5,018,606	4,641,505	3,411,794	5,342,746	9,924,669	12,885,783	78,175,283	121,959,
	z. Reimbursements applied thru 1979 to:									
	1. Calif. Water Resources Development Bond Fund	104,800	1,134,824	4,237,926	2,317,424	5,199,181	7,614,401	14,811,452	2,263,466	37,683,
2. All other funds	2,456,608	3,982,178	804,195	1,379,991	875,053	4,065,214	2,339,021		15,902,	
Total	2,561,408	5,117,002	5,042,121	3,697,415	6,074,234	11,679,615	17,150,473	2,263,466	53,585,	
	TOTAL INTEREST ACCRUALS, 1952 THRU 1979	1,803	98,396	400,616	285,621	731,488	1,754,946	4,264,691	29,468,927	37,006,

WATER RESOURCES DEVELOPMENT BOND FUND DISBURSEMENTS

@ 4.378% per annum)

COSTS OF ACQUIRING LAND FOR RECREATION DEVELOPMENT												GRAND TOTAL
Frenchman Dam and Lake	Grizzly Valley Dam and Lake Davis	Abbey Bridge Dam and Reservoir	San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir	California Aqueduct Delta to Dos Amigos P.P.	Oroville Division	Del Valle Dam and Lake Del Valle	California Aqueduct Dos Amigos P.P. to Termini	Castaic Dam and Lake	Cedar Springs Dam and Silverwood Lake	Perris Dam and Lake Perris	Total	
3,379 49,947	204,115 5,246	9 9,921	392,781 210,785	461,086 108,532	1,879,884 327,843	519,425 -37,647	750,668 295,254	1,845,536 185,477	421,732 241,956	856,039 3,621,642	7,334,654 5,018,956	83,957,058 44,939,482
3,513 49,947	219,214 5,246	9 9,921	420,864 210,785	595,796 108,532	2,568,401 327,843						3,807,797 712,274	36,706,259 13,293,741
134	15,099		28,083	134,710	688,537	247,265	300,193	889,641	194,594	444,107	2,942,363	27,616,740
					20	766,690 -37,647	1,050,861 295,254	2,735,177 185,477	616,326 241,956	1,300,146 3,621,642	6,469,220 4,306,682	74,867,539 31,645,741
			692	888	1,880	44	149	10,833	5,739		-45 20,225	-134 1,099,819
			692	888	1,880	141,158					141,143 3,460	2,607,714 2,392,286
						625,522 -37,603	1,050,861 295,403	2,735,177 196,310	616,326 247,695	1,300,146 3,621,642	6,328,032 4,323,447	72,259,691 30,353,274
						30,476	46,007	119,746	26,983	56,920	280,132	3,220,615
							655,998 -37,603	1,096,868 295,403	2,854,923 196,310	643,309 247,695	1,357,066 3,621,642	75,480,306 30,353,274
			729	617	1,637	88	561	18,590	2,528		-45 24,750	-122 1,404,544
			729	617	1,637			2,382,141			4,134,962 261,432	4,188,825 811,175
								472,782 214,900	643,309 250,223	1,357,066 3,621,642	2,473,157 4,086,765	71,291,359 30,946,643
						14,360	24,010	72,843	28,164	59,412	198,789	3,212,831
						14,360	24,010	545,625 214,900	671,473 250,223	1,416,478 3,621,642	2,671,946 4,086,765	74,504,190 30,946,643
			1,076	978	1,284	708	167,477	4,860	3,104		-56 179,487	-1,617 1,255,580
			1,076	978	1,284	14,360 708	24,010 167,477	545,625 219,760	671,473 253,327	1,416,478 1,486,496	2,671,890 2,131,106	2,672,998 2,327,002
										2,135,146	2,135,146	71,829,575 29,875,221
						314	526	11,944	14,699	31,007	58,490	3,203,247
						314	526	11,944	14,699	31,007	58,490	75,032,822 29,875,221
			270	9,284	1,067	178	340,266	3,119	2,415		-33 356,599	-63 2,239,936
			270	9,284	1,067	314	340,266	11,944	14,699	31,007	58,457	2,321,927 2,678,073
										2,135,146	2,135,146	72,710,832 29,437,084
						7	12	261	322	679	1,281	3,234,110
						7	12	261	322	679	1,281	75,944,942 29,437,084
						7	12	261	322	679	1,281	105,382,026
3,379 49,947 53,326	204,115 5,246 209,361	9 9,921 9,930	392,781 213,552 606,333	461,086 120,292 581,385	1,879,705 333,711 2,213,416	519,425 -36,629 482,796	750,668 803,707 1,554,375	1,845,536 222,879 2,068,415	421,732 255,742 677,474	856,039 3,621,642 4,477,681	7,334,475 5,600,017 12,934,492	83,955,122 50,939,361 134,894,483
3,513 49,947 53,460	219,214 5,246 224,460	9 9,921 9,930	420,864 213,552 634,416	595,796 120,292 716,095	2,568,242 333,711 2,901,953	811,840 -36,629 775,211	1,121,404 803,707 1,925,111	2,939,710 222,879 3,162,589	686,172 255,742 941,914	1,447,485 3,621,642 5,069,127	10,814,249 5,600,017 16,414,266	48,497,723 21,502,277 70,000,000
134	15,099		28,083	134,710	688,537	292,422	370,748	1,094,435	264,762	592,125	3,481,055	40,487,543

Summary of Allocation Percentages

The Department annually determines water contractor charges for the State Water Project based on allocations of costs among purposes of those facilities which are jointly used for more than one purpose. These determinations

utilize the percentages previously reported to and approved by the Legislature, as well as preliminary estimates for facilities which have not been reported. These percentages are summarized in the table below.

SUMMARY OF CAPITAL COST ALLOCATION PERCENTAGES

(in percent of joint costs of the respective facilities)

Facilities of the State Water Project	Reimbursable Purposes	Nonreimbursable Purposes ^(a)		Total
	Water Supply and Power Generation	Flood Control	Recreation and Fish and Wildlife Enhancement	
<u>Project Conservation Facilities</u>				
Frenchman Dam and Lake (b)	21.5	0	78.5	100.0
Antelope Dam and Lake (b)	0	0	100.0	100.0
Grizzly Valley Dam and Lake Davis (b)	5.1	0	94.9	100.0
Oroville Division (b (d)	97.1	0	2.9	100.0
California Aqueduct, Delta to Dos Amigos Pumping Plant (b)	96.6	0	3.4	100.0
Delta Facilities (c)	86.0	0	14.0	100.0
<u>Project Transportation Facilities</u>				
California Aqueduct:				
California Aqueduct, Delta to Dos Amigos Pumping Plant (b (e)	96.6	0	3.4	100.0
California Aqueduct, Dos Amigos Pumping Plant to terminus excluding the Coastal Branch (b(e)	94.3	0	5.7	100.0
Coastal Branch	100.0	0	0	100.0
South Bay Aqueduct:				
Del Valle Dam and Lake Del Valle (b)	25.2	26.8	48.0	100.0
Remainder of South Bay Aqueduct	100.0	0	0	100.0
North Bay Aqueduct (c)	100.0	0	0	100.0
<p>a) Additional purposes may be identified after project formulation in the Delta is completed.</p> <p>b) Final percentages, subject to periodic review as discussed on Page 9.</p> <p>c) Illustrative percentages only, assumed for current project financial and repayment analyses.</p> <p>d) Percentages are applicable to Capital Costs of Features Jointly Used, minus Federal Flood Control Payments.</p> <p>e) Percentages shown were used to compute costs allocated to recreation and fish and wildlife enhancement which are reported for reimbursement under AB-12. However, until these percentages are approved by the Legislature, 97.0 percent of the joint capital costs are used for determining water contractor charges.</p> <p>NOTE: Percentages shown are those applicable to the costs of the facility as accounted by the State, or, in the case of federal-state joint-use facilities (San Luis Facilities), only the State's share of the total cost.</p>				

The facilities which remain to be reported are two reservoirs in the Upper Feather River area and the Delta Facilities. Upon completion of project formulation for the Delta Facilities, costs

may be allocated to purposes other than those shown in the above table. The allocation for the Delta Facilities is scheduled to be reported in 1993 as shown in the table on page 9.

DERIVATION OF PROJECT PURPOSE COST ALLOCATION PERCENTAGES
FOR THE CALIFORNIA AQUEDUCT, DOS AMIGOS PUMPING PLANT TO TERMINI

The California Aqueduct, Dos Amigos Pumping Plant to Termini is being operated for the purposes of water supply and recreation and fish and wildlife enhancement. An allocation of California Aqueduct costs among these project purposes is required for administration of:

- o The payment provisions of 31 water supply contracts executed between the State and local water agencies.
- o The Davis-Dolwig Act provision that the Department shall report to the Legislature the costs of the State Water Project that are allocated to recreation and enhancement.

DERIVATION METHOD

The water supply contracts between the Department and the water contracting agencies provide that costs of the initial project conservation facilities shall be allocated among project purposes by the separable costs-remaining benefits method. However, for the project transportation facilities, the contracts do not clearly specify a project purpose cost allocation method.

Separable costs-remaining benefits is currently the most equitable and widely accepted method of allocating costs of multipurpose water projects among project purposes. Therefore, the project purpose allocation percentages for the California Aqueduct, Dos Amigos Pumping Plant to the terminal facilities, were derived by the separable costs-remaining benefits method.

Several alternatives have been developed to allocate costs of the California Aqueduct by the separable costs-remaining benefits method. The Department has derived project purpose allocation percentages for the Aqueduct using various pricing levels for project benefits and various methods of combining facilities. These allocation studies

have resulted in a range of 5.7 percent to about 13 percent of joint capital costs allocated to recreation.

The project purpose cost allocation for the California Aqueduct, Dos Amigos Pumping Plant to Termini, reported herein results in the minimum level of costs allocated to recreation and enhancement of the allocations considered. However, the Department's cost allocation studies are continuing and this allocation may be revised once the Department has completed its review of the report on cost allocation methodology prepared by the Department of Finance. This report is titled "Review of Davis-Dolwig Allocation Methodology: Recreation Costs of State Water Project, California Department of Water Resources", dated October 1979.

The derivation of allocation percentages for the joint costs of the California Aqueduct, Dos Amigos Pumping Plant to Termini is summarized in Table 3. Computational steps for the derivation are outlined in Table 3a.

The costs of a multipurpose facility are estimated and accounted as the sum of specific costs (costs of features of the facility which can be readily identified

TABLE 3

 DERIVATION OF PROJECT PURPOSE COST ALLOCATION PERCENTAGES ^(a)
 CALIFORNIA AQUEDUCT: DOS AMIGOS PUMPING PLANT TO TERMINI

(in thousands of dollars unless otherwise noted)

Line No.	Item of Benefit or Cost ^(a)	Water Supply ^(b)	Recreation ^(c)	Total
1.	Benefits	173,033	12,525	185,558
2.	Alternative Costs	102,965	25,812	128,777
3.	Justifiable Costs	102,965	12,525	115,490
4.	Separable Costs:			
	Total	84,262	7,109	91,371
	Capital	50,979	2,778	53,757
	Minimum OMP&R	12,336	4,072	16,408
	Variable OMP&R	20,947	259	21,206
5.	Remaining Justifiable Costs	18,703	5,416	24,119
6.	Percent Distribution of Remaining Justifiable Costs	77.5%	22.5%	100.0%
7.	Remaining Joint Costs:			
	Total	14,495	4,208	18,703
	Capital	12,948	3,759	16,707
	Minimum OMP&R	1,547	449	1,996
	Variable OMP&R	0	0	0
8.	Total Allocated Project Costs:			
	Total	98,757	11,317	110,074
	Capital	63,927	6,537	70,464
	Minimum OMP&R	13,883	4,521	18,404
	Variable OMP&R	20,947	259	21,206
9.	Percent Distribution of Total Project Costs:			
	Total	89.7%	10.3%	100.0%
	Capital	90.7%	9.3%	100.0%
	Minimum OMP&R	75.4%	24.6%	100.0%
	Variable OMP&R	98.8%	1.2%	100.0%
10.	Specific Costs:			
	Total	21,756	7,032	28,788
	Capital	807	2,701	3,508
	Minimum OMP&R	2	4,072	4,074
	Variable OMP&R	20,947	259	21,206
11.	Allocated Costs of Features Jointly Used:			
	Total, Excluding Variable OMP&R	77,001	4,285	81,286
	Capital	63,120	3,836	66,956
	Minimum OMP&R	13,881	449	14,330
12.	Percent Distribution of Costs of Features Jointly Used:			
	Total, Excluding Variable OMP&R	94.7%	5.3%	100.0%
	Capital	94.3%	5.7%	100.0%
	Minimum OMP&R	96.9%	3.1%	100.0%

a) Benefits and costs for 50 years of Project operation converted to equal annual equivalent values, at 4.5% interest for the 50-year period 1968-2017.

b) Includes associated purpose of power generation.

c) Includes associated purpose of fish and wildlife enhancement.

TABLE 3A
OUTLINE OF CALCULATIONS FOR DERIVING ALLOCATION PERCENTAGES ^(a)
 (equal annual equivalent values in thousands unless otherwise noted)

Step No.	Calculation
1	alternative water supply costs (\$102,965) = justifiable water supply cost (\$102,965) ^(b)
2	recreation benefits (\$12,525) = justifiable recreation costs (\$12,525) ^(b)
3	total project costs (\$110,074) - hypothetical recreation project costs (\$25,812) = separable water supply costs (\$84,262)
4	total project costs (\$110,074) - hypothetical water supply project costs (\$102,965) = separable recreation costs (\$7,109)
5	justifiable water supply costs (\$102,965) - separable water supply costs (\$84,262) = remaining justifiable water supply costs (\$18,703)
6	justifiable recreation costs (\$12,525) - separable recreation costs (\$7,109) = remaining justifiable recreation costs (\$5,416)
7	remaining justifiable water supply costs (\$18,703) + remaining justifiable recreation costs (\$5,416) = total remaining justifiable costs (\$24,119)
8	$\frac{\text{remaining justifiable water supply costs } (\$18,703)}{\text{total remaining justifiable costs } (\$24,119)} \times 100 = \text{percent distribution of remaining justifiable water supply costs } (77.5\%)$
9	$\frac{\text{remaining justifiable recreation costs } (\$5,416)}{\text{total remaining justifiable costs } (\$24,119)} \times 100 = \text{percent distribution of remaining justifiable recreation costs } (22.5\%)$
10	total allocated project costs (\$110,074) - total separable costs (\$91,371) = total remaining joint costs (\$18,703)
11	total remaining joint costs (\$18,703) x percent distribution of remaining justifiable water supply costs (77.5%) = remaining joint water supply costs (\$14,495)
12	total remaining joint costs (\$18,703) x percent distribution of remaining justifiable recreation costs (22.5%) = remaining joint recreation costs (\$4,208)
13	remaining joint water supply costs (\$14,495) + separable water supply costs (\$84,262) = total costs allocated to water supply (\$98,757)
14	remaining joint recreation costs (\$4,208) + separable recreation costs (\$7,109) = total costs allocated to recreation (\$11,317)
15	specific water supply costs (\$21,756) + specific recreation costs (\$7,032) = total specific costs (\$28,788)
16	total costs allocated to water supply (\$98,757) - specific water supply costs (\$21,756) = joint costs allocated to water supply (\$77,001)
17	total costs allocated to recreation (\$11,317) - specific recreation costs (\$7,032) = joint costs allocated to recreation (\$4,285)
18	joint costs allocated to water supply (\$77,001) + joint costs allocated to recreation (\$4,285) = total joint costs (\$81,286)
19	$\frac{\text{joint costs allocated to water supply } (\$77,001)}{\text{total joint costs } (\$81,286)} \times 100 = \text{percent of joint costs allocated to water supply } (94.7\%)$
20	$\frac{\text{joint costs allocated to recreation } (\$4,285)}{\text{total joint costs } (\$81,286)} \times 100 = \text{percent of joint costs allocated to recreation } (5.3\%)$
21	percent of joint costs allocated to water supply (94.7%) + percent of joint costs allocated to recreation (5.3%) = 100%

a) Applicable to the total costs (Capital and OMP&R) of features jointly used by project purposes.

b) Justifiable costs for each purpose are the total benefits of that purpose or the costs of the least costly single-purpose alternative project providing the same benefits, whichever are less.

as serving one project purpose exclusively -- such as on-shore recreation developments) and joint costs (costs of features which generally serve more than one purpose -- such as multipurpose dams and reservoirs). The specific costs of recreation developments, except associated land costs, are accounted by agencies other than the Department of Water Resources and are financed by funds other than Project funds. All other specific costs and all joint costs of the State Water Project facilities are accounted by the Department and financed by Project funds. The costs of a multipurpose facility also may be estimated (but not accounted) on the basis of separable costs and remaining joint costs. Separable costs are estimated for each purpose of a multipurpose facility as the difference in the estimated total costs of the facility less the estimated costs of a similar facility designed to exclude the particular purpose. The separable costs of a facility are the total separable costs for all purposes of the facility. The remaining joint costs are the differences in the estimated total costs of the facility less the estimated separable costs of the facility.

Justifiable costs are the estimated maximum expenditures which theoretically would be justified to realize the benefits of a multipurpose facility. Remaining justifiable costs are those justifiable costs in excess of the sum of the

Project benefits are the net value of goods and services that will directly result from operation of the California Aqueduct.

Water Supply Benefits

The project purpose of water supply includes the conveyance of water in pro-

separable costs of the facility. The derivation of allocation percentages for the California Aqueduct, Dos Amigos Pumping Plant to termini, as shown in Table 3, follows the separable costs-remaining benefits allocation method. Under this method, total costs of the multipurpose facility are allocated to each project purpose to be accommodated by the facility by the sum of:

- o The estimated separable costs of each purpose (item 4 of Table 3).
- o A share of the estimated remaining joint costs allocated among purposes (item 7 of Table 3) on the basis of remaining justifiable costs of each purpose (items 5 and 6 of Table 3).

Conventionally, the total costs allocated to each purpose (item 8), expressed as a percentage of such total costs (item 9), are the final result of the allocation procedure. However, since some of the specific costs of the State Water Project are accounted by agencies other than the Department of Water Resources, the percentages of each purpose's allocation of the estimated total costs must be adjusted to a percentage applicable only to the estimated joint costs (item 11) by deducting the estimated specific costs. The resulting percentages can then be applied to the actual joint costs of project facilities as accounted by the Department.

BENEFITS

ject facilities to State Water Project service areas in the San Joaquin Valley and Southern California.

Water supply benefits are measured at the points of delivery from project facilities and are evaluated by different methods for agricultural use and for municipal and industrial use.

The measure of benefit for agricultural use is taken as the difference between net returns from farming operations with and without project water, reduced by the costs of local distribution systems between project facilities and farm headgates. The net return from farming operations is considered to be the remainder of gross income less all farm expenses (except water costs and either land rental or interest on land investment).

The measure of benefit for municipal and industrial use is taken as the estimated cost of an equivalent water supply from

the least expensive of any source -- multipurpose or single-purpose -- other than project facilities, limited by the estimated maximum price users are willing to pay.

The estimated water supply benefits of the State Water Project, exclusive of the Upper Feather Division, are shown in Table 4. These estimates reflect entitlement water service under long-term contracts. Excluded are surplus water service under short-term contracts and federal water service from joint state facilities.

TABLE 4

TOTAL WATER SUPPLY BENEFITS OF THE STATE WATER PROJECT (a)

Service Area	Maximum Annual Entitlement (b) (acre-feet)	Equal Annual Equivalent Entitlements (c) (acre-feet)	Estimated Unit Net Benefit (d) (dollars per acre-foot)	Equal Amount Equivalent Net Benefits (c) (thousands of dollars)
Feather River	37,100	12,997	10.00	130
North Bay	67,000	27,963	23.87	667
South Bay	188,000	144,858	38.00	5,504
San Joaquin Valley	1,355,000	832,162	31.47	26,188
Central Coastal	82,700	30,406	181.81	5,528
Southern California	<u>2,497,500</u>	<u>1,383,061</u>	<u>204.41</u>	<u>282,711</u>
Total, State Water Project	4,227,300	2,431,447	131.91	320,728

a) Excluding the facilities of the Upper Feather Division.
 b) Existing as of January 1, 1980 (Bulletin 132-79, Table B-4).
 c) Annual values through 2017, converted to equal annual equivalents for the 50-year period 1968-2017, at 4.5 percent interest.
 d) Measured at the points of delivery from project facilities.

Distribution of Water Supply Benefits Among Project Facilities. Water supply benefits are derived from the combined operation of project conservation facilities and project transportation facilities, except for the relatively minor reservoirs in the Upper Feather Division which are operated primarily for local

needs. Costs of these facilities are allocated separately among project purposes. To compute such cost allocations, total project water supply benefits are distributed among the component facilities of the State Water Project, including the Additional Conservation Facilities, in the same proportions as the

costs of these facilities which are allocated to water supply.

The portion of the total water supply benefits of the State Water Project that are assignable to the California Aqueduct, Dos Amigos Pumping Plant to the terminal facilities, is estimated to be \$173,033,000 annually:

- (a) Estimated total costs of California Aqueduct, Dos Amigos Pumping Plant to termini allocable to water supply \$110,074,000.
- (b) Estimated total costs of the State Water Project, excluding the Upper Feather Division, allocable to water supply. \$204,016,000.
- (c) Percent (a) of (b). 53.95%
- (d) Estimated total water supply benefits of the State Water Project excluding the Upper Feather Division (from Table 4). \$320,728,000.
- (e) Total water supply benefits assigned to the California Aqueduct, Dos Amigos Pumping Plant to termini. \$173,033,000.

Recreation and Fish and Wildlife Enhancement Benefits. Estimated recreation and fish and wildlife enhancement benefits for the California Aqueduct from Dos Amigos Pumping Plant to the terminal facilities include those associated with initial and future recreation and enhancement features along the California Aqueduct and at Silverwood Lake, Lake Perris, Pyramid Lake and Castaic Lake.

For this exhibit, the projected recreation use and recreation benefit unit values for the California Aqueduct, including the four Southern California reservoirs, were provided by the Department's Recreation Planning Section. The recreation benefit unit values were determined using two factors:

1. Variety and quality of recreation at a facility were evaluated using a scale with a maximum value of 100 points.
2. Esthetic qualities of a recreation facility were evaluated using a maximum value of 100 points. The effect of the fluctuation of the water surface area of a reservoir had a rating in the range of zero to 50 points and all other esthetic factors combined had a rating in the range of zero to 50 points.

The point scores resulting from application of the two above factors are added, and the recreation benefit unit value is equal to \$0.50 plus \$0.01 per point. This yields a range of values for recreation from \$0.50 to \$2.50 per recreation day.

In recreation studies it is difficult to separate fish and wildlife related activities from other activities. Therefore, the recreation benefit unit values include an amount for fish and wildlife enhancement.

Federal, State and local agencies have signed contracts for operation of concessions at all four Southern California reservoirs. Terms of these contracts provide for payment by the concessionaires of a percentage of gross annual receipts to the contracting government agencies. Estimates of these payments are added to the recreation use benefits to arrive at the total recreation benefit for the facility.

Current estimates of recreation and enhancement benefits for the California Aqueduct, Dos Amigos Pumping Plant to termini including concessionaire payments are summarized in Table 5.

TABLE 5

RECREATION AND FISH AND WILDLIFE ENHANCEMENT USE AND BENEFITS FOR
THE CALIFORNIA AQUEDUCT, DOS AMIGOS PUMPING PLANT TO TERMINI

Decade	Use (Recreation Days)	Recreation Benefits (Dollars)	Concessionaire Payments	Equal Annual Equivalent (in thou- sands)
	(1)	(2)	(3)	(4)
<u>Fishing Access Sites (a)</u>				75
1971-1981	372,690	652,208		
1982-1991	617,000	1,079,750		
1992-2001	617,000	1,079,750		
2002-2011	617,000	1,079,750		
2012-2021	577,000	1,009,750		
<u>Walk In Fishing (a)</u>				294
1973-1981	1,080,180	1,890,315		
1982-1991	2,790,000	4,882,500		
1992-2001	2,790,000	4,882,500		
2002-2011	2,790,000	4,882,500		
2012-2021	2,014,000	3,524,500		
<u>Ritter Canyon Aquatic Recreation Area (b)</u>				165
1981	24,500	44,100		
1982-1991	1,739,000	3,130,200		
1992-2001	1,880,000	3,384,000		
2002-2011	1,880,000	3,384,000		
2012-2021	1,880,000	3,384,000		
<u>Wildlife Habitat Area (c)</u>				6
1975-1981	18,000	44,000		
1982-1991	36,000	88,000		
1992-2001	36,000	88,000		
2002-2011	36,000	88,000		
2012-2021	36,000	88,000		
<u>Bikeway (d)</u>				15
1973-1981	83,500	167,000		
1982-1991	100,000	200,000		
1992-2001	100,000	200,000		
2002-2011	100,000	200,000		
2012-2021	100,000	200,000		
<u>Silverwood Lake (e)</u>				2,169
1972-1981	5,023,300	11,237,000	454,000	
1982-1991	11,062,100	24,564,000	1,191,000	
1992-2001	17,667,800	38,917,000	1,909,000	
2002-2011	20,250,000	44,520,000	2,190,000	
2012-2021	20,250,000	44,520,000	2,190,000	
<u>Lake Perris (f)</u>				5,006
1974-1982	13,858,300	29,750,000	175,000	
1983-1992	34,780,600	74,424,000	1,043,000	
1993-2002	41,295,400	88,320,000	1,239,000	
2003-2012	44,248,800	94,522,000	1,327,000	
2013-2022	46,612,000	99,485,000	1,398,000	
<u>Pyramid Lake (g)</u>				1,643
1974-1982	4,333,800	7,259,000	101,000	
1983-1992	16,054,000	24,858,000	433,000	
1993-2002	20,750,000	31,704,000	560,000	
2003-2012	21,750,000	33,155,000	587,000	
2013-2022	22,750,000	34,605,000	614,000	
<u>Castaic Lake (h)</u>				3,152
1972-1981	12,037,500	24,655,000	641,000	
1982-1991	20,975,000	42,530,000	1,631,000	
1992-2001	22,470,000	45,520,000	1,749,000	
2002-2011	23,650,000	47,880,000	1,842,000	
2012-2021	24,650,000	49,880,000	1,921,000	
TOTALS	466,782,470	931,957,823	23,195,000	12,525

a) \$1.75 per recreation day.

b) \$1.80 per recreation day.

c) General recreation at \$1.50 per recreation day.

Nature photography at \$3.25 per recreation day.

Hunting at \$4.00 per recreation day.

d) \$2.00 per recreation day.

e) General recreation at \$1.45 per recreation day.

Trout fishing at \$2.50 per recreation day.

f) General recreation at \$2.10 per recreation day.

Trout fishing at \$2.50 per recreation day.

g) General recreation at \$1.45 per recreation day.

Trout fishing at \$2.00 per recreation day.

h) General recreation at \$2.00 per recreation day.

Trout fishing at \$2.50 per recreation day.

TOTAL PROJECT COSTS

The estimated total project costs of the California Aqueduct, Dos Amigos Pumping Plant to termini, are summarized in Table 6.

TABLE 6

TOTAL PROJECT COSTS

(in thousands of dollars)

Project Features	First Costs (a)	Equal Annual Equivalent Costs at 4.5% Interest: 50-Year Period 1968-2017			
		Capital	Minimum OMP&R	Variable OMP&R	Total
San Luis Division	78,567	4,488	2,051	1,992	8,531
South San Joaquin Division	262,095	12,675	3,816	9,096	25,587
Tehachapi Division	287,764	13,111	1,845	17,061	32,017
Mojave Division except Silverwood Lake	191,660	8,251	2,766	2,594	13,611
Silverwood Lake	64,869	2,718	1,062	0	3,780
Santa Ana Division except Lake Perris	120,886	5,312	920	-3,581	2,651
Lake Perris	95,301	3,754	1,971	0	5,725
West Branch except Pyramid and Castaic Lakes	246,407	10,605	1,607	-5,956	6,256
Pyramid Lake	68,562	2,445	954	0	3,399
Castaic Lake	158,714	7,105	1,412	0	8,517
Totals	1,574,825	70,464	18,404	21,206	110,074

a) "First Costs" represent total capital costs exclusive of interest charges during construction.

ALTERNATIVE COSTS

In project formulation and cost allocation studies, the "alternative costs" of a purpose included in a multipurpose project are estimated as the costs of the least expensive single-purpose alternative means that would provide the same benefits for that purpose as provided by the multipurpose facility. Alternative means include the possible construction of a single-purpose facility at the same site as the multipurpose facility. Inclusion of a purpose in the planned operation of a multipurpose facility is justified only if the costs allocated to the purpose do not exceed the alternative costs or the benefits of the purpose, whichever is less.

Water Supply Alternative Costs. The least expensive alternative means of providing the same water supply benefits

as the multipurpose California Aqueduct is estimated to be those multipurpose facilities resized so as to accommodate the project purpose of water supply only. The costs of the single-purpose water supply facilities essentially would be the costs of the features jointly used by purposes of the complete multipurpose facilities. Recreation and fish and wildlife enhancement features would not be needed. Thus, the cost of the alternative single-purpose water supply facilities is equal to the total project costs of the multipurpose facilities, less the estimated costs of including recreation and enhancement in the multipurpose project.

The total estimated costs of this hypothetical single-purpose water supply facility are summarized in Table 7.

TABLE 7

WATER SUPPLY ALTERNATIVE COSTS

(in thousands of dollars)

Item	First Costs	Equal Annual Equivalent Costs at 4.5% Interest: 50-Year Period 1968-2017			
		Capital	Minimum OMP&R	Variable OMP&R	Total
Total Project Costs	1,574,825	70,464	18,404	21,206	110,074
Less: Costs attributable to recreation	89,511	2,778	4,072	259	7,109
Remainder: Water Supply Alternative Costs	1,485,314	67,686	14,332	20,947	102,965

Recreation and Fish and Wildlife Enhancement Alternative Costs. The least expensive single-purpose means of providing the same recreation and enhancement benefits as the multipurpose facilities from Dos Amigos Pumping Plant to the terminal facilities are estimated to include:

- o An aqueduct from Dos Amigos Pumping Plant to the junction of the West Branch and the California Aqueduct, sized to provide 3 370 litres per second (119 cubic feet per second) of conveyance capacity for filling and maintaining four single-purpose reservoirs in Southern California.
- o An aqueduct from the junction of the West Branch and the California Aqueduct to the vicinity of Lake Perris, sized to provide 991 litres per second (35 cubic feet per second) of conveyance capacity for filling and maintaining single-purpose reservoirs in the vicinity of existing Silverwood Lake and Lake Perris.
- o A West Branch Aqueduct sized to provide 2 379 litres per second (84 cubic feet per second) of conveyance cap-

acity for filling and maintaining single-purpose reservoirs in the vicinity of existing Pyramid Lake and Castaic Lake.

- o A single-purpose recreation Silverwood Lake of 92 475 cubic dekametres (74,970 acre-feet) gross capacity.
- o A single-purpose recreation Lake Perris of 61 674 cubic dekametres (50,000 acre-feet) gross capacity.
- o A single-purpose recreation Pyramid Lake of 56 247 cubic dekametres (45,600 acre-feet) gross capacity.
- o A single-purpose recreation Castaic Lake of 222 028 cubic dekametres (180,000 acre-feet) gross capacity.
- o Recreation and enhancement features essentially as planned for the existing multipurpose facilities.

Table 8 summarizes the total estimated costs of this hypothetical single-purpose recreation facility.

TABLE 8

RECREATION AND FISH AND WILDLIFE ENHANCEMENT
ALTERNATIVE COSTS

(in thousands of dollars)

Item	First Costs	Equal Annual Equivalent Costs at 4.5% Interest: 50-Year Period 1968-2017			
		Capital	Minimum OMP&R	Variable OMP&R	Total
Single-Purpose Aqueduct and Reservoirs	368,311	16,784	1,996	259	19,039
Specific Recreation Features	87,653	2,701	4,072	0	6,773
Totals	455,964	19,485	6,068	259	25,812

SEPARABLE COSTS

In project formulation and cost allocation studies, the separable cost of a particular purpose of a multipurpose project is the estimated cost of accommodating that purpose in the planned construction and operation of the multipurpose facility. The separable cost of a particular purpose is the difference between the following two cost estimates: (a) the total cost of the multipurpose facility; and (b) the total estimated costs of a hypothetical facility planned to accommodate all purposes of the complete multipurpose facility except the particular purpose. The total

separable costs of the multipurpose facility is the total of the separable costs for all purposes accommodated in the planned construction and operation of the facility.

Water Supply Separable Costs. If the California Aqueduct, Dos Amigos to termini, were redesigned to accommodate all project purposes except water supply, the hypothetical facility would include the same features as the single-purpose recreation and enhancement alternative project (Table 8). Table 9 summarizes the water supply separable costs.

TABLE 9

WATER SUPPLY SEPARABLE COSTS

(in thousands of dollars)

Item	First Costs	Equal Annual Equivalent Costs at 4.5% Interest: 50-Year Period 1968-2017			
		Capital	Minimum OMP&R	Variable OMP&R	Total
Total Project Costs	1,574,825	70,464	18,404	21,206	110,074
Less: Hypothetical Facilities for recreation and fish and wildlife enhancement (Recreation Alternative Costs)	287,459	19,485	6,068	259	25,812
Remainder: Water Supply Separable Costs	1,287,366	50,979	12,336	20,947	84,262

Recreation and Fish and Wildlife Enhancement Separable Costs. The separable costs of recreation and enhancement are equal to the total estimated costs of multipurpose facilities from Dos Amigos Pumping Plant to termini in excess of the estimated costs of hypothetical facilities sized for water supply only.

Such hypothetical water supply facilities are equivalent to the alternative water supply facilities previously described (Table 7). The estimated recreation and enhancement separable costs for multipurpose facilities from Dos Amigos Pumping Plant to termini are shown in Table 10.

TABLE 10

RECREATION AND FISH AND WILDLIFE ENHANCEMENT
SEPARABLE COSTS

(in thousands of dollars)

Item	First Costs	Equal Annual Equivalent Costs at 4.5% Interest: 50-Year Period 1968-2017			
		Capital	Minimum OMP&R	Variable OMP&R	Total
Total Project Costs	1,574,825	70,464	18,404	21,206	110,074
Less: Hypothetical Facilities for Water Supply	1,485,314	67,686	14,332	20,947	102,965
Remainder: Separable Recreation and Fish and Wildlife Enhancement Costs	89,511	2,778	4,072	259	7,109



Beach and marina at Lake Perris on Labor Day 1979
with approximately 10,000 people at the lake.

COMMENTS
BY
THE DEPARTMENT OF BOATING AND WATERWAYS,
THE DEPARTMENT OF PARKS AND RECREATION,
AND THE DEPARTMENT OF FISH AND GAME

Memorandum

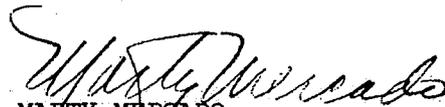
To : Ronald B. Robie
Director
Department of Water Resources
1416 9th Street
Sacramento, Ca 95814

Date : March 17, 1980

Subject: Annual Report to the
Legislature, State Water
Project Cost Allocation
to Recreation and Fish
and Wildlife Enhancement

From : **Department of Boating and Waterways**

In accordance with California Water Code Section 11912, the Department of Boating and Waterways has reviewed the subject report and we have no comment.


MARTY MERCADO
Director

Memorandum

Date : MAR 21 1980

To : Ronald B. Robie, Director
Department of Water Resources
1416 Ninth Street, 11th Floor
Sacramento, CA 95814

MAR 31 1980 Noted
RBR

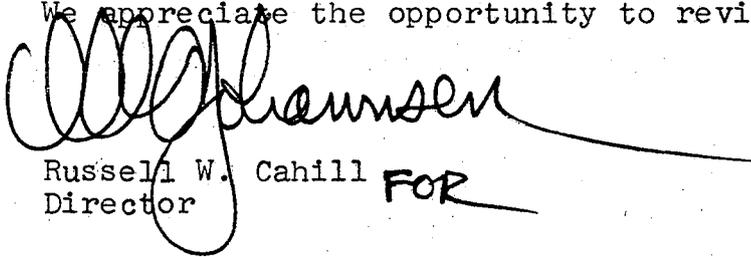
From : Department of Parks and Recreation

Subject: Cost Allocations to Recreation
and Fish and Wildlife Enhancement,
State Water Project

The Department of Parks and Recreation has reviewed the Draft Appendix D, Costs of Recreation and Fish and Wildlife Enhancement.

The Department has no comments.

We appreciate the opportunity to review the document.



Russell W. Cahill
Director FOR

Memorandum

To : Ronald B. Robie, Director
Department of Water Resources

Date: March 24, 1980

From : **Department of Fish and Game**

Subject: Annual Report to the Legislature, State Water Project Costs of Recreation and Fish and Wildlife Enhancement

In accordance with California Water Code, Section 11912, you requested our written comments on State Water Project joint costs allocated to recreation, fish and wildlife enhancement, as reported in the review draft of Appendix D to Bulletin No. 132-80.

We have reviewed the 1980 State Water Project draft report, Appendix D, and find it consistent with previous reports. The Department, therefore, supports the cost allocation and recommends the addition of \$108,251,992 for recreation, fish and wildlife enhancement. We understand that this amount is substantially higher than that reported in 1979 due to the initial reporting of joint capital costs of the California Aqueduct, Das Amigos Pumping Plant to termini allocated to recreation and enhancement.

We commented in our review of Bulletin 132-79 that the recreation, fish and wildlife enhancement unit values used in the cost allocation are low in relation to values generally accepted by the resource economic community. This is again true of the unit values used in Bulletin 132-80. The Department is aware of your ongoing efforts to determine the feasibility of updating these values and offer our assistance in this endeavor.

Since we no longer employ an economist on our staff, the report was not subject to an economic analysis.

Thank you for the opportunity to review this report.



FOR Director

CONVERSION FACTORS

English to Metric System of Measurement

Quantity	English Unit	Multiply by*	To get metric equivalent
Length	Inches (in)	25.4	millimetres (mm)
		.0254	metres (m)
	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square inches (in ²)	6.4516 x 10 ⁴	square metres (m ²)
	square feet (ft ²)	.092903	square metres (m ²)
	acres	4046.9	square metres (m ²)
		.40469	hectares (ha)
		.40469	square hectometres (hm ²)
		.0040469	square kilometres (km ²)
	square miles (mi ²)	2.590	square kilometres (km ²)
Volume	gallons (gal)	3.7854	litres (l)
		.0037854	cubic metres (m ³)
	million gallons (10 ⁶ gal)	3785.4	cubic metres (m ³)
	cubic feet (ft ³)	.028317	cubic metres (m ³)
	cubic yards (yd ³)	.76455	cubic metres (m ³)
	acre-feet (ac-ft)	1233.5	cubic metres (m ³)
		1.2335	cubic dekametres (dm ³)
		.0012335	cubic hectometres (hm ³)
	1.233 x 10 ⁻⁶	cubic kilometres (km ³)	
Volume Time (Flow)	cubic feet per sec (ft ³ /s)	28.317	litres per second (l/s)
		.028317	cubic metres per sec (m ³ /s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
		6.309 x 10 ⁻⁵	cubic metres per sec (m ³ /s)
	million gallons per day (mgd)	.043813	cubic metres per sec (m ³ /s)
Water Usage	acre-feet per acre	.3048	cubic metres per square metre (m ³ /m ²)
Mass	pounds (lb)	.45359	kilograms (kg)
	tons (short, 2,000 lb)	.90718	tonne (t)
		907.18	kilograms (kg)
Power	horsepower (hp)	0.7460	kilowatts (kW)
Pressure	pounds per square inch (psi)	6894.8	pascal (Pa)

* For greater accuracy, use conversion factors in "Metric Practice Guide" (American Society for Testing and Materials, E 380-72).

