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PER GOV. CODE § 6103

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SUPERIOR COURT OF THE STATE OF CALIFORNIA  
COUNTY OF LOS ANGELES

**SANTA BARBARA CHANNELKEEPER,**  
  
Petitioner,  
  
**v.**  
  
**STATE WATER RESOURCES CONTROL  
BOARD, a California State Agency; CITY  
OF BUENAVENTURA, a California  
municipal corporation,**  
  
Respondents,

Case No. 19STCP01176

**STATE AGENCIES' REQUEST FOR  
JUDICIAL NOTICE IN SUPPORT OF  
SUPPLEMENTAL BRIEFING ON THE  
PHYSICAL SOLUTION DOCTRINE**

Date: March 15, 2021  
Time: 1:30 p.m.  
Dept.: 10  
Judge: Honorable W. Highberger  
Trial Date: None Set  
Action Filed: September 19, 2014

1  
2 **CITY OF SAN BUENAVENTURA, a**  
3 **California municipal corporation,**  
4 Cross-Complainant,  
5  
6 **v.**  
7 **DUNCAN ABBOTT, an individual; et al.,**  
8 Cross-Defendants.

9 JESSICA EILEEN TUCKER-MOHL  
10 Supervising Deputy Attorney General  
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21 *California Department of Parks and Recreation*  
22  
23  
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1 Respondent and intervenor State Water Resources Control Board (the “State Water  
2 Board”), intervenor California Department of Fish and Wildlife (the “Department”), and cross-  
3 defendant California Department of Parks and Recreation (“Parks”) (collectively, the “State  
4 Agencies”) respectfully request that the Court take judicial notice pursuant to Evidence Code  
5 section 452, subdivision (d) of the statement of decision in the following state court matter:

- 6 1. *Environmental Defense Fund, Inc. et al., v. East Bay Municipal Utility District et al.*  
7 (Superior Court Alameda County Case No. 425955) – attached hereto as Exhibit 1.

8 Under Evidence Code section 453, this Request for Judicial Notice is conditionally  
9 mandatory and must be granted if sufficient notice is given to an adverse party and if the court is  
10 furnished with sufficient information to enable it to take judicial notice of the matter (*People v.*  
11 *Maxwell* (1978) 78 Cal.App.3d 124, 130). By this request, the State Agencies give the Court and  
12 all parties sufficient notice and information to enable the Court to take judicial notice of the  
13 document attached hereto.

14 Pursuant to Evidence Code section 452, subdivision (d), this Court may take judicial  
15 notice of “Record of (1) any court of this state [...].” Therefore, the State Agencies request the  
16 Court take judicial notice of the attached statement of decision that are relevant to this Court’s  
17 consideration of this Ventura River watershed adjudication.

18  
19 Dated: March 10, 2021

Respectfully Submitted,

20 XAVIER BECERRA  
21 Attorney General of California  
22 MYUNG J. PARK  
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23 

24  
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28 State Water Resources Control Board

1 Dated: March 10, 2021

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3  
4  
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8 Dated: March 10, 2021

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# **Exhibit 1**

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8 IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA  
9 IN AND FOR THE COUNTY OF ALAMEDA  
10

11 ENVIRONMENTAL DEFENSE )  
12 FUND, INC., et al., )

13 Plaintiff, )

14 v. )

15 EAST BAY MUNICIPAL )  
16 UTILITY DISTRICT, et al., )

17 Defendants. )  
18

19 COUNTY OF SACRAMENTO, )  
20 et al., )

21 Intervenor. )  
22

No. 425955

STATEMENT OF DECISION

23 I.

24 The single issue, which has spawned 17 years of litigation to date, is  
25 whether, pursuant to a 1970 contract with the Bureau of Reclamation, EBMUD  
26 may divert 150,000 acre-feet annually (AFA) from the Folsom Reservoir at the  
27 Folsom-South Canal or whether the mandates of Article X, section 2 of the  
28 California Constitution and public trust doctrine require that the diversion occur

1 below the confluence of the American River and Sacramento River. Plaintiffs  
2 and intervenors<sup>1</sup> contend that the EBMUD diversion and consequent diminution  
3 of instream flows will cause substantial ecological harm to riparian habitat,  
4 fisheries, and recreational resources. Plaintiffs and intervenors further direct  
5 their concern to the cumulative impact of the EBMUD diversion in combination  
6 with projected appropriation and diversion of American River water in response  
7 to expanding urbanization and population growth.

8 EBMUD contends that the evidence is insufficient to demonstrate any  
9 appreciable harm to public trust values; that principles of California Water Law  
10 require the recognition and implementation of its contract rights; that sound  
11 public policy requires that high quality drinking water be obtained from the best  
12 available source; and that the Folsom Dam was constructed pursuant to objectives  
13 and purposes that preempt state interference. Each side has advanced a number  
14 of subordinate and corollary issues, each of which will be considered in turn.

15 The Court has concluded that providing high quality drinking water is a  
16 significant public policy objective that is furthered by EBMUD's diversion at the  
17 Folsom-South Canal. The evidence has demonstrated persuasively, however,  
18 that specific conditions must attach to that diversion in order to protect sensitive  
19 public trust values. Accordingly, the Court has fashioned a physical solution  
20 designed to accommodate the competing concerns which have emerged.

21 Finally, the evidence is overwhelming that the cumulative impact of  
22 EBMUD's diversion along with those consumptive demands projected over the  
23 next few decades would cause irreparable damage to the American River, its  
24 fisheries and its riparian habitat. Consequently, both Article X, section 2 and  
25 public trust doctrine require that this court's physical solution be considered a base  
26 line against which any future diversion or appropriation is to be measured.

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27 <sup>1</sup> The terms "plaintiff(s)" and "intervenor(s)" are sometimes used interchangeably. It is possible  
28 that some arguments or positions may be attributed to a party who did not advance them, and vice versa.

1 Cumulative impact inconsistent with the physical solution may compel a  
2 cessation of EBMUD's diversion.

## 3 II.

4 In 1944 Congress authorized Folsom Dam as a United States Army Corps of  
5 Engineers flood control project. (Pub. L. No. 8-534) In 1949 Folsom Dam was  
6 reauthorized as a United States Bureau of Reclamation ("USBR") multiple  
7 purpose reclamation project (Pub. L. No. 81-356). As part of the this legislation,  
8 Congress also directed the Bureau of Reclamation to conduct studies for disposing  
9 of the water and electric power made available by the project, and specifically  
10 included Alameda and Contra Costa counties among the areas to be served.  
11 Folsom Dam was closed in 1956, and water storage was begun.

12 In March 1958, the State Water Resources Control Board ("SWRCB") issued  
13 Decision 893, granting permits to the USBR for storage of water at Folsom.<sup>2</sup> The  
14 USBR's permits were subject to minimum flows for fisheries resources, as  
15 provided for in a memorandum between the USBR and the California  
16 Department of Fish and Game (250 CFS from January 1 through September 14,  
17 and 500 CFS from September 15 through December 31). The USBR's permits were  
18 also subject to reduction by future appropriation of water for reasonable beneficial  
19 use within the watershed tributary to Folsom Reservoir.

20 In 1965, the Auburn-Folsom South Unit was authorized by Congress under  
21 Public Law 89-161. The main features of the project were Auburn Dam and  
22 Reservoir, and the Folsom-South Canal. The legislation states that the principal  
23 purpose of the project was to increase the supply of water available for irrigation  
24 and beneficial uses. The statute also authorized the Secretary of the Interior to  
25

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26 <sup>2</sup> The decision also granted permits to the City of Sacramento for the diversion of water from the  
27 American River. The city holds water rights on the Sacramento River as well. The decision also  
28 granted to Sacramento, San Joaquin and Placer counties a 10-year period in which to negotiate with  
the United States for a contract for American River water before the supply was permanently  
committed elsewhere.



1 allocate water and reservoir capacity to recreation and fish and wildlife  
2 enhancement.

3 Construction of the Folsom-South Canal commenced in 1968 and 27 miles  
4 of the canal have been completed. Suit was filed in 1972 by certain  
5 environmental groups, including SARA and EDF, that challenged the USBR's  
6 decision to proceed with the Auburn-Folsom South project on the ground that  
7 the EIS was inadequate. (See NRDC v. Stamm, 6 ERC 1525.) In view of the  
8 Secretary of the Interior's announcement that no further construction of the  
9 Folsom-South Canal would be undertaken pending further studies of the source  
10 of supply, the Court determined that the question of further construction of the  
11 Folsom-South Canal was not ripe for review and abstained from deciding that  
12 question, but retained jurisdiction and imposed conditions requiring that the  
13 federal defendants provide at least sixty days notice before commencing  
14 construction of the remaining stretches of the Canal, or before entering into any  
15 water service contracts for American River water. The Department of the Interior  
16 has not completed an EIS for the contracting of additional American River water.

17 Construction of the Auburn Dam was also begun in 1967, and would have  
18 provided 2.3 million acre-feet of additional storage. Concern over the seismic  
19 safety of the dam, however, required redesign and brought the project to a  
20 standstill. The present estimated cost to complete the dam is far in excess of the  
21 authorized cost ceiling, and will require additional authorization and  
22 appropriations by Congress if the project is to proceed.

23 In April, 1970 the SWRCB issued Decision-1356, granting the USBR water  
24 rights permits for Auburn Dam. The board also reserved jurisdiction for the  
25 purpose of formulating terms and conditions relative to flows to be maintained  
26 in the lower American River for recreational purposes, and for the protection and  
27 enhancement of fish and wildlife. Such flows were set in 1972 by Decision 1400.

28 //

1 During the hearing proceedings leading to Decision 1356, the USBR entered  
2 into a stipulation, dated January 26, 1967, with the Sacramento River and Delta  
3 Water Association. This association represented Sacramento County among  
4 other parties. The stipulation extended until 1975 the priority granted to  
5 Sacramento, Placer and San Joaquin counties by D-893 to secure a contract with  
6 the USBR for American River water.

7 During this same time period, EBMUD was negotiating with the Bureau for  
8 a contract for American River water. Recognizing that the 1967 stipulation could  
9 impair any contract that it might obtain, the district entered into negotiations  
10 between the Bureau, the Sacramento River and Delta Water Association  
11 (representing Sacramento County), and the Central Valley East Side Project  
12 Association (representing San Joaquin Valley interests). An agreement was  
13 finally reached among these parties on November 21, 1968. Under the terms of  
14 that agreement, the 1967 stipulation was amended to provide that EBMUD could  
15 contract for 70,000 acre-feet of American River water annually without any  
16 conditions. The delivery of an additional 80,000 acre-feet annually was contingent  
17 upon construction of the Hood-Clay connection if sufficient bureau contracts had  
18 been made by 1976 to warrant such construction. However, the bureau did not  
19 enter into such additional contracts, and this condition expired in 1976. The  
20 Hood-Clay connection would have diverted water from the Sacramento River  
21 eastward into the Folsom-South Canal in order to supply additional water to the  
22 San Joaquin Valley. It would have joined the Folsom-South Canal at a point  
23 downstream from EBMUD's delivery point, and would not have provided water  
24 to EBMUD. The Hood-Clay project was never authorized by Congress.

25 By virtue of the 1968 agreement, Sacramento County's priority to obtain a  
26 bureau contract was confirmed to December 31, 1975, but subject to EBMUD's  
27 contract, conditioned as noted. Sacramento County did not exercise its priority.

28 //

1       The 1968 agreement was submitted to the State Water Resources Control  
2 Board as part of the proceedings leading to Decision-1356. The agreement was  
3 approved by the board in D-1356, and its terms were included in EBMUD's  
4 contract with the bureau. Following such State Board approval, EBMUD executed  
5 its bureau contract on December 22, 1970.

6       EBMUD's contract calls for the delivery of American River water from the  
7 Folsom-South Canal at Grant Line Road, a distance of approximately twelve miles  
8 from the American River. EBMUD is obligated to construct its own conveyance  
9 facilities to take the water from the Folsom-South delivery point to its own  
10 service area. The contract is for 150,000 acre-feet, requiring certain minimum  
11 payments on a take-or-pay basis. The only other long-term contract on the  
12 Folsom-South Canal is held by the Sacramento Municipal Utility District for its  
13 Rancho Seco Nuclear Power Plant. That contract provides for 75,000 acre-feet  
14 annually, although only about 20,000 acre-feet is now being used.

15       In 1971, the SWRCB held nine days of hearings pursuant to its reserved  
16 jurisdiction in Decision 1356 to determine flows to be maintained in the lower  
17 American River for recreation and fisheries. In 1972, the SWRCB issued  
18 Decision 1400. Flows for fisheries were set at 1250 CFS from October 15 through  
19 July 14, and at 800 CFS from July 15 through October 14. These flows were  
20 recommended by the California Department of Fish and Game, and were higher  
21 than those under D-893. Minimum recreation flows were set at 1500 CFS.  
22 Recreation flows could be eliminated and fishery flows reduced during dry years  
23 when the bureau rations deliveries to its customers. The flows in D-1400 were  
24 based on the assumption that Auburn Dam would be built and relate only to the  
25 bureau's Auburn permits. Since Auburn Dam has not been constructed, the D-  
26 1400 flows are not legally binding upon the bureau. However, the bureau still  
27 operates to meet such minimum flows if water is available, measuring such flows

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1 immediately upstream of the City of Sacramento's diversion near "H" Street.  
2 These are referred to as modified D-1400 flows.

3 As part of its Report of Referee in this case, the State Water Resources  
4 Control Board indicated that it planned to review the American River water  
5 rights of the Bureau of Reclamation, and of the City of Sacramento. The board  
6 stated that the purpose of the review "would be to determine the appropriate flow  
7 to be maintained in the lower American River." (p. 28) In November, 1988, the  
8 board issued a work plan for its review of water rights on the American River.  
9 The proceeding is now underway, and is scheduled for a board decision in  
10 January, 1991.

11 As part of the board's American River Water Rights Review, the City of  
12 Sacramento is seeking permission to expand its Fairbairn Water Treatment Plant  
13 on the American River. The plant presently has a capacity to divert 91 million  
14 gallons per day ("mgd"). This is the equivalent of approximately 102,000 acre-feet  
15 annually. The City's petition is to increase the capacity of the plant to 200 mgd, or  
16 to 224,000 acre-feet annually. The City's basic American River water rights are in  
17 the form of four permits from the State Board (Nos. 11358-11361), and a Bureau of  
18 Reclamation contract. The combined total of these rights is 245,000 acre-feet  
19 annually, taken at a rate not to exceed 675 cubic feet per second. The City also has  
20 certain wells and groundwater rights, and a State Board Permit (No. 992) to divert  
21 81,000 acre-feet annually from the Sacramento River. That permit expired  
22 December 1, 1988, and an extension application has been filed. The City has a  
23 separate water treatment plant on the Sacramento River to treat those diversions.

### 24 III.

### 25 INTRODUCTION

26 As early as 1915, the City of Sacramento planned for development of  
27 recreational parks within the American River floodplain. The City established  
28 the first park in the vicinity of the "H" Street Bridge in the 1920's. The County of

1 Sacramento also planned for development of recreational sites along the  
2 American River. However, the purchase and development of riverfront property  
3 proceeded slowly and in piecemeal fashion until the completion of Folsom Dam  
4 in 1956. The pressure for urban development adjacent to the river spurred efforts  
5 to preserve open space along the river. In 1959 the County of Sacramento  
6 established a Department of Parks and Recreation to develop a detailed plan of  
7 park needs along the American River. The American River Parkway Plan was  
8 approved by the Board of Supervisors in January, 1962, and was incorporated into  
9 the recreational element of the County General Plan. A systematic land  
10 acquisition program was initiated, and by 1986 Sacramento County had acquired  
11 over 4,000 acres of parkway land at a cost of 22 million dollars.

12 Today the American River Parkway consists of a series of fourteen  
13 connected parks comprising a complete riparian corridor along both sides of the  
14 American River from Folsom Dam to the confluence of the American with the  
15 Sacramento River. The lower 23 miles, from Nimbus Dam to the river's mouth,  
16 are administered by the County of Sacramento. In 1981 the Secretary of the  
17 Interior also designated the lower 23 miles of the American River below Nimbus  
18 Dam as a recreational river under the National Wild and Scenic Rivers Act. (16  
19 U.S.C. § 1271 et seq.) In 1972, the California Legislature included the same  
20 segment in the State Wild and Scenic system (Pub. Resources Code §§ 5093.50,  
21 5093.54(e).) The lower American River was statutorily designated as a  
22 "recreational" river in the system in 1982. (Pub. Resources Code § 5093.545.)

### 23 Recreation

24 The American River Parkway is unique among urban rivers the United  
25 States. Running through the center of the Sacramento metropolitan area, the  
26 river and parkway provide a public recreational resource of great value and  
27 regional significance; it has no equivalent in California and few equivalents in  
28 this country. The parkway provides an outstanding variety and quality of

1 recreational opportunities in the heart of a major metropolitan area. The  
2 parkway is California's largest urban riparian area. The parkway is managed to  
3 balance the dual goals of preserving natural, or open space, and protecting  
4 environmental quality within the urban environment, and at the same time  
5 contributing to recreational opportunities in the Sacramento area.

6 The California Legislature has declared that "[t]he American River parkway  
7 and its environs contribute to the quality of life within the City of Sacramento  
8 and the County of Sacramento, enhance the image of the city and the county as  
9 desirable places to live, provide for the public safety and welfare of the  
10 community, and thereby contribute to the economic well-being of the  
11 community." (Pub. Resources Code § 5841.5(a).)

12 The Legislature has further declared that "[t]he recreation capacity of the  
13 American River Parkway is immense, including such diverse activities as hiking,  
14 bicycling, picnicking, birding, horseback riding, canoeing, kayaking, rafting,  
15 sailing, and power cruising." (*Id.*, at § 5841(c).) Some of the activities in the  
16 parkway are water-dependent, such as rafting, canoeing, kayaking, swimming,  
17 wading, and fishing; others are water-enhanced, such as biking, hiking, picnicking  
18 and sight-seeing.

19 The parkway contains developed parks such as Discovery, Ancil Hoffman  
20 and Goethe parks, as well as areas set aside in their natural condition. The  
21 Jedediah Smith Bicycle Trail permits parkway users to bicycle the full 23 miles  
22 from the confluence of the Sacramento and American rivers at Discovery Park to  
23 Nimbus Dam, crossing the river on the special bicycle bridge between Goethe Park  
24 and the William Pond Recreation Area. The bicycle trail then continues along  
25 Lake Natoma to Folsom State Park. Separate equestrian trails extend for many  
26 miles along the parkway.

27 A wide range of special activities takes place in the parkway, including  
28 nature study at the Effie Yeaw Nature Center, Take-a-Kid Fishing Day, Eppie's

Great Race (triathlon), a kite festival, and other organized programs. The parkway is also an excellent place for those who simply wish to relax in pleasant surroundings.

A 1978 survey listed the various parkway activities and percentages of usage as follows:

<u>Activity</u>	<u>Usage (%)</u>	<u>Activity Cluster</u>	<u>Water Orientation</u>
Fishing	9.5	Fishing	Water-Dependent
Swimming	9.5	Swimming	"
Rafting	10.0	Boating	"
Boating	1.4	"	"
Biking	6.7	Trail Users	Water-Enhanced
Jogging	3.9	"	"
Horseback	0.7	"	"
Hiking	4.3	"	"
Dog Walking	4.9	"	"
Picnicking	5.1	Picnicking	"
Relaxing	7.4	"	"
Nature Study	0.8	Nature Study	"
Photography	0.2	"	"
Archery	0.1	Field Sports	Not Water Oriented
Golf	2.1	"	"
Field Games	2.1	"	"
Other	14.7	Other	"
Total	100.0		

#### Riparian Vegetation

The riparian vegetation acts as a buffer between the lower American River and the surrounding urban development. This vegetation, together with the river itself, are the most prominent features of the Parkway, and contribute greatly to the recreational experiences there. Many species of wildlife use the riparian vegetation for sources of food, cover, nesting sites, roosting areas and migratory corridors. Riparian vegetation is recognized by ecologists as being among the most productive wildlife habitat in the state.

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The following table summarizes the acreage by vegetation type for the entire lower American River parkway:

<u>Type</u>	<u>Number of Stands</u>	<u>Total Acres</u> (Acres)	<u>Mean Area</u>	<u>Percent of Parkway</u>
1. Gravel Bar	4	29	7.3	0.8
2. Willow Scrub	33	294	8.9	8.0
3. Alders	18	130	7.2	3.5
4. Cottonwood-Willow Scrub	27	152	5.6	4.1
5. Cottonwood-Tree Willow	33	192	5.8	5.2
6. Cottonwood-Mixed Scrubs	15	103	6.9	2.8
7. Old Cottonwood	19	167	8.8	4.5
8. Elderberry-Walnut Assoc.	16	221	13.8	6.0
9. Valley Oak Assoc.	21	312	14.8	8.4
10. Live Oak Assoc.	21	708	33.7	19.2
11. Tailings Riparian	3	99	31.1	2.7
12. Old Field	35	947	24.6	25.6
13. Pavement, Bare Tailings	6	62	10.3	1.6
14. Cultivated	8	279	34.8	7.6
Total	259	3,695	14.3	100.0

Analysis of the historical aerial photographs dating from 1937 indicates a general increase in the density and extent of the riparian vegetation in some reaches of the parkway. Part of this increase is due to more protective management afforded the parkway in recent decades, restricting activities such as woodcutting and agriculture that served to remove riparian vegetation. Also, part of the increase in vegetation within the parkway can be attributed to the effect of Folsom Dam on decreasing the intensity and frequency of moderate floods, which would otherwise tend to reduce vegetation cover. Gravel mining within the riverbed and banks has served to disrupt much of the riparian zone of the parkway. In some locations, only the barren tailings piles remain that support little vegetation. At many locations, dredge mining created ponds and tailings piles that ponded water, allowing riparian plants to germinate and grow.

Closure of Folsom Dam has deprived the river of much of its sediment supply, and hence the channel of the river has begun to adjust by deepening and



1 narrowing in some reaches. The time required for the river to reach equilibrium  
2 with the new conditions cannot be determined with certainty, but several more  
3 decades will be required at the minimum.

#### 4 Riparian Vegetation and Floodplain Relationships

5 The parkway's riparian vegetation and the river system are dynamic and  
6 interdependent. As the lower American River moves down and across its valley,  
7 the river attempts to erode its banks and cut deep channels at the outside of a  
8 bend where the water is swift, and to deposit the eroded fines and gravels farther  
9 downstream on the inside of a bend where the water is slower. Historically,  
10 unconfined Central Valley streams like the Lower Sacramento River formed  
11 broad meander belts where the riparian vegetation was up to several miles wide.

12 When the river overflows its banks, the water slows and deposits its  
13 sediment load on the floodplain. Spring runoff ("snowmelt" recession) can leave  
14 deposits of moist, nutrient-rich beds upon which riparian plant seedlings can  
15 become established, if the timing coincides with the release of ripening willow  
16 and cottonwood seeds. However, sediments deposited by the spring runoff, and  
17 any seedlings germinated thereby, are susceptible to removal by floods occurring  
18 within the next several winter flood seasons.

19 Winter flood events on the American River rework sediments in the  
20 active channel too frequently to allow many seedlings to survive. Floods during  
21 December, January and February average 46,000 CFS, and are considerably higher  
22 than average spring runoff. Production and survival of the riparian vegetation  
23 on the semi-confined lower American River is dominated by these flood  
24 processes. The American River watershed produces large floods. A peak flood of  
25 100,000 CFS has a chance of occurring in less than one out of ten years.

26 Riparian vegetation on the lower American River has adapted its  
27 reproduction processes by re-sprouting after damage from floods. The "scour and  
28 re-sprout process" is more important on the lower American River than seedling

1 germination. Following the large 1986 flood (130,000 CFS), this re-sprouting  
2 process produced vigorous new stands of cottonwood 25 to 30 feet above the  
3 summer low-flow channel. Even the Willow vegetation, adapted to the hostile  
4 conditions of the active channel, re-sprouted after that large flood event.

#### 5 Riparian Vegetation Zones

6 The riparian vegetation of the parkway is organized in a manner typical of  
7 other Central Valley rivers. The typical arrangement of vegetation along the  
8 river banks can be thought of, in an idealized sequence, extending from the  
9 water's edge out into the uplands, and consisting of three distinct zones.

10 However, the actual physical arrangement of these zones along any given reach of  
11 the river may deviate from this idealized sequence. The zone nearest to the river  
12 is subject to frequent flooding and disruption, and is termed the "active zone."

13 The typical plants which occur here are well adapted to withstand submergence  
14 during high flows. They commonly have flexible stems and branches that bend  
15 under the force of these flows. If above-ground portions of the plants are scoured  
16 off by water driven cobbles or buried by silt and sand, the buried plant parts are  
17 able to re-sprout readily. A few trees are found in the active zones, but willow  
18 shrubs are more common. Seeds of active zone plants are able to germinate on  
19 gravel or sand bars that lack soil development, and would be inhospitable to other  
20 riparian species.

21 Moving back from the active zone, there are areas of the floodplain which  
22 are higher and less frequently inundated. There is the border zone, which is  
23 marked by a taller and more complex plant community, including tree species,  
24 various heights of shrubs, and trailing vines.

25 Typical of the border zone are Fremont cottonwoods (Populus Fremontii),  
26 Gooding's willow (Salix Goodingii), wild grape (Vitis Californica), white alder  
27 (Alnus rhombifolia), and Oregon ash (Fraxinus latifolia). Depending on soils and  
28 drainage, the border zone vegetation may also include elderberry (Sambucus sp.),

interior live oak (Quercus Wizlizenii), and valley oak (Quercus lobata). This great diversity of plant species creates a very complex and dense canopy, and offers some of the most valuable habitat for wildlife in the parkway.

The outer zone is dominated by the valley and live oak communities. This more upland area is less influenced by flood flows and sedimentation, but is still under the influence of the river to the extent that the water table may be recharged during high flows. Canopy height, canopy complexity, and species richness are probably greatest at the ecotone, or transition, between the border and outer zones along the parkway.

A breakdown of vegetation by the three zones is shown in the following table:

	<u>Number of Stands Per Zone</u>	<u>Total Acres Per Zone</u>	<u>Approximate Percent of Parkway</u>
Active Zone (Closest to River)	55	453	12%
Gravel Bar			
Willow Scrub			
Alders			
Border Zone(Most Complex)	110	835	23%
Cottonwood-Willow Scrub			
Cottonwood-Tree Willow			
Mixed Cottonwood			
Old Growth Cottonwood			
Elderberry-Walnut Association			
Outer Zone (Farthest From River)	42	1,020	28%
Valley Oak Association			
Live Oak Association			
Disturbed	52	1,387	38%
Tailings Riparian			
Old Field			
Pavement, Bare Tailings			
Cultivated			

## Riparian Vegetation and Wildlife

The parkway supports a wide variety of birds and wildlife. More than 220 bird species have been recorded in the parkway. Sacramento County estimates that 30 mammal species, 13 reptile species, and 6 amphibian species also inhabit the parkway. The possibility of catching a glimpse of deer, beaver, blue heron, or wild turkeys adds to the pleasure of parkway users. The riparian habitat is important not only as breeding grounds for resident animals, but also as wintering grounds and migratory corridors for nonresident species.

## Ponds

The parkway includes a number of off-channel ponds that have high wildlife value. Ponds are found at Sacramento Bar, Arden Bar, Rossmoor Bar, just upstream of Discovery Park, and in Ancil Hoffman Park Golf Course. Bushy Lake is also located within the parkway. These ponds were mostly developed during the late 1960's and early 1970's when tailing mounds from the gold dredging era were excavated for the production of aggregate. Water surface elevations in the ponds are controlled, in large measure, by water surface elevations of the river nearby. However, the depths of the ponds do not require high river flows. Lower river elevations can be easily offset, if needed, by simply deepening the ponds. One of Sacramento County's expert witnesses (Dr. Susan Sanders) testified that the ponds provided the most important riparian habitat for wildlife. Additional ponds could be created within the parkway from former mine tailing areas which have no vegetation.

## IV.

## FISHERIES

The lower American River has 41 reported species of fish. Of these species, nine are anadromous (they live mainly in salt water but ascend freshwater rivers to spawn). The most abundant anadromous game fish in the river are chinook salmon, striped bass, American shad and steelhead trout.

1       Of these species, most data collection and research on the relationships  
2 between streamflow and the fishery resource have been devoted to chinook  
3 salmon. The lower American River chinook salmon run is one of the state's  
4 most valuable fisheries, supporting significant commercial and sport fisheries in  
5 the Pacific Ocean and in the lower American River. Although some adult  
6 salmon may be found in the river year around, the population is mainly the fall-  
7 run species. The lower American River's spring-run species of chinook salmon  
8 was eliminated by dams. The fall-run adult salmon begin to enter the river in  
9 September. Spawning occurs through January and incubation and rearing of  
10 juvenile salmon extends through mid-July. A consensus of expert opinion as to  
11 the life cycles of the salmon, steelhead and shad is set forth below.

12       American shad support a popular sport fishery in the lower American  
13 River. The shad fishery draws anglers from throughout Northern California.  
14 The popularity of the lower American River as a shad fishery is in large part  
15 attributable to the fact that the entire length of the river is accessible to the public.  
16 Thus, anglers have free access to the fish as they migrate up the river. This  
17 accessibility is unique and sets the lower American River apart from the other  
18 California rivers which have the significant shad runs.

19       Adult American shad enter the lower American River in May and June to  
20 spawn. Water temperature is a key factor affecting spawning and egg  
21 development of American shad. In addition, studies by the Department of Fish  
22 and Game found a correlation between the number of shad entering the river and  
23 the volume of river flow. Thus, the American River attracts migrant shad as a  
24 function of its flow contribution to the total Sacramento River flow in May and  
25 June.

26       Steelhead trout support a popular sport fishery in the lower American  
27 River. The main run of adult steelhead enter the river in the winter and early

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1 spring to spawn. The juvenile steelhead rears in freshwater for at least a year  
2 before emigrating to the ocean. The number of juvenile steelhead which  
3 naturally rear in the river has not been investigated; however, recent field studies  
4 confirm that juvenile steelhead trout in unknown numbers are rearing in the  
5 river.

6 The steelhead trout, like the chinook salmon, is a coldwater fish whose  
7 various life stages are affected by water temperature.

8 V.

9 PROCEDURAL HISTORY OF THE LITIGATION

10 Like many water cases, this litigation has a long judicial history. Filed 17  
11 years ago, the case has been before the California Supreme Court on two  
12 occasions, and before the United States Supreme Court once, all on pleadings  
13 issues. While the trial commenced in 1984, the case was then referred to the State  
14 Water Resources Control Board, as referee. The Reference proceedings required  
15 three and a half years and resulted in a five-volume report, to which plaintiffs  
16 and intervenors took voluminous exceptions.

17 The original Complaint was filed in 1972 by the Environmental Defense  
18 Fund, Save the American River Association, the Oceanic Society, and certain  
19 named individuals against EBMUD and its directors. The suit was based on  
20 Article XIV, section 3 (now Article X, section 2) of the California Constitution, and  
21 Water Code sections 100 and 13500 et seq. Plaintiffs challenged: (1) EBMUD's  
22 decision not to develop facilities to reclaim wastewater to supplement its existing  
23 water supplies and to assist in meeting its future water requirements; and  
24 (2) EBMUD's decision to seek a supplemental supply of water from the American  
25 River to be diverted from the Folsom-South Canal above Clay.

26 Plaintiffs also alleged that EBMUD's actions made a major contribution to  
27 the "likelihood" that the Bureau of Reclamation would complete its Auburn-  
28 Folsom South project and the East Side Division in the San Joaquin Valley.

1 Plaintiffs alleged that these projects would have "myriad negative environmental  
2 and social effects," including the diminution of lower American River flows,  
3 particularly in water-short years.

4 Approximately three months after the Complaint had been filed,  
5 Sacramento County intervened on behalf of the plaintiffs. The county  
6 incorporated plaintiffs' causes of action into its own Complaint, and in addition,  
7 alleged that the 23 miles of the lower American River were used by the public for  
8 scenic and recreational purposes, including boating, swimming and fishing.  
9 Furthermore, the county alleged that it had acquired land and expended funds for  
10 a parkway along the lower American River; that the 150,000 acre-feet contracted  
11 for by EBMUD, if taken from the Folsom-South Canal, would not be available for  
12 flows in the lower American River; and that Decision 1400 flows were less than  
13 those necessary for optimum conditions for fish and recreation. The county  
14 further alleged that "minimum flow of water in the lower American River  
15 necessary to provide optimum conditions for fishery purposes" is 1400 cubic feet  
16 per second from October 15 through July 14, and 1000 cubic feet per second during  
17 the remainder of the year. Flows between 2000 to 2500 cubic feet per second were  
18 alleged to be the minimum flows necessary to provide optimum conditions for  
19 boating.

20 A demurrer to plaintiffs' Complaint was sustained, and in December, 1972,  
21 plaintiffs filed their First Amended Complaint, incorporating in it the allegations  
22 of Sacramento County's Complaint in Intervention. EBMUD again demurred,  
23 and on May 1, 1973, the Superior Court sustained the demurrers to both  
24 Complaints without leave to amend. Judgment was entered on May 9, 1973, and  
25 an appeal followed.

26 In its first decision in this case, the California Supreme Court affirmed the  
27 judgment in favor of EBMUD. (Environmental Defense Fund, Inc. v. East Bay  
28 Municipal Utility District (1977) 20 Cal.3d 327.) This decision is often referred to as

1 "EDF I." The Supreme Court held that the reclaimed wastewater issue must be  
2 presented in the first instance to the State Water Resources Control Board.  
3 Plaintiffs chose not to do so, and this issue was dropped from subsequent  
4 complaints.

5 The Supreme Court held that the remaining allegations were preempted by  
6 federal law. The Court stated:

7 "Insofar as the complaints challenge construction of the canal and  
8 the choice of diversion point on the basis of state law, they fail to  
9 state a cause of action because they attempt to use state law to  
10 determine a matter within the authority of the federal agency."  
(EDF I, 20 Cal.3d at p. 334.)

11 Furthermore, the Court stated:

12 "The allegation of the EBMUD-Bureau contract will facilitate the  
13 Bureau's completion of the Central Valley Project on its face  
14 represents attempted interference with the Bureau's completion  
of a project Congress has directed it to undertake." (Id., at p. 340.)

15 Plaintiffs then filed a petition for Certiorari with the United States  
16 Supreme Court. In 1978, the Court vacated the judgment in EDF I. and remanded  
17 the case to the California Supreme Court for further consideration in light of the  
18 United States Supreme Court's decision in California v. United States (1978)  
19 438 U.S. 645. (Environmental Defense Fund, Inc. v. East Bay Municipal Utility  
20 District (1978) 439 U.S. 811.)

21 On remand, the California Supreme Court reversed the judgment of  
22 dismissal following the trial court's sustaining the demurrers without leave to  
23 amend. (Environmental Defense Fund, Inc. v. East Bay Municipal Utility District  
24 (1980) 26 Cal.3d 183, "EDF II." ) The Supreme Court re-affirmed its earlier ruling  
25 that to the extent the Complaints challenged EBMUD's contract on the ground  
26 that the construction of the Auburn Dam and the Folsom-South Canal would  
27 constitute a violation of state law, there was federal preemption. (EDF II, 26 Cal.3d  
28 at p. 193.) However, the Court further held that to the extent the Complaints



1 "challenge the location of the diversion point as being violative of California law,  
2 there is no federal preemption." (Id., at p. 193) Accordingly, plaintiffs and  
3 intervenor were granted leave to amend their Complaints to "allege that  
4 diversion of EBMUD's water through the Folsom-South Canal constitutes an  
5 unreasonable method of diversion." (Id., at p. 200)

6 In the text of its opinion, the Supreme Court discussed D-1400, noting that  
7 none of the parties that sought reconsideration of D-1400 "claimed that the  
8 required flows for recreational uses were insufficient or that EBMUD should have  
9 been required to use a lower diversion point." (Id., at p. 190) Furthermore, the  
10 Court pointed out that the County of Sacramento intervened in a mandamus  
11 action to review D-1400, "claiming that the decision was lawful." (Id., at p. 191)

12 Following the decision in EDF II, plaintiffs filed their Second Amended  
13 Complaint in September, 1980, and Sacramento County filed its First Amended  
14 Complaint in Intervention in November, 1980. Both Complaints alleged that  
15 EBMUD's "decision" to seek a supplemental supply of water from the American  
16 River to be diverted in a manner which would not allow the water to flow down  
17 the lower American River constitutes an abuse of discretion and an unreasonable  
18 diversion and use of water; and by virtue of such decision, flows in the American  
19 River will be so diminished, "particularly in water-short years, that severe harm  
20 will be done to the fisheries of the river, as well as to recreational opportunities  
21 on hand near the river." Sacramento County continued to allege that flows of  
22 1400 and 1000 CFS provide minimum flows necessary for optimum conditions for  
23 fishery purposes, and that flows between 2000 and 2500 CFS provide minimum  
24 flows necessary for optimum conditions for canoeing and kayaking.

25 EBMUD demurred again to the Amended Complaints, in part on the  
26 ground that the federal government was an indispensable party to the suit. By  
27 order dated March 4, 1981, the Court overruled the demurrers.

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1 Trial of the case commenced on April 9, 1984 in the Alameda County  
2 Superior Court, with one witness being placed on the stand in order to toll the  
3 five-year statute of limitations. At the same time, plaintiff Save the American  
4 River Association moved for a continuance, and the County of Sacramento  
5 moved for an Order Referring Issues to the State Water Resources Control Board,  
6 pursuant to Water Code section 2000 et seq. Following briefing and argument on  
7 a number of legal issues, the Order for Reference was entered November 21, 1984.  
8 Twenty-one specific issues, including both factual and legal matters, were referred  
9 to the State Board as referee.

10 Beginning in January, 1985, a series of meetings were held by the State  
11 Board staff and the parties to receive comments and suggestions for a draft work  
12 plan and procedures for the Reference. Meetings were also held with other  
13 interested agencies, such as the California Department of Fish and Game, the  
14 Department of Water Resources, and the United States Bureau of Reclamation.  
15 The work plan and procedures were approved by the board on February 6, 1985.  
16 No objections were received from any of the parties or interested persons. The  
17 board indicated that it would rely, first and foremost, upon the parties for the  
18 production of evidence, and that each party had the burden of producing evidence  
19 to support the propositions favoring its case. Initial reports and documentary  
20 evidence, together with an identification of expert witnesses, were required by  
21 February 15, 1985. The State Board staff interviewed some 60 technical witnesses  
22 and reviewed more than 200 exhibits and reports submitted by the parties. EDF  
23 and SARA did not submit any exhibits relating to technical matters, but relied  
24 upon the County of Sacramento's exhibits.

25 In November, 1985, the Court granted leave to the California Department  
26 of Fish and Game to intervene for the limited purpose of addressing issues related  
27 to the protection and enhancement of the State's fish, wildlife resources, and  
28 associated recreational activities in the lower American River. On June 16, 1986,

1 the California state Lands Commission was also granted leave to intervene on a  
2 limited basis related to riparian issues.

3 The State Board staff finally established April 15, 1986 as the deadline for  
4 submitting further supplemental or rebuttal exhibits. The staff also requested  
5 comments from the California Department of Health Services and the  
6 Department of water Resources on certain water quality issues. A Draft Report of  
7 Referee was issued in February, 1987, together with procedures for submitting  
8 objections to the Draft Report. The Draft Report consisted of five volumes: A  
9 Report of Referee, a Technical Report, two appendices, and a legal report. After  
10 issuance of the Draft Report, but before the hearing thereon, the County of  
11 Sacramento sought to introduce additional exhibits, including its primary report  
12 on fishery resources. Over EBMUD's objections, the additional material was  
13 allowed.

14 During May and June of 1987, the State Board itself held 10 days of hearings  
15 on the Draft Report. At the hearing, the parties were allowed to make  
16 presentations on key issues as well to present evidence to support their objections  
17 to the Draft Report. The State Board also held two informal hearings to receive  
18 comments and policy statements from interested citizens.

19 The Final Report of Referee was issued in June, 1988. The Final Report closely  
20 followed the Draft Report. The State Water Resources Control Board, as referee,  
21 found:

22 1. That delivery to EBMUD of 150,000 acre-feet from the Folsom-South  
23 Canal "will not cause significant harm to reasonable uses made of the lower  
24 American River;" further, that the maximum diversion "will not significantly  
25 harm reasonable public trust uses of the lower American River." (Final Report of  
26 Referee at p. 11.)

27 2. That under current Bureau of Reclamation operations, "the supply  
28 of water available in the lower American River is sufficient to meet existing and

1 projected demand and to provide a reasonable level of protection to public trust  
2 uses." (Id., at p. 11.)

3 3. That none of the alternatives suggested by plaintiffs is as feasible as  
4 the Folsom-South Canal, and that "[s]ubstantial additional effort would be  
5 required to determine if any alternative is feasible and cost effective from a social,  
6 engineering and environmental standpoint." (Final Report of Referee at p. 13;  
7 Final Technical Report at pp. 259, 243.)

8 4. That of the three sources, namely, the American River, the  
9 Sacramento River, or the Delta, "... water from the American River has the  
10 highest quality, with the least potential for degradation and the lowest risk to  
11 public health;" and further that, "[p]rudence requires that public water suppliers  
12 should minimize treatment uncertainties by seeking water from the best available  
13 source and as removed from the potential for degradation as possible." (Report of  
14 Referee at pp. 14, 15.)

15 5. Finally, that the Folsom-South Canal diversion point is not  
16 unreasonable, within the meaning of Article X, section 2 of the Constitution.  
17 (Final Report of Referee at p. 17.)

18 Plaintiffs and intervenors filed extensive exceptions to the Final Report,  
19 and trial on those exceptions began on March 6, 1989.

## 20 VI.

21 Central to a final adjudication of this controversy is the definition and  
22 application of the public trust doctrine in conjunction with a consideration of  
23 constitutional requirements under Article X, section 2. Probably no party would  
24 disagree with Sacramento County that "the focus of this case is on the public trust  
25 impacts and constitutional 'reasonableness'" of EBMUD's proposal to take water  
26 through the Folsom-South Canal.

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1       The public trust doctrine protects ecological, recreational, commercial,  
2 navigation, and fishery values in the navigable waters of the state. (National  
3 Audubon Society v. Superior Court (1983) 33 Cal.3d 419, 434-35.)

4       In Audubon, the Supreme Court confronted the task of accommodating  
5 public trust doctrine and the appropriative water rights system.

6       "Ever since we first recognized that the public trust protects  
7 environmental and recreational values (citation omitted), the  
8 two systems of legal thought have been on a collision course  
9 (citations omitted). They meet in a unique and dramatic setting  
10 which highlights the clash of values. Mono Lake is a scenic and  
11 ecological treasure of national significance, imperiled by  
12 continued diversions of water; yet, the need of Los Angeles for  
13 water is apparent, its reliance on rights granted by the board  
14 evident, the cost of curtailing diversions substantial."  
15 (Id., at p. 425.)

16       Thus could be described the setting for the instant controversy. The American  
17 River and its parkway also are "scenic and ecological treasures of national  
18 significance," imperiled by prospective diversions of water. Similarly, the need of  
19 EBMUD for high-quality water is apparent, its reliance on rights granted by the  
20 board and the Bureau of Reclamation "evident," and the cost of diverting water  
21 from locations on the Sacramento River or Delta are considerably greater than the  
22 cost of diversion at the Folsom-South Canal.

23       From Audubon, supra, in conjunction with United States v. State Water  
24 Resources Control Board (1986) 182 Cal.App.3d 82, EBMUD urges upon the Court  
25 the importance of balancing competing public water usages without according  
26 "any priority for instream uses" or establishing any "artificially created priorities."  
27 (EBMUD Brief Re: Public Trust Doctrine, at p. 6.) Intervenor Environmental  
28 Defense Fund ("EDF") argues that Audubon "does not stand for the principle that  
public trust and consumptive use enjoy parity" and that "protection of the  
viability of the public trust resource is the first priority of public trust doctrine."

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1 (EDF Brief at pp. 10, 11.) Thus are the issues joined and the application of  
2 Audubon to the instant facts required.

3 Plaintiff's and intervenors' efforts to compel a semantic conclusion that  
4 consumptive uses are not encompassed within public trust usages, and that public  
5 trust uses are entitled to a "first priority," do not aid in the analysis required by  
6 Audubon. That case explicitly rejected the "first priority" argument. "Plaintiffs ...  
7 argue that the public trust is antecedent to and thus limits all appropriative water  
8 rights[.] ... We are unable to accept [this] position." (Audubon, supra, 33 Cal.3d at  
9 p. 445.)

10 "The population and economy of this state depend upon the appropriation  
11 of vast quantities of water for uses unrelated to instream trust values." Id., at  
12 p. 446. The Audubon court specifically recognized the substantial concerns voiced  
13 by Los Angeles: "[t]he city's need for water, its reliance upon the 1940 board  
14 decision, the cost both in terms of money and environmental impact of obtaining  
15 water elsewhere. Such concerns must enter into any allocation decision." (Id., at  
16 p. 448, emphasis added.)

17 It is clear that Audubon encourages and requires the trier of fact to balance  
18 and accommodate all legitimate competing interests in a body of water. The  
19 Audubon court sought "an accommodation which will make use of the pertinent  
20 principles of both the public trust doctrine and the appropriative rights system,"  
21 id., at p. 445, rather than the "unbalanced structure" that would result from a flat  
22 preference for either instream or consumptive values. (Ibid.) The court noted its  
23 concern with the Mono Lake diversion in these terms:

24 "This is not a case in which the Legislature, the water board, or  
25 any judicial body has determined that the needs of Los Angeles  
26 outweigh the needs of the Mono Basin, that the benefit gained is  
27 worth the price. Neither has any responsible body determined  
28 whether some lesser taking will better balance the diverse  
interests." (Id., at p. 447, emphasis added.)

1 The essential task, then, is to identify, evaluate, balance, and accommodate the  
2 diverse and competing interests which would take American River water. The  
3 function of this court, like that of the Water Board, "has steadily evolved from  
4 the narrow role of deciding priorities between competing appropriators to the  
5 charge of comprehensive planning and allocation of waters." (Audubon, supra,  
6 33 Cal.3d at p. 444.)

7 Audubon demands that any such decision consider the requirements of  
8 Article X, section 2 of the Constitution, along with evolving public trust doctrine.  
9 Under Article X, section 2, "all uses of water, including public trust uses, must  
10 now conform to the standard of reasonable use. [citations omitted.]" (Audubon,  
11 supra, 33 Cal.3d at p. 443.)

12 It is the duty of this court not to protect public trust uses absolutely, but to  
13 preserve them "so far as consistent with the public interest." (Id., at pp. 446-47.)  
14 The Audubon court recognized that "practical necessity" might warrant  
15 appropriations harming the public trust, but that proper consideration of all  
16 values could prevent "unnecessary and unjustified" harm to the public trust. (Id.,  
17 at p. 446.) As one commentator succinctly stated, "[T]he Court appeared to suggest  
18 that the public trust doctrine requires consideration of public trust values, but that  
19 the constitutional test authorizes the state to balance these values against other  
20 public needs." (Walston, The Public Trust and Water Rights, 23 Land and Water  
21 Law Review, 701, 719 (1987).)

22 Water quality cannot be excluded from the analysis simply because it does  
23 not fit plaintiffs' and intervenors' conception of a public trust value. Neither,  
24 however, can the importance of the public trust be diluted by treating it as merely  
25 another beneficial use under Article X, co-equal with irrigation, power  
26 production, and municipal water supply. (See H. Dunning, Instream Flows, the  
27 Public Trust, and the Future of the West, Proceedings, The Public Trust and the  
28 Waters of the American West: Yesterday, Today and Tomorrow (March 31-

1 April 1, 1988), Natural Resources Law Center, Lewis and Clark Northwestern  
2 School of Law.)

3 No bright line of reconciliation of Article X and public trust values has  
4 emerged. Still, while Audubon provided no specific category either for the  
5 municipal use of water nor for the health-related quality of that water, it is  
6 absolutely clear that Audubon would require that consideration be given to such  
7 interests and that they would receive full credit in any constitutional balancing  
8 evaluation.

9 Article X, section 2 itself breaks down into at least three separate albeit  
10 related concepts:

11 First, that the "waste or unreasonable use or unreasonable method of use of  
12 water be prevented";

13 Second, that "the consumption of such waters is to be exercised with a view  
14 to the reasonable and beneficial use"; and

15 Third, a requirement that water resources "be put to the beneficial use to  
16 the fullest extent of which they are capable."

17 It is the third principle -- "fullest beneficial use" -- that must obtain under  
18 Audubon. In achieving that fullest beneficial use, Audubon acknowledges the  
19 necessity that in some circumstances unavoidable harm may occur to trust uses at  
20 the source stream. (Audubon, supra, 33 Cal.3d at p. 446.) The public trust, like  
21 other interests in water, is protected only to the extent that interest and that  
22 protection are reasonable in light of the public interest. (See id., at pp. 443, 446-47.)  
23 The affirmative duty of the Court is to "take the public trust into account in the  
24 planning and allocation of water resources, and to protect public trust uses  
25 whenever feasible." (Id., at p. 446.)

26 This analysis does not denigrate public trust values. Public trust doctrine  
27 occupies an exalted position in any judicial or administrative determination of  
28 water resource allocation. Whether Article X, section 2 "overrides" public trust



1 considerations, or whether the two concepts operate in harness to provide a  
2 context for comprehensive planning really does not require precise adjudication  
3 in this case -- just as it was not critical to a determination in Audubon.

4 (Audubon, supra, 33 Cal.3d at p. 447, fn. 28.) Here, as will be shown, the interests  
5 can be accommodated to the satisfaction of both Article X, section 2 and public  
6 trust doctrine.

7 In analyzing the issues relating to public trust doctrine, plaintiffs offer the  
8 following "argument:"

9 1. Audubon requires that in the allocation of water resources, the state  
10 has a duty "to protect public trust uses whenever feasible," and "to attempt, so far  
11 as feasible, to avoid or minimize any harm to those interests";

12 2. EBMUD has "feasible" alternative diversion sites;

13 3. Therefore, EBMUD may not divert at the Folsom-South Canal.

14 The logic is defective. The crux of Audubon is that public trust values  
15 require consideration and protection. It is simply not a fact that diversion below  
16 the confluence of the American/Sacramento rivers is the only way to achieve that  
17 protection. And if protection of public trust values can be accomplished  
18 consistently with the diversion at Folsom-South Canal, then plaintiffs and  
19 intervenors can have no sustainable complaint. In the absence of an unnecessary  
20 diminution of public trust values, plaintiff's demand for a different diversion site  
21 has no supportable legal foundation. In the absence of harm, plaintiff is not  
22 entitled simply to achieve a different diversion site as a question of policy or  
23 preference.

24 There is simply no escape from the administrative and judicial necessity of  
25 providing a comprehensive allocation of water rights, considering all factors  
26 currently manifest or reasonably to be anticipated, and considering the  
27 cumulative impact of all known and anticipated diversions and appropriations.  
28 The proposition is not that "if there are feasible alternatives to a particular

1 diversion, no public trust values may be attenuated in the slightest." This is a  
2 semantic proposition, rather than a proposition conducive to comprehensive  
3 planning. Audubon, in fact, anticipates the harming of public trust values in  
4 certain circumstances of necessity.

5 "As a matter of practical necessity, the state may have to approve  
6 appropriations despite foreseeable harm to public trust uses. In so  
7 doing, however, the state must bear in mind its duty as trustee to  
8 consider the effect of the taking on the public trust (citations  
omitted), and to preserve, so far as consistent with the public  
interest, the uses protected by the trust."

9 In assessing appropriation values versus public trust values, it is  
10 impossible to avoid a balancing analysis.

11 The feasibility of protecting a particular public trust value, regardless of the  
12 social cost involved, is only a single factor in the balancing process. To prove that  
13 diversion of drinking water from the Delta can be physically accomplished does  
14 not establish that diversion at the Folsom-South Canal is constitutionally  
15 impermissible. Were such the case, this would be a simple matter to resolve. No  
16 one disputes the physical feasibility of Delta or Sacramento River diversion. But  
17 can it be accomplished at reasonable cost and without compromising in a serious  
18 way the long-term health requirements of the East Bay community?

19 The case has proceeded on a factor-by-factor analysis of all considerations  
20 thought relevant by the parties after 17 years of litigation. This court agrees  
21 entirely that the factors presented are those which are properly to be placed in the  
22 balance, including water quality; costs; fisheries; riparian interests; and so on.

23 Also, Audubon posited an integration of public trust doctrine with the  
24 state's water rights system. The latter is not entirely to be discarded. Here,  
25 EBMUD has accomplished a valid contract right and has acted to its considerable  
26 detriment upon that right. Audubon permits a reconsideration of prior permits  
27 and contracts, but not without at least a recognition of, if not deference to, validly  
28 subsisting rights.

Depending upon the evidence, any of the aforesaid factors could prove to be of dispositive weight: For example, were it proven that the diversion of EBMUD water could be accomplished at the Folsom-South Canal only by exterminating the fall run of salmon, and with minimal health benefits to the consumer, the balance would shift markedly in favor of plaintiffs. Substantial increase in expenditures of accomplishing a Delta diversion, even to the extent of millions of dollars, would not in such circumstances preclude the absolute protection of that significant public trust value. Again, that would be an easy case.

It has been argued that “where there are feasible alternatives to a proposed diversion which is likely to cause injury to trust uses, those alternatives must be taken and the harm avoided. No balancing of uses is required.” Avoiding harm “where feasible” is not the logical equivalent of precluding an appropriation where there are “feasible” alternatives. Plaintiff urges that this is not a “balancing question”: that no balancing of uses is required. Such is not the case. The uses must be balanced or evaluated to determine whether the fullest beneficial use of water has been achieved under Article X section 2. Evaluation, or balancing, is implicit in the determination of “fullest beneficial use of water.” The point of Audubon is that the Court does not stop with that determination. Having determined the “fullest beneficial use of water,” the Court must still be cautious to avoid needless harm to public trust values. And if the harm to those values becomes significant, then the fullest beneficial use of water may be precluded as a violation of public trust.

VII.

EBMUD argues that the public trust doctrine is not available at all to plaintiffs in this case, since the “res” at issue consists of water “stored” behind the Folsom and Nimbus dams. EBMUD urges that the “scope of the public trust doctrine in California is relatively narrow,” and has been used to protect the “natural values associated with unique areas.” (EBMUD Brief on Public Trust

1 Doctrine, p. 22.) According to EBMUD, there is no "logical theory" which would  
2 permit the application of public trust doctrine to "artificially created flow  
3 regimens," and "no court has ever attempted to do so." Audubon, the argument  
4 proceeds, re-affirmed the emphasis in Marks v. Whitney (1971) 6 Cal.3d 251, on  
5 "natural conditions" and cannot be read to apply "to control the level of storage in  
6 an artificially created resource." (EBMUD Brief, Public Trust Doctrine, p. 18.)

7 The argument is not compelling. Initially, Audubon is not so factually  
8 distinguishable as EBMUD would suggest. Audubon involved the construction  
9 of facilities and tunnels to divert virtually the entire flow of the five fresh-water  
10 streams which fed into Mono Lake. Here, there was the construction of dams and  
11 canals for the purpose of regulating, channeling, and diverting the waters of the  
12 American River. In each case, the natural and historic instream flow pattern was  
13 interrupted by artificial instrumentalities. In each case, the opportunity exists, by  
14 administrative and judicial action, to re-evaluate instream uses and to compel the  
15 imposition of a public trust upon identified interests. To the extent that the  
16 Federal government was granted permission to modify the nature and extent of  
17 the already existing trust values of the American River, that grant "... is  
18 necessarily revocable, and the exercise of the trust by which the property was held  
19 by the state can be revoked at any time ...." (Audubon, supra, 33 Cal.3d at p. 438,  
20 citing Illinois Central Railroad Company v. Illinois (1892) 146 U.S. 387, 455.)

21 It is not "stored water" which is the res to which the public trust attaches. It  
22 is American River water from whatsoever tributary, accretion or source, and  
23 whether free flowing or temporarily "stored" behind Folsom or Nimbus dams or  
24 elsewhere. The significance of Audubon lies not in its recitation of historical  
25 water law, but rather in its emphasis on the necessity for the "comprehensive  
26 planning and allocation of water." The position of EBMUD would constitute a  
27 serious interference with that objective.

28 //

1 Public trust value in the lower American River existed prior to the erection  
2 of the dam. Those values were necessarily modified, sometimes for better and  
3 sometimes for worse. An entire race of spring-run salmon was exterminated as a  
4 consequence of the dam. Yet, other fish species have thrived. The Department of  
5 Fish and Game, through the operation of the hatchery, has interacted with the  
6 changed conditions to develop new salmon and steelhead viability in the lower  
7 reaches of the river. At work is continued comprehensive planning at all levels  
8 of government, including a "cooperative Federalism." The artificial construct  
9 advanced by EBMUD is a throwback to linear concepts of water rights that  
10 Audubon would reject. The logical consequence of EBMUD's position, for  
11 example, would permit the Bureau of Reclamation to preclude all flows, or to  
12 provide flows so minimal that significant destruction of fishery interests would  
13 ensue. The entire thrust of Audubon is to preclude the possibility of such wanton  
14 ecological destruction.

15 EBMUD argues that requiring release of minimum flows to protect public  
16 trust values "will defeat the purpose for which Folsom Dam was created." To the  
17 contrary, this court is satisfied that there is sufficient available water resources to  
18 satisfy both the needs of EBMUD and the beneficiaries of the American River  
19 public trust.

20 EBMUD correctly notes the paucity of authority on the issue. Neither  
21 Bohn v. Albertson (1951) 107 Cal.App. 738, nor Raiser Aetna v. United States  
22 (1979) 444 U.S. 164, provides substantial nourishment for EBMUD's position.  
23 More persuasive is State of California v. Superior Court, (Fogerty) (1981) 29 Cal.3d  
24 240. In Fogerty, the Court held that lands occasionally submerged by the damming  
25 of Lake Tahoe were impressed with the public trust, notwithstanding shoreline  
26 property owners' position that the trust was limited to the "natural" boundary.  
27 (Fogerty, supra, at pp. 247-49. Fogerty dealt expressly with the issue whether the  
28 people's public trust interests should be measured in terms of Lake Tahoe in its

1 natural state, or should be measured by the present size of the lake, which was  
2 raised approximately six feet by the dam. Quoting State v. Sorenson (1937)  
3 222 Iowa 1248, the Court said:

4 "The artificial condition is . . . stamped with the character of a  
5 natural condition, and the title to the lands covered by the waters  
6 of the lake is deemed to have passed from private ownership to  
7 the same trust as that of lands covered by the water of natural  
8 navigable lakes." (Fogarty, 29 Cal.3d at pp. 248-49.)

9 In United States v. State Water Resources Control Board (1986)  
10 182 Cal.App.3d 82, the Court held that the State Water Resources Control Board,  
11 under the public trust doctrine, had continuing jurisdiction over the  
12 appropriations of the State Water Project and the Central Valley Project for the  
13 purposes of protecting fish and wildlife in the Sacramento-San Joaquin Delta and  
14 Suisun Marsh. It was clear that these projects regulated flows through the  
15 regulation and storage of vast amounts of water, and that at least under its public  
16 trust authority the Board could control the storage and release of water. Further,  
17 as noted by Justice Traynor in Natural Soda Products Company v. City of L.A.  
(1943) 23 Cal.2d 193, 197:

18 "A change in the flow of a stream that appears to be permanent  
19 usually leads to costly adjustments by those interested, as they  
20 come to regard the artificial condition as permanent. It is,  
21 therefore, reasonable that they should receive as much protection  
22 as if the condition weren't natural."

23 As Professor Sax noted in his article, "Liberating the Public Trust Doctrine  
24 From Its Historical Shackles," 14 U.C. Davis Law Review, page 185 (1980):

25 "The central idea of the public trust is preventing the  
26 destabilizing disappointment of expectations held in common but  
27 without formal recognition such as title. The function of the  
28 public trust as a legal doctrine is to protect such public  
expectations against destabilizing changes, just as we protect  
conventional private property from such changes. So conceived,  
the trust doctrine would serve not only to embrace a much wider

1 range of things than private ownership, but would also make  
2 clear that the legal system is pursuing a substantive goal identical  
3 to that for the management of natural resources. Concepts like  
4 renewability and sustained yield, so familiar to us in fisheries and

5 forest management, are designed precisely to prevent the sort of  
6 sudden decline in stocks that is destabilizing and crisis-  
7 provoking. The legal system incorporates parallel concerns in  
8 protecting expectations, and it remains only to assure the legal  
9 principle's application more comprehensively."

10 The construction of the Folsom Dam was a destabilizing event in the  
11 history of the American River. Still, ecological benefits have developed along  
12 with manifest detriment. The dam has now been in place for over thirty years.  
13 Reasonable and legitimate expectations have arisen with respect to the protection  
14 of instream and riparian values. Those expectations are worthy of legal  
15 recognition and protection without resort to the niceties of ancient tideland  
16 principles, or confused concepts of "res."

17 "At its heart, the public trust doctrine is not just a set of rules  
18 about tidelands, a restraint on alienation by the government or a  
19 historical inquiry into the circumstances of long-forgotten grants.  
20 And neither Roman law nor the English experience with lands  
21 underlying tidal waters is the place to search for the core of the  
22 trust idea." (Sax, supra, p. 186.)

23 Simply stated, EBMUD's position that the state, for historical or other  
24 reasons, is powerless to regulate water resources which have been subjected to  
25 artificial damming runs counter to strong administrative and judicial trends  
26 favoring comprehensive planning in the allocation of those resources.

27 EBMUD urges that Golden Feather Community Association v.  
28 International Irrigation District, (89 Daily Journal, DAR. 5479 [April 26th, 1989])  
"has a significant effect on plaintiff's and intervenors' claims regarding the  
breadth of public trust doctrine." Nothing could be further from a fair reading of  
that case.

Golden Feather involved the construction of a dam in 1924 on a waterway  
conceded by the litigants to be non-navigable. Plaintiffs sought to enjoin the

1 owners from reducing the level of the water behind the dam to the detriment to  
2 fishing and recreational uses which had developed over the years.

3 The simple answer to EBMUD's reliance on Golden Feather is that court's  
4 emphasis on the non-navigable nature of the reservoir. Navigability is "the  
5 measure of the public trust doctrine" (*id.*, at p. 5481), and was central to the  
6 Golden Feather decision. No further distinction is required.

7 Apart from that obvious distinction, however, Golden Feather can hardly  
8 be construed to provide sustenance for EDMUD's position on the application of  
9 public trust doctrine. So far as can be determined from the record, prior to the  
10 construction of that dam, the stream not only was non-navigable, thereby  
11 precluding resort to public trust doctrine, but also provided no appreciable fishing  
12 or recreational value. The reservoir, built by private interests, created in the first  
13 instance a recreational resource. Unlike the present case, the destruction of  
14 environmental resources was not implicated by the construction of the dam. In  
15 these "particular circumstances" the Court of Appeal apparently felt no  
16 compelling reasons to launch public trust doctrine onto uncharted and non-  
17 navigable waters.

18 Finally, it is apparent that the Court of Appeal was concerned about the  
19 procedural limitations which acted to limit the issues.

20 "In contrast to existing authorities, the plaintiffs in this case do  
21 not seek protection of a recognized public trust interest since they  
22 concede the waters at issue are nonnavigable and the reservoir is  
23 an artificial body of water. Moreover, plaintiffs do not seek to  
24 enjoin an activity, such as diversion of a stream, which harms a  
25 public trust interest. Instead, plaintiffs seek an order which  
26 would compel defendants to continue diverting water from a  
27 nonnavigable stream but which would preclude them from  
utilizing the diverted water in order to maintain an artificial  
reservoir for the recreational benefit of the public. Plaintiffs have  
not provided, and we have not discovered, authority for applying  
the public trust doctrine in such a manner."

28 //



1 Under these circumstances, Golden Feather has but insubstantial value in  
2 any of the critical determinations before this court.

3 VIII.

4 East Bay MUD urges that to preclude the diversion for municipal/  
5 industrial purposes at the Folsom-South Canal is inconsistent with two distinct  
6 congressional directives regarding the Folsom Dam project and thus would  
7 violate principles of Federalism enunciated in State of California v. United States  
8 (1978) 438 U.S. 645, 57 L.Ed.2d 1018, 98 S.Ct. 2985, and U.S. v. State of California  
9 State Water Resources Control Board (9th Cir. 1982) 694 F.2d 1171, East Bay MUD  
10 adduces an abundance of legislative history, purporting to demonstrate that  
11 Congress had a particularized intention of utilizing the project to satisfy  
12 municipal water requirements of the East Bay area and, further, of assuring the  
13 financial feasibility of the project through contracts for the sale of such water for  
14 municipal/ industrial purposes.

15 The Folsom project involved a multitude of federal objectives, including  
16 flood control, power generation, irrigation, and recreation, as well as municipal  
17 and industrial purposes. Whatever the specific congressional intent may have  
18 been for the Folsom Dam, however, it is clear that the Federal Reclamation Act  
19 provides for an accommodation of state and federal interests.

20 "  '[N]othing in this Act shall be construed as affecting or intended  
21  to affect or to in any way interfere with the laws of any State or  
22  Territory relating to the control, appropriation, use, or  
23  distribution of water used in irrigation, or any vested right  
24  acquired thereunder, and the Secretary of the Interior, in carrying  
25  out the provisions of this Act, shall proceed in conformity with  
26  such laws, and nothing herein shall in any way affect any right of  
27 any State or of the Federal Government or of any landowner,  
28 appropriator, or user of water in, to, or from any interstate  
[438 US 651] stream or the water, thereof:  Provided, that the right  
to the use of water acquired under the provisions of this Act shall  
be appurtenant to the land irrigated, and beneficial use shall be  
the basis, the measure, and the limit of the right. 32 Stat 390

1 (emphasis added).’ ” (California v. United States, supra, 438 U.S.  
2 at pp. 650-651.)

3 The emphasis on “beneficial” use is mirrored precisely by Article X  
4 section 2 of the California Constitution which requires that waters of the State be  
5 “put to beneficial use to the fullest extent of which they are capable.” Further, the  
6 bureau’s own operating instructions require that “[p]roject plans” must comply  
7 with state legal provisions or priorities for beneficial use of water. (California v.  
8 United States, supra, 438 U.S. at p. 675.) From these parallel emphases in state and  
9 Federal law, then, one can see the priority accorded to achieving the “highest  
10 beneficial use” in water allocation and can further ascertain the necessity of  
11 “negotiation” and “mutual accommodation and agreement” in achieving that  
12 optimum utilization of water resources. (See United States v. State Water  
13 Resources Control Board, supra, 694 F.2d at p. 1178.)

14 Here, as in the New Melones Dam cases, the issues of Federalism fall short  
15 of ripeness for an adjudication by virtue of the role of the United States  
16 government. In the New Melones cases, the United States, on remand,  
17 inexplicably declined to produce any evidence as to any harmful consequences  
18 which might flow from the state-imposed conditions. Here, the Bureau of  
19 Reclamation is not a party to the action and did not seek to intervene. Perhaps as  
20 a consequence, evidence has not been forthcoming as to the ability of the bureau  
21 to meet its water allocation or financial objectives if diversion at the Folsom-  
22 South Canal is either precluded or subjected to state-mandated conditions, or if  
23 diversion is required at sites other than the Folsom-South Canal.

24 In any case, this court is satisfied that the public trust and Article X values  
25 adduced by plaintiffs and intervenors herein can be reconciled with congressional  
26 intent. It bears emphasis that many of the particular environmental and  
27 ecological consequences advanced in this case were not evident at the time of the  
28 congressional hearings (which were occurring in the late 1940’s). Further, much

1 of the most critical environmental damage became manifest only after the dam  
2 was constructed and made operational. Only then, for example, was an entire  
3 species of spring-run salmon permanently destroyed. Had these environmental  
4 issues been considered by the Congress, it seems entirely probable that the  
5 provisions of Section 8 of the Reclamation Act would have been honored by the  
6 specific protection of such environmental interests.

7 In any event, no congressional intent has been divined with respect to  
8 construction of the Folsom Dam which would override the principles  
9 enumerated in Section 8 of the Reclamation Act. It seems apparent that  
10 achieving the fullest beneficial use of American River water resources requires  
11 that competing values be accommodated.

12 Further, in Environmental Defense Fund, Inc. v. EBMUD (1980) 26 Cal.3d  
13 183 ("EDF II"), the California Supreme Court concluded that:

14 "[L]ocation of the diversion point downstream on the basis of  
15 state law would not be inconsistent with congressional directive.  
16 43 United States Code section 616aaa-616fff authorizing the  
17 Auburn-Folsom South Unit, American River division, provides  
18 in section 616ddd for the secretary to locate and design the works  
19 and facilities giving due consideration to the California Water  
20 Plan and consulting with local interests through public hearings.  
21 A section requiring the secretary to seek conformity to local  
22 wishes does not make state law inapplicable.

23 "Accordingly, to the extent the complaints challenge the  
24 location of the diversion point as being violative of California  
25 law, there is no federal preemption." (EDF II, 26 Cal.3d at p. 193,  
26 emphasis added.)<sup>3</sup>

27 Finally, as Sacramento County's brief on Federal Preemption persuasively  
28 establishes, the legislative documentation is at best uncertain, and in all  
probability does not support East Bay's position at all. If anything, the legislative  
history manifests a priority of interest in "irrigation, hydroelectric power

<sup>3</sup> In this case, it is unnecessary to determine whether or not this holding of EDF is "the law of the case."

1 production, and other uses" for the Central Valley area rather than in the  
2 municipal/industrial needs of the East Bay.

3 It bears emphasis that Congress authorized the Folsom Dam only in  
4 anticipation of a much more complex system of water development, including  
5 the construction of the Auburn Dam. It was anticipated, for example, that the  
6 Folsom-South Canal would be supplied with water from both Auburn and  
7 Folsom reservoirs. The failure to complete all but the initial phases of the system  
8 must cast considerable doubt upon those expressions of congressional intent  
9 which anticipated an entirely different system of water delivery and  
10 development.

#### 11 IX.

12 EBMUD argues that "in enacting section 11265 of the Water Code, the  
13 California Legislature 'made an express disposition of lower American trust assets  
14 by approving Folsom Dam and the Folsom-South Canal to further trust  
15 purposes'" (Defendant's Brief at p. 23). The argument is that in enacting  
16 section 11265, the Legislature engaged in a balancing of trust values, and that  
17 neither the court nor any administrative agency may now modify nor redress that  
18 balance.

19 In response, plaintiffs note correctly that public law number 81-356, 63 Stat.  
20 853, incorporated into Water Code section 11265, authorizes the construction of  
21 the dam and provides for feasibility studies for a diversion canal, but it neither  
22 expressly nor by implication purports to grant any rights to use lower American  
23 water. Indeed, the act specifically provides that nothing in it "shall be construed  
24 by implication or otherwise as an allocation of water . . ." (63 Stat. 853.)

25 Further, nothing in the federal or state legislative history demonstrates an  
26 intent to revoke or limit the state's continuing supervisory powers over the lower  
27 American River trust. Such legislation must be strictly construed and an intent to  
28 abandon the trust will not be implied if any other reasonable interpretation is

1 possible. In People v. California Fish Company (1913) 166 Cal 576, 597, the Court  
2 stated:

3 "Statutes purporting to authorize an abandonment of . . . public  
4 use will be carefully scanned to ascertain whether or not such was  
5 the legislative intention, and that intent must be clearly expressed  
6 or necessarily implied. It will not be implied if any other  
7 inference is reasonably possible. And if any interpretation of the  
8 statute is reasonably possible which would not involve a  
9 destruction of the public use or an intention to terminate it in  
10 violation of the trust, the courts will give the statute such  
11 interpretation."

12 This court agrees with intervenor's position that the more reasonable  
13 interpretation of section 11265 is that the State Legislature simply intended to  
14 include the American River development in the State Central Valley Project as a  
15 facility and did not intend to make a water allocation determination. The  
16 Legislature's reference to Public Law 356, the federal statute authorizing the  
17 American River development, supports this interpretation.

18 In Public Law 356, Congress expressly stated:

19 "Nothing contained in this act shall be construed by implication  
20 or otherwise as an allocation of water, and in the studies for the  
21 purpose of developing plans for the disposal of water as herein  
22 authorized, the Secretary of the Interior shall make  
23 recommendations for the water in accord with state water laws,  
24 including but not limited to such laws giving priority to the  
25 counties and areas of origin for present and future needs."  
26 (Public Law No. 356, (1949), 63 Stat. 852, Section 1; and Intervenor  
27 State Lands Brief, page 17, 18.)

28 In Audubon, it is observed that no grant is free of public trust unless, inter  
alia, the Legislature makes clear its intent to so convey (Audubon, supra, 33 Cal.3d  
at p. 439). Further, such acts are limited only to "rare instances" (Id., at p. 440), and  
it is unlikely they will apply it to usufructuary water rights. (Id., at p. 445, fn. 25.)

It is not apparent that the California Legislature has expressed any  
intention to divest the lower American River from the public trust in order to

1 sustain other public trust purposes. And the continuing supervisory powers  
2 bestowed under Audubon are sufficiently broad to permit a comprehensive  
3 evaluation of current environmental impacts within the context of current public  
4 trust values.

5 X.

6 WILD AND SCENIC RIVERS SECTION

7 Plaintiffs and intervenors urge that the Wild and Scenic Rivers Act precludes  
8 EBMUD's diversion at the Folsom-South Canal. In the context of this case, the  
9 following provisions of the statute are relevant:

10 "Section 5093.50. Legislative declaration

11 "It is the policy of the State of California that certain rivers  
12 which possess extraordinary scenic, recreational, fishery, or wildlife  
13 values shall be preserved in their free-flowing state, together with  
14 their immediate environments, for the benefit and enjoyment of the  
15 people of the state. The Legislature declares that such use of these  
16 rivers is the highest and most beneficial use and is a reasonable and  
17 beneficial use of water within the meaning of Section 2 of Article X  
18 of the California Constitution. It is the purpose of this chapter to  
19 create a California Wild and Scenic Rivers System to be administered  
20 in accordance with the provisions of this chapter."

21 (Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by Stats.  
22 1982, c. 1481, p. 5692, Section 1.)

23 "Section 5093.52. Definitions

24 "As used in this chapter:

25 "(d) 'Free-flowing' means existing or flowing without  
26 artificial impoundment, diversion, or other modification of the  
27 river. The presence of low dams, diversion works, and other minor  
28 structures shall not automatically bar any river's inclusion within  
the system; provided, however, that this subdivision shall not be  
construed to authorize or encourage future construction of such  
structures on any component of the system."

(Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by Stats.  
1982, c. 1481, p. 5693, Section 2.)

//

1       "Section 5093.53. Classification of rivers

2               "Those rivers or segments of rivers included in the system  
3 shall be classified as one of the following:

4               "(c)       Recreational rivers, which are those rivers or  
5 segments of rivers that are readily accessible by road or railroad, that  
6 may have some development along their shorelines, and that may  
7 have undergone some impoundment or diversion in the past."

8               (Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by  
9 Stats. 1982, c. 1481, p. 5693, Section 3.)

10       "5093.54. Components of system

11               "The following rivers and segments thereof are designated as  
12 components of the system:

13               "(e)       American River. The North Fork from its source  
14 to the Iowa Hill Bridge; the Lower American from Nimbus Dam to  
15 its junction with the Sacramento River."

16               (Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by  
17 Stats. 1982, c. 1481, p. 5694, Section 4.)

18       "5093.55. Restrictions on construction of dams, reservoirs,  
19 diversions, other impoundments, or water diversion facilities

20               "Except as provided in subdivision (d) of Section 5093.54, no  
21 dam, reservoir, diversion or other water impoundment facility,  
22 other than temporary flood storage facilities permitted pursuant to  
23 Section 5093.57, shall be constructed on any river designated in  
24 Section 5093.54 after the effective date of this chapter; nor shall any  
25 water diversion facility be constructed on any such river unless and  
26 until the secretary determines that such facility is needed to supply  
27 domestic water to the residents of the county or counties through  
28 which the river flows, and unless and until the secretary determines  
that facility will not adversely affect its free-flowing condition and  
natural character."

              (Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by  
Stats. 1982, c. 1481, p. 5707, Section 8.)

"5093.56. Prohibition against governmental cooperation in projects  
affecting system

              "No department or agency of the state shall assist or cooperate,  
whether by loan, grant, license, or otherwise, with any department or

1 agency of the federal, state, or local government, in the planning or  
2 construction of any dam, reservoir, diversion, or other water  
3 impoundment facility that could have an adverse effect on the free-  
flowing condition and natural character of the river segments  
designated in Section 5093.54 as included in the system."

4 (Added by Stats. 1972, c. 1259, p. 2510, Section 1. Amended by  
5 Stats. 1982, c. 1481, p. 5707, Section 9.)

6 The Wild and Scenic Rivers Act (hereinafter "the act") was enacted in 1972.  
7 In 1972, the lower American River "... from Nimbus Dam to its junction with  
8 the Sacramento River" was added to the system. The Referee concluded that the  
9 act has in no application to this case, since the point of diversion lies upstream of  
10 the "designated segment." The Referee further relied on statutory construction,  
11 noting that prior to 1982 section 5093.55 prohibited the construction of any dam,  
12 reservoir, diversion or other water impoundment facility "on or directly affecting  
13 a designated stream," and that the deletion of the underlined phrase manifests an  
14 intention to permit the EBMUD diversion. Intervenors also argue that any  
15 interpretation of the provision is "inconsequential" since section 5093.53(e), by its  
16 language, is intended to include the area behind the Nimbus Dam and therefore  
17 the point of origin of the Folsom-South Canal.

18 As to the latter point, it seems apparent that the segment intended for  
19 protection is that portion of the river commencing at the Nimbus Dam and lying  
20 downstream therefrom. It makes no sense in describing and protecting "free  
21 flowing rivers" to extend that protection to a manmade lake. Common English  
22 usage further suggests that section 5093.54(e) intends to make the dam structure  
23 itself the point of origin for the protection of the free-flowing river waters. Had  
24 the intent been otherwise, section 5093.54(e) would have described the protected  
25 segment as "from Folsom Dam to its juncture with the Sacramento River." The  
26 clear language does not support the intervenor's interpretation.

27 Plaintiff's other arguments are more persuasive. Whatever the Legislature  
28 may have intended by deleting the language "on or directly affecting a designated



1 stream," reason suggests that it did not mean to sanction diversions upstream of  
2 the Nimbus Dam, the effects of which would destroy public trust values in the  
3 "designated segment." EBMUD's position that section 5093.55 "only prohibits  
4 facilities constructed on a protected segment" ignores the larger purposes of the  
5 act. The objective is not simply to preclude unsightly facilities, but rather to  
6 preserve the collective public trust values of the designated stream.

7 Section 5093.50 could scarcely be more clear in its specific adoption of Article X,  
8 Section 2 values as the underlying rationale for the statutory scheme.

9 The Court agrees with intervenors that section 5093.50 is "intended as a  
10 directive to preserve public trust values and is thus a codification of the State's  
11 public trust authority" (Department of Fish and Game and State Lands  
12 Commission's Trial Brief on Wild and Scenic Rivers Legislation, p. 5). Further,  
13 the Court agrees with intervenor's position, contrary to that proposed by EBMUD,  
14 that the "recreational" classification refers only to factors of accessibility, past  
15 diversions, and existing development rather than a limitation on the values  
16 intended for statutory protection.

17 Accepting the application of the act to the instant controversy does not  
18 justify the conclusion that EBMUD's diversion must necessarily be prohibited. As  
19 emphasized throughout this opinion, if public trust values can adequately be  
20 protected in the context of a physical solution, then no sound rationale exists for  
21 depriving defendants of the best available source for drinking water. Without  
22 minimizing the principle of statutory construction that later, specific statutes  
23 supersede more general enactments, it nonetheless bears comment that  
24 section 106 of the Water Code provides a hierarchy of values somewhat different  
25 from the act. Section 106 provides as follows:

26 "It is hereby declared to be the established policy of this state that the  
27 use of water for domestic purposes is the highest use of water and  
28 that the next highest use is for irrigation."

1 Both statutes, it should be noted, draw specifically upon Article X, section 2  
2 for their "authority." "Highest and most beneficial use" is only a more precise  
3 borrowing from Article X, section 2 than the section 106 reference to "the highest  
4 use." In the complex arena of water law, it is reasonable to suppose a legislative  
5 intent to accommodate those conflicting interests, wherever such accommodation  
6 can reasonably be accomplished.

7 The act can only be read with emphasis on the 1972 legislation which  
8 brought the lower American River into the system, with reference to section 106  
9 of the Water Code, and in the spirit of comprehensive planning and resource  
10 management required by Audubon. As thus considered, the physical solution  
11 protects the public trust resources, while at the same time permitting that  
12 diversion by EBMUD of which the Legislature must have been aware in 1972.

13 Section 5093.56 offers a further basis for determining that the act applies to  
14 diversions other than those constructed within the geographical confines of the  
15 designated segment. In the context of the instant litigation, however, the result is  
16 not different. Again, the physical solution is designed to preclude adverse effects  
17 of diversion, as well as to accommodate competing interests.

18 Nor does the federal Wild and Scenic Rivers Act (16 USC § 1271 et seq.)  
19 provide any avenue of relief for plaintiffs which is more accessible than Article X,  
20 section 2 and the Doctrine of Public Trust. Indeed, the preservation objectives of  
21 the federal act recognize the necessity to accommodate, where possible, conflicting  
22 interests and values.

23 "Each component of the national wild and scenic rivers system shall  
24 be administered in such manner as to protect and enhance the  
25 values which caused it to be included in said system without, insofar  
26 as is consistent therewith, limiting other uses that do not  
27 substantially interfere with public use and enjoyment of these  
28 values. In such administration, primary emphasis shall be given to  
protecting its esthetic, scenic, historic, archaeological, and scientific  
features. . . ." (Section 1281(a); emphasis added.)

Thus, neither the state nor federal acts provide obstacles to the balancing approach of Audubon, nor to the fashioning of a physical solution designed to protect and enhance public trust values.

XI.

East Bay MUD urges that intervenor, Sacramento County, is estopped to deny the legal efficacy of the East Bay MUD contract with the Bureau of Reclamation for the diversion of water at the Folsom-South Canal, based upon a history of negotiation and contract in which Sacramento County allegedly agreed to East Bay MUD's diversion in return for East Bay MUD's reducing the amount of water which it was seeking from the bureau and in return for defendant's acceding to an extension of a previously granted priority on behalf of Sacramento County to enter into water contracts with the bureau.

Specifically, defendant alleges that the contractual foundation for estoppel arose from hearings in the mid-1960's, wherein the bureau was applying to the State Water Rights Board for a permit to appropriate water at the proposed Auburn Dam. It was a time of competition, negotiation and compromise among those who would appropriate the water, including the Sacramento River and Delta Water Association ("SRDWA"), the Sacramento Municipal Utility District ("SMUD"), the Central Valley East Side Project Association ("CVESPA"), and others. Sacramento County, in 1958, had received a priority to obtain water contracts from the bureau for American River water. Defendant's attempts to negotiate a contract were tempered by this pre-existing priority. In 1968, the bureau, East Bay MUD, CVESPA, and SRDWA executed a finalized agreement (the "four-party agreement"; Exhibit E to EBMUD's Brief Re: Estoppel) by which Sacramento County agreed to allow the bureau to contract with East Bay MUD for 70,000 acre feet, and for 80,000 acre feet more when the Hood-Clay Connector was completed. Based on this proposal, East Bay MUD agreed to reduce the amount of water it sought from 225,000 acre feet to 150,000 acre feet. Furthermore, in the

1 1968 agreement, Sacramento County gained the approval of East Bay MUD, the  
2 bureau, and the San Joaquin interests for an extension to December 31st, 1975, of  
3 Sacramento's priority to contract with the bureau.

4 Furthermore, in current bureau EIS marketing proceedings, Sacramento  
5 County has requested from the bureau the right to appropriate an additional  
6 243,000 acre feet annually from the American River. Apparently, Sacramento  
7 County has kept open its option to take delivery of that water at the Folsom-  
8 South Canal. In 1978, Sacramento County adopted a "Sacramento County Water  
9 Plan," calling for the delivery of 260,000 acre feet annually to Sacramento County  
10 through the Folsom-South Canal. And, of course, all the Sacramento County  
11 hydrology projections in this case have assumed a diversion of 218,000 AFA by  
12 Sacramento County at the Folsom-South Canal.

13 In different circumstances, defendant's estoppel argument could well be  
14 dispositive. There is a unseemly aspect to Sacramento County's position in this  
15 case as they conjure a parade of environmental horrors were any of the  
16 American River water to be diverted to the Folsom-South Canal, while at the  
17 same time maintaining an option to divert the same water at the same location.

18 Admittedly, Mr. Somach, Sacramento County's attorney, has, in court,  
19 offered to defendant a quid pro quo: Sacramento County would not divert at the  
20 Folsom-South Canal if East Bay MUD will abandon its contract for diversion at  
21 that point.

22 One flaw in defendant's estoppel argument, however, is that the 1968  
23 agreement and their antecedents were in the context of the construction of the  
24 Auburn Dam. It was in expectation of the Auburn Dam that the negotiations  
25 were entered, the decisions made as to how respective water allocations were to be  
26 made, and the contracts finalized which set forth the agreed-upon conditions of  
27 water allocation. The Auburn Dam was never constructed, however. As a  
28 consequence, no party can be faulted for reevaluating its position, nor may

1 Sacramento County be precluded from advancing its view that at this time  
2 environmental interests can be protected only by a complete absence of diversion  
3 at the Folsom-South Canal.

4 While no aspect of the litigation is without a measure of gravity, EBMUD's  
5 pursuit of the estoppel argument could scarcely be characterized as "spirited."  
6 EBMUD has not pled estoppel or unclean hands in its answer, nor has any  
7 appreciable evidence been advanced to demonstrate facts necessary to support  
8 such a conclusion.

9 From the exhibits alone, it would appear that Sacramento County was not a  
10 signatory to the four-party agreement. SRDWP was, at the time of the agreement,  
11 an association of over 50 water users, including some of the largest commercial  
12 and corporate farmers in California. The county's Reply Brief on Estoppel  
13 correctly notes that SRDWA presumably could bind the county only if specifically  
14 authorized to do so by the Board of Supervisors. (See City of Redwood City v.  
15 Moore (1965) 231 Cal.App.2d 563; Lehane v. City and County of San Francisco  
16 (1972) 30 Cal.App.3d 1051, 1054, app. dism., 410 U.S. 962.)

17 In opposition to EBMUD's motion, the county makes the following  
18 observations:

19 "The relationship between Sacramento County and SRDWA was  
20 limited. SRDWA was authorized to negotiate proposed terms  
21 and form of settlement, 'it being specifically understood that said  
22 board does not commit itself to acceptance of any settlement  
23 which may be proposed . . .' (Sacramento County Board of  
24 Supervisors, Resolution No. 65-1168, copy attached as Exhibit A.)  
25 On March 13, 1968, the County Board of Supervisors, acting ex  
26 officio as the Board of the Sacramento County Water Agency,  
27 adopted Resolution No. 85, in which it formally recorded its  
28 opposition to the then-proposed contract between EBMUD and  
USBRE and to the proposed agreement unless certain conditions  
were met, among them that EBMUD's point of diversion would  
be below the Hood-Clay Connection. (A copy of Resolution 85 is  
attached as Exhibit B.) EBMUD has failed to produce any  
resolution by Sacramento County approving the four-party

1 agreement or authorizing SRDWA to execute it on the County's  
2 behalf. The County cannot be bound absent such approval."

3 From a review of the exhibits, it would appear that Sacramento County is  
4 correct in demonstrating a failure of county approval to the four-party agreement.  
5 The critical point, however, is that from an evidentiary standpoint, EBMUD has  
6 not pled nor proved the contrary.

7 Had EBMUD been successful in establishing the unlimited authority of  
8 SRDWA to act for and bind the county with respect to the full panoply of  
9 American River interests, estoppel would still be an inappropriate remedy on the  
10 facts of this case. It is a "well-established proposition that an estoppel will not be  
11 applied against the government. To do so would effectively nullify 'a strong rule  
12 of policy' adopted for the benefit of the public." (City of Long Beach v. Mansell  
13 (1970) 3 Cal.3d 452, 493; State of California v. Superior Court (Fogerty) (1981)  
14 29 Cal.3d 240.) Here, both Article X section 2 and public trust values represent  
15 significant public policies that, on the facts of this case, would preclude estoppel as  
16 a matter of law.

17 "Estoppel will not be applied to the government if the result  
18 would be to nullify a strong rule of policy adopted for the benefit  
19 of the public (Mansell, 3 Cal.3d at p. 294), and we entertain no  
20 doubt that this would be the result if we were to hold that the  
21 People are barred from asserting the public trust in the lands at  
22 issue." (State of California v. Superior Court (Fogerty), supra,  
23 29 Cal.3d at p. 244.)

24 Finally, while EBMUD might claim some strategic benefit from proceeding  
25 against Sacramento County on this issue, estoppel would not be applicable to  
26 plaintiffs or other intervenors in this action and, consequently, would have little  
27 impact on the outcome of this litigation.

## 28 XII.

Considering the complexity of this litigation, EBMUD's ultimate legal  
position is exquisitely simple: The contract of December 22nd, 1970 was executed

1 in full compliance with all state and federal requirements; the federal  
2 government holds the necessary water rights to divert American River water and  
3 supply it through the Folsom-South Canal; EBMUD's contract has priority over  
4 other subsequent appropriations, and in the absence of demonstrable harm to  
5 public trust values, must be enforced. First and foremost, EBMUD maintained  
6 that its diversion alone would not cause harm. Still, apparently concern that  
7 Audubon invites an extended process of balancing competing interests and  
8 values, a major EBMUD evidentiary focus has been on the issue of water quality.  
9 Apart from singular reliance on its existing contract and alleged lack of harm,  
10 EBMUD advanced the proposition that the superior quality of water obtainable at  
11 the Folsom-South Canal is a sufficiently strong "value" to outweigh plaintiffs'  
12 concerns about fishing and riparian habitat values. Throughout this proceeding,  
13 in fact, the Court has been invited to engage in a process of balancing such  
14 interests.

15 Issue 10 of the Order of Reference directs the board to determine: "Is there a  
16 significant difference in water quality, with or without available treatment  
17 technologies, between the flows of the American River available through the  
18 Folsom-South Canal, and waters available from the Sacramento River below the  
19 confluence with the American River, and from the Delta?" The Board considered  
20 the Okun report, the critique of that report by the Department of Water Resources  
21 (DWR), the comments of the Department of Health Services (DOHS), and the  
22 testimony from various experts, including Dr. Greenberg, as well as other sources  
23 referred to on page 196 of the Technical Report. From these sources, the Board  
24 was able to analyze, to some degree, the impact on public health of THMs,  
25 brominated THMs, pesticides, herbicides, NVTOC, TOC, TOX, sodium, asbestos,  
26 selenium, microbiological contaminants, and turbidity.

27 The Court has found no basis in the testimony for discounting the accuracy  
28 of the board's survey of the evidence presented in the water quality section

1 (Technical Report at pp. 192-239). The problem for the Board, as well as for this  
2 court, is synopsised in the board's conclusion:

3 "It is difficult -- perhaps impossible -- to determine accurately the  
4 public health risks due to drinking treated water from alternative  
5 sources. As described above, the scientific methodology and data  
6 used to assess public health risks are limited. There are  
7 significant differences in expert opinion regarding the risks posed  
8 by drinking water from the alternative sources."

9 The Okun report was produced in response to the demands of litigation  
10 before the Board, and on the basis of evidence then available, as were the  
11 responsive reports of DWR and DOHS. Still, it would appear from testimony  
12 before this court that very little definitive, scientific research has occurred since  
13 the board hearings, and the scientific opinions and interpretations of available  
14 data, while perhaps more sophisticated at this point, are no less irreconcilable.

15 The testimony with respect to water quality consisted of plaintiff's experts,  
16 Dr. Lester Lave and Dr. Alvin Greenberg; and defendant's experts, Dr. Daniel  
17 Okun, John Gaston, Dr. Robert Harris, and Dr. A. Karim Ahmed.<sup>4</sup>

18 Dr. Greenberg presented testimony regarding various alleged health  
19 hazards relative to the Mokelumne, American and Sacramento rivers, as well as  
20 the Delta. Noting that waterborne diseases of the sort which had historically beset  
21 human populations had largely been controlled through current water treatment  
22 modalities, particularly chlorine, he addressed various of the chemicals and  
23 pollutants whose presence was suspected or found in various waterways. He  
24 noted his agreement with the Okun report (Exhibit 25) that the following  
25 inorganic chemicals would pose no significant health risk if any of the available  
26 water sources were used for potable water:

27 //

28 <sup>4</sup> The qualifications of each of these eminently qualified scientists will not be recited here. In no instance did the court consider the absence of professional qualifications a factor in determining credibility.



1           Arsenic, barium, cadmium, chromium, lead, mercury, nitrate, selenium,  
2 silver and fluoride.

3           Dr. Greenberg testified that waterborne asbestos posed no particular risk in  
4 any of the water sources under consideration. As to sodium, Dr. Greenberg found  
5 no risks in the American or Sacramento River, and only insignificant risk in the  
6 Delta.

7           With respect to pesticide pollution, Dr. Greenberg agreed with the report of  
8 the Department of Water Resources (DWR) Report (Exhibit 2012, page 9) which  
9 criticized the Okun Report as follows:

10           "On page 21 (Okun Report), the statement is made that 'pesticides  
11 in fertilizers applied within a drainage basin find their way into  
12 surface waters within the basin, impact on the water quality, and  
13 present potential health risks to the population served by the  
14 water from that watershed.' This generalization was not,  
15 however, supported by data."

16           Dr. Greenberg felt there was no ascertainable health hazard from any of the  
17 three water sources as a result of pesticide pollution. He testified that pesticides  
18 were frequently "nonmobile," migrating into the soil; that they degrade after  
19 application; that they bind to the soil; and that settlement occurs after the  
20 pesticides reach the water sources.

21           Dr. Greenberg addressed a particular herbicide problem which has  
22 developed along the Sacramento River. In recent years, the existence of  
23 unpleasant taste and odors in Sacramento drinking water led to an investigation  
24 by DHS which uncovered the discharge of rice herbicides into the Sacramento  
25 River. These herbicides, which have been present in raw water for a brief time in  
26 the spring, have broken down completely in the treatment process and do not  
27 occur in drinking water. But the breakdown components produce an unpleasant  
28 taste, detectable by 10-25 percent of consumers, when mixed with chlorine.

29           Dr. Greenberg concluded that no significant health problem has arisen from these  
30 herbicides. Basagran, while suspected of being a carcinogen in rats, could be

1 regulated by Proposition 65, and in any event, is being discontinued.

2 Dr. Greenberg felt that administrative regulations should be sufficient to keep the  
3 rice herbicide discharges at levels which are not hazardous. Mr. Sequeira, the  
4 Manager of the Water Division for the City of Sacramento, echoed Dr. Greenberg's  
5 conclusions, and pointed out that the highest levels of these herbicides ever  
6 detected in raw water are below the maximum contaminant levels for finished  
7 water set by the Department of Health Services.

8 One critical area of concern, as seen by EBMUD, is the presence in drinking  
9 water of trihalomethanes (THMs) and non-volatile total organic halogens  
10 (NVTX). THMs are halogenated organic compounds that are found when  
11 naturally occurring organic substances are exposed to chlorine during the  
12 disinfection process (Exhibit 2010, page 18) . Chloroform is one type of THM  
13 which occurs in treated water from the Mokelumne as well as the other three  
14 potential sources. Other "brominated THMs," formed from the reaction of THM  
15 to bromide salts, occur certainly in the Delta, and according to EBMUD experts, in  
16 the Sacramento River. According to the DWR report (Exhibit 2012):

17 "Trihalomethanes are of concern because research has indicated  
18 that THMs can cause cancer in test animals, and possibly in  
19 humans. The research is still inconclusive, but there is a  
20 possibility that brominated methanes are more mutagenic than  
chloroform."

21 In general, Dr. Greenberg found no significant risk from THM or NVTX from  
22 drinking chlorinated water, noting the agreement in that regard of the E.P.A.  
23 Report to Congress (Exhibit 5008), which found such a risk to be not large.  
24 Dr. Greenberg also emphasized that, in this case, the issue is not whether a risk  
25 exists; rather, the issue is the difference between two risks, each of which is itself  
26 small.

27 In exhibits 5010-5012, Dr. Greenberg presented his risk assessment of  
28 relative cancer risk from THM' s associated with chlorinated drinking water from

1 the targeted water sources. He utilized a potency slope (that is a rate of expected  
2 cancer from a unit dose) for chloroform which is recommended by the E.P.A. He  
3 assumed that brominated THMs would have potencies equivalent to chloroform.  
4 He further assumed that operationally EBMUD would cause Mokelumne River  
5 water to be blended with Sacramento River and Delta water. On these bases, his  
6 assessment concluded that there was no cognizable nor appreciable difference  
7 between chlorinated water from the available water sources. Dr. Greenberg's  
8 methodology was severely criticized on cross-examination, and through  
9 defendant's experts, partially on the following grounds:

10 1. His assumption regarding the blending of Mokelumne River with  
11 other sources was entirely speculative;

12 2. Some of his data derived from Mokelumne River water stored in  
13 the San Leandro Reservoir was necessarily skewed by unusual conditions in  
14 which Delta water had been stored there during a particularly dry year;

15 3. His use of chloroform as a surrogate on the assumption that  
16 brominated THMs were not more potent;

17 4. The assumption that brominated THMs were not present in the  
18 Sacramento River;

19 5. His use of a potency slope shown to be outdated by subsequent E.P.A.  
20 requirements.

21 Dr. Greenberg defended his position against such criticism, contending, for  
22 example, that recent studies by the National Toxicology Program (unconsidered by  
23 EBMUD's experts) and the opinions of other scientists demonstrate that  
24 chloroform is approximately as potent (or perhaps slightly less so) as one of the  
25 brominated THMs, and more potent than the other two. In any event, he  
26 emphasized the "conservative assumptions" inherent in his calculations, and  
27 that actual risks are probably much lower than those derived in the quantitative  
28 assessments.

1 With respect to NVTOX, including (3-Chloro-4(dichloromethyl)--5-  
2 hydroxy-2(5H)-furanone[MX]) (MX) and (E-2-Chloro-3-(dichloromethyl)-4-oxo-  
3 butenoic acid [E-MX]) (E-MX), Dr. Greenberg expressed his agreement with the  
4 E.P.A. Report (Exhibit 5008), concluding that carcinogenic and mutagenic risks  
5 from chlorinated drinking water "are probably not large." On the basis of  
6 epidemiological evidence, Dr. Greenberg expressed general agreement with the  
7 E.P.A. report that:

8 "According to epidemiological evidence, chlorination of drinking  
9 water may cause a slight increase in the risk of cancer."  
10 (Exhibit 5008, p. 3-33)

11 Dr. Lave, relying almost entirely upon information provided to him by  
12 Dr. Greenberg, provided testimony about the disciplines of risk assessment and  
13 risk management.

14 "As recently defined by the National Academy of Sciences,  
15 risk assessment is the scientific activity of evaluating the toxic  
16 properties of a chemical and the conditions of human exposure to  
17 it in order both to ascertain the likelihood that exposed humans  
18 will be adversely affected, and to characterize the nature of the  
19 effects they may experience.

20 "The academy distinguishes risk assessment from risk  
21 management; the latter activity concerns decisions about whether  
22 an assessed risk is sufficiently high to present a public health  
23 concern and about the appropriate means for control of a risk  
24 judged to be significant." (Exhibit 995, "Principals of Risk  
25 Assessment," p. II-2.)

26 Dr. Lave testified regarding the processes by which chemicals are  
27 determined to be carcinogenic. He noted the physical limitations of  
28 epidemiological studies and the necessary reliance on rat studies (rodent  
bioassays) to provide scientific data relating chemicals to the development of  
cancer. One thrust of his testimony was the exceptionally conservative approach  
of these studies, the consequence of which is that very few known carcinogens are

1 underestimated in the scientific process. The very purpose of the studies is to  
2 guarantee that cancer risks are not underestimated. The corollary of this  
3 conservative approach, however, is the considerable doubt that must exist as to  
4 whether a particular result from a rodent bioassay can be extrapolated to humans.  
5 Risk management requires that various governmental agencies determine  
6 appropriate risks significant enough to justify regulation. In California, for  
7 example, Proposition 65 uses a "significant risk" factor of 10 in 1 million. The  
8 F.D.A. uses a standard of one in one million (Exhibit 999).

9 In the context of the present case, Dr. Lave testified that T13Ms in the water  
10 currently utilized by EBMUD from the Mokelumne River would cause a  
11 "theoretical" .03 day's reduction in life expectancy for EBMUD customers, based  
12 on risk analysis methods and the assumption that a cancer caused by THMs  
13 would shorten a life by 20 years. The same analysis applied to Sacramento River  
14 water, would change the reduction to .04 days. Similarly, Dr. Lave presented  
15 Exhibit 5004, demonstrating THM risk from Mokelumne River water alone, and  
16 from 50-50 blends of Mokelumne River water with Sacramento River water, at  
17 various frequencies. Mokelumne water alone, over 70 years of exposure, creates a  
18 risk of 2.4 cancers per million lifetimes due to THM ingestion. A 50-50 blend with  
19 Sacramento River water creates a calculated risk of 2.89 cancers per million over  
20 the same period.

21 Dr. Lave offered no judgment as to whether the aforementioned statistical  
22 differences are significant or not in terms of social policy. Apart from his personal  
23 opinion that EBMUD's diversion at the Folsom-South Canal represents a "beggar  
24 thy neighbor" policy, his testimony was simply an elaboration of Dr. Greenberg's  
25 testimony in terms of risk management principles. His analysis concluded that  
26 EBMUD could divert waters from the Sacramento River (assuming a blending of  
27 the waters) with a statistically insignificant increase in carcinogenic risks to the  
28 general population from THMs. His presentation was largely statistical in nature

1 and did not consider the consequences of pesticide pollution as well as any  
2 number of other degradation factors. As indicated, his assessment was limited to  
3 an analysis of THM, only one of the many pollution problems developed in the  
4 testimony. He agreed that the value of his testimony was entirely dependent  
5 upon Dr. Greenberg's initial analysis. Finally, Dr. Lave readily conceded that there  
6 are an abundance of "unknowns" in his analysis, including the synergistic effect  
7 of unknown and unquantifiable chemicals within the waterways, as well as the  
8 continual introduction of new chemicals into industrial and agricultural  
9 commerce. The presence of some uncertainty did not, however, alter his  
10 conclusions with respect to the water quality or the risk management issues that  
11 inhere in this case.

12 For EBMUD, Dr. Harris testified generally about the genesis of concerns  
13 regarding health hazards in drinking water. He testified that there are over 60,000  
14 manmade chemicals in the environment, with a thousand or more added each  
15 year. While the Federal Safe Drinking Water Act Amendment of 1986 mandates  
16 the E.P.A. to promulgate regulations for 83 new chemicals in 1989 and for an  
17 additional 25 chemicals each three years thereafter, it is highly improbable that  
18 this can be accomplished given bureaucratic and scientific limitations. Further, it  
19 is expected that the E.P.A. will lower THM standards from 100 parts per billion to  
20 between 25 and 50 parts per billion. As other experts noted, this will have a  
21 dramatic effect in water treatment, requiring that facilities in many cases will  
22 have to switch from chlorination to ozonation or granular activated carbon  
23 (GAC), perhaps in conjunction with chlorine or chloramine additives as  
24 "residual" disinfectants in the distribution system.

25 Dr. Harris focused on the health threat posed by organics in drinking water  
26 and drinking water source supplies. He testified that organics enter a water  
27 supply through many sources, including urban runoff, agriculture, sewage  
28 treatment,, industry, and pulp mills (Exhibit 4150). Dr. Harris opined that

1 attempts to regulate these discharges have "almost been a dismal failure."  
2 Through toxic tort liability, industries are becoming more careful, but regulatory  
3 strictures are not adequate to control organic discharges. Organics react with  
4 chlorine during treatment to produce chlorine "by-products," many of which are  
5 highly mutagenic and probably carcinogenic. Dr. Harris testified that chlorine  
6 treatment cannot be abandoned with present technology because the health risk  
7 posed by waterborne infectious disease is significant. Nonetheless, he cautioned  
8 that the amount of chlorine added during treatment should be minimized, and  
9 that this can only occur with the selection of a pure water supply.

10 Dr. Harris testified that knowledge of types and toxicity of chlorinated by-  
11 products is increasing. Over 30 of the 100 known compounds have now been  
12 identified (through gas chromatograph technology). THMs (Exhibit 4153), which  
13 during the 1970's were thought to represent the entirety of the risk from  
14 chlorination, are now seen as representing only the "tip of the iceberg," with  
15 chloroform THMs representing only the tip of the tip of the iceberg (Exhibit 4152).  
16 Recent discovery of MX and E-MX (Exhibit 4154) in the non-volatile fraction of  
17 the "iceberg" has led to increasing concern over the toxicity and health risks  
18 associated with the "unknowns" of this NVTOC fraction. Dr. Harris testified that  
19 MX is the most potent mutagen ever tested. E-MX is one/tenth as potent as MX,  
20 and is also considered a highly potent mutagen.

21 THMs, MX and E-MX are by-products of the reaction between organics in  
22 the water supply and chlorine applied during treatment. The higher quality the  
23 water source, the fewer organics ("precursors") in the water supply. Water  
24 supplies with fewer "precursors" produce fewer chlorine by-products.  
25 Furthermore, a higher quality source requires less chlorine for adequate  
26 treatment. A higher quality source thus has fewer "precursor" organics and  
27 requires less chlorine for treatment. The finished water from a higher quality

28 //

1 source will thus contain fewer chlorinated by-products such as THMs, MX and E-  
2 MX.

3 Dr. Harris testified that the trihalomethane formation potential (THMFP)  
4 of the three alternative sources varies. The THMFP of a source is calculated by  
5 adding chlorine to a sample from the water source in a laboratory and measuring  
6 the resultant THMs. While it may not exactly predict the THMs which will be  
7 present in the finished water, it is indicative of the organics present in the water  
8 source and the likely challenges facing the treatment process. It provides a means  
9 of comparing the relative qualities and potential relative risks of various sources.  
10 Dr. Harris testified that the THMFP for chloroform may be 50 percent higher than  
11 the chloroform which actually occurs in finished water. Dr. Harris testified that  
12 the THMFP for the brominated compounds, however, is less than the levels  
13 occurring in finished water. Thus, for sources with higher percentages of  
14 chloroform THMs (such as the Mokelumne River and the American River),  
15 THMFP may overpredict the actual risk; whereas, for sources with higher  
16 percentages of brominated THMs (such as the Sacramento River and the Delta),  
17 THMFP may underpredict the actual risk.

18 Dr. Harris presented a comparison of the THMFP of the Mokelumne River,  
19 American River, Sacramento River and Delta. He compared the risks presented  
20 by chloroform THMs (Exhibit 4156), bromoform THMs (Exhibit 4157),  
21 bromodichloromethane THMs (Exhibit 4158), and dibromochloromethane THMs  
22 (Exhibit 4159). In each case, the Sacramento River and the Delta waters contain  
23 much higher concentrations of THMs than either the Mokelumne River or  
24 American River.

25 Dr. Harris testified on the "reservoir effect" of placing different source  
26 waters in reservoirs for storage (Exhibit 4160). Dr. Harris testified that the  
27 reservoir storage adds THMs to the finished water. Fertilizers, particularly  
28 nitrogen and phosphorus, present in agricultural watersheds, wash off into the



1 water and collect in the reservoirs (Exhibit 4161). Dr. Harris stated that both  
2 nitrogen and phosphorus act as growth enhancing nutrients to biological  
3 organisms present in the watershed, thus increasing the total organic content in  
4 the reservoir. When the water is treated, the added organic materials combine  
5 with the chlorine to form by-products such as THMs, MX, and E-MX. Thus, by  
6 storing water with high fertilizer runoff, THMs levels in finished water are  
7 increased (Exhibit 4162, Exhibit 4163). Dr. Harris testified that while the reservoir  
8 effect should be considered in source selection, the risk analysis presented by  
9 Dr. Karim Ahmed for EBMUD would not attempt to quantify this effect.

10 Dr. Harris stated that he and his colleagues had confirmed that this process  
11 is operating in EBMUD's reservoirs. This process was especially evidenced in the  
12 late 1970's - early 1980's when Delta water was added to the reservoirs during  
13 emergency drought conditions. The THM levels in the reservoirs took several  
14 years to return to normal. Dr. Harris calculated the predicted THMFP for the  
15 EBMUD's reservoirs using water from the alternative sources, and found a  
16 significant increase in THMFP with the use of Sacramento River and Delta water  
17 during average (Exhibit 4164) and dry years. During wet years, the effect is  
18 lessened because runoff from the reservoir watershed dilutes the reservoirs.

19 Dr. Harris testified on MX, a by-product of chlorination and a very powerful  
20 mutagen. MX is thought to comprise one-half of the mutagenicity of the  
21 chlorinated by-products. Because MX is so potent, Dr. Harris testified that it  
22 cannot be ignored in conducting a risk assessment. Dr. Harris noted that because  
23 MX has been so recently discovered, there are no long-term definitive tests of its  
24 toxicity. Dr. Harris calculated MX through a correlation with TOC (Exhibit 4165).  
25 By using actual TOC figures, Dr. Harris derived the MX concentrations which will  
26 likely occur in the three proposed sources (Exhibit 4166). The TOC data used by  
27 Dr. Harris was derived from recent monitoring by EBMUD. It is consistent with

28 //

1 the DWR data presented in the DWR report (Exhibit 2012) at page 24. The data is  
2 as follows:

	<u>American River</u>	<u>Sacramento River</u>	<u>Delta</u>
3 1985-86	3.88 ppm	6.1 ppm	9.15 ppm
4 1987-88	1.64 ppm	1.98 ppm	3.43 ppm
5 average			
6 1985-88	2.62 ppm	3.85 ppm	5.96 ppm

7  
8 Dr. Harris found that MX levels in the Sacramento River and the Delta are  
9 significantly higher than in the American River, whether considering observed  
10 TOC alone (the orange bar of Exhibit 4166), or potential TOC resulting from  
11 reservoir storage of the source waters (the red bar of Exhibit 4166). Dr. Harris  
12 testified that the brominated THMs, MX and E-MX are significant public health  
13 risks and must be considered in any assessment of risk due to alternative drinking  
14 water sources. He noted that because this data was not available in 1985, it was  
15 not included in the Okun report (EBMUD Exhibit 25). Since there is more  
16 information today, including cancer potency factors for the brominated THMs, the  
17 source selection process can be assisted through the performance of a quantitative  
18 risk assessment.

19 Dr. Harris testified that a risk assessment of drinking water sources should  
20 take into account pesticide contamination. Quantitative information on actual  
21 pesticide contamination is difficult to obtain, notwithstanding monitoring efforts  
22 conducted by the state. Dr. Harris testified that monitoring efforts are hindered by  
23 significant limitations, including different analytical methods required to  
24 measure different chemicals; the sporadic application and washoff of pesticides  
25 makes the timing of the monitoring crucial; and many of the detection limits for  
26 pesticides are above their toxic thresholds (Exhibit 4167). Despite these problems,  
27 the E.P.A. has developed health advisories for 50 pesticides, and is expected to  
28 follow up with regulations (Exhibit 4223).

1 Dr. Harris testified that of the carcinogenic pesticides known to be used in  
2 the watersheds of the American River, the Sacramento River and the Delta, only  
3 10 are being monitored. For those 10, actual sampling occurs only 4 to 8 days per  
4 year. Dr. Harris concluded that monitoring is inadequate for pesticides that may  
5 pose a risk.

6 Dr. Harris testified that although pesticides are not detected through  
7 monitoring, their presence in water has been proven by their accumulation in  
8 fish (the Department of Fish and Game has been sampling for pesticides in fish  
9 tissue and the pesticides are showing up in fish tissue from the Sacramento River  
10 and the Delta), the detection of Basagran, Ordram and Bolero in the Sacramento  
11 River (daily monitoring is conducted), and the demonstrable reservoir storage  
12 phenomena.

13 Dr. Harris testified that in 1985, at the time of the Okun report (Exhibit 25),  
14 there was not sufficient data on which to base a quantitative assessment of risk  
15 presented by the three sources. There was sufficient information to do a sanitary  
16 survey, as has been historically done by sanitary and environmental engineers on  
17 drinking water source selection. In 1989, there is still relatively little information  
18 regarding the vast range of chlorinated by-products known to exist. Dr. Harris  
19 testified that there are, however, sufficient data on brominated THMs and some  
20 data on MX and E-MX which would permit a risk analysis to be conducted based  
21 on those compounds.

22 Dr. Harris testified that while the risks from THMs, and to a limited extent,  
23 pesticides, can be quantified, there are many other chemicals affecting water  
24 quality and posing a threat to public health, that cannot be quantified in a risk  
25 assessment. Industrial discharges (including dioxins which have been found in  
26 fish downstream from paper mills), landfills, urban runoff, and some pesticides  
27 cannot be quantified, and have to be analyzed qualitatively; i.e., with the technical  
28 judgment of sanitary engineers. In these cases, preliminary toxicological data and

1 potential vulnerability of the watersheds must come into play. These are assessed  
2 through a sanitary survey, such as was done in the Okun report Exhibit 25).

3 Dr. Harris testified that with respect to these qualitative factors, the American  
4 River presents the cleanest or "best" source, with the Sacramento River and the  
5 Delta being less desirable sources (Exhibit 4171).

6 Dr. Harris testified regarding the efficacy of alternative treatment  
7 techniques, and whether treatment could be considered as an alternative to "best  
8 available source" (Exhibit 4172). Dr. Harris testified during his cross-examination  
9 that the treatment of Sacramento River or Delta water would not result in water  
10 of the same low risk as that of treated American River water. Dr. Harris further  
11 stated that alternative treatment methods should be approached with caution,  
12 since there is only limited information on the health risks associated with their  
13 by-products.

14 On direct examination, Dr. Harris addressed certain criticisms of the Okun  
15 report (Exhibit 25) by the report of DWR (Exhibit 2012). For example, the DWR  
16 report criticized the Okun report for failing to show that treatment would not  
17 meet existing drinking water standards. Dr. Harris responded that in 1985,  
18 standard treatment may have met the minimal standards which existed. He  
19 stated, however, that new standards arising from the 1986 congressional  
20 amendments will be much harder to meet, and that new treatment systems may  
21 have to be built to comply with the new standards.

22 The DWR report criticized the Okun report for failing to show "actual  
23 harm." Dr. Harris responded that it is not prudent public policy to wait until  
24 actual harm is shown (the "falling bodies approach"). He stated that you have  
25 epidemiological evidence available upon which to make basic public policy  
26 determinations, emphasizing a continued viability of the "best available source"  
27 as the key to meeting changing governmental standards.

28 //

1           The DWR report criticized the Okun report for dealing only with a sanitary  
2 survey and failing to demonstrate quantitative information. Dr. Harris  
3 responded that prior to 1985, a valid quantitative analysis could not be done,  
4 because:

- 5           A.    No cancer data on brominated THMs existed;
- 6           B.    No quantitative data on NVTOC or MX existed;
- 7           C.    There was considerable uncertainty regarding epidemiological  
8 studies; and
- 9           D.    Pesticides were not monitored.

10          He noted that the inadequacy of pesticide monitoring continues to be a  
11 problem.

12          Dr. Harris testified that the sanitary survey prepared in 1985 and presented  
13 in the Okun report was just as valid today. He stated that the quantitative risk  
14 assessment prepared by Environ for these proceedings has not modified his  
15 opinion as to the health risks associated with the three targeted water sources.

16          Dr. Harris testified during cross-examination that although individual  
17 chemicals may seem to pose slight risks, cancer risks are at least additive, perhaps  
18 synergistic, and pose a very real health threat.

19          In conjunction with Dr. Harris' testimony, Dr. A Karim Ahmed testified as  
20 to his formalized risk assessment of the health hazards present in the three  
21 sources. He relied upon known epidemiological data, rodent bioassays, short-  
22 term test data ("Ames test"), and other studies, such as metabolic data and  
23 structure/activity relationships.

24          Dr. Ahmed testified regarding the relative risks presented by pesticides in  
25 the three watersheds. He stated that the Sacramento River watershed has  
26 10 times the pesticide use of the American River watershed, and that the Delta is  
27 even higher (Exhibit 4201). Dr. Ahmed showed the substantial differences in

28    //

1 pesticide use per square mile (Exhibit 4203); and the differences in carcinogenic  
2 (either B2 or C) pesticide use (Exhibit 4204).

3 Using 1,3-Dichloropropene as an example (Exhibit 4205), Dr. Ahmed  
4 estimated the lifetime cancer risk presented by the various sources (Exhibit 4206).  
5 The actual risk presented from 1,3-Dichloropropene alone by the Delta water is 3  
6 cancers per lifetime per million; the Sacramento River water presents a risk of .36  
7 cancers per lifetime per million; and the American River water presents a risk of  
8 .001 cancers per lifetime per million. Dr. Ahmed noted that only the Delta is  
9 above the "de minimis" risk of 1 in 1,000,000, and that all three sources are pre-  
10 sent below the detection limit set for current monitoring devices (Exhibit 4207).  
11 Dr. Ahmed testified that of the carcinogenic pesticides known to be used in the  
12 watershed, 7 pose a carcinogenic cancer risk of 1 in 1,000,000 at levels below the  
13 detection limit (Exhibit 4208). Thus, even if year-round monitoring existed, these  
14 compounds could not be detected, but would still pose a significant cancer risk.

15 Fish bioaccumulation evidence is commonly used to derive the pesticide  
16 contamination level in a water source. The E.P.A. has determined that water  
17 source contamination risk levels can be calculated by dividing the fish data by  
18 5,000. The risk presented by the Sacramento River for dioxin, for example, has  
19 been calculated by this method to pose a risk of 10 in 1,000,000 .

20 Sacramento County Exhibit 5045, presented during the "alternatives"  
21 testimony of Dr. Chen on April 28, 1989, confirms the widespread use of this  
22 methodology. At page 4-48, plaintiffs' Exhibit states:

23 "Although pesticides are currently not often detected in Delta  
24 waters, there is evidence from the accumulation of organics in  
25 fish tissues that pesticides are present and may pose a drinking  
water quality problem in the future (DWR, 1987)."

26 Dr. Ahmed presented a risk assessment of chlorination by-products. He  
27 offered criticisms of Dr. Greenberg's analysis, objecting to his use of chloroform as  
28 a surrogate, opining that brominated THMs are together significantly more potent

1 than chloroform. He opined that the brominated species contribute a significant  
2 portion of the total risk for THMs in each water source. He testified that, under  
3 his calculations, in the Mokelumne and American rivers, the risk posed by the  
4 brominated types is approximately 2/3 of the total risk (Exhibits 4190 and 4191); in  
5 the Sacramento River the brominated species represents 3/4 of the total THM risk  
6 (Exhibit 4192); and in the Delta, almost the entire THM risk (Exhibit 4193). The  
7 numerical calculations are presented in Exhibit 4194.

8 Dr. Ahmed testified that the estimated lifetime cancer risks for THMs per  
9 million population posed by the various sources are as follows:

10	Mokelumne River:	18 cancers
11	American River:	22 cancers
12	Sacramento River:	51 -cancers
13	Delta:	430 cancers

14 Dr. Ahmed testified that the different cancer risks result from the different  
15 concentrations of organics (total organic carbon, or "TOC") in the water sources,  
16 and the consequential differing amounts of chlorine required for treatment. He  
17 noted that the risks posed by the Sacramento River are double those for either the  
18 American or Mokelumne sources. The risk posed by the Delta is, under the  
19 calculations Dr. Ahmed performed, 20 times greater than the American or  
20 Mokelumne rivers, and 8 times greater than the Sacramento River.

21 Dr. Ahmed expressed considerable concern about MX, "a very potent  
22 mutagen" when tested by the Ames test. Employing a methodology not utilized  
23 by the E.P.A., and extrapolating from the Ames test and observed TOC levels, he  
24 concluded that there might be a significantly increased carcinogenic risk for the  
25 Delta and Sacramento River sources compared with the American.

26 Just as defendants were critical of plaintiff's experts, so did plaintiffs  
27 reciprocate in their attacks on Dr. Ahmed (and Harris). For example, plaintiffs  
28 urge that the quantitative risk assessment for THM was seriously flawed by

1 Dr. Ahmed's assumption that THM formation potential was the equivalent of  
2 THM, an error which, according to plaintiffs, would dramatically inflate the  
3 figures relating to carcinogenic risk. More critically, plaintiffs attacked the entirety  
4 of Dr. Ahmed's assessment of risk from MX as being largely speculative,  
5 supporting that conclusion with a step-by-step critique set forth in Sacramento  
6 County's Closing Brief on Alternatives Including Water Quality at pages 32-35.

7 Despite the criticisms, Dr. Ahmed concluded that the Delta and Sacramento  
8 River sources presented significantly higher public health risks than the  
9 Mokelumne River or American River water diverted at the Folsom Dam.

10 John Gaston, formerly with the Department of Health Services and  
11 currently chairman of the E.P.A. National Drinking Water Advisory Council,  
12 provided an overview of pollution problems for the three targeted water sources.  
13 For example, he noted that while the American River collects 6 million gallons of  
14 sewerage daily, the Sacramento River accumulates 255 million gallons, and the  
15 Delta over 600 million gallons per day. Rice herbicides also constitute a "major  
16 pesticide insult" to the Sacramento River and Delta, which has led to litigation by  
17 City of Sacramento and environmental groups for more stringent regulations. In  
18 fact, DHS has adopted strict regulations which recently became effective. In the  
19 past, however, farmers have disregarded the regulations in light of agricultural  
20 necessities.

21 Current estimates establish that millions of pounds of herbicides are  
22 applied annually in the Sacramento River watershed and Delta. According to  
23 Mr. Gaston, the Delta is not monitored with sufficient regularity to identify the  
24 various pesticides, nor is laboratory technology adequate to the task of testing for  
25 the full range of pesticides. Over 284 pesticides are currently in use in the  
26 Sacramento and San Joaquin River watersheds.

27 Based on these and myriad other water quality considerations, Mr. Gaston  
28 concluded that water treatment, even as enhanced by new technologies such as



1 ozonation and granular activated carbon (GAC), "is absolutely not" a substitute  
2 for the best available source.

3 Dr. Daniel Okun testified as to the history of the "sanitary survey" as the  
4 favored method and "best available source" as the favored objective of water  
5 source selection. In specific terms, Dr. Okun's testimony was mirrored in large  
6 part by the Okun report (Exhibit 25) and was covered by other of the East Bay MUD  
7 witnesses who testified.

8 During cross-examination especially, each side made effective use of the  
9 numerous documents and reports addressing the issues of water quality. For  
10 example, during the cross-examination of Dr. Harris on the issue of the health  
11 hazards of chlorinated by-products, Sacramento County noted the conclusion  
12 from a series of studies that, "While these data do not prove the chlorination of  
13 drinking water fails to increase carcinogenic and mutagenic risks, they do indicate  
14 that the risks are probably not large." (E.P.A. Report to Congress: "Comparative  
15 Health Effects Assessments of Drinking Water Treatment Technologies [1988];  
16 Exhibit 5058.)

17 In fact, the E.P.A. report reflects throughout the fundamental public health  
18 policy controversies which are at issue before this court. Consider, for example,  
19 the following epidemiological section of the E.P.A. report:

20 "Since 1974, when the use of chlorine as a disinfectant was shown  
21 to lead to the formation of trihalomethanes in finished drinking  
22 water (Bellar et al., 1974; Rook, 1974), a great deal of effort has  
23 gone into identifying other chlorine by-products and assessing the  
24 hazards these chemicals present to human health. According to  
25 epidemiological evidence, chlorination of drinking water may  
26 cause a slight increase in the risk of cancer. In particular, cancers  
27 of the bladder, colon, and rectum seem implicated (Craun, 1985).

28 "The early studies in this area were reviewed by the  
National Research Council (NAS, 1980) and found to have a  
number of methodological problems -- primarily lack of control  
over potentially confounding variables, small and variable  
increases in the relative risk, and inadequate documentation of  
exposure. However, more rigorous studies conducted since the

1 NRC review (Cantor et al., 1985; Cragle et al., 1985; Young et al.,  
2 1986) confirm some of the observations in the early studies.

3 "In the Cragle et al. (1985) case-comparison study of colon  
4 cancers and hospital-comparison subjects among North Carolina  
5 white residents, odds ratios of 1.38, 2.15, and 3.36 were observed  
6 for home consumption of chlorinated water for 16 or more years  
7 and colon cancer in 60-, 70-, and 80-year olds. These odds ratios  
8 suggest a weak-to-moderate association between water  
9 chlorination and colon cancer in the study population.

10 "In an analysis of his 1978 epidemiological data, Cantor et  
11 al. (1987) found that, for one subgroup, i.e., those drinking greater  
12 than average amounts of water and exposed to chlorinated  
13 surface water for more than 40 years, there was an association  
14 (odds ratio of 3.1) with a small increased risk of bladder cancer.

15 "Attempts to associate the development of cancer with  
16 specific chlorination by-products (e.g., trihalomethanes) have not  
17 been particularly successful (Young et al., 1987). This is not  
18 surprising given the large variety of disinfection by-products with  
19 carcinogenic and/or mutagenic properties that are known to be  
20 generated at small concentrations Bull, 1986). Therefore, it is  
21 unlikely that one by-product would stand out as solely  
22 responsible for these small increases in cancer risk." (E.P.A.  
23 Report 3.33,3.34.)

24 To plaintiffs, the operative words with respect to the foregoing identified  
25 health hazards are: "Slight increase," "weak-to-moderate association," "small  
26 increases in cancer risk," and so on. To plaintiff, "EBMUD's approach to the water  
27 quality issue consists of slogans, speculation, and arm waiving." (Sacramento  
28 County: Closing Brief on Alternatives, Including Water Quality, at p. 5:7.)  
Plaintiffs urge, in effect, that the mere potential of increased health hazards is not  
sufficient to justify the diversion of water from the best available source at the  
expense of the identified environmental interests in the American River  
watershed.

Page 6 of the East Bay MUD brief on water quality synthesizes their position  
and in the process underlines the basis for plaintiff's argument that East Bay MUD  
cannot justify its position in terms of provable detriment. East Bay MUD argues  
that:

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1           1.       Sacramento River and Delta water contain substantially higher  
2 levels of identifiable pollutants, and both sources carry a "higher potential for  
3 contamination by undiscovered, unmeasured and new toxic and carcinogenic  
4 compounds;"

5           2.       Drinking water standards are becoming progressively stricter and  
6 more difficult to meet;

7           3.       Conventional treatment does not remove many of the known  
8 harmful chemicals and does not address those which remain unknown;

9           4.       The addition of chemicals during the treatment process produces  
10 many toxic and carcinogenic by-products.

11           The joinder of issues over water quality is further demonstrated by the  
12 conclusion of the Okun report in comparison with the criticism of that report by  
13 the DWR.

14           "Our conclusions are (1) that to provide the greatest public health  
15 protection, drinking water should be taken from the best  
16 available source, and (2) that the American River at Nimbus is  
the best available source, far better than either the Sacramento  
River or the Delta.

17           "The first conclusion is based primarily on three points:

18           "1.       The principle of 'best available source' is and long  
19 has been the fundamental policy underlying the provision of safe  
drinking water supplies;

20           "2.       With the continuous introduction to commerce of  
new chemicals and the development of new methods for  
21 detecting contaminants in drinking water, an increasing number  
of potentially harmful substances have been found in drinking  
22 water drawn from polluted sources so that there is today even a  
greater need to adhere to the best available source principle; and

23           "3.       Water treatment is not a reliable substitute for  
obtaining water from the best available source.

24           "The second conclusion, that the American River is the  
best available source, is based on two points:

25           "1.       The industrial, agricultural and urban character of  
26 the American River watershed, as compared to the other  
watersheds considered, indicates conclusively that activities in  
27 the American River watershed represent far less of a public  
health threat to drinking water supplies both today and in the  
28 future; and

1           "2.    Water quality data, based on samples from the  
2           several possible sources, demonstrate that water from the  
3           American River is of much higher quality today than water from  
4           the other sources considered."

5           In response, DWR . . .

6           "did not find sufficient evidence in the Okun report to support  
7           the stated conclusions that American River water provides the  
8           greatest public health protection and is far better than either the  
9           Sacramento River or Delta diversion sites. The department  
10          acknowledges that American River source water is less exposed to  
11          pesticides, fertilizers, and industrial and municipal waste  
12          discharges than waters of the Sacramento River and Clifton  
13          Court. However, the Okun report did not present evidence  
14          demonstrating actual adverse effects from these sources of  
15          pollutant input on waters of the three candidate diversion sites.  
16          In fact, the differences in raw water composition at the diversion  
17          sites have not prevented modern treatment facilities from  
18          treating these sources to meet drinking water quality standards."

19          The essence of the water quality controversy resides in the element of  
20          uncertainty. After extended analysis, the board could only conclude that the  
21          public health data were "inconclusive" and that prudence required that EBMUD  
22          seek its municipal water supply from the American River (Technical Report, at  
23          p. 239). For this trial, each side has honed its scientific testimony, and reached out  
24          for an "edge" in scientific certainty through various risk assessments and  
25          quantitative evaluations which were not available at the board hearings.  
26          Unfortunately, neither the fine-tuning of the testimony of Doctors Harris and  
27          Greenberg, nor the additional testimony of Doctors Ahmed and Lave has  
28          achieved the desired result. Absolute certainty cannot be divined.

29          In another scientific context, specifically that relating to the greenhouse  
30          effect which has been linked to the discharge of synthetic chemicals into the  
31          atmosphere, Professor Ramanathan made the following observations:

32          "The problem is unique in the sense that it's a scientific debate  
33          right in the center of a public policy question. For many  
34          scientists . . . our biggest dilemma is whether to emphasize the  
35          uncertainty surrounding our current research or the potential  
36          dangers involved if the problem develops and we ignore it. It's a

1 delicate path to straddle, but one thing is certain, and that is if the  
2 predictions of a global warming are correct, then we are running  
3 out of time, and what we decide to do in the next few decades  
4 may be very critical to the future of the planet." (Tim Obermiller,  
5 "A Delicate Balance," University of Chicago Magazine, Spring  
6 1989.)

7 It is ironic, as EBMUD emphasizes, that in other litigation, plaintiff EDF has  
8 seized upon the same "potential" problems as a basis for establishing stricter  
9 controls in water quality. As a single example, consider the EDF argument made  
10 in Bridgeport Hydraulic Company v. Council On Water Company Lands of the of  
11 Connecticut (1977) 453 F.Supp. 942.

12 "To the traditional biological agents such as the pathogens and  
13 bacteria measured in terms of coliform and other traditional  
14 water quality parameters, such as suspended solids and turbidity,  
15 are now added chemical contaminants associated with  
16 development, including the pesticides, the fertilizers, heavy  
17 metals, salts and nitrates associated with agricultural and urban  
18 and street runoff, and a whole range of soluble toxic and  
19 carcinogenic organic compounds. The enormous enforcement  
20 and control difficulties associated with these so-called 'non-point'  
21 sources of pollution once they enter water courses in a water  
22 supply watershed have raised considerable alarm and uncertainty  
23 on how most appropriately to deal with these contaminants. . . .  
24 Further doubts [exist] over the effectiveness of water treatment  
25 methods, such as filtration (as distinct from preventable policies  
26 as land retention) to treat adequately these non-point source  
27 pollutants. . . ." (Emphasis added.)

28 From the evidence presented, this court is satisfied that the health risk  
concerns of EBMUD are well-founded. There is much more to EBMUD's case  
than "slogans, speculation and arm waiving." Scientific uncertainty as to the  
parameters of risk, yes. But, no credible uncertainty at all as to the existence of  
risk itself.<sup>5</sup>

To this court, the establishment of "slight" or "moderate" risks with respect  
to certain pollutants assumes a higher level of significance given the substantial

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<sup>5</sup> Risk, after all, is defined as "the chance of injury, damage or loss."

1 unknown factors which have also been demonstrated. Developing chemical  
2 technologies continue to increase the pollutant load on the waterways, while the  
3 technology of effective detection has not kept apace. Further, it entirely likely that  
4 the existence of deadly carcinogens may first be conclusively determined only  
5 through epidemiological studies which are successful in charting patterns of  
6 illness only after substantial illness has occurred throughout the population. It is  
7 the respect for the unknown which dictates the continuing validity of the sanitary  
8 survey as one of the legitimate bases for public health decisions. And if  
9 defendant's risk assessment proves prophetic, then it would have been a judicial  
10 act of exceptional irresponsibility not to have taken the safer course. This is  
11 particularly true given the formulation of a physical solution which can, in this  
12 court's view, protect the public trust values which have been advanced as the  
13 other side of the equation.

14 It does bear emphasis, however, that the essence of East Bay MUD's  
15 position in this case is the importance of drinking water of the highest quality and  
16 not merely the convenient availability of that water. Without the issue of water  
17 quality, East Bay MUD's position would be greatly attenuated, and possibly could  
18 not withstand the logic of plaintiff's position that multiple uses of the American  
19 River water constitute the most reasonable and highest beneficial use under  
20 Article X, section 2. Thus, it needs to be emphasized that the diversion of water to  
21 East Bay MUD is for the use of East Bay MUD customers only, and shall not be  
22 used as a "marketable commodity" for transport to agricultural or other uses. As  
23 will be emphasized in the court's order, any diversion permitted in this case will  
24 be strictly conditioned upon utilization of the water by East Bay MUD customers  
25 for urban uses and only under circumstances where the water can be used for  
26 those intended purposes. Were it possible to further limit the utilization for  
27 drinking water purposes, the Court would seriously consider that as an option.

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XIII.

Having determined that water quality for municipal purposes is appreciably superior when drawn directly from the reservoir at the Folsom-South Canal, it remains to be determined if any resulting harm to American River public trust values is of sufficient magnitude to preclude the diversion.

A determination of the effect of the EBMUD diversion at the Folsom-South Canal requires a comprehension of the relevant hydrology. The board utilized hydrologic models which, in essence, applied current operating conditions (including modified D-1400), and attempted to determine the percentage of time those flows could be achieved with and without the diversion of 150,000 acre-feet at the Folsom-South Canal. The Board presented the results of its evaluation in terms of "exceedence analysis," which can be demonstrated by figure 5-10 from the Technical Report. The figure demonstrates that 3000 CFS (the Department of Fish and Game recommended flow for rearing chinook salmon) is equaled or exceeded in March in 32 percent of the years in which EBMUD takes from the Folsom-South Canal, and in 36 percent of the years if EBMUD takes from the Sacramento River. The difference (D) is indicated in the table as 4 percent. These model studies showed the incremental addition of EBMUD's diversions, assuming that other projected year 2020 uses of American River water were being met first.

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TABLE 5-10

Effects of EBMUD's Proposed Diversion on Flows  
Recommended for Rearing of Juvenile Chinook Salmon  
(Exceedence of recommended rearing flows below Nimbus Dam)

Agency	Recommended Flow (cfs)	% Exceedence											
		Mar			Apr			May			Jun		
		FSC	SR	D	FSC	SR	D	FSC	SR	D	FSC	SR	D
DFG	3000	32	36	4	45	57	12	55	61	6	56	64	8
USFWS	1250	93	95	2	84	84	0	86	88	2	86	88	2
EBMUD	750,750												
	750&2000	94	96	2	92	94	2	92	94	2	60	65	5
Sac Co	4000,4500												
	4500&4000	25	25	0	28	31	3	42	45	3	48	55	7

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Criteria:

FSC: EBMUD diversion at Folsom-South Canal - Study S-237

SR: EBMUD diversion below American River confluence - Study S-79

D: difference (D)

This exceedence analysis was roundly criticized by plaintiff's experts. Mr. Steiner testified that the Board used planning rather than operational models; that by targeting only D-1400 flow objectives, the analysis was very limited, and permitted no analysis of other preferable flow patterns, nor their impact; that tables such as 5-10 ignore entirely all those times in which flows are already too low and where EBMUD's diversions would cause them to go lower, thus exacerbating environmental degradation; and give no indication of the magnitude of reduction in flows below environmentally acceptable rates.

Defendants counter that using Modified D-1400 flows simply mirrored the current actual operations of the dam. "They simply show how much water would be in the river under present operating criteria, including Modified D-1400, assuming a repeat of 1921-78 hydrology, and under varying conditions of



1 demand." (EBMUD Reply to Sacramento County's Summation Re: Hydrology  
2 and Fishery, at p. 2.)

3 Plaintiffs concern was that the court would make too much of the board's  
4 model studies analysis, concluding from Table 5-10, for example, that the  
5 demonstrated difference of 4 percent would be insignificant in determining the  
6 effects of EDMUD's diversion on public trust values. The concern was  
7 understandable, given the board's reliance on the various studies, particularly  
8 Studies 79 and 237.<sup>6</sup> For example, the board draws the following conclusions  
9 from the studies at projected 2020 levels of development:

10 "These studies show that EBMUD's diversion causes a  
11 reduction of flow in the river.

12 "As shown on figure 4-29, for the 2020 development level  
13 (Studies 79 and 237) the average flow during the peak runoff  
14 period (February to June) is reduced about 1000 CFS. D-1400 full  
15 recreational flow was provided in 45 of the 57 years (79 percent)  
16 with EBMUD diverting via the Folsom-South Canal and 47 years  
17 of the 57 years (82 percent) without EBMUD diverting from the  
18 canal [table 4-19]

19 "Of prime concern is the flow in the river during the low-  
20 flow period (July through October). Comparison of these four  
21 studies in table 4-17 shows that EBMUD's maximum diversion  
22 would result in a reduction of the flow in the river in 4 of the 57  
23 years of record, or about once each 14 years at the 2020  
24 development level . . . ."

25 While noting that these hydrologic studies "provide a reasonable estimate  
26 of future conditions and allow adequate assessment of the specific issues in this  
27 case," the board also notes the following limitations:

28 "The hydrologic studies are based on historical stream flow  
records, estimated projected water needs, current bureau  
operational criteria for Folsom Dam, numerous assumptions,  
and a strict set of operational conditions in the computer model."

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6 In Study 79, SMUD diverts its full 75,000 AFA from Folsom-South Canal, and EBMUD takes nothing; in Study 237, based upon 2020 projections, EBMUD takes 150,000 acre-feet and SMUD takes 85,000 AFA.

1 The board further qualified its conclusions by noting, again:

2 "Depending on the unique hydrologic conditions that occur in  
3 any given year, a large measure of human judgment would be  
4 required to manage effectively the water resources of the  
5 American River, including provision of adequate instream flow,  
6 maintenance of an adequate reservoir level and supply for  
7 consumptive water demands."

8 While accepting the view that the model studies are quite useful in certain  
9 prospective evaluations, the court has concluded that the stated limitations  
10 compromise the ultimate value of these studies in the context of the instant  
11 litigation. First, as will be emphasized in the next section evaluating plaintiff's  
12 RMI studies, the assumptions of the models are based upon a projected  
13 consumptive demand that is entirely inconsistent with the maintenance of public  
14 trust values in the lower American River. Second, the models do not adequately  
15 forecast short-term impacts which may have devastating and permanent effects  
16 on public trust values. Finally, in the long run, it is a large measure of human  
17 judgment" that will be required to guarantee the protection of public trust values.  
18 A framework for the exercise of that judgment is one objective of these  
19 proceedings.

20 In summary, the court agrees with plaintiff's position that the board's  
21 hydrologic studies provided insufficient basis for conclusively determining the  
22 real impact of EBMUD or other diverters upon the ability to meet flows necessary  
23 to protect instream and public trust values in the lower American River.

24 While criticizing the board's analysis and projections based on planning  
25 models and exceedence analysis, plaintiffs until this trial provided no modeling  
26 alternatives. To crystalize their criticism of the board's analysis and conclusions  
27 based upon D-1400 operational flows, plaintiffs have countered with their own  
28 models, designed by RMI. A predicate for the RMI model was the evaluation of  
various flow rates (rather than just D-1400 flows). Noting that the validity of  
model depends upon its assumptions, Mr. Link testified that he sought out the

advice of County fishery experts (BEAK) and the Department of Fish and Game to ascertain those "preferred flows" which would protect fishery interests. Provided with preferred flows ranging from 2500 to 3500 CFS, it was apparent that such flows simply could not be met in an operational context. Accordingly, lower flows were accommodated to the model. It was determined that 1750 CFS was the pattern which could be met most consistently given other consumptive demands. The projected 2020 A.D. study utilized 1000 CFS on the assumption that the system by that time could not consistently meet a flow of 1750 CFS.

Without considering the entire range of assumptions and diversions in the models run by RMI, their general approach can be seen by the 1980-50A study, compared with the 2020-590A study, which was described in the RMI report as follows:

"1980-50A Study: This simulation uses the 1980 level of American River Basin development, and Folsom-South Canal diversions of 50 ,000 acre-feet (AF) of water per year. Pertinent information includes:

Diversions above Folsom Dam:	80,000	AF/Year
Folsom South-Canal Diversions:	50,000	AF/Year
Sacramento City Diversions:	91,000	AF/Year
Accretions/Depletions:	74 ,000	AF/Year
Preferred River Flow (Fall):	1,750	CFS
Preferred River Flow (Summer):	1,750	CFS
Preferred Maximum River Flow:	10,000	CFS
End of September Target Storage:	610,000	AF

"In this simulation an attempt is made to establish a preferred release of 1,750 cubic feet per second (CFS) to the Lower American River at Nimbus Dam on October 1 of each year. If it is determined that storage in Folsom Reservoir on September 30 or at the end of each succeeding month through February is too low to maintain releases of this size, then a relaxation in the magnitude of the release is allowed. Releases required for the evacuation of flood control space in Folsom Reservoir overrides any flow level otherwise determined for this period.

"On March 1, a determination of the available water supply is calculated based on a March through September river flow

criteria in May and June, is released evenly during the July through September period.

"2020-590A Study: This simulation uses the 2020 level of American River Basin development, and Folsom-South Canal diversions of 590,000 acre-feet of water per year. Pertinent information includes:

Diversions above Folsom Dam:	421,000	AF/Year
Folsom-South Canal Diversions:	590,000	AF/Year
Sacramento City Diversions:	226,000	AF/Year
Accretions/Depletions:	74,000	AF/Year
Preferred River Flow (Fall):	1,000	CFS
Preferred River Flow (Summer):	1,000	CFS
Preferred Maximum River Flow:	10,000	CFS
End of September Target Storage:	610,000	AF

"In this simulation an attempt is made to establish a preferred release of 1,000 CFS to the Lower American River at Nimbus Dam on October 1 of each year. The same water supply forecasting and flow establishment routines are used in this study as were used for the 1980-50A study. However, if the supply of water is insufficient to meet the preferred river flow, then the available water for release below Nimbus is evenly released over the March through September period subject to D-893 flow requirements below H Street or 100 CFS flow in the Lower American River at all locations, whichever is greater."

Without an extended analysis of the strengths and weaknesses of the RMI study, some basic observations are required. It must be remembered that the RMI model was developed by plaintiffs at least partly in response to plaintiff's criticism that the board's exceedence analysis was limited and misleading as to the effects of the EBMUD diversion, along with other consumptive demands, in the year 20, '0. By contrast, the RMI 1980 study assumes no EBMUD diversions off the Folsom-South Canal, and the 2020 study assumes EBMUD to utilize its full complement of 150,000 AFA. The RMI 2020 study assumes a total diversion off the Folsom-South Canal of 590,000 AFA, with substantial upstream (above Folsom Dam) and downstream diversions as well to accommodate increased urban, industrial and agricultural demand.

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1 To the court, it seems that the RMI model, while correcting certain  
2 deficiencies of the board models, is replete with difficulties of its own, particularly  
3 as it is intended to provide a framework for analyzing fishery needs of the river.  
4 While the board's exceedence analysis may be too facile, the RMI model does not  
5 show the effect of the EBMUD diversion alone. Any effect is masked by the RMI  
6 assumptions about the other prospective demands fed into the model. The  
7 590,000 AFA diversion assumed for the Folsom-South Canal in 2020, for example,  
8 includes a 218,000 AFA allocation for Sacramento County, 225,000 AFA for San  
9 Joaquin County, and 75,000 AFA for SMUD to accommodate the Rancho Seco  
10 Nuclear Power Plant. While these assumptions may have a sound basis in  
11 mathematics, they have no basis at all in social, political, and legal reality.  
12 Rancho Seco is a highly controversial project, which has never utilized its full  
13 complement of water allocation and probably never will. Any new contracts for  
14 American River water are subject to the conditions in NRDC v. Stamm, and the  
15 Department of the Interior has not completed an EIS on such contracts. As to the  
16 proposed diversion by Sacramento County of 218,000 AFA from the Folsom-  
17 South Canal, that irony has not only placed the intervenors in an awkward  
18 position in this litigation, it also has compromised the validity of the RMI  
19 assumptions.

20 The RMI assumptions re 2020 consumptive demand on the American  
21 River illustrate a critical issue which has evolved with the presentation of  
22 evidence. The board's report, in several different contexts, expressed a frustration  
23 at the absence of the Bureau of Reclamation as a party, concluding that no  
24 effective relief could therefore be fashioned. The board, for example, expressed its  
25 view that if EBMUD's diversion were precluded, nothing could keep the bureau  
26 from simply allocating that body of water to some other appropriator at the  
27 Folsom-South Canal. It was further assumed that the bureau could, with

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1 impunity, ignore any board or court order pertaining to required flows in this  
2 case.

3       These are, of course, valid concerns. This court, however, is here  
4 confronted with the fundamental problem of ensuring the protection of public  
5 trust values now, and in the future, against any depredations which might occur  
6 from the water diversion by EBMUD. The court's charge is to protect those public  
7 trust values, wherever feasible, and in the context of a long-term and  
8 comprehensive plan for the entire American River. Any other approach would  
9 be to trivialize this trial in which 17 years of litigation has finally been considered  
10 by a trier of fact. The point is that any assumption about future contracting or  
11 appropriation of American River water, whether by operational modelers or by  
12 those who would contract for or appropriate the water, can only be considered in  
13 the context of protecting public trust values of the river and can therefore be  
14 considered only in the context of this litigation.

15       The RMI models are not adequate to predict the harm to public trust values  
16 which might ensue from the EBMUD diversions alone. From the evidence  
17 presented, it is abundantly clear that the public trust values, particularly fishery  
18 interests, are at serious risk if the total diversions which form the basis for the  
19 RMI assumptions were permitted to occur.

20       Around the issue of models and their efficacy, certain larger issues have  
21 been joined by the parties. To EBMUD, plaintiff's inability to show substantial  
22 harm to fishery and other public trust values precludes the requested relief.  
23 Audubon acknowledges the importance of municipal water interests, while also  
24 extolling the importance of protecting public trust values. Since the EBMUD  
25 diversions in isolation cannot be shown to be harmful, according to EBMUD, they  
26 must prevail. To plaintiffs and intervenors, the projected consumptive demand  
27 will lead inexorably to the degradation of fishery and public trust values so that  
28 the only rational course is to preclude all diversions from the Folsom-South

1 Canal. Implicit in plaintiffs' /intervenor's' argument is the value judgment that if  
2 future appropriations or contracts are to be foreclosed from the river, then it is not  
3 fair to permit the EBMUD diversion. Water from the Delta is good enough for 17  
4 million Californians, this court has been repeatedly reminded, so why shouldn't  
5 it be good enough for EBMUD?

6 The latter question begs the issue. Water quality is a significant factor  
7 worthy of substantial weight in the balancing of competing interests. Further,  
8 comprehensive planning requires stability and predictability in the process itself.  
9 Extended litigation can itself be a negative value in the planning process.

10 In this case, EBMUD is in possession of a valid and subsisting contract from  
11 the Bureau of Reclamation to divert water at the Folsom-South Canal. That  
12 contract, combined with a strong societal interest in obtaining high quality  
13 drinking water from uncontaminated sources, affords EBMUD valuable rights to  
14 water. Audubon integrated the appropriative water rights system with public  
15 trust doctrine; it did not eliminate the former. Most simply, EBMUD is entitled to  
16 its validly obtained contract rights with the critical caveat that those rights may  
17 not unnecessarily harm or compromise public trust values.

18 It is not an option of this court to determine if other possible appropriators  
19 are more worthy than EBMUD, nor if EBMUD ought not to share its allocations  
20 with others. It is the Court's duty to protect the public trust values whenever  
21 feasible. Given the proposed continuing diversions of EBMUD, and the  
22 possibility of future diversions by third parties, the protection of these values  
23 requires a comprehensive evaluation of current and future diversions, and an  
24 evaluation of the cumulative impact of EBMUD's diversion with other  
25 appropriations.

26 Accordingly, there is no realistic option but to determine, if possible, what  
27 flows of the American River must be maintained in order to protect those public  
28 trust values.

1 XIV.

2 In determining whether public trust values will be compromised by  
3 diversion at the Folsom-South Canal, the attention of all sides has tended to focus  
4 on the effects of such diversion on fishery interests, and in particular on the  
5 chinook salmon. The focus is appropriate, since,

6 1. As an anadromous fish species, the life cycle of the chinook salmon  
7 is particularly affected by the vicissitudes of water flow, temperature, and  
8 composition;

9 2. Its economic role for commercial fishermen is substantial. The  
10 lower American chinook salmon constitutes the 5th most productive run in  
11 California, comprising 10 percent of the ocean harvest, and having a commercial  
12 fishing economic value of over 9 million dollars annually;

13 3. Its recreational role for sport fishermen is important. The sport  
14 fishing value of the species was found by the Referee to be over 6 million dollars  
15 annually;

16 4. Unlike most other fish species in the American River, its life cycle,  
17 habits and environmental requirements have been extensively studied.

18 The threshold issue can be posed in one of two ways:

19 1. Will the diversion of 150,000 acre-feet annually at the Folsom-South  
20 Canal have harmful environmental consequences for the chinook salmon?; or

21 2. What instream flows are required to minimize the possibility of  
22 harmful ecological consequences for the salmon?

23 In fashioning a physical solution, the second formulation gets to the point  
24 more quickly. Once an instream flow is established which will protect  
25 salmon, then an appropriate corollary is to preclude any diversion of water which  
26 would endanger them. While plaintiff would preclude any diversion whatsoever  
27 of water at the Folsom-South Canal, a physical solution which requires the

28 //



1 protection of the salmon is simply not subject to objection on public trust  
2 grounds.

3 The issue of what instream flow is necessary to protect public trust values is  
4 critical to a final adjudication of this matter. The board concluded, on the basis of  
5 then available information, that the diversion of water by EBMUD at the Folsom-  
6 South Canal would have only a minimal impact on critical elements of the  
7 chinook salmon life cycle: A "small effect" on the amount of spawning habitat;  
8 "little, if any effect on temperatures causing chinook salmon egg mortality"; "a  
9 small effect on natural salmon rearing and smolt production"; and so on  
10 (Technical Report, at p. 154).

11 In making those determinations, the board offered the following broad  
12 caveat:

13 "Within the past few years, USFWS, EBMUD and Sacramento  
14 County have conducted field studies that have contributed to  
15 knowledge of habitat use, habitat/flow relationships, temperature  
16 requirements, food habits and migration of chinook salmon in  
17 the Lower American River. EBMUD's consultants, Sacramento  
18 County's consultants, and DFG would all like to study the river's  
19 fisheries for several more years before making final streamflow  
20 recommendations. Additional studies may ultimately contribute  
21 to wiser water and fisheries management of the Lower American  
22 River, and should be encouraged. However, given the limited  
23 nature of this proceeding and the high likelihood that a few more  
24 years of study would not provide more definitive answers to the  
25 questions posed by the court, this reference is being completed on  
26 the basis of existing information."

27 Intervenor Sacramento County provides an accurate synopsis of the  
28 immediate problems which beset the board and this court in determining what  
the flow regimes will protect various of the fishery interests:

29 "It is without controversy that there are existing gaps in scientific  
30 knowledge concerning the biological requirements of the river's  
31 fishery resources. Even EBMUD's witnesses refuse to go beyond  
32 hypothetical flow scenarios suggested for testing over several  
33 years' time. (See, e.g., Trial Testimony of Donald Kelley, p. 195, 1.  
34 21 to p. 196, 1. 13, p. 198, 11, 17-23, p. 215, 1. 21 to p. 221, 1. 19.)

1           "Establishment of flows for fishery needs is complicated by  
2 a number of uncertainties. There is lack of knowledge  
3 concerning the effects of flows and temperatures on food  
4 abundance, juvenile salmon emigration timing and the  
5 temperature effects of the American River on the temperatures  
6 in the Sacramento River. There is disagreement over the  
7 optimum water temperatures for juvenile rearing, disagreement  
8 over the use of the lower river as juvenile rearing habitat,  
9 disagreement over the impacts of water temperature upon  
10 salmon and steelhead smoltification and disagreement over the  
11 existence of naturally reproducing and rearing steelhead in the  
12 river. In addition, there has been little study of the impact of  
diversions upon carry-over storage and the cold water pool  
available to meet fishery needs. These and other issues have  
been identified by the various biologists for further study before  
diversion commitments are made. Thus, the Referee's  
determination that gaps in scientific knowledge prevent selection  
of any flow scenario other than existing flows to protect fishery  
resources was well founded."

13           The real tragedy of this environmental controversy has been the extent to  
14 which scientific resources have been directed more to litigation than to a  
15 resolution of critical fishery and hydrologic issues. In these areas, much of the  
16 expert testimony has consisted of attack and criticism of opposing experts, without  
17 the offering of affirmative scientifically-based solutions. The designation of  
18 "new" experts -- all distinguished and highly qualified -- has been a most  
19 disturbing aspect of this trial.

20           In response to that concern, the court suggested a protocol to which counsel  
21 have acceded, by which experts on both sides of the fishery/hydrology issues met  
22 in closed session, without attorneys, to attempt the resolution of differences. As a  
23 result, the parties submitted the following "Report on Agreements and  
24 Recommendations.

25           "Consensus was reached by the meeting participants on the  
26 following language:

27           "FISH HABITAT MANAGEMENT OBJECTIVES FOR THE  
28 LOWER AMERICAN RIVER

1 "1. To maximize the in-river production (i.e., spawning,  
2 juvenile survival) of chinook salmon in the lower American  
3 River.

4 "2. To maximize the in-river production of steelhead trout to  
5 the extent that it does not interfere with chinook salmon  
6 management.

7 "3. To manage American shad in the lower American River  
8 for reproduction and sport fishing purposes.

9 "4. To maintain a diverse and naturally reproducing fish  
10 fauna in the lower American River.

#### 11 "LIFE HISTORY PERIODICITIES

12 "1. Adult fall run chinook salmon are known to enter the  
13 lower American River from approximately mid-September  
14 through January. There is a high year-to-year variability,  
15 however, the bulk of the migration occurs from approximately  
16 mid-October through December.

17 "2. Adult chinook salmon are known to spawn in the lower  
18 American River from approximately mid-October through early  
19 February. There is high variability from year-to-year, however,  
20 the bulk of the spawning occurs from approximately mid-October  
21 through December.

22 "3. Chinook salmon egg and alevin incubation is known to  
23 occur in the lower American River from approximately mid-  
24 October through mid-April. There is high variability from year-  
25 to-year. however, most incubation occurs from approximately  
26 mid-October through February.

27 "4. Chinook salmon fry emergence is known to occur in the  
28 lower American River from January through mid-April.

"5. Chinook salmon young-of-the-year juvenile rearing is  
known to occur in the lower American River from January to  
approximately mid-July. There is high year-to-year variability,  
however, the bulk of the juvenile rearing occurs from February  
through May. During March 1989, a few yearling chinook salmon  
were collected in the lower American River, suggesting that some  
fish may rear in the river year round.

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1 "6. Adult fall and winter run steelhead trout migrate into the  
2 lower American River from August through April. The bulk of  
the migration occurs from mid-September through February.

3 "7. Fall and winter run steelhead spawn in the lower  
4 American River from November through April. The bulk of the  
spawning occurs from December through February.

5 "8. Fall and winter run steelhead incubation in the lower  
6 American River occurs from November through May. The bulk  
7 of the incubation occurs from December through mid-April.

8 "9. Large numbers of juvenile steelhead rear in the lower  
9 American River during the spring and early summer. Their  
10 survival depends upon rearing in freshwater until at least the  
11 following late winter or early spring. During March 1989, a few  
12 yearling steelhead were captured in the lower American River,  
13 suggesting that some of the juveniles do survive their first  
summer and fall. The degree to which year round rearing occurs  
14 is presently unknown. They probably emigrate from the lower  
15 American River from February through May.

16 "10. The period of American shad use of the lower American  
17 River is from late April through early July, during which time  
18 adult migration and spawning occurs. Juvenile rearing is not  
19 known to occur in the lower American River.

#### 20 "WATER TEMPERATURES

21 "1. Based on the scientific literature, the range of water  
22 temperatures for highest survival of incubating chinook salmon  
23 eggs appears to be between 43 degrees F. to 58 degrees F.  
24 Prolonged (i.e., more than a few days) exposure of eggs to  
25 temperatures in excess of 58 degrees F. results in high egg  
26 mortality. 62 degrees F. should be avoided.

27 "2. Any definition of an 'optimum' water temperature or  
28 temperature range for juvenile chinook salmon should include a  
synthesis of information on the effects of temperature on: 1)  
growth rates; 2) effects on and availability to fish of the food  
supply (ration); 3) predation; 4) disease; 5) stimulation of  
emigration; 6) physiological transformation to endure seawater;  
and, 7) acclimation to the waters of the Lower Sacramento River  
and Delta when warmer than the American River.

"Consensus on the optimum temperature (or range) could not be  
reached.

1 "FLOW NEEDS

2 "1. SWRCB Decisions 893 and 1400 are inadequate to meet the  
3 chinook salmon spawning habitat management objective for the  
4 lower American River.

5 "2. The group could not reach consensus on the optimum  
6 spawning flow (or range of flows) needed to meet the fishery  
7 habitat management objective for chinook salmon in the lower  
8 American River.

9 "3. Consensus could not be reached on the levels of flow  
10 required to provide optimum rearing habitat needed for juvenile  
11 chinook salmon in the lower American River.

12 "4. SWRCB Decision 893 does not provide adequate rearing  
13 flows to meet the fish habitat management objective of  
14 maximizing the in-river production of juvenile chinook salmon  
15 in the lower American River."

16 Perhaps the most salient aspect of the fishery/hydrology testimony consists  
17 of its large area of remaining uncertainty. A brief analysis of that testimony is  
18 appropriate to crystallize the issues and the information which is available as a  
19 basis for making judgments about the flow regimes which are required to protect  
20 public trust fishery values.

21 Don Kelley occupies a central position among the experts, having testified  
22 extensively before the board, and being the only expert to have conducted field  
23 studies in the lower American River. Kelley's work combined field studies with  
24 modeling projections, and was designed, among other objectives, to predict the  
25 population density for salmon at various flow regimes, taking into account the  
26 variables and interplay of velocity, depth and substrate (Second Report, October,  
27 1985, Exhibit 68). The preliminary data were acquired by divers making a physical  
28 count within a roped grid area, divided into cells, located at Sailor Bar. Fish were  
counted in each cell by divers pulling themselves upstream by rope. The depth  
and mean velocity of cells within the grid were measured. Regression analyses

1 were then performed "of the way velocity, depth and substrate in those grids  
2 interacted to affect the number of juvenile salmon" (Exhibit 68, at p. 10).

3 Kelley provided a range of "best flows" in his January, 1985 report  
4 (Exhibit 17), a modified range in his October, 1985 addendum (Exhibit 68), and a  
5 still further refined range in this trial. His October, 1985 recommendation was  
6 offered "for criticism and analysis." There, he recommended further field testing  
7 and a proposal for "trying out recommended flows and monitoring the results."  
8 Still adhering to the tentative nature of his conclusions, Mr. Kelley at trial  
9 recommended the following flow regimes:

- 10 1. Spawning flows from 1500 CFS to 2000 CFS from October 15th  
11 through December;
- 12 2. Egg incubation flows of 1250 CFS;
- 13 3. Juvenile rearing flows of 750/1250 CFS from March to May;
- 14 4. Juvenile rearing and migration flows at 2000 CFS from May 16th-  
15 June. This flow should be modified to assure daily average temperature not to  
16 exceed 65 degrees Fahrenheit at the mouth of the river.

17 Throughout his testimony, Mr. Kelley emphasized the importance of the  
18 interrelationship of numerous factors, including velocity, depth, substrate; water  
19 flows sufficiently high to cover the eggs, but not so high that they are scoured  
20 away; flows which provide upstream migration at a moderate pace to discourage  
21 too rapid an entry into the reservoir; flows which allow food availability and  
22 prevent the stranding of late spawners; et cetera. And superimposed over all of  
23 these and numerous other considerations is the issue of temperature.

24 Kelley emphasized that increased flows per se are not necessarily helpful to  
25 the salmon at particular stages of their development. For example, the October  
26 1985 study noted that:

27 "... flows of 750-1,000 CFS maximized the area covered with the  
28 best combination of velocities, depths and substrate in the upper

1 16 miles of the lower American River. Higher flows raised  
2 velocities so that juvenile salmon can remain and feed only in  
3 limited parts of the channel."

4 The point is that simply disgorging all available water into the American  
5 River may well not provide the best protection for chinook salmon. Exhibit 310  
6 and figures 11 and 12 from exhibit 311, for example, suggest that salmon prefer  
7 certain water velocities which, when significantly increased, result in diminution  
8 of the population. Kelley noted that the interrelationship of all of the above-  
9 mentioned factors must be thoroughly understood and investigated prior to any  
10 final determination as to those flow levels which will protect and enhance the  
11 fishery interests.

12 Mr. Kelley, in general, views the American River as a story of successful  
13 management by the Department of Fish and Game, noting that returning  
14 spawners now number 47,000 per year compared to 26,000 pre-Folsom Dam.  
15 While emphasizing the necessity of maintaining a natural run of salmon, to  
16 maintain genetic strength and diversity, he estimated that approximately  
17 80 percent of the current salmon run is hatchery originated.

18 A substantial part of Mr. Kelley's testimony was given to answering the  
19 criticisms of Dr. Hankin as to his methodology and conclusions. While  
20 acknowledging certain problems in the study, and emphasizing the necessity for  
21 extended further study and research, Mr. Kelley maintained the essential validity  
22 of his observations and recommendations .

23 Dr. Hankin found Dr. Kelley's testimony vulnerable at every point: Field  
24 sampling, statistical analyses, and predictions. The diver counts were not verified  
25 or calibrated; the count was contaminated by the presence of hatchery fish; the  
26 grid sizes varied from survey to survey, et cetera. The raw data, therefore, were  
27 unreliable. The study was flawed at inception by selection of a single reach for  
28 study, where other reaches have substantially different characteristics. The

1 statistical analysis was flawed by its assumption that the habitat was "fully  
2 seeded," and by the inappropriate use of polynomial fittings, which Dr. Hankin  
3 described in vivid detail (Exhibit 928, at pp. 16-18). Figure 12 of Kelley's January,  
4 1985 report, for example, attempted to fit high--order polynomials to diffuse  
5 "clouds" of data points. It does seem apparent that there is, in fact, no statistically  
6 valid "fit." Dr. Hankin criticizes the methods employed for predicting rearing  
7 capacity (see Exhibit 328, at pp. 21-22), and finally condemns the "rather bizarre  
8 correspondence between reach location an miles assumed represented by a  
9 particular reach" (Exhibit 928, at p. 23). Dr. Hankin notes that:

10 "The so-called 'representative reach' approach has been used  
11 elsewhere in stream research in fisheries. The difficulty with this  
12 approach is that choice of 'representative reach' is subjective, may  
13 result in serious errors of extrapolation, and, most importantly,  
14 allows no assessment of possible errors that result from  
15 extrapolation. This approach may be contrasted with statistically  
16 valid sampling designs recommended by Hankin (1984, 1985) and  
17 Hankin and Reeves (1988). Unless statistically valid sampling  
18 designs are used to obtain alternative estimates of the proportions  
19 of river habitat that may belong to certain habitat type categories,  
20 however, it is impossible to specify the extent of errors that may  
21 result from use of the mileage figures assume[d] for each reach."

22 Without detailing Dr. Hankin's extensive analyses, it seems apparent that  
23 his criticism has a substantial basis. Mr. Kelley himself urges the necessity for a  
24 much expanded and precise study of the American River fishery. From the  
25 testimony, it's clear that older technologies, dependent more on observation and  
26 judgment, are giving way to more refined technologies and statistical methods.  
27 The unfortunate aspect is not that Mr. Kelley's analysis is vulnerable to  
28 methodological criticism, but rather that Dr. Hankin's report did not offer its  
illumination until December, 1988. This litigation, it seems, has been the impetus  
for inspired criticism. But, in the absence of applying Dr. Hankin's recommended  
methods to an actual study of the river, very little has been accomplished except  
to maximize uncertainty. As with the water quality issue, it is the fact of



1 uncertainty which is left with the Court. There is simply no basis in the evidence  
2 for a reasoned selection among various of the competing positions. This  
3 represents not an abdication of court responsibility, but, rather, a recognition of  
4 existing scientific reality.

5 The issue of water temperature which, as noted before, is superimposed  
6 over all other issues of depth, velocity, substrate, habitat, et cetera, illustrates the  
7 point. Dr. Coutant testified that, optimally, temperatures for spawning and  
8 incubation should not exceed 56 degrees, with egg mortality increasing at  
9 58 degrees, and with 100 percent mortality at 62 degrees. For growth and survival  
10 of juvenile salmon, the optimal temperatures are 55-59 degrees Fahrenheit.  
11 Dr. Coutant testified at length about the dynamics of water temperature as  
12 affecting the growth of fish, and consequently, their time of emigration from the  
13 American River, and how increasing temperatures in the fall spawning period  
14 push the onset of birth and emigration into later and warmer months, causing  
15 increased mortality. Dr. Coutant's view was that the current river temperatures  
16 often exceed appropriate biological limits, and that temperature conditions are  
17 frequently "marginal." Based on 2020 projections of diversion, Dr. Coutant  
18 foresaw major adverse impacts with increasing diversions of water.

19 Dr. Kerstetter echoed Dr. Coutant's views about temperature, but centered  
20 his concern on smoltification, the process by which steelhead trout and juvenile  
21 salmon modify their biological features to adapt to salt water. It was  
22 Dr. Kerstetter's opinion that the optimum temperatures for juvenile salmon  
23 smolting are 55-59 degrees F. The optimum temperatures for steelhead trout  
24 smoltification are below 55 degrees F. Dr. Kerstetter explained thermal load as the  
25 measurement of the magnitude and duration of harmful temperature. He  
26 concluded that both existing and 2020 conditions result in significant thermal  
27 loading which can inhibit successful smolting of juvenile salmon.

28 //

1 Dr. Charles Hanson testified for EBMUD on the question of whether  
2 salmon populations in the lower American River are currently stressed by  
3 elevated water temperatures. He also considered the question whether  
4 temperature changes caused by diversions will significantly impact salmon  
5 spawning and rearing success in the river.

6 Dr. Hanson reached several conclusions regarding the present effect of  
7 temperature on salmon. First, he testified that during the period from mid- to  
8 late November and into December and January, temperatures are almost always  
9 within the limits that have been established for successful spawning and egg  
10 incubation. He also testified that juvenile salmon rear principally in the upper  
11 reaches of the river and that temperatures in those areas are generally within a  
12 range acceptable for juvenile salmon rearing through the month of June.

13 Dr. Hanson also testified that warmer water temperatures during the egg  
14 incubation and juvenile rearing period may result in a situation where young  
15 salmon are induced to emigrate early from the lower American River, before  
16 water temperatures in the lower Sacramento River rise to lethal levels. From his  
17 analysis of other studies, Dr. Hanson concluded that lower water temperatures in  
18 the winter and early spring months could place a "biological squeeze" on  
19 American River fisheries, by causing fish to emigrate later when Sacramento  
20 River temperatures are higher.

21 Finally, Dr. Hanson testified that he compared temperatures predicted by  
22 the County's temperature model to exist in the lower American River at a  
23 diversion level of 50,000 acre-feet through the Folsom-South Canal (1980  
24 conditions) with temperatures predicted to exist assuming a diversion level of  
25 590,000 acre-feet through the Folsom-South Canal (2020 conditions). He found  
26 predicted temperatures to be generally within 2°F to 3°F under the different  
27 scenarios throughout the year. He concluded that changes of this magnitude

28 //

1 would be unlikely to impact the success of salmon spawning, egg incubation,  
2 juvenile growth or survival.

3 One conclusion which plaintiffs would invite from the testimony of  
4 Dr. Humphrey, Coutant and Kerstetter is that water temperature is both critical to  
5 salmon survival and that any diversion of water is an invitation to  
6 environmental disaster. The problem is that the evidence does suggest that the  
7 American River fishery is currently surviving and, by some accounts, even  
8 thriving.

9 The experts, while agreeing to very little about temperature requirements,  
10 did agree to the following:

11 "Any definition of a 'optimum' water temperature or  
12 temperature range for juvenile chinook salmon should include a  
synthesis of information on the effects of temperature on:

- 13 "1. Growth rates;
- 14 "2. Effects on availability to fish of the food supply (ration);
- 15 "3. Predation;
- 16 "4. Disease;
- 17 "5. Stimulation of emigration.
- 18 "6. Physiological transformation to endure sea water; and,
- 19 "7. Acclimation to the waters of the Lower Sacramento River  
20 and Delta when warmer than the American River."
- 21

22 Thus is required an analysis of complex, interrelated phenomena as to which  
23 little definitive evidence has been advanced. The evidence which has been  
24 produced is largely derived from laboratory studies, or studies of streams of much  
25 less magnitude than the American River. The Rich experiments, for example,  
26 may or may not predict the biology of fish in natural circumstances -- and the  
27 experiments may have been flawed by the variations in population density over  
28 the course of the experiment. Further, some experts have testified that maximum

1 flow patterns can be harmful to fish survival, for example, during juvenile  
2 rearing and emigration. And while absolute temperature considerations are a  
3 useful tool, they do not account for the propensity of salmon to seek out cooler  
4 parts of the stream, nor for the natural adaptation of these particular species of  
5 salmon, to changing environmental conditions.

6 The task for this court is to recognize the fundamental inadequacy of  
7 existing studies as they relate to the American River, to extract from the  
8 "consensus" and from the testimony those factors which can provide a guide for  
9 protecting fishery values, and significantly, to retain jurisdiction until the  
10 scientific community can provide definitive answers. For the first time, instead  
11 of simply objecting to any flow patterns short of a flow of 100 percent of the  
12 available water, plaintiff and intervenors may be encouraged to provide an  
13 effective and constructive response to a comprehensive planning model which  
14 includes the EBMUD diversion.

15 The Court's purpose here is to set a flow standard which shall be  
16 maintained until evidence can be adduced, pursuant to the court's reserved  
17 jurisdiction, which will dictate the necessity for modifying that pattern to  
18 accommodate public trust values. While in general the experts in conference  
19 could not reach a consensus on optimum flows for spawning and rearing habitat,  
20 they do offer the important stipulation that D-1400 is inadequate to meet the  
21 chinook salmon spawning habitat objectives of the lower American River. The  
22 parties have prepared an unmarked Exhibit which is included here for reference,  
23 and which is a chart of the various flow recommendations of various parties and  
24 agencies:

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26 //

27 //

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1 Again, accepting the expert's agreement that salmon spawn from mid-  
2 October through early February, it should be beyond dispute that higher flows are  
3 indicated for that period. Therefore, the Court requires a flow regimen of 2000 CFS  
4 from mid-October through February.<sup>7</sup> The Court accepts the "low" flow  
5 recommendation of the Department of Fish and Game of 3000 CFS for March  
6 through June, representing a substantial part of the juvenile rearing out  
7 migration period as to which there has been an abundance of testimony  
8 demonstrating the dangers of high temperatures. From July through October 15th,  
9 the court sets a flow requirement of 1750 CFS, as a compromise between the  
10 several figures advanced for various recreation uses as, for example, the EBMUD  
11 proposals in the footnote to the flow chart.

12 Additionally, the Court will require that 60,000 AFA will be maintained in  
13 reserve from mid-October through June for releases in accordance with the  
14 demands of DFG in response to specific fishery needs arising from climatic or  
15 other environmental factors.

16 In the water quality section of this opinion, the Court relied on proven  
17 uncertainty as a basis for articulating a safe and prudent course of water resource  
18 management. Here again, the fact of uncertainty dictates what is intended as a  
19 safe and prudent course designed to protect public trust values. It is anticipated  
20 that, over a reasonable period of time, expert consensus will develop as to the  
21 flows required to protect public trust values. The diversion of water at Folsom-  
22 South Canal by EBMUD would at all times be subject to modification in light of  
23 developing scientific consensus.

24 Implicit in the foregoing analysis is an acceptance, to some considerable  
25 degree, of the criticism of the board's flow analysis by Roy Leidy. To summarize:

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27  
28 <sup>7</sup> 2000 CFS is the flow recommended by the Fish & Wildlife Service for a significant part of that  
period, and the FWS recommendation was based largely upon an analysis of habitat.

1 "Describing changes in the exceedence of identified flows or  
2 temperatures does not constitute an impact analysis because it  
tells us nothing of the nature or extent of the biological impact.

3 "Exceedence only counts the frequency of events, not their timing  
4 duration, or magnitude - all of which are essential to assessing  
biological impacts.

5 "The 'temperature' exceedence tables are based upon mean  
6 monthly data and, consequently, mask biological impacts that  
7 may occur over shorter time periods."

8 Further, board models relied on D-1400 flows, which all experts in this case  
9 have now agreed to be inadequate.

10 It bears emphasis that the foregoing analysis was not intended to ignore or  
11 to denigrate the importance of other fish species, particularly the steelhead trout  
12 and shad. Protection of these species will require a development of knowledge  
13 from scientific inquiry which, compared to that available for the chinook salmon,  
14 is in its merest infancy. The "consensus" establishes the existence and importance  
15 of those species. Again, the reservation of jurisdiction is intended to encourage  
16 the required scientific inquiry.

17 The foregoing analysis manifests this court's adoption of the board's  
18 approach of imposing a "physical solution." It is perhaps appropriate to set forth  
19 briefly the legal basis for that approach.

20 The doctrine of physical solution is a "common sense approach" to water  
21 rights litigation, having a long judicial history and based on equitable  
22 considerations designed to preclude harsh results in complex water appropriation  
23 matters.

24 The 1928 amendment to the California Constitution, now Article X, section  
25 2, added a second doctrinal basis for the imposition of physical solutions.  
26 Furthermore, it elevated the concept to a favored status, and created a duty  
27 incumbent upon every trier of fact:

28 //

1 "Since the adoption of the 1928 constitutional amendment, it is  
2 not only within the power but it is also the duty of the trial court  
3 to admit evidence relating to possible physical solutions, and if  
4 none is satisfactory to it, to suggest on its own motion such  
5 physical solution." (City of Lodi v. East Bay Municipal Utility  
District (1936) 7 Cal.2d 316, 341, emphasis added; see also  
Meridian Ltd. v. San Francisco (1939) 13 Cal.2d 424, 447.)

6 A number of California decisions have employed a physical solution to  
7 resolve complete water rights issues. (See Tulare Irrigation District v. Lindsay-  
8 Strathmore Irrigation District (1935) 3 Cal.2d 489, 574; Peabody v. Vallejo (1935)  
9 2 Cal.2d 351, 379-80; Rancho Santa Margarita v. Vail (1938) 11 Cal.2d 501, 561-62;  
10 Reclamation District No. 833 v. Quigley (1937) 8 Cal.2d 183; Montecito Valley  
11 Water Company v. City of Santa Barbara (1904) 144 Cal. 578; Hillside Water  
12 Company v. City of Los Angeles (1938) 10 Cal.2d 677; Allen v. California Water  
13 and Telephone Company (1946) 29 Cal.2d 466.)

14 While an extended analysis of physical solution doctrine is not required for  
15 this case, two particular aspects of the doctrine are appropriate for comment. In  
16 Peabody v. Vallejo, supra, 2 Cal.2d 351, the court stated:

17 "That if a physical solution be ascertainable, the court has the  
18 power to make and should make reasonable regulations for the  
19 use of the water by the respective parties, provided they be  
20 adequate to protect the one having the paramount right in the  
21 substantial enjoyment thereof and to prevent its ultimate  
22 destruction, and in this connection the court has the power to  
23 and should reserve unto itself the right to change and modify its  
24 orders and decree as occasion may demand, either on its own  
25 motion or on motion of any party." (Id., at pp. 383-384)

26 Also, in Rancho Santa Margarita v. Vail, supra, 11 Cal.2d 501, 561-62, the  
27 court stated:

28 "Under this section it has been held that it is not only within the  
power, but it is the duty of the trial court, to work out, if possible,  
a physical solution, and if none is suggested by the parties, to  
work out one independently of the parties. In this connection, if  
the trial court needs or desires expert assistance or evidence on  
this, or any other phase of the case, it possesses the statutory

1 power either to refer the matter to the division of water rights, or  
2 to appoint it as an expert." (Id.)

3 Thus, it is clear that the trial court has broad discretion and responsibility to  
4 fashion appropriate physical solutions for complex water appropriation problems.  
5 The physical solution doctrine fits hand in glove with the requirements for  
6 comprehensive planning elucidated by Audubon. The physical solution doctrine  
7 anticipates that the court will reserve jurisdiction, monitor developments  
8 through the appointment of masters or referees, and allocate costs and expenses  
9 attendant to a fair and comprehensive solution.

10 While the flow regimens set forth in the preceding section were derived  
11 largely from considerations of fishery values, that emphasis should not minimize  
12 or trivialize other of the significant public trust interests. As indicated, the July  
13 through October flows of 1750 CFS were in large part responsive to recreational  
14 interests, since those times are not critical for salmon spawning or rearing. It  
15 should be apparent that the Court did consider recreation an important factor in  
16 fashioning the physical solution.

17 The importance of American River recreation is reflected in section 5841.5  
18 of the Public Resources Code:

19 "(a) The American River Parkway and its environs contribute  
20 to the quality of life within the City of Sacramento and the  
21 County of Sacramento, enhance the image of the City and the  
22 County as desirable places to live; provide for the public safety  
23 and welfare of the community, and thereby contribute to the  
24 economic well-being of the community.

25 \* \* \*

26 "(c) The lower American River sustains a myriad of fish  
27 populations, including steelhead, king salmon, striped bass, shad,  
28 and other fish and wildlife populations, which in turn annually  
support millions recreation user-days and commercial, scientific,  
and educational uses and benefits.



1       “(d) The recreation capacity of the American River Parkway is  
2       immense, including such diverse activities as hiking, bicycling,  
3       picnicking, birding, horseback riding, canoeing, kayaking, rafting,  
4       sailing and power cruising.” (Pub. Resources Code § 5841.5.)

5       Additionally, the Wild and Scenic Rivers Act declares in part that “it is the  
6       policy of the State of California that certain rivers which possess extraordinary,  
7       scenic, recreational, fishery, or wildlife values shall be preserved in their free-  
8       flowing state, together with their immediate environments, for the benefit and  
9       enjoyment of the people of the state.” (Pub. Resources Code § 5093.50.) As  
10      previously noted in this decision, consistent with this policy the lower American  
11      River has been designated as a recreational river within the Wild and Scenic  
12      River System since 1972. (Pub. Resources Code §§ 5093.54(e), 5093.545(h).)

13      Substantial evidence was produced at trial about the wide range of water-  
14      dependent recreational activities, including fishing, various kinds of boating,  
15      swimming, wading, etc. Not all of the interests can reasonably be accommodated  
16      on a year-round basis, and those flows which provide maximum enhancement  
17      for some activities will interfere with others. It should again be remarked that the  
18      flows set forth in the physical solution are minimal requirements only, and that  
19      much more substantial flows will occur in response to climatic conditions and  
20      sometimes by the operational requirements of the bureau. Sufficient flows are  
21      provided for the lazy rafting of summer, and larger spring flows can be anticipated  
22      for those who require more adventure.

23      An important problem is that posed by projected recreation use.  
24      Sacramento is one of the fastest growing metropolitan areas in the state; the 1985  
25      population of 890,000 is projected to grow to 1.5 million by 2020. It seems apparent  
26      that unfettered recreational use of the river could seriously compromise fishery,  
27      wildlife and riparian interests. The fact is that water-dependent recreational  
28      interests must occupy a lower position in the hierarchy of public trust values,  
29      given the much more environmentally sensitive fishery interests.

XV.

The Order of Reference required an evaluation of the impact of EBMUD's diversion on the riparian habitat of the American River. The environmental values of that habitat are acknowledged by all parties, including the Referee, and was confirmed by the on-site inspection of the Court.

Dr. Jacobs testified as to the wild and scenic designation conferred by the Legislature and that the river has been accorded the highest classification on the Inventory of Significant State Lands prepared by the State Lands Commission pursuant to Public Resources Code Section 6370. Significant to the commission's determination is the unique and greatly diminished nature of riparian woodland in the Sacramento and San Joaquin valleys. Dr. Holland estimated there are approximately 2500 acres of riparian vegetation in the American River Parkway. Approximately 600 to 800 acres consist of mature forest. He testified that in the 1840's, there were approximately 800,000 to 1,000,000 acres of riparian vegetation in the Great Valley; in the 1970's, the Department of Fish and Game estimated that, exclusive of the Delta, there were only 10,000 to 12,000 acres of mature forest type riparian vegetation left. So much riparian vegetation has been lost that the Fish and Game Commission has adopted a policy that any additional loss is unacceptable. The policy calls for "no net loss" in extent or value of the habitat.

Dr. Holland summarized the long-term impacts that may be expected on the riparian corridor from reduced flows. These are:

1. Thinning of canopy and resultant loss of wildlife habitat;
2. Narrowing of the riparian corridor;
3. Fragmentation of the riparian green belt;
4. Encroachment of vegetation into the stream channel; and.
5. Change in species composition, diversity and density (Exhibit 973).

With regard to cumulative impacts, Dr. Holland testified that diversion of 590,000 acre-feet from the Folsom-South Canal (2020 projection) will have even

1 more of an impact than the diversion of 150,000 acre-feet. It is his view that even  
2 the latter diversion will have a negative impact on the riparian corridor.

3 Dr. Holland testified that flow is the most crucial from April to mid-June or mid-  
4 July because this is the period of most growth in the riparian corridor.

5 For defendants, Mitchell Swanson testified in detail about American River  
6 geomorphic and riparian phenomena. He examined the historical development  
7 and changes in the American River from pre-dam times to the present. He noted  
8 the "confined" (as opposed to "meandering") nature of the river, emphasizing  
9 that resprouting following flood scour, not seed generation is the predominant  
10 mechanism for reproduction of riparian vegetation. He noted, as did plaintiff's  
11 experts, the importance of flooding in the life of the river.

12 Mr. Swanson testified that flooding is both frequent and severe on the  
13 lower American River.

14 The mean average flood is 46,000 CFS (Exhibit 429);

15 A 23,000 CFS flood is a very common flow on the river

16 A flood of 85,000 CFS is a "typical winter flood resulting from rain" and  
17 occurs about 1 in every 7 years;

18 A flood of 100,000 CFS is a 1 in 10 year event;

19 A flood of 130,000 CFS is a 1 in 70 year event;

20 A flood of 230,000 CFS is a 1 in 100 year event.

21 A flood event can result in a monthly flow of over 1,000,000 acre-feet of  
22 water. In January, 1980, for example, the flooding produced 1,220,000 acre-feet of  
23 water. Folsom Reservoir can hold only about 1,000,000 acre-feet of water. Thus, its  
24 ability to withstand and control the flooding on the lower American River is  
25 substantially limited. Up to the 70-year level (130,000 CFS), Folsom can store  
26 enough water to slow flow levels to 115,000 CFS. There are doubts as to whether  
27 this target flood level of 115,000 CFS can be met in the event of a 100-year flood  
28 level of 230,000 CFS.

1 Mr. Swanson presented the following conclusions with respect to the  
2 geomorphology and riparian vegetation on the lower American River:

3 A. The presence of vegetation is the result of its ability to withstand  
4 destruction by flooding and sediment transport but remain close enough to the  
5 channel to access water in the summer drought season;

6 B. The lower American River is an intermediate river type closer in  
7 character to a confined bedrock stream than a meandering river. Channel and  
8 floodplain positions are generally fixed with far less lateral migration of channel  
9 and floodplain that is characteristic of meandering river;

10 C. Damming, dredging, and changes in the management of riparian  
11 vegetation have disrupted natural conditions on the lower American River  
12 causing both immediate and long-term changes. The impact of these activities  
13 will continue to affect riparian vegetation in the future;

14 D. Scour, erosion and deposition are dominant forces shaping riparian  
15 vegetation in the lower American corridor Exhibit 452 shows up to 6 feet of  
16 channel lowering at the Southern Pacific Bridge. This is the result of Folsom  
17 Dam cutting off sediment replenishment. In the long term, the river is moving  
18 toward a deeper, more incised channel;

19 E. Regeneration of riparian vegetation by the scour and sprout process  
20 occurs well above the low flow channel (at least 25 feet) and is a more important  
21 mechanism of vegetation than seedling dispersal by spring snow-melt recession  
22 floods;

23 F. The effect of the EBMUD diversion on the flooding regime is  
24 minuscule and immeasurable.

25 Folsom Dam now effectively "irrigates" the riparian corridor in the  
26 summer. Exhibits 448-449 show the increase in vegetation which has occurred  
27 since 1937 as a result of this water supply.

28 //

1           Between flows of 500 and 2500 CFS, the water surface of the river changes  
2 about 1 inch for each 100 CFS. But at higher flows, the change is less. Between  
3 3600 and 4500 CFS, the change is about .43 inch per 100 CFS, or less than half the  
4 surface elevation change at lower flows. Exhibit 463 shows EBMUD's impact on  
5 the surface elevation of the river. A 1000 CFS reduction in spring flow would  
6 lower the river surface by less than 6 inches.

7           Exhibit 401 is a final summary of Mr. Swanson's conclusions. EBMUD's  
8 impact on water availability is virtually "imperceptible"; and it has no impact on  
9 the flooding regime, or on the human factors that affect the river.

10          Mr. Swanson testified in court that his conclusions, as outlined above, had  
11 been presented to both the State Board staff and the State Board (see Exhibit 401,  
12 columns 1 & 2). He stated that since the Board hearings, he has tested his  
13 conclusions against data derived from the 1986 flood (see Exhibit 401, column 3).  
14 Mr. Swanson testified that his studies following the 1986 flood confirmed his  
15 original testimony before the State Board staff and the State Board.

16          From the entirety of the testimony, the Court has concluded that the  
17 riparian habitat could be severely endangered were water flows to be significantly  
18 lessened on the American River. Further, that the riparian habitat is  
19 irreplaceable; that is, that the replacement of riparian by upland habitat will result  
20 in significant loss to wildlife who are dependent upon the unique existing  
21 vegetation. Plaintiff's trial testimony was not persuasive that the proposed  
22 diversion would, in fact, cause a significant diminution in riparian habitat. The  
23 Court's physical solution takes into account Dr. Holland's testimony that April to  
24 mid-June or mid-July is the most critical part of riparian growth, and accordingly,  
25 has provided a minimum flow pattern of 3000 CFS during most of that period. In  
26 determining the flow pattern, the Court was also mindful of Mr. Swanson and  
27 Dr. Taylor's testimony that the present lower American River riparian structure  
28 has become an "irrigated system," which to some extent improves on historical

1 conditions in which the river frequently would run dry during summer months.  
2 The proposed physical solution continues an irrigation regimen, but also  
3 recognizes that the natural course of flooding, scouring, regeneration and  
4 resprouting will continue.

5 Finally, the Court would take notice of Dr. Taylor's comments regarding  
6 the "passive nature" of the county's management of the riparian habitat.  
7 Dr. Taylor suggested that more active management, for example, the planting of  
8 cottonwoods and supplementing of other vegetation is, of course, to be preferred.  
9 The subject will receive some further attention in the final physical solution.

10 XVI.

11 As indicated, this court rejects the logic of plaintiff's position that the  
12 existence of feasible alternatives "forbids the utilization of the Folsom-South  
13 Canal." (Sacramento County Brief on Alternatives, page 5) Still, in terms of  
14 determining if the diversion of water at the Folsom-South Canal for  
15 municipal/industrial uses constitutes the "fullest beneficial use" of the resource  
16 under Article X, section 2, it is appropriate to consider the feasibility of alternative  
17 diversion sites as part of the balancing analysis which is constitutionally  
18 mandated.

19 At the outset, it should be noted that no point of diversion is without  
20 ecological consequences. It is simply not the case that diversion at the Folsom-  
21 South Canal creates an environmental disaster, while diversion on the  
22 Sacramento River or Delta poses only inconsequential hazards. The Delta and  
23 Sacramento River waterways are part of a complex natural and artificial water  
24 system replete with dikes, channels, aqueducts, pipes and an elaborate pumping  
25 system so powerful so that the very flow of the San Joaquin River can be reversed.  
26 In some instances, the Delta environment is so precarious for fish survival, that  
27 salmon and striped bass from the Nimbus Hatchery must be transported around  
28 the Delta and deposited in the Carquinez Straits to ensure their survival.

1        One major problem of this pumping operation is the loss of fish due to  
2        entrainment (the process by which small fish are sucked into diversion works)  
3        and impingement (when larger fish are pressed by the current against the screens  
4        and suffocate). Dr. Charles Hanson estimated that Delta water diversion by  
5        EBMUD would cause the loss of 15 million striped bass larvae (the equivalent of a  
6        loss of 7,500 six-inch striped bass) due to entrainment. (See Exhibit 4701).  
7        Similarly, Don Kelley testified that diversion from the Delta or Sacramento River  
8        would exacerbate existing problems for fish in these areas. He estimated that  
9        EBMUD's diversion from the Clifton Court Forebay would cause a loss of 3.5  
10       million striped bass per year and a loss of about 36,000 salmon. While the  
11       magnitude of the loss is disputed, the fact of substantial losses cannot be. For  
12       these reasons, both Don Kelley and Dr. Charles Hanson recommended that, from  
13       a fisheries point of view, the delivery of water to EBMUD through the Folsom-  
14       South Canal is preferable to either a Delta diversion or diversion from the  
15       Sacramento River.

16       EBMUD further urges that in assessing alternatives, the Court not ignore  
17       the element of cost. It is worthy of more than a passing footnote to state that there  
18       may well be construction and maintenance costs exceeding hundreds of millions  
19       of dollars, depending upon the point of diversion. EBMUD says that "... even  
20       the County of Sacramento's conservative estimate that the cheapest alternative to  
21       EBMUD's contracted-for American River supply is 129 million dollars more  
22       expensive up front and 7 million more costly to operate and maintain each and  
23       every year thereafter" (EBMUD's Reply to Public Trust Trial Briefs of Plaintiffs,  
24       2:1-7).

25       Understandably, there was spirited debate among the experts as to the  
26       relative cost estimates. Dr. Chen testified for plaintiffs that EBMUD had  
27       substantially overestimated the differential between construction and  
28       maintenance costs with Folsom-South Canal diversion compared with diversions

1 at the various other sites. He felt that EBMUD underestimated Folsom-South  
2 Canal costs by neglecting to consider that new E.P.A. standards regarding THM  
3 removal will require plant modification, incorporating ozonation, GAC,  
4 chloramine addition, and other variations, and that Delta/Sacramento River costs  
5 had been overestimated. Even by Dr. Chen's estimations, however, the difference  
6 in costs between the diversion sites reaches into the hundreds of millions. A  
7 comparison of Dr. Chen's analysis with that of EBMUD's is set forth in  
8 Exhibit 5055. The EBMUD figures are derived from exhibit 5043, the Summary  
9 Report prepared by CH2M and testified to by Mr. Gaston.

10 Accepting EBMUD's figures, the magnitude of cost differential is  
11 breathtaking. Modulating those figures to take into account Dr. Chen's criticisms  
12 does not alter the fundamental fact that the cost differentials are significant and  
13 constitute a factor which must be considered in the selection of diversion site.

14 Just as with the cost differential, plaintiffs would denigrate EBMUD's  
15 concerns about the legal and political impediments which could absolutely  
16 preclude any of the alternative diversion sites which have been proposed.  
17 Extended litigation, unfortunately or not, is an unavoidable consequence of any  
18 water diversion project in California. Since 1970, EBMUD has had a validly  
19 executed contract pursuant to a validly issued permit held by the Bureau of  
20 Reclamation. In contrast, taking water from the alternative sites would require  
21 numerous governmental approvals, none of which can be assured. At a  
22 minimum, existing water rights permits would require modification. Permits  
23 would be required of the Army Corps of Engineers. E.P.A. approval is required, as  
24 is the permission of several state agencies, including the Department of Fish and  
25 Game. Based on the evidence and legal arguments presented before this court, it is  
26 apparent that the selection of any diversion site will meet opposition in the public  
27 administrative hearings antecedent to the various required approvals, and in  
28 litigation.



The evaluation of “feasible alternatives,” then, becomes part of that balancing process by which the proposed diversion of water is tested for compliance with Article X, section 2 requirements. Given the Court’s adoption of a Physical Solution which accommodates both water quality and public trust values, however, no specific determination is required as to the feasibility of alternative diversion sites. It is sufficient to observe that in balancing the competing values and interests, and in formulating the Physical Solution, the Court did examine and consider all those factors, including cost and ecological consequences, attendant to diversion sites below the confluence of the American and Sacramento rivers.

Adopting the Board's approach and following well-established judicial precedent, this Court will impose a Physical Solution as a means of accommodating the diverse and conflicting interests which have been addressed. The ultimate objective is to provide for the fullest beneficial use of the water under Article X, section 2, and at the same time, to protect the sensitive public trust values of the lower American River. The Physical Solution presented here is a mandate of Article X, section 2, in conjunction with public trust doctrine, and represents an absolute condition of diversion by EBMUD.

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## XVII.

### PHYSICAL SOLUTION

Physical Solution shall be accomplished as follows:

1. EBMUD may divert not to exceed 150,000 acre-feet annually (AFA) from the Folsom-South Canal pursuant to its contract of December 22nd, 1970, with the U.S. Bureau of Reclamation.

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1           2.     The following instream flow requirements must be met throughout  
2 the lower American River as a condition of diversion:

3           A.     October 15th through February, 2000 CFS;

4           B.     March through June, 3000 CFS;

5           C.     July through October 15th, 1750 CFS;

6           3.     An additional 60,000 AFA will be maintained in reserve at the  
7 reservoir from mid-October through June for release upon the recommendation  
8 of the Department of Fish and Game in response to specific fishery requirements.

9           4.     EBMUD shall use its best efforts to divert as much water as possible  
10 during those times when instream flows are least required for the protection of  
11 environmental interests and public trust values.

12           5.     The instream flow conditions set forth above are not intended to  
13 constitute operational flows that are to be met in every month of every year  
14 without regard to the hydrologic conditions that might prevail at any given time.  
15 The court anticipates that operational criteria will need to be established, based  
16 upon the various hydrologic year types (critically dry, dry, below normal, above  
17 normal, etc.) to ensure that Folsom Reservoir is not emptied and that there are  
18 flows available in the river whenever possible. However, the court intends that  
19 the instream flow requirements set forth above remain the standard that should  
20 be maintained to the fullest possible extent. Moreover, the court intends that the  
21 instream flow requirements be an absolute limit on EBMUD's ability to divert  
22 water from the Folsom-South Canal. When the instream flow requirements  
23 cannot be met, EBMUD may not divert any part of its appropriation.

24           6.     Defendants shall not divert water except to meet the demands for  
25 customers within the EBMUD utility district.

26           7.     EBMUD shall not market nor sell any part of its water diverted  
27 hereunder to any third party.

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1           8. All parties hereto shall cooperate in the development and  
2 implementation of scientific studies pertaining to the fish, wildlife and habitat  
3 issues which have been identified in this litigation. These studies shall be under  
4 the supervision of the special master. EBMUD shall contribute its fair share of the  
5 cost of programs to maintain a viable fishery and riparian habitat in the lower  
6 American River. EBMUD's "fair share" shall be determined by a comparison  
7 with contributions by other users and agencies and upon the recommendation of  
8 the special master with regard to individual projects.

9           9. The court retains jurisdiction for the purpose of implementing the  
10 Physical Solution and providing for its modification in light of the scientific  
11 studies required in paragraph 8, and in light of the studies and information which  
12 may be developed by various of the interested governmental agencies as well as  
13 the parties.

14           10. The Court is mindful that the strict adherence to the flow regimen  
15 could, in some circumstances, affect carryover storage in Folsom Reservoir and  
16 reduce the availability of water for instream public trust uses in subsequent  
17 months. It is the intention of the Court, however, to maintain the indicated flow  
18 regimen in the absence of convincing evidence, presented through the Special  
19 Master, that diversions accomplished during any particular month will adversely  
20 affect the ability to meet the Court's mandated flow levels in subsequent months.

21           11. Notwithstanding any other provision of this Physical Solution, it is  
22 anticipated that during certain "dry year" periods, modification of the flow  
23 regimens herein may be permitted in limited circumstances to accommodate  
24 EBMUD. At such times of crisis, and with the guidance of the special master, the  
25 court may temporarily modify the flow regimen if such modification can be  
26 effected without substantial harm to the fishery, habitat and other public trust  
27 values identified herein. Any such modification will be temporary and only in  
28 response to a showing of significant, specific, and immediate health risks to

EBMUD. In evaluating circumstances in which a modification may be indicated, recreational interests identified herein may be accorded a lower priority than they would otherwise obtain.

12. The court appoints John Williams of Carmel Highlands, California, as the special master to aid and advise this court in the implementation of the Physical Solution. His duties shall include the development, coordination and monitoring of scientific research to determine optimum flows, releases, and storage patterns designed to protect the public trust values; the coordination of said studies with those of other agencies; advising the court as to developments affecting the rights of the parties hereto; evaluating dry-year flows and release patterns, and advising the court as to necessary modifications; and such other duties as the parties may request and the court require, consistent with the Physical Solution.

13. Each party may nominate an individual whose responsibility will be to communicate with the Special Master in the implementation of the Physical Solution. Said individuals will communicate regularly with the Special Master and will advance the recommendations of the parties with respect to any matters pertaining to the Physical Solution. Nothing contained in this Physical solution, however, shall limit the right of the parties to file motions directly with the Court pursuant to its continuing jurisdiction.

The foregoing flow regimen is not merely interim in nature. It is intended as a permanent constitutionally mandated prerequisite to diversion, modifiable only upon the presentation of convincing evidence which demonstrates the need for such modification in accordance with the foregoing provisions of the Physical Solution.

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1           Relief is granted on the pleadings in accordance with the foregoing  
2 opinion.

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4 DATED: \_\_\_\_\_

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RICHARD A. HODGE  
Judge of the Superior Court

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