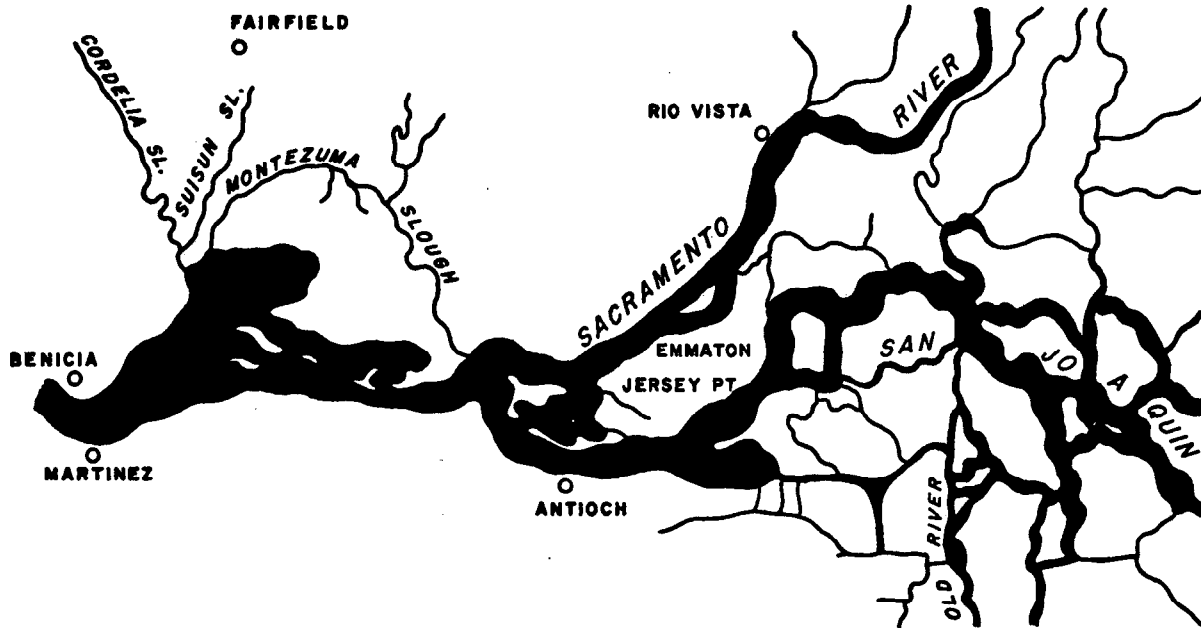


# water right Decision 1485

In the Matter of Permit 12720 (Application 5625) and Other Permits of United States Bureau of Reclamation for the Federal Central Valley Project and of California Department of Water Resources for the State Water Project.

DECISION IN FURTHERANCE OF JURISDICTION RESERVED IN DECISIONS D 893, D 990, D 1020, D 1250, D 1275, D 1291, D 1308, D 1356, and PERMIT ORDER 124

## Sacramento-San Joaquin Delta and Suisun Marsh



August 1978

STATE WATER RESOURCES CONTROL BOARD



**STATE OF CALIFORNIA**

*Edmund G. Brown Jr., Governor*

**STATE WATER RESOURCES**

**CONTROL BOARD**

*John E. Bryson, Chairman*

*W. Don Maughan, Vice Chairman*

*W. W. Adams, Member*

*Larry Walker, Executive Director*  
*Water Quality*

*C. L. Whitney, Executive Director*  
*Water Rights and Administration*

**STATE/FEDERAL**

**WATER PROJECTS OPERATIONS UNIT**

*Michael A. Campos, Chief*

*Gerald E. Johns*

*Lloy D. Johnson*

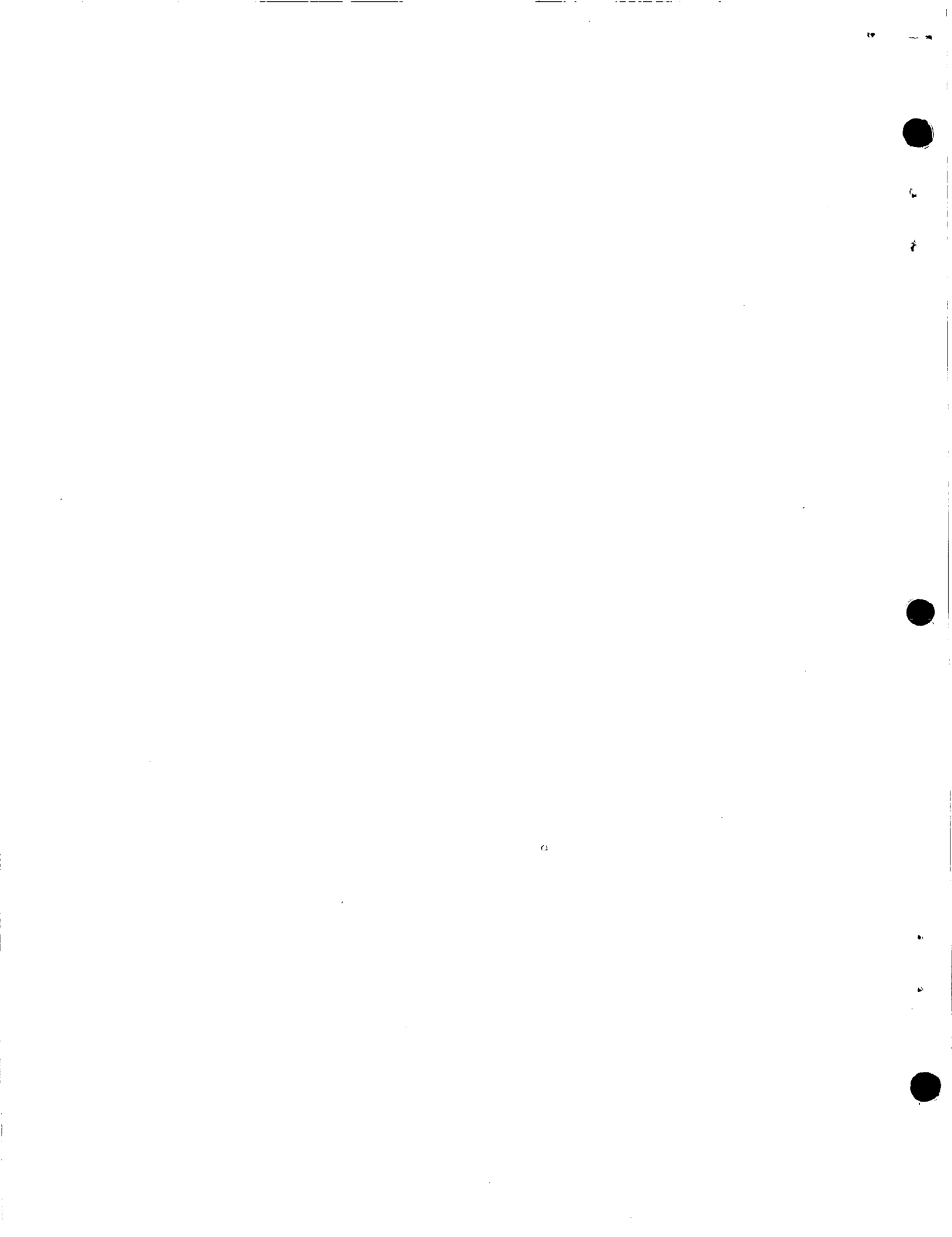
*Steven C. Macaulay*

*Walter E. Ryley*

*Lucy Hollingsworth*

## TABLE OF CONTENTS

	<u>Page</u>	
Past Proceedings . . . . .	3	
Decision 1379 . . . . .	4	
Present Proceeding . . . . .	4	
Scope of Board Actions . . . . .	8	
Beneficial Uses to be Protected . . . . .	10	
Agriculture . . . . .	11	
Fish and Wildlife . . . . .	12	
Suisun Marsh . . . . .	14	
Municipal and Industrial . . . . .	15	
Export Uses . . . . .	17	
Compliance with Standards . . . . .	17	
Order . . . . .	21	
Table I	Permits for Federal Central Valley Project and State Water Project Containing Reserved Jurisdiction Regarding the Sacramento-San Joaquin Delta or Coordination of Terms and Conditions . . . . .	31
Table II	Decision 1485, Water Quality Standards for the Sacramento-San Joaquin Delta and Suisun Marsh . . . . .	37
Table III	Decision 1485, Delta Estuary Water Quality Monitoring Program . . . . .	42
Figure I	Decision 1485, Water Quality Monitoring Locations, Water Quality Profile Routes and Sampling Frequencies. . . . .	44
Plate I	Sacramento-San Joaquin Delta	



STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

In the matter of Permit 12720 )  
(Application 5625) and other )  
permits of U. S. Bureau of )  
Reclamation for the Federal )  
Central Valley Project and of )  
California Department of Water )  
Resources for the State Water )  
Project )

DECISION 1485

DECISION IN FURTHERANCE OF JURISDICTION RESERVED  
IN PERMITS OF UNITED STATES BUREAU OF RECLAMATION  
FOR THE FEDERAL CENTRAL VALLEY PROJECT AND  
DEPARTMENT OF WATER RESOURCES FOR THE  
STATE WATER PROJECT

BY THE BOARD:

The Sacramento-San Joaquin Delta and Suisun Marsh, located east of San Francisco Bay and south of Sacramento, comprise one of California's most valuable natural resources (see Plate 1).

The Delta and Marsh support unique and valuable fish and wildlife resources, a substantial local agricultural economy, and a major water-related industrial corridor in the vicinity of Antioch. Suisun Marsh provides habitat for a wide variety of wildlife and is a major wintering area for waterfowl using the Pacific Flyway.

The Delta is a vital link between river systems of the Sacramento Valley and the water deficient areas to the south and west of the Delta. Two major systems - the State Water Project (SWP) operated by the Department of Water Resources (Department)

and the federal Central Valley Project (CVP) operated by the United States Bureau of Reclamation (Bureau) - withdraw supplies from the Delta for use in areas of need. These projects are the two largest water diversions from the Delta. They provide municipal supplies to areas where over 14 million people live and support an extremely productive agricultural economy in the San Joaquin Valley.<sup>1/</sup>

This decision amends the water right permits of the Department and Bureau for the SWP and CVP facilities. The permits are summarized in Table 1 which is bound at the back of this decision. This decision is in exercise of the Board's reserved jurisdiction to establish or revise terms and conditions for salinity control and for protection of fish and wildlife, and to coordinate the terms of the various permits for the two projects.

The Board's authority to review and amend these permits is derived from Section 1394 of the California Water Code, jurisdiction expressly reserved in the subject permits, Water Code Section 100, and the continuing authority of the Board, as stated in the terms of the permits, to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water, and Section 763.5 of Title 23 of the California Administrative Code.

<sup>1/</sup> A detailed description of these projects and their basic operations is contained in the Phase I prehearing staff report dated November 1976.

### Past Proceedings

Water rights for the CVP and SWP have been the subject of a series of proceedings by the Board and its predecessor agency, the State Water Rights Board, over the last 20 years. The complex interaction of Delta inflow, Delta consumptive uses, export diversions, agricultural return flows and tidal action make it difficult to set, with reasonable accuracy, conditions for the Delta of unlimited duration. In recognition of these facts, the Board and its predecessor reserved continuing jurisdiction in permits affecting Delta water supplies issued to the Department and Bureau for subsequent amendment of conditions.

In 1967, Decisions D 1275 and D 1291 authorized issuance of water right permits to the Department for the SWP; all of these permits contain conditions reserving jurisdiction concerning salinity control and protection of fish and wildlife in the Delta and coordination of terms and conditions with those of other permits for the CVP and SWP.

The permits for the federal Central Valley Project were issued pursuant to Decisions D 893 (in 1958), D 990 (in 1961), D 1020 (in 1961), D 1250 (in 1966), 1308 (in 1968) and 1356 (in 1970) and Permit Order 124 (in 1959). Not all of the Bureau permits currently before the Board in this proceeding contain all of the above items. However, in most of these permits jurisdiction was reserved to formulate or revise terms and conditions relative to salinity control in the Delta and to coordinate terms and

conditions of the permits issued to the Bureau with terms and conditions of other permits issued in furtherance of the CVP and SWP.

Decision 1379. In the exercise of reserved jurisdiction as discussed above and following an extensive hearing during 1969 and 1970, the Board adopted Decision 1379 on July 28, 1971. Decision 1379 established new water quality requirements for the Delta and Suisun Marsh and rescinded the previous requirements in Decisions D 1275 and D 1291. However, Decision 1379 has been stayed by the courts since October 1971 as a result of litigation originally instituted by the Central Valley East Side Project Association and the Kern County Water Agency to set aside the decision. Due to the order staying Decision 1379, requirements of Decision D 1275, as amended by Decision D 1291, remained in effect. However, the federal district court approved a stipulation that the evidentiary record of the Decision 1379 proceeding could be used by the Board in exercising the jurisdiction reserved in other decisions.

#### Present Proceeding

The present proceeding was initiated on April 29, 1976, with a preliminary hearing on the evidentiary scope of the proceeding. The Bureau participated in the evidentiary proceeding pursuant to a stipulation with the Board covering then pending litigation in California v. United States in which both parties agreed that any condition on water right entitlements held by the Bureau,



developed through the Delta hearing, shall not become effective until a final judgment of a court of competent jurisdiction has been entered recognizing such Board authority over Bureau appropriations.

On July 3, 1978, the United States Supreme Court issued its decision in California v. United States that a state may impose any condition on control, appropriation, use or distribution of water in a federal reclamation project that is not inconsistent with clear congressional directives respecting the project. The decision thus affirms the Board's authority to impose terms and conditions in Bureau permits including those under consideration herein. The Board is not aware of any congressional directives which are in conflict with the permit conditions contained in this decision. That, however, is a legal issue which was not briefed by the parties to this proceeding.

The present proceeding is a consolidated hearing pursuant to both the water quality control and water right authority of the Board. As a result of the proceeding, the Board not only is amending terms and conditions for the subject permits of the Department and Bureau, but also is adopting a water quality control plan (Delta Plan) containing water quality standards for the protection of beneficial uses of the waters of the Sacramento-San Joaquin Delta and Suisun Marsh.

To ensure protection of Delta beneficial uses and to make optimum use of storage, pumping and conveyance facilities, operation of the CVP and SWP must be coordinated. Separation of the effects of the two projects on Delta water supplies, uses and environment is not possible. Therefore, terms and conditions related to the Delta, including those for protection of fish and wildlife, must be the same in all of these permits. Inclusion of such terms in some, but not all, of the permits for the CVP and SWP would create confusion and would be unworkable. Therefore, maintenance of the water quality standards set forth in this decision, including flows to be maintained for the protection of fish and wildlife, will be imposed as a condition to all of the CVP and SWP permits shown in Table I.

This decision and the Delta Plan are the culmination of 32 days of evidentiary hearing initiated on November 15, 1976 and concluded on October 7, 1977.

The two documents adopted today by the Board (a water quality control plan and a water right decision) represent a unified effort by the Board to develop and implement under its full authority a single comprehensive set of water quality standards to protect beneficial uses of Delta water supplies. Since the two distinct approvals constitute the whole of a single project, a single environmental impact report (EIR) has been prepared and finalized for both of these documents.

Notwithstanding its integrated actions under these authorities, the Board's water right authority is quite distinct and separate from its water quality control authority. Unlike its water quality control authority under the State Porter-Cologne Water Quality Control Act and the Federal Water Pollution Control Act (PL 92-500) which is a State/federal responsibility, its water right function is strictly a State responsibility.

This water right decision includes as conditions in permits for the CVP and SWP the same standards as are adopted in the Delta Plan except for the southern Delta (as explained below). In view of this, no attempt will be made to duplicate the findings contained in the Delta Plan. Instead, the findings contained in the plan and in the Final EIR are incorporated herein by this reference and are expressly determined to constitute the findings upon which the conclusions and Order contained herein are based.

Both the Delta Plan and EIR have undergone considerable public review. All reviews required by the California Environmental Quality Act have been satisfied. Drafts of the plan and EIR were released for public review on March 15, 1978. Following a review period of over 75 days, a public hearing on the draft plan and Draft EIR was held on May 30, 1978. The hearing record was left open until June 15, 1978 in order to accommodate written comments.

Over 40 parties have submitted extensive comments on the draft plan and Draft EIR. The commenting parties include the project

operators, federal and state water service contractors, Delta water agencies, municipal and industrial users in Contra Costa County, fish and wildlife interests and environmental groups. A summary of the respective concerns of each party and the Board's response to each is set out in a special appendix to the Delta Plan and Final EIR.

#### Scope of Board Actions

As previously indicated, the jurisdiction reserved by the Board to revise or formulate additional terms and conditions in the water right permits issued to the Department and Bureau affecting Delta water supplies covers three general areas: (1) salinity control, (2) protection of fish and wildlife, and (3) coordination of terms and conditions of the respective permits for the SWP and CVP.

The terms and conditions established under this reserved jurisdiction are based on circumstances expected to prevail over the next ten years. The Board, in limiting the effective period of this decision, recognizes the uncertainty associated with possible future project facilities and the need for additional information on the complex effects of project operations and varying water quality conditions in the Delta and Suisun Marsh. As additional information is developed or as additional factors affecting the Delta and Marsh are identified, the Board will review permit terms and conditions to ensure that beneficial uses of Delta

supplies are protected. Accordingly, the Board in this decision continues the reservation of jurisdiction in the subject permits.

In exercising its reserved jurisdiction, the Board has two broad statutory mandates: (1) protection of vested water rights, and (2) protection of the public interest. These twin responsibilities are discussed in greater detail in Chapter I of the Delta Plan. Of controlling importance to the Board's determination is Part 4.5 of Division 6 of the Water Code, referred to as the Delta Protection Act. The Delta Protection Act accords first priority to satisfaction of vested rights and public interest needs for water in the Delta and relegates to lesser priority all exports of water from the Delta to other areas for any purpose. These statutory policies are subject to the overriding constitutional provision that all uses of water and diversions of water must be reasonable (Article 10, Section 2, California Constitution).

In addition, the projects must be operated so as not to cause any material deterioration of water quality which would impair its usefulness for the reasonable beneficial uses which are made of water by senior right holders (Water Code Section 11461). In order to ensure that the operation of project facilities does not adversely encroach upon vested right holders, the Board must identify the extent to which such rights would have been satisfied in the absence of the projects. This follows from the fundamental requirement that the Board find that unappropriated water is

available. This does not mean, of course, that the Board in this proceeding is adjudicating individual vested water rights; rather it means that the Board must assess the collective needs of prior rights, as it must in connection with every application that comes before it.

Based on information submitted during the evidentiary hearing, the SWP and CVP facilities covered by the permits before the Board in this proceeding do not appear to have a direct impact on water quality conditions in the southern Delta. Thus, the Board cannot justify imposing terms and conditions through this decision to resolve the water quality problems in the southern Delta.

#### Beneficial Uses to be Protected

Beneficial uses in the Delta and Suisun Marsh have been classified historically under three broad categories: (1) fish and wildlife, (2) agriculture, and (3) municipal and industrial. Water quality standards have been established for each of these broad categories of use to ensure that each is protected in its own right.

The underlying principle of these standards is that water quality in the Delta should be at least as good as those levels which would have been available had the state and federal projects not been constructed, as limited by the constitutional mandate of reasonable use. The standards include adjustments in the levels of protection to reflect changes in hydrologic conditions experienced under different water year types.

Agriculture. The application of this principle to agricultural uses in the Delta has resulted in substantially greater protection in the Delta for agricultural uses than that provided in the existing Water Quality Control Plan for the Sacramento-San Joaquin Delta Basin (Basin 5B Plan). The agricultural standards in the Basin 5B Plan reflect criteria that have not changed for over 13 years and are based essentially on the water quality needs of the Bureau's Tracy Pumping Plant in the southern Delta.

Even though this decision is consistent with the Delta Plan, only those elements of the plan for which a project mitigation responsibility or a compelling public interest can be shown have been incorporated into this decision. Thus, as indicated earlier, the specific provisions for agriculture in the southern Delta have not been incorporated into this decision.

The current negotiations between the project operators and the South Delta Water Agency concerning the construction of physical facilities to provide adequate circulation in the southern Delta to meet these standards are discussed in Chapter I of the Delta Plan. These negotiations appear to be directed toward the most practical solution for long-term protection of southern Delta agriculture and should be concluded as soon as practicable, at least by January 1980. If an agreement is not executed by January 1, 1980, the Board will examine in detail southern Delta water rights, determine the causes and sources of any encroachment, and take appropriate action to the extent of the Board's authority.

Riparian rights would be generally sufficient to provide suitable water quality for agricultural uses in the southern Delta. Upstream depletion and water quality degradation of the San Joaquin River and its tributaries have greatly reduced the flows available for protection of agriculture in the southern Delta. However, the permits of water development facilities in the San Joaquin River watershed, including those of the Bureau<sup>2/</sup>, which contribute to southern Delta quality and quantity deterioration are not before the Board, nor has any jurisdiction been reserved in those permits to amend or supplement terms and conditions therein. However, the permits provide that the appropriations authorized thereby are subject to prior vested rights.

In the event facilities under the permits currently before the Board are found to have an effect on water quality conditions in the southern Delta, the Board would use the jurisdiction reserved under this decision to amend terms and conditions in these permits as appropriate.

Fish and Wildlife. The fish and wildlife standards are taken essentially from a draft Four-Agency Agreement developed through five years of negotiations between the Department, Bureau, California Department of Fish and Game (Fish and Game) and U. S. Fish and Wildlife Service. However, the agreement has not yet been

---

<sup>2/</sup> The SWP has no facilities on the San Joaquin River System. Also, in addition to the New Melones Project on the Stanislaus River the CVP has the Friant Project on the San Joaquin River.



executed. The criteria in the draft agreement were recommended by Fish and Game and endorsed by the Department, and were extensively analyzed by the Board staff. Based on our most current assessment, the fishery standards provide significantly higher protection than existing basin plans. The Striped Bass Index is a measure of young bass survival through their first summer. The Striped Bass Index would be 71 under without project conditions (i.e., theoretical conditions which would exist today in the Delta and Marsh in the absence of the CVP and SWP), 63 under the existing basin plans, and about 79<sup>3/</sup> under this decision.

While the standards in this decision approach without project levels of protection for striped bass, there are many other species, such as white catfish, shad and salmon, which would not be protected to this level. To provide full mitigation of project impacts on all fishery species now would require the virtual shutting down of the project export pumps. The level of protection provided under this decision is nonetheless a reasonable level of protection until final determinations are made concerning a cross-Delta transfer facility or other means to mitigate project impacts.

---

<sup>3/</sup> There is some indication that factors other than those considered in the Board's analysis of without project levels may also affect striped bass survival. The effects of these factors are such that the without project levels would be greater than 71. However, the magnitude of this impact is unknown and cannot be quantified at this time.

Suisun Marsh. Full protection of Suisun Marsh now could be accomplished only by requiring up to 2 million acre-feet of freshwater outflow in dry and critical years in addition to that required to meet other standards. This requirement would result in a one-third reduction in combined firm exportable yield of State and federal projects. In theory, the existing Basin 5B Plan purports to provide full protection to the Marsh. However, during the 1976-77 drought when the basin plan was in effect, the Marsh received little if any protection because the system almost ran out of water and emergency regulations had to be imposed. This decision balances the limitations of available water supplies against the mitigation responsibility of the projects. This balance is based on the constitutional mandate "...that the water resources of the State be put to beneficial use to the fullest extent of which they are capable..." and that unreasonable use and unreasonable diversion be prevented (Article 10, Section 2, California Constitution).

The Bureau, the Department, Fish and Game, and U. S. Fish and Wildlife Service are working together to develop alternative water supplies for the Marsh. Such alternative supplies appear to represent a feasible and reasonable method for protection of the Marsh and mitigation of the adverse impacts of the projects. Under this decision the Department and Bureau are required, in cooperation with other agencies, to develop a plan for Suisun Marsh by July 1, 1979. The Suisun Marsh plan should ensure that the

long-term standards for full protection of Suisun Marsh contained in this decision are met by no later than October 1984.

Until needed physical facilities to provide supplemental supplies to the Marsh are constructed, this decision sets interim standards to protect the Marsh. Also, the decision requires that initial components of the Suisun Marsh plan (on which there is general agreement by affected parties) shall be implemented by January, 1980.

Municipal and Industrial. The level of protection for municipal drinking water supplies under this decision is the same as that of the existing basin plan; however, the period over which salt-sensitive industries would be protected is somewhat shorter than that in the basin plan. The level of protection provided in this decision is equivalent to water quality conditions offshore of Antioch which would occur in the absence of the federal and State projects.

Industries in the vicinity of Antioch have benefited by the operation of project facilities including the Contra Costa Canal, especially during the period 1945-1967. After 1967, when the SWP commenced operations and demands on the CVP increased, the benefits of project operations decreased and will continue to be reduced in the future. The water rights of these industries do not entitle them to flows which are in excess of natural flow

conditions in the Delta. If without project conditions in the Delta are provided by this decision, vested water rights, as limited by reasonable use, will be protected against infringement by the SWP and CVP operations. However, in accordance with the Delta Protection Act, if Delta water users desire additional benefits, they may seek such benefits from the project operators through water service contracts.

In comparing the relative municipal and industrial use protection provided by this decision to the protection afforded by the basin plans, consideration must also be given to conditions relatively certain to occur in the absence of this decision. Under conditions similar to the 1976-77 drought the salt-sensitive industries would in all likelihood receive considerably greater protection under this decision than under the previous approach.

The Basin 5B Plan provides that the Antioch standard should be terminated upon a determination by the Board that adequate substitute supplies are available to all municipal and industrial users in the vicinity of Antioch. During the public hearing on the Delta Plan the Department requested the Board to make such a determination regarding the salt-sensitive industries in the vicinity of Antioch. For each acre-foot of water diverted to beneficial use from a point of diversion offshore at Antioch, 25 acre-feet of freshwater must flow out of the Delta to repel seawater. In view of this and the Department's offer to pay any

increased cost incurred by these principal water users as a result of this substitution, the Board finds that a substitute supply is available and provision of such supply is consistent with the reasonableness requirements of the Constitution. Thus, this decision includes no standard offshore at Antioch. In accordance with the Delta Protection Act (Water Code Section 12202), however, the substitute supply must be of like quantity and quality to that which otherwise would have to be made available offshore at Antioch and must be provided at no additional cost.

Export Uses. Although there are other factors considered in assessing project impacts including the use of upstream reservoir storage, firm exportable yield is the primary measure of the projects' capability to meet export demands. The combined firm exportable yield of the SWP and CVP is the maximum annual delivery capability to meet a given level of firm export demands during a recurrence of the 1928-1934 hydrologic dry period. Under this decision, about 160,000 acre-feet of additional yield will be conserved as compared to the conditions under the basin plans.

#### Compliance with Standards

The Delta and Marsh comprise a highly productive and immensely valuable ecosystem which must be managed and protected as a matter of statewide public interest. The effect of the Delta Plan and

this decision is that water quality standards in the Delta must be satisfied prior to any export from the Delta to other areas for any purpose. These standards must be maintained as first priority operating criteria for any and all projects or parts thereof that may be constructed and operated under the permits considered in this decision.

A monitoring program is required by this decision to ensure collection of the data necessary to measure compliance with the water quality standards. This program also specifies special studies that are needed over the next few years to help address major concerns that cannot be confidently resolved now due to lack of data. The program will be implemented through terms and conditions in the Department and Bureau permits.

The Board intends to reopen the hearing on this matter within eight years from the adoption date, depending upon the availability of additional information upon which to re-examine these standards.

As indicated in the Delta Plan, the Board takes no position regarding additional project facilities to be constructed by the Department and Bureau. However, in its review of applications for additional appropriations by the CVP and SWP or of proposed transfer of water utilizing CVP and SWP facilities, the Board will review conservation and wastewater reclamation programs in the proposed service areas to ensure that these additional water

resources will be used in the most efficient manner possible consistent with the general public interest. Unappropriated water in California is an increasingly short, precious resource. As greater demands are made on a more limited unclaimed supply, the Board must scrutinize proposed uses more intensely than ever before to ensure that vested water rights and the public interest are protected.





ORDER

IT IS HEREBY ORDERED THAT:

1. The Board continue the reservation of jurisdiction to:

- (a) Formulate terms and conditions relative to flows to be maintained in the Delta for the protection of fish and wildlife in the permits issued pursuant to Applications 5629, 5630, 14443, 14444, 14445A, 17512, 17514A, 18721, 18723, 21636, and 21637 contained in Decisions D 1275, D 1291 and 1356.
  
- (b) Formulate terms and conditions relative to salinity control in the Delta in the permits issued pursuant to Applications 5625, 5626, 5629, 5630, 9363, 9364, 9365, 9366, 9367, 9368, 13370, 13371, 13372, 14443, 14444, 14445A, 14662, 15764, 17512, 17514A, 18721, 18723, 21542, 21636, 21637 and 22316 contained in Decisions D 893, D 990, D 1020, D 1250, D 1275, D 1291, 1308, and 1356.
  
- (c) Formulate terms and conditions relative to coordination of terms and conditions of the permits issued pursuant to Applications 5625, 5626, 5627, 5628, 5629, 5630, 9363, 9364, 9365, 9366, 9367, 9368, 14443, 14444, 14445A, 15374,

15375, 15376, 15764, 16767, 16768, 17374,  
17512, 17514A, 18721, 18723, 21542, 21636,  
21637 and 22316 contained in Decisions D 990,  
D 1020, D 1250, D 1275, D 1291, 1308 and 1356  
with other permits issued to the United  
States Bureau of Reclamation in furtherance  
of the Central Valley Project and permits  
issued to the Department of Water Resources  
in furtherance of the State Water Project.

2. Permittees shall maintain, by reduction of direct diversion at the project pumps or by release of natural flow or water in storage, or by operation of the Delta Cross Channel gates, or by any combination of these measures, water quality conditions in the channels of the Delta and Suisun Marsh equal to or better than the standards set forth in the attached Table II entitled "Decision 1485, Water Quality Standards for the Sacramento-San Joaquin Delta and Suisun Marsh". These standards are included in the Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh adopted by the State Water Resources Control Board on August 16, 1978.

3. To the extent that operational constraints on the Central Valley Project to minimize diversion of young striped bass from the Delta during May and June reduce project exports, permittee, the United States Bureau of Reclamation, shall be allowed through coordinated operations to make up such deficiencies during later periods of the year by direct diversion or by rediversion of releases of stored water through State Water Project facilities.
  
4. To ensure compliance with existing water quality standards, to identify meaningful changes in any significant water quality parameters potentially related to operations of the Federal Central Valley Project and the State Water Project and to reveal trends in ecological changes potentially related to project operations, permittees shall independently or in cooperation with other agencies or individuals:
  - (a) Operate and maintain continuous electrical conductivity recorders at the stations indicated in the attached Table III entitled "Decision 1485, Delta Estuary Water Quality Monitoring Program" and shown on the attached Figure I entitled "Decision 1485 Water Quality

Monitoring Locations - Water Quality Profile Routes and Sampling Frequencies" to report mean daily water quality conditions representative of each location.

- (b) Conduct the discrete sampling program shown in Table III and on Figure I. The sampling frequency may vary as appropriate. When the monthly Delta outflow index is projected to average greater than 10,000 cfs, the program operators may reduce the sampling frequency of the base parameters to once each month. When the outflow is below 10,000 cfs the sampling frequency of base parameters shall be increased to at least twice a month, if necessary to achieve the monitoring goals.
- (c) Conduct water quality profiles in the main navigation channels between Carquinez Strait on the west and Stockton and Rio Vista on the east, using a boat-mounted continuous recorder for the following parameters: water temperature, electrical conductivity, pH, dissolved oxygen, turbidity, and in vivo chlorophyll.
- (d) Establish continuous recorders at representative stations in the Delta and Suisun Bay

to collect information on air and water temperature, wind velocity and direction, pH, dissolved oxygen, turbidity, and, where feasible, in vivo chlorophyll. These data shall be evaluated and correlated with conditions as they exist in the adjacent main channels.

- (e) Conduct ongoing and future monitoring surveys as recommended by California Department of Fish and Game and concurred in by the Board concerning food chain relationships and fisheries impacts as they are affected by CVP and SWP operations in the Delta and Suisun Marsh.
  
- (f) Permittees shall make available to the Board and other interested agencies upon request results of the above monitoring as soon as practicable following the month during which the monitoring was accomplished. Annual reports summarizing the previous calendar year's findings and detailing future study plans shall be submitted to the Board by January 15 of each year. Detailed reports containing the previous year's monitoring results shall be submitted by August 1 of each year.

5. The Delta and Suisun Marsh monitoring program as set forth in Condition No. 4 and Table III shall be

evaluated continuously by permittees to ensure that the goals of the monitoring program are attained. Permittees should propose appropriate modifications for the concurrence of the Board to ensure attainment of the monitoring goals. Further, the Board will review annually the results of the monitoring program and may make appropriate modifications thereto.

6. Upon request to and approval of the Board, variations in flow for experimental purposes for protection and enhancement of fish and wildlife may be allowed; provided, that such variations in flow do not cause violations of municipal, industrial and agricultural standards in Table II.
  
7. For the protection of Suisun Marsh, permittees shall:
  - (a) Develop a plan for Suisun Marsh by July 1, 1979, in cooperation with other agencies which will ensure that the standards in Table II for full protection of the Marsh are met. Such plan must be satisfactory to the Board and shall include appropriate EIR/EIS documentation, a monitoring network, physical facilities, operating and management procedures, and assurances to restore and maintain

Suisun Marsh primarily as a brackish water marsh capable of producing high-quality feed and habitat conditions for waterfowl and other marsh-related wildlife using best practical management practices.

- (b) Implement fully such Suisun Marsh plan by October 1, 1984. Under this plan water quality standards for full protection of Suisun Marsh shall be met by no later than October 1, 1984.
  
- (c) Implement initial components of the Suisun Marsh plan, on which there is general agreement by affected parties, to achieve the following goals by January 1, 1980:
  - o Conveyance and delivery of water from Montezuma Slough to wetland areas on Grizzly, Simmons, Wheeler, Dutton, Van Sickle, and Hammond Islands which are presently flooded with water from Honker, Suisun and Grizzly Bays.
  
  - o Conveyance and delivery of water from Goodyear Slough to certain adjacent wetland areas and provision of outflow from Goodyear Slough into either Grizzly or Suisun Bays.

- (d) Report to the Board by January 15 of each year on progress toward implementation of mitigation facilities.
8. Permittees shall report to the Board on or about January 1 and July 1, 1979 regarding the status and progress of negotiations with the South Delta Water Agency concerning the construction of physical facilities and other measures for long-term protection of southern Delta agriculture. If such agreement is not executed by January 1, 1980, the Board will examine in detail southern Delta water rights, determine the causes and sources of encroachment and take appropriate action.
9. Permittees shall report to the Board by January 15, 1979, and annually thereafter, on the methods to be used in determining flows past Rio Vista and improving accuracy of Delta outflow estimates or on studies to be commenced by that date to determine such procedures. Permittees shall also report annually on methods for making more precise projections of salinity distribution in the Delta under varying inflow, outflow and export conditions.
10. To develop a better understanding of the hydrodynamics, water quality, productivity and



significant ecological interactions of the Delta and Suisun Marsh so that more accurate predictions of environmental impacts related to operations of the CVP and SWP can be made, permittees shall, independently or in cooperation with other agencies or individuals:

- (a) Conduct special studies to meet specific needs and to take advantage of particular circumstances where the data obtained are of significant value. Such studies include, but are not limited to, fish population and zooplankton measurements, waterfowl food plant production measurements, intensive phytoplankton studies, tissue analysis of selected biota, photosynthesis rates, sediment profile and composition, and water velocity.
- (b) Develop and improve water quality and biological predictive tools with emphasis on improving the understanding of flow/salinity/phytoplankton relationships in the western Delta, and on improving hydraulic characteristics in existing models to represent more closely true channel characteristics, for

the following areas of the estuary:

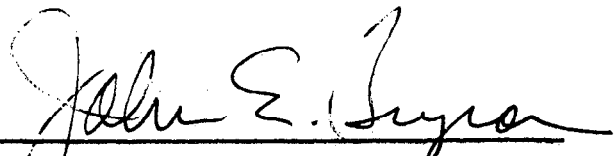
- i) Western Delta and Suisun Bay area,  
including Suisun Marsh.
- ii) San Francisco Bay to Golden Gate Bridge.
- iii) Interior Delta.

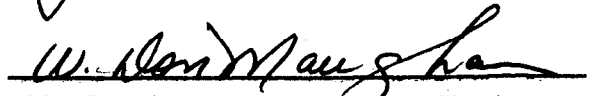
(c) Participate in research studies to determine:


- i) Outflow needs in San Francisco Bay,  
including ecological benefits of unregu-  
lated outflows and salinity gradients  
established by them.
- ii) The need for winter flows for long-term  
protection of striped bass and other  
aquatic organisms in the Delta.

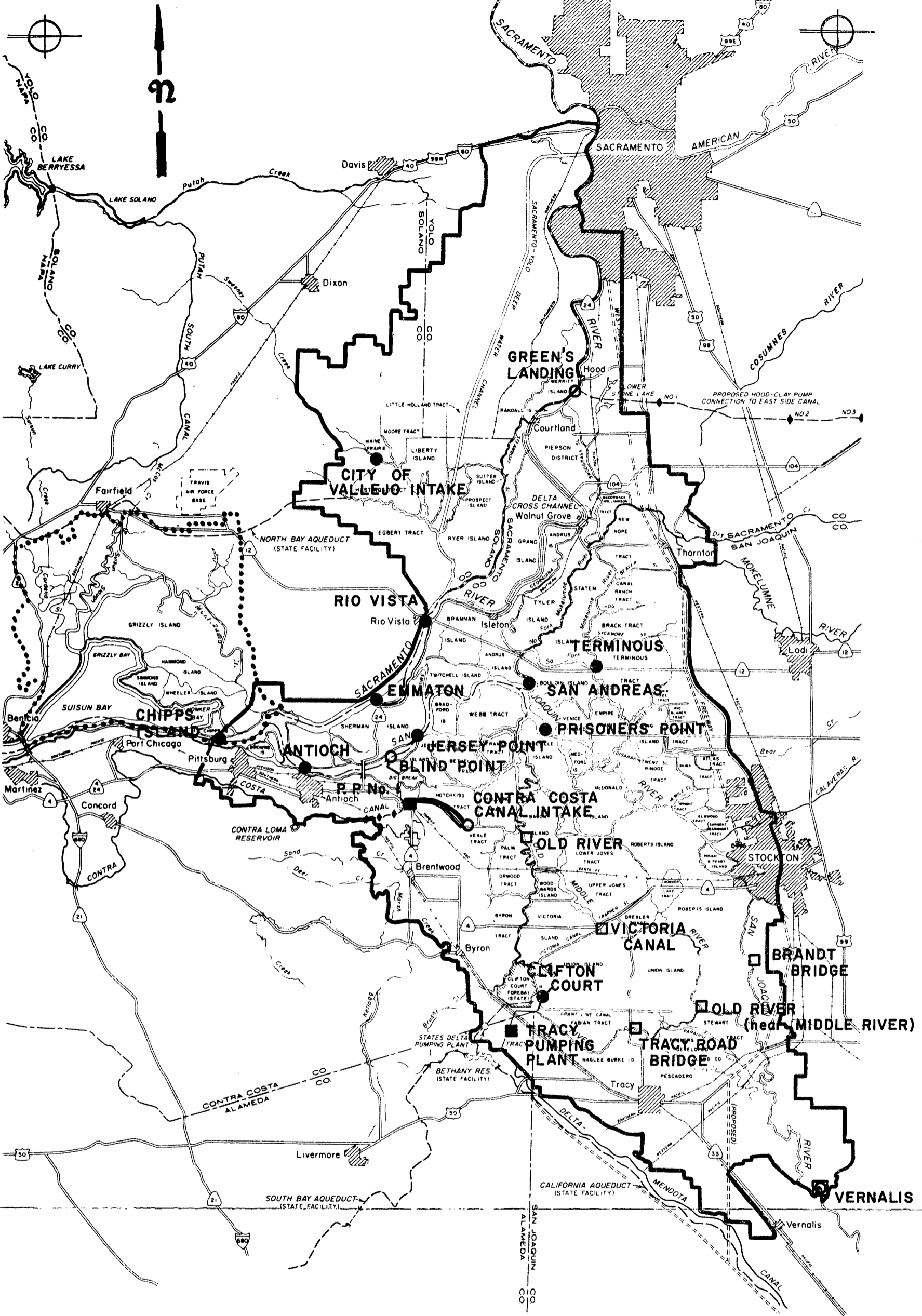
11. Conditions relating to salinity control and protection of fish and wildlife in the Delta in Decisions D 1275, D 1291 and 1379 are rescinded.

Dated: August 16, 1978.

  
\_\_\_\_\_  
John E. Bryson, Chairman

  
\_\_\_\_\_  
W. Don Maughan, Vice Chairman

  
\_\_\_\_\_  
W. W. Adams, Member



- HISTORICAL & CURRENT WATER QUALITY CONTROL STATION
- HISTORICAL WATER QUALITY CONTROL STATION
- NEW WATER QUALITY CONTROL STATION
- POSSIBLE FUTURE WATER QUALITY CONTROL STATION
- ..... SUISUN MARSH BOUNDARY
- LEGAL DELTA BOUNDARY

STATE OF CALIFORNIA  
 STATE WATER RESOURCES CONTROL BOARD  
 SACRAMENTO-SAN JOAQUIN DELTA

NOTE:  
 BASE MAP BY THE BUREAU OF RECLAMATION

TABLE I

PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS

Permit- tee 1/	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
USBR	5625	12720	Sacramento River	11,000	Jan.1 to Dec. 31	3,190,000	Oct. 1 to June 30	Power
USBR	5626	12721	Sacramento River	8,000	Jan.1 to Dec. 31	3,190,000	Oct. 1 to June 30	Irrigation, domestic, stockwatering navigation and recrea- tion
USBR	5627	11966	Trinity River	1,100	Jan.1 to Dec. 31	1,540,000	Jan. 1 to Dec. 31	Power
USBR	5628	11967	Trinity River	2,500	Jan.1 to Dec. 31	1,540,000	Jan. 1 to Dec. 31	Irrigation, domestic, navigation, salinity con- trol and flood control
DWR	5629	16477	Feather River	7,600	Jan.1 to Dec. 31	380,000	Oct. 1 to July 1	Power, re- creation, fish and wildlife enhancement
DWR	5630	16478	Feather River	1,400	Oct.1 to July 1	380,000	Oct. 1 to July 1	Irrigation, domestic, municipal, industrial, salinity con- trol, recrea- tion, fish and wildlife enhancement
USBR	9363	12722	Sacramento River	1,000	Jan.1 to Dec. 31	310,000	Oct. 1 to June 30	Municipal and indus- trial

TABLE I

(Continued)

Sheet 2 of 6.

PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS

Permit- tee 1/	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
USBR	9364	12723	Sacramento River	9,000	Jan. 1 to Dec. 31	1,303,000	Oct. 1 to June 30	Irrigation, flood control, domestic, stockwatering, navigation & recreation
USBR	9365	12724	Sacramento River	2,275	Jan. 1 to Dec. 31	1,303,000	Oct. 1 to June 30	Power
USBR	9366	12725	Rock Slough	200	Jan. 1 to Dec. 31	--	--	Irrigation and domestic
USBR	9367	12726	Rock Slough	250	Jan. 1 to Dec. 31	--	--	Municipal and industrial
USBR	9368	12727	Old River	4,000	Jan. 1 to Dec. 31	--	--	Irrigation and domestic
USBR	13370	11315	American River	8,000	Nov. 1 to Aug. 1	1,000,000	Nov. 1 to July 1	Irrigation, salinity con- trol and flood control
USBR	13371	11316	American River	700	Nov. 1 to Aug. 1	300,000	Nov. 1 to July 1	Municipal, industrial, domestic and recreational
USBR	13372	11317	American River	8,000	Jan. 1 to Dec. 31	1,000,000	Oct. 1 to July 1	Power

**TABLE I**

(Continued)

Sheet 3 of 6

**PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS**

Permit- tee 1/	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
DWR	14443	16479	Feather River,  Sacramento-San Joaquin Delta Channels	1,360  6,185	Jan. 1 to Dec. 31  Jan. 1 to Dec. 31	3,500,000  42,100	Sept. 1 to July 31  Jan. 1 to Dec. 31	Irrigation, domestic, municipal, in- dustrial, salinity con- trol, recrea- tional, fish and wildlife enhancement
DWR	14444	16480	Feather River	11,000	Jan. 1 to Dec. 31	3,500,000	Oct. 1 to July 1	Power, recrea- tional and fish and wild- life enhance- ment
DWR	14445A	16481	Italian Slough	2,115	Oct. 1 to July 1	44,000	Oct. 1 to July 1	Irrigation, domestic, municipal, in- dustrial, salinity con- trol, recrea- tional and fish and wildlife en- hancement
USBR	14662	11318	American River	--	--	300,000	Oct. 1 to July 1	Power

-3-

TABLE I (Continued)

PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS

Permit- tee 1/	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
USBR	15374	11968	Trinity River	300	Jan. 1 to Dec. 31	200,000	Jan. 1 to Dec. 31	Municipal and industrial
USBR	15375	11969	Trinity River	1,700	Jan. 1 to Dec. 31	1,800,000	Jan. 1 to Dec. 31	Irrigation, domestic, fish & wild- life propaga- tion, navi- gation, water quality con- trol and recreation
USBR	15376	11970	Trinity River	3,525	Jan. 1 to Dec. 31	1,800,000	Jan. 1 to Dec. 31	Power
USBR	15764	12860	Old River	--	--	1,000,000	Oct. 1 to April 30	Irrigation, domestic, stockwatering municipal, industrial and recrea- tion
USBR	16767	11971	Trinity River	--	--	700,000	Jan. 1 to Dec. 31	Irrigation, domestic and water quality control
USBR	16768	11972	Trinity River	175	Jan. 1 to Dec. 31	700,000	Jan. 1 to Dec. 31	Power

TABLE I (Continued)

PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS

Permit- tee 1/	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
USBR	17374	11973	Trinity River	1,500	Jan. 1 to Dec. 31	--	--	Irrigation, domestic, municipal, industrial, salinity con- trol, recrea- tion, fish and wildlife enhancement
DWR	17512	16482	Italian Slough and San Luis Creek	--	--	1,100,000	Oct. 1 to July 1	Irrigation, domestic, municipal, in- dustrial, salinity con- trol, recrea- tion, fish and wildlife enhancement
DWR	17514A	16483	Lindsey Slough	135	Oct. 1 to July 1	--	--	Municipal and industrial
USBR	18721	16209	North Fork Ameri- can River and Knickerbocker Creek	100	Nov. 1 to Aug. 1	1,700,000	Nov. 1 to July 1	Irrigation, recreation, incidental domestic and water quality control
USBR	18723	16210	North Fork Ameri- can River and Knickerbocker Creek	6,300	Jan. 1 to Dec. 31	1,700,000	Nov. 1 to July 1	Power, inci- dental recreation and domestic



TABLE I (Continued)

PERMITS FOR FEDERAL CENTRAL VALLEY PROJECT AND STATE WATER PROJECT  
CONTAINING RESERVED JURISDICTION REGARDING THE SACRAMENTO-SAN JOAQUIN DELTA  
OR COORDINATION OF TERMS AND CONDITIONS

Permit- tee <sup>1/</sup>	Applica- tion No.	Permit No.	Source	Direct Diversion		Storage		Purpose
				Quantity(cfs)	Season	Quantity(AF)	Season	
USBR	21542	15149	Old River	--	--	1,000,000	Nov. 1 to April 30	Power
USBR	21636	16211	North Fork Ameri- can River and Knickerbocker Creek	600	Jan. 1 to Dec. 31	800,000	Nov. 1 to July 1	Power
USBR	21637	16212	North Fork Ameri- can River and Knickerbocker Creek	900	Nov. 1 to July 1	800,000	Nov. 1 to July 1	Irrigation, municipal, industrial, domestic, recreation, fish and wildlife en- hancement and water quality control
USBR	22316	15735	Rock Slough	--	--	5,400	Oct. 1 to June 30	Irrigation, domestic, municipal, industrial, water quality control and recreation

<sup>1/</sup> USBR = Permit held by U.S. Bureau of Reclamation  
DWR = Permit held by Department of Water Resources

Table II  
 DECISION 1485  
 WATER QUALITY STANDARDS  
 FOR THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH <sup>1/</sup>

BENEFICIAL USE PROTECTED and LOCATION	PARAMETER	DESCRIPTION	YEAR TYPE <sup>2/</sup>	VALUES							
<b>MUNICIPAL and INDUSTRIAL</b>											
Contra Costa Canal Intake at Pumping Plant No. 1	Chloride	Maximum Mean Daily Cl <sup>-</sup> in mg/l	All	250							
Contra Costa Canal Intake at Pumping Plant No. 1 or Antioch Water Works Intake on San Joaquin River	Chloride	Maximum Mean Daily 150 mg/l Chloride for at least the number of days shown during the Calendar Year. Must be provided in intervals of not less than two weeks duration. (% of Year shown in parenthesis)	Wet Ab. Normal Bl. Normal Dry Critical	<u>Number of Days Each Calendar Year Less than 150 mg/l Chloride</u> 240 (66%) 190 (52%) 175 (48%) 165 (45%) 155 (42%)							
City of Vallejo Intake at Cache Slough	Chloride	Maximum Mean Daily Cl <sup>-</sup> in mg/l	All	250							
Clifton Court Forebay Intake at West Canal	Chloride	Maximum Mean Daily Cl <sup>-</sup> in mg/l	All	250							
Delta Mendota Canal at Tracy Pumping Plant	Chloride	Maximum Mean Daily Cl <sup>-</sup> in mg/l	All	250							
<b>AGRICULTURE</b>											
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"></td> <td style="width: 30%;"></td> <td style="width: 20%;"></td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">0.45 EC April 1 to Date Shown</td> <td style="width: 10%; text-align: center;">EC from Date Shown <sup>3/</sup> to Aug. 15</td> </tr> </table>										0.45 EC April 1 to Date Shown	EC from Date Shown <sup>3/</sup> to Aug. 15
				0.45 EC April 1 to Date Shown	EC from Date Shown <sup>3/</sup> to Aug. 15						
<b>WESTERN DELTA</b> Emmaton on the Sacramento River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet Ab. Normal Bl. Normal Dry Critical	Aug. 15 July 1 June 20 June 15 --	-- 0.63 1.14 1.67 2.78						
Jersey Point on the San Joaquin River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet Ab. Normal Bl. Normal Dry Critical	Aug. 15 Aug. 15 June 20 June 15 --	-- -- 0.74 1.35 2.20						
<b>INTERIOR DELTA</b> Terminus on the Mokelumne River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet Ab. Normal Bl. Normal Dry Critical	Aug. 15 Aug. 15 Aug. 15 Aug. 15 --	-- -- -- -- 0.54						
San Andreas Landing on the San Joaquin River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet Ab. Normal Bl. Normal Dry Critical	Aug. 15 Aug. 15 Aug. 15 June 25 --	-- -- -- 0.58 0.87						

Table II  
DECISION 1485  
WATER QUALITY STANDARDS  
FOR THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH<sup>1/</sup>

BENEFICIAL USE PROTECTED and LOCATION	PARAMETER	DESCRIPTION	YEAR TYPE <sup>2/</sup>	VALUES		
<b>FISH AND WILDLIFE</b>						
<b>• STRIPED BASS SPAWNING</b>						
Prisoners Point on the San Joaquin River	Electrical Conductivity	Average of mean daily EC for the period not to exceed	All	April 1 to May 5 0.550 mmhos		
Chippis Island	Delta Outflow Index in cfs	Average of the daily Delta outflow index for the period, not less than	All	April 1 to April 14 6700 cfs		
Antioch Waterworks Intake on the San Joaquin River	Electrical Conductivity	Average of mean daily EC for the period, not more than	All	April 15 to May 5 1.5 mmhos		
Antioch Waterworks Intake	Electrical Conductivity (Relaxation Provision - replaces the above Antioch and Chippis Island Stan- dard whenever the projects impose deficiencies in firm supplies <sup>5/</sup> )	Average of mean daily EC for the period, not more than the values corresponding to the deficiencies taken (linear interpolation to be used to determine values between those shown)	All - whenever the projects impose deficiencies in firm supplies <sup>5/</sup>	Total Annual Imposed Deficiency MAF	April 1 to May 5 EC in mmhos	
				0	1.5	
				0.5	1.9	
				1.0	2.5	
				1.5	3.4	
				2.0	4.4	
				3.0	10.3	
				4.0 or more	25.2	
<b>• STRIPED BASS SURVIVAL</b>						
Chippis Island	Delta Outflow Index in cfs	Average of the daily Delta outflow index for each period shown not less than		May 6-31	June	July
			Wet	14,000	14,000	10,000
			Ab. Normal	14,000	10,700	7,700
			Bl. Normal	11,400	9,500	6,500
			Subnormal			
			Snowmelt	6,500	5,400	3,600
			Dry <sup>6/</sup>	4,300	3,600	3,200
			Dry <sup>7/</sup> or Critical	3,300	3,100	2,900
<b>• SALMON MIGRATIONS</b>						
Rio Vista on the Sacramento River	Computed net stream flow in cfs	Minimum 30-day running average of mean daily net flow		Jan.	Feb. 1- Mar. 15	Mar. 16- June 30
			Wet	2,500	3,000	5,000
			Ab. Normal	2,500	2,000	3,000
			Bl. Normal	2,500	2,000	3,000
			Dry or Critical	1,500	1,000	2,000
				July	Aug.	Sept. 1- Dec. 31
			Wet	3,000	1,000	5,000
			Ab. Normal	2,000	1,000	2,500
			Bl. Normal	2,000	1,000	2,500
			Dry or Critical	1,000	1,000	1,500
<b>• SUISUN MARSH</b>						
Chippis Island at O&A Ferry Landing	Electrical Conductivity	Maximum 28-day running average of mean daily EC		Jan.-May	Oct.-Dec.	
			Wet	12.5 mmhos	12.5 mmhos	
			Ab. Normal	12.5 mmhos	12.5 mmhos	
			Bl. Normal	12.5 mmhos	12.5 mmhos	
			Dry or Critical	12.5 mmhos	15.6 mmhos	
		(The 15.6 mmhos EC Standard applies only when project water users are taking deficiencies in scheduled water supplies <sup>8/</sup> otherwise the 12.5 mmhos EC remains in effect.)				
Chippis Island	Delta Outflow Index in cfs	Average of the daily Delta outflow index for each month, not less than values shown	Wet	February-May 10,000 cfs		
			Subnormal Snowmelt	February-April 10,000 cfs		
		Minimum daily Delta outflow index for 60 consecutive days in the period	Ab. Norm. and Bl. Norm.	January-April 12,000 cfs		

Table II  
 DECISION 1485  
 WATER QUALITY STANDARDS  
 FOR THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH <sup>1/</sup>

BENEFICIAL USE PROTECTED and LOCATION	PARAMETER	DESCRIPTION	YEAR TYPE <sup>2/</sup>	VALUES																		
<b>FISH AND WILDLIFE</b>																						
• <b>SUISUN MARSH</b>																						
Chippis Island (continued)	Delta Outflow Index in cfs	Average of the daily Delta outflow index for each month, not less than values shown	All (if greater flow not required by above standard) - whenever storage is at or above the minimum level in the flood control reservation envelope at two out of three of the following: Shasta Reservoir, Oroville Reservoir, and CVP storage on the American River	Jan.-May 6,600 cfs																		
Collinsville on Sacramento River (C-2)	Electrical Conductivity	The monthly average of both daily high tide values not to exceed the values shown (or demonstrate that equivalent or better protection will be provided at the location)	All - To become effective Oct. 1, 1984	<table style="margin-left: auto; margin-right: 0;"> <thead> <tr> <th style="text-align: left;">Month</th> <th style="text-align: left;">EC in mmhos</th> </tr> </thead> <tbody> <tr><td>Oct.</td><td>19.0</td></tr> <tr><td>Nov.</td><td>15.5</td></tr> <tr><td>Dec.</td><td>15.5</td></tr> <tr><td>Jan.</td><td>12.5</td></tr> <tr><td>Feb.</td><td>8.0</td></tr> <tr><td>Mar.</td><td>8.0</td></tr> <tr><td>Apr.</td><td>11.0</td></tr> <tr><td>May</td><td>11.0</td></tr> </tbody> </table>	Month	EC in mmhos	Oct.	19.0	Nov.	15.5	Dec.	15.5	Jan.	12.5	Feb.	8.0	Mar.	8.0	Apr.	11.0	May	11.0
Month	EC in mmhos																					
Oct.	19.0																					
Nov.	15.5																					
Dec.	15.5																					
Jan.	12.5																					
Feb.	8.0																					
Mar.	8.0																					
Apr.	11.0																					
May	11.0																					
Miens Landing on Montezuma Slough (S-64)																						
Montezuma Slough at Cutoff Slough (S-48)																						
Montezuma Slough near mouth																						
Suisun Slough near Volanti Slough (S-42)																						
Suisun Slough near mouth (S-31)																						
Goodyear Slough south of Pierce Harbor (S-35)																						
Cordelia Slough above S. P. R.R. (S-32)																						
• <b>OPERATIONAL CONSTRAINTS</b>																						
Minimize diversion of young striped bass from the Delta	Diversions in cfs	The mean monthly diversions from the Delta by the State Water Project (Department) not to exceed the values shown. The mean monthly diversions from the Delta by the Central Valley Project (Bureau), not to exceed the values shown	All	<table style="margin-left: auto; margin-right: 0;"> <thead> <tr> <th style="text-align: left;">May</th> <th style="text-align: left;">June</th> <th style="text-align: left;">July</th> </tr> </thead> <tbody> <tr> <td>3,000</td> <td>3,000</td> <td>4,600</td> </tr> </tbody> </table>	May	June	July	3,000	3,000	4,600												
May	June	July																				
3,000	3,000	4,600																				
Minimize diversion of young striped bass into Central Delta		Closure of Delta cross channel gates for up to 20 days but no more than two out of four consecutive days at the discretion of the Department of Fish and Game upon 12 hours notice	All - whenever the daily Delta outflow index is greater than 12,000 cfs	April 16-May 31																		
Minimize cross Delta movement of Salmon		Closure of Delta Cross Channel gates (whenever the daily Delta outflow index is greater than 12,000 cfs)	All	Jan. 1-April 15																		

**Table II**  
**DECISION 1485**  
**WATER QUALITY STANDARDS**  
**FOR THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH <sup>1/</sup>**

**FISH PROTECTIVE FACILITIES**

Maintain appropriate records of the numbers, sizes, kinds of fish salvaged and of water export rates and fish facility operations.

**STATE FISH PROTECTIVE FACILITY**

The facility is to be operated to meet the following standards to the extent that they are compatible with water export rates:

- (a) King Salmon — from November through May 14, standards shall be as follows:
  - (1) Approach Velocity — 3.0 to 3.5 feet per second
  - (2) Bypass Ratio — maintain 1.2:1.0 to 1.6:1.0 ratios in both primary and secondary channels
  - (3) Primary Bay — not critical but use Bay B as first choice
  - (4) Screened Water System — the velocity of water exiting from the screened water system is not to exceed the secondary channel approach velocity. The system may be turned off at the discretion of the operators.
- (b) Striped Bass and White Catfish — from May 15 through October, standards shall be as follows:
  - (1) Approach Velocity — in both the primary and secondary channels, maintain a velocity as close to 1.0 feet per second as is possible
  - (2) Bypass Ratio
    - (i) When only Bay A (with center wall) is in operation maintain a 1.2:1.0 ratio
    - (ii) When both primary bays are in operation and the approach velocity is less than 2.5 feet per second, the bypass ratio should be 1.5:1.0
    - (iii) When only Bay B is operating the bypass ratio should be 1.2:1.0
    - (iv) Secondary channel bypass ratio should be 1.2:1.0 for all approach velocities.
  - (3) Primary Channel — use Bay A (with center wall) in preference to Bay B
  - (4) Screened Water Ratio — if the use of screened water is necessary, the velocity of water exiting the screened water system is not to exceed the secondary channel approach velocity
  - (5) Clifton Court Forebay Water Level — maintain at the highest practical level.

**TRACY FISH PROTECTIVE FACILITY**

The secondary system is to be operated to meet the following standards, to the extent that they are compatible with water export rates:

- (a) The secondary velocity should be maintained at 3.0 to 3.5 feet per second whenever possible from February through May while salmon are present
- (b) To the extent possible, the secondary velocity should not exceed 2.5 feet per second and preferably 1.5 feet per second between June 1 and August 31, to increase the efficiency for striped bass, catfish, shad, and other fish. Secondary velocities should be reduced even at the expense of bypass ratios in the primary, but the ratio should not be reduced below 1:1.0
- (c) The screened water discharge should be kept at the lowest possible level consistent with its purpose of minimizing debris in the holding tanks
- (d) The bypass ratio in the secondary should be operated to prevent excessive velocities in the holding tanks, but in no case should the bypass velocity be less than the secondary approach velocity.

**FOOTNOTES**

- 1/ Except for flow, all values are for surface zone measurements. Except for flow, all mean daily values are based on at least hourly measurements. All dates are inclusive.
- 2/ Footnote 2 is set forth on next sheet.
- 3/ When no date is shown in the adjacent column, EC limit in this column begins on April 1.
- 4/ If contracts to ensure such facilities and water supplies are not executed by January 1, 1980, the Board will take appropriate enforcement actions to prevent encroachment on riparian rights in the southern Delta.
- 5/ For the purpose of this provision firm supplies of the Bureau shall be any water the Bureau is legally obligated to deliver under any CVP contract of 10 years or more duration, excluding the Friant Division of the CVP, subject only to dry and critical year deficiencies. Firm supplies of the Department shall be any water the Department would have delivered under Table A entitlements of water supply contracts and under prior right settlements had deficiencies not been imposed in that dry or critical year.
- 6/ Dry year following a wet, above normal or below normal year.
- 7/ Dry year following a dry or critical year.
- 8/ Scheduled water supplies shall be firm supplies for USBR and DWR plus additional water ordered from DWR by a contractor the previous September, and which does not exceed the ultimate annual entitlement for said contractor.

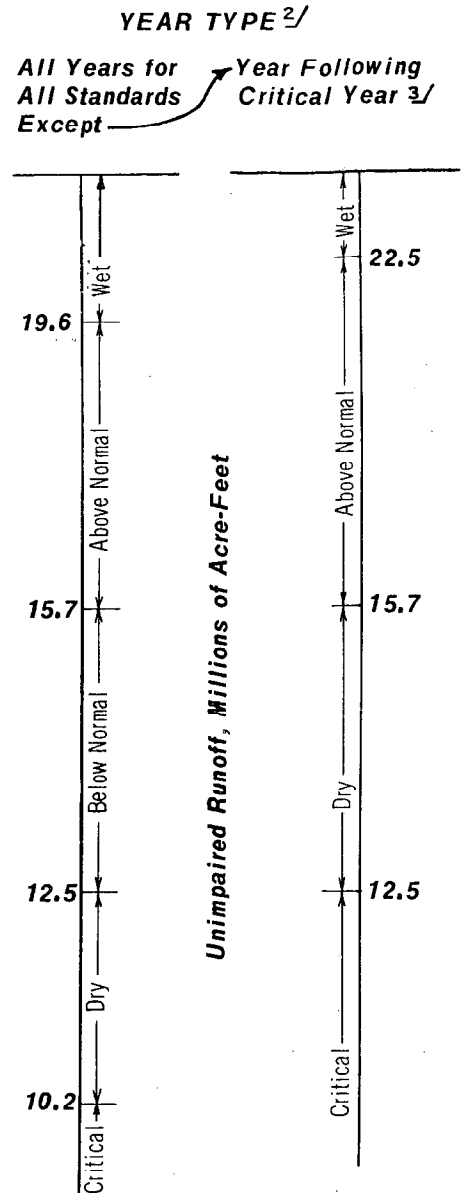
NOTE: EC values are mmhos/cm at 25°C.

FOOTNOTE 2 OF TABLE II

YEAR CLASSIFICATION

Year classification shall be determined by the forecast of Sacramento Valley unimpaired runoff for the current water year (October 1 of the preceding calendar year through September 30 of the current calendar year) as published in California Department of Water Resources Bulletin 120 for the sum of the following locations: Sacramento River above Bend Bridge, near Red Bluff; Feather River, total inflow to Oroville Reservoir; Yuba River at Smartville; American River, total inflow to Folsom Reservoir. Preliminary determinations of year classification shall be made in February, March and April with final determination in May. These preliminary determinations shall be based on hydrologic conditions to date plus forecasts of future runoff assuming normal precipitation for the remainder of the water year.

YEAR TYPE	RUNOFF, MILLIONS OF ACRE-FEET
Wet <sup>1/</sup>	equal to or greater than 19.6 (except equal to or greater than 22.5 in a year following a critical year). <sup>3/</sup>
Above Normal <sup>1/</sup>	greater than 15.7 and less than 19.6 (except greater than 15.7 and less than 22.5 in a year following a critical year). <sup>3/</sup>
Below Normal <sup>1/</sup>	equal to or less than 15.7 and greater than 12.5 (except in a year following a critical year). <sup>3/</sup>
Dry	equal to or less than 12.5 and greater than 10.2 (except equal to or less than 15.7 and greater than 12.5 in a year following a critical year). <sup>3/</sup>
Critical	equal to or less than 10.2 (except equal to or less than 12.5 in a year following a critical year). <sup>3/</sup>



- <sup>1/</sup> Any otherwise wet, above normal, or below normal year may be designated a subnormal snowmelt year whenever the forecast of April through July unimpaired runoff reported in the May issue of Bulletin 120 is less than 5.9 million acre-feet.
- <sup>2/</sup> The year type for the preceding water year will remain in effect until the initial forecast of unimpaired runoff for the current water year is available.
- <sup>3/</sup> "Year following critical year" classification does not apply to Agricultural, Municipal and Industrial standards.

TABLE III - DECISION 1485  
 DELTA ESTUARY WATER QUALITY  
 MONITORING PROGRAM

Station Location	Electrical Conductivity	Base <sup>1/</sup> Parameters	Phytoplankton <sup>2/</sup>	Phosphorus <sup>3/</sup> TDS and Cl <sup>-</sup>	Heavy Metals, Pesticides <sup>4/</sup>	Benthos <sup>5/</sup>
C2 Sacramento River @ Collinsville	C					
C3 Sacramento River @ Greens Landing	C	SM/M	SM/M	M	SA	SA
C4 San Joaquin River @ San Andreas Landing	C					
C5 Contra Costa Canal @ PP #1	C					
C6 San Joaquin River at Brandt Bridge	C G.H.					
C7 San Joaquin River @ Mossdale		SM/M	SM/M	M	SA	SA
C8 Old River near Middle River	C					
C9 West Canal @ mouth/intake to Clifton Ct. <sup>Forabay</sup>	C	SM/M	SM/M	M		
C10 San Joaquin River @ Vernalis	C Flow	SM/M		M		
C13 Mokelumne River @ Terminous	C					
C19 Cache Slough @ City of Vallejo Intake	C					
D4 Sacramento River above Point Sacramento		SM/M	SM/M	M	SA	SA
D6 Suisun Bay at Bulls Head Point nr. Martinez		SM/M		M	SA	SA
D7 Grizzly Bay @ Dolphin nr. Suisun Slough		SM/M	SM/M	M		SA
D8 Suisun Bay off Middle Point nr. Nichols		SM/M	SM/M	M		
D9 Honker Bay near Wheeler Point		SM/M	SM/M	M	SA	SA
D10 Sacramento River @ Chipps Island	C	SM/M		M		
D11 Sherman Lake near Antioch		SM/M		M	SA	SA
D12 San Joaquin River @ Antioch Ship Channel		SM/M	SM/M	M	SA	
D12* San Joaquin River @ Antioch Water Works	C					
D14A Big Break near Oakley		SM/M		M	SA	SA
D15 San Joaquin River @ Jersey Point	C	SM/M	SM/M	M		
D16 San Joaquin River @ Twitchell Is.		SM/M		M		
D19 Franks Tract near Russo's Landing		SM/M		M	SA	SA
D22 Sacramento River @ Emmaton	C	SM/M		M		
D24 Sacramento River below Rio Vista Bridge	C Flow	SM/M	SM/M	M		
D26 San Joaquin River @ Potato Point		SM/M	SM/M	M		
D28A Old River near Rancho Del Rio	C	SM/M		M	SA	SA
D29 San Joaquin River @ Prischers Point	W					
D42 San Pablo Bay near Rodeo		SM/M	SM/M	M		
DMC1 Delta Mendota Canal	C					

(Continued on next page)

TABLE III - DECISION 1485  
DELTA ESTUARY WATER QUALITY  
MONITORING PROGRAM

Station Location	Electrical Conductivity	Base <sup>1/</sup> Parameters	Phytoplankton <sup>2/</sup>	Phosphorus <sup>3/</sup> , TDS and Cl <sup>-</sup>	Heavy Metals, Pesticides <sup>4/</sup>	Benthos <sup>5/</sup>
MD6 Sycamore Slough near Mouth		SM/M		M		SA
MD7 South Fork Mokelumne River below Sycamore Slough		SM/M	SM/M	M		SA
MD10 Disappointment Slough @ Bishop Cut		SM/M	SM/M	M		
P8 San Joaquin River at Buckley Cove		SM/M	SM/M	M	SA	SA
P10 Middle River @ Borden Highway	C G.H.	SM/M		M		
P12 Old River @ Tracy Road Bridge	C G.H.	SM/M		M		
S31 Suisun Slough near mouth	C					
S32 Cordelia Slough above S.P.R.R.	C					
S35 Goodyear Slough so. of Pierce Harbor	C					
S42 Suisun Slough near Volanti Slough	C	SM/M	SM/M	M		
S48 Montezuma Slough at Cutoff Slough	C					
S64 Miens Landing on Montezuma Slough	C					
D7* Montezume Slough near mouth	P					

\* Location close to the station shown

C - Continuous

W - Weekly (April 1 - May 5)

SM - Semi-monthly (twice a month)

M - Monthly

SA - Semi-annually (spring and fall)

G.H. - Gage Height

P - Periodic, to obtain adequate correlation with other stations

<sup>1/</sup> Air and water temperature, electrical conductivity, pH, dissolved oxygen, turbidity, water depth to 1% light intensity, secchi disc depth, volatile and non-volatile suspended solids, nitrate, nitrite, ammonia, total organic nitrogen, extracted chlorophyll a, silica.

<sup>2/</sup> Enumeration and identification to the species level where possible.

<sup>3/</sup> Orthophosphate and total phosphorus.

<sup>4/</sup> Heavy metals - arsenic, cadmium, chromium (all valences), copper, iron, lead, manganese, mercury, zinc.

Pesticides - chlorinated hydrocarbons to include: Aldrin, Altrazine, BHC, Chlordane, Dacthal, DDD, DDE, DDT, Dieldrin, Endrin, Endosulfan, Heptachlor, Kelthane, Lindane, Methoxychlor, Simazine, Toxaphene, PCB.

Sampling to take place in water column and bottom sediments.

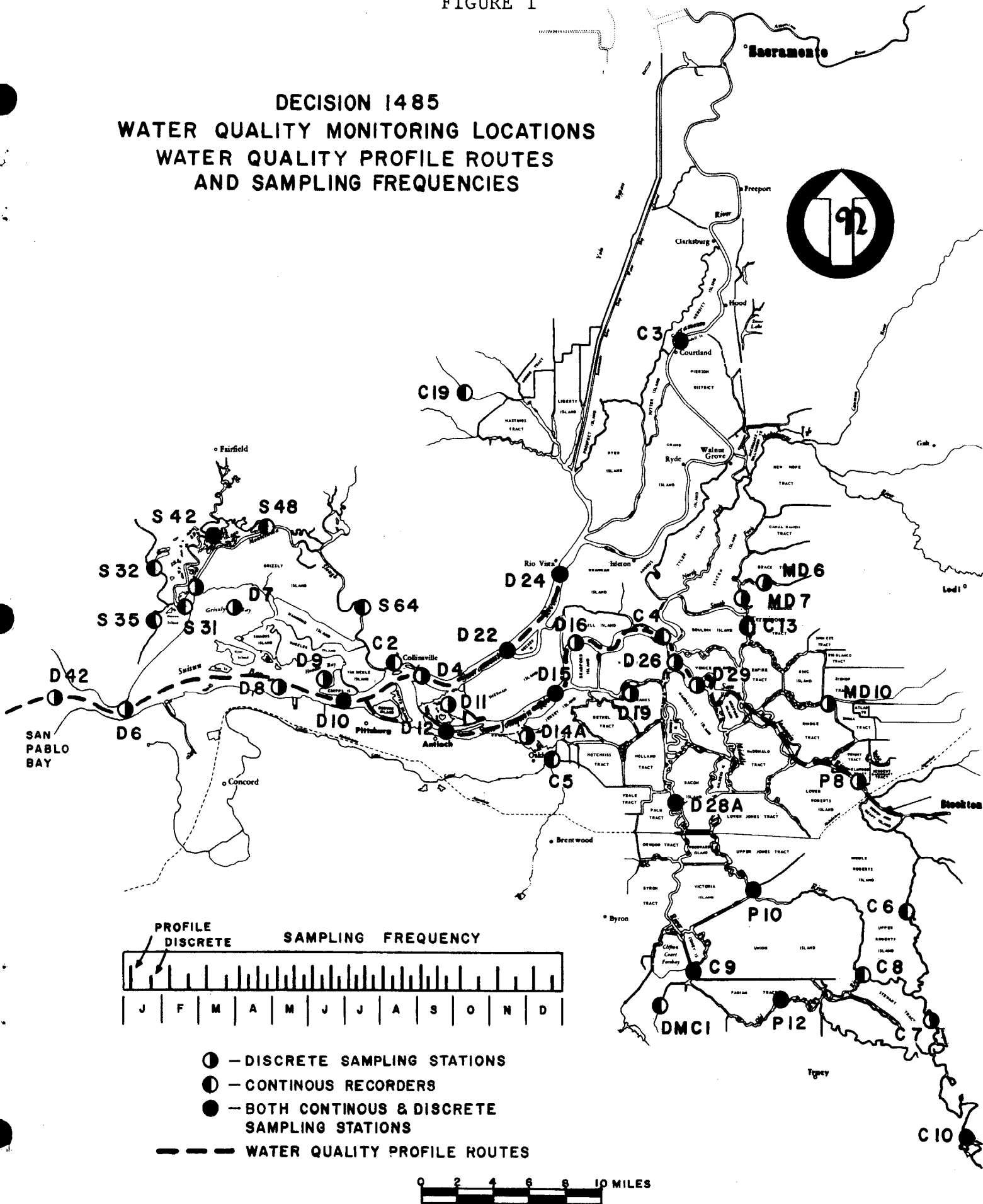
Sediment samples are to be taken in transects across the channel.

<sup>5/</sup> Benthic samples are to include identification and enumeration to the lowest taxonomic level possible. Samples to be taken in transects across the channel. Continuation of this aspect of the monitoring program will be reevaluated annually.



FIGURE I

DECISION 1485  
 WATER QUALITY MONITORING LOCATIONS  
 WATER QUALITY PROFILE ROUTES  
 AND SAMPLING FREQUENCIES



(BASE MAP PROVIDED BY DEPT. OF WATER RESOURCES)