

**ADDENDUM TO
THE AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF CALIFORNIA
FOR COORDINATED OPERATION OF THE
CENTRAL VALLEY PROJECT AND THE STATE WATER PROJECT**

This addendum to the 1986 Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and State Water Project (“Agreement”) is entered into by the United States and the State of California, this 12 day of December, 2018, in light of the following:

EXPLANATORY RECITALS

After the execution of the Agreement in 1986, the United States added facilities to the Central Valley Project, including the Red Bluff Pumping Plant and Fish Screen and the Delta Mendota Canal California Aqueduct Intertie.

After the execution of the Agreement in 1986, the State added facilities to the State Water Project, including the Barker Slough Pumping Plant and the Harvey O. Banks Pumping Plant 4-pump expansion.

In 1995 and 2006 the California State Water Resources Control Board established New Delta Standards.

Implementation of New Delta Standards imposed restrictions on the operations of the Central Valley Project and the State Water Project, including new restrictions on Delta exports by the United States and the State and new Delta outflow for the protection of aquatic species in the Delta.

After execution of the Agreement in 1986, biological opinions for the coordinated operations of the Central Valley Project and State Water Project were issued pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) that further restricted operations of the Projects and affected the ability of the United States and the State to achieve their respective water supply objectives.

The United States and the State have heretofore shared responsibility for meeting New Delta Standards and export capacity when exports were constrained by biological opinions for the coordinated operations of the Central Valley Project and the State Water Project through agreements reached between operators of the Central Valley Project and operators of the State Water Project.

The United States and the State have determined that periodic review pursuant to Article 14 of the Agreement would promote achieving their respective water supply objectives considering the New Delta Standards and the restrictions imposed under the Endangered Species Act.

NOW, THEREFORE, it is agreed:

1. Article 6(c) of the Agreement is amended to provide:

(c) Sharing of Responsibility for Meeting Sacramento Valley Inbasin use With Storage Withdrawals During Balanced Water Conditions: Each party's responsibility for making available storage withdrawals to meet Sacramento Valley inbasin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley inbasin use of storage withdrawals by the following percentages:

	<u>United States</u>	<u>State</u>
Wet Years	80%	20%
Above Normal Years	80%	20%
Below Normal Years	75%	25%
Dry Years	65%	35%
Critical Years	60%	40%

The water year classifications described in this Article 6(c) shall be based on the Sacramento Valley 40-30-30 Index as most recently published through the Department of Water Resources' Bulletin 120.

In a Dry or Critical Year following two Dry or Critical Years, the United States and State will meet to discuss additional changes to the percentage sharing of responsibility to meet inbasin use.

2. A new Article 10(i) is added to the Agreement to provide:

(i) Sharing of Applicable Export Capacity When Exports are Constrained: During periods when exports are constrained by non-discretionary requirements imposed on the Central Valley Project and the State Water Project South Delta exports by any federal or state agency, applicable export capacity shall be shared by the following percentages:

	<u>United States</u>	<u>State</u>
Balanced Water Conditions	65%	35%
Excess Water Conditions	60%	40%

3. Article 10(b) of the Agreement is amended to provide:

(b) The State will transport up to 195,000 acre-feet of Central Valley Project water through the California Aqueduct Reaches 1, 2A, and 2B no later than November 30 of each year by direct diversion or by rediversion of stored Central Valley Project water at times those diversions do not adversely affect the State Water Project purposes or do not conflict with State Water Project contract provisions. The State will provide available capacity at the Harvey O. Banks Pumping Plant ("Banks") to the Central Valley Project to divert or redivert 195,000 acre-feet when the diversion capacity at the south Delta intake to Clifton Court Forebay is in excess of 7,180 cubic feet per second during the July 1 through September 30, except when the Delta is in Excess Water Conditions during July 1 through September 30, the diversion capacity at the south Delta intake to Clifton Court Forebay in excess of 7,180 cubic feet per second shall be shared equally by the State and the United States. This Article does not alter the Cross-Valley Canal contractors' priority to pumping at the Harvey O. Banks Pumping Plant, as now stated in Revised Water Rights Decision 1641 (March 15, 2000).

4. Pursuant to Article 11, Exhibit A will be updated to conform with Delta standards established by the State Water Resources Control Board in the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

5. Exhibit B shall be updated based on a joint operations study of the amendments as agreed to in this addendum.

6. Article 14(a) of the Agreement is amended to provide:


(a) Prior to December 31 of the fifth full year following execution of this agreement, and before December 31 of each fifth year thereafter, or within 365 days of the implementation of new or revised requirements imposed jointly on Central Valley Project and State Water Project operations by any federal or state agency, or prior to initiation of operation of a new or significantly modified facility of the United States or the State or more frequently if so requested by either party, the United States and the State jointly shall review the operations of both projects. The parties shall (1) compare the relative success which each party has had in meeting its objectives, (2) review operation studies supporting this agreement, including, but not limited to, the assumptions contained therein, and (3) assess the influence of the factors and procedures of Article 6 in meeting each party's future objectives. The parties shall agree upon revisions, if any, of the factors and procedures in Article 6, Exhibits B and D, and the Operation Study used to develop Exhibit B.

7. A new Article 14(c) is added to the Agreement to provide:


(c) For any triggering event requiring review under Article 14 that occurs after December 15, 2018, either party may move directly to the Advisory Board process. The

Advisory Board, consisting of one member designated by each party and a third member chosen by both parties, shall report its unanimous recommendations to both parties at a date not to exceed 180 days from which the matter was referred to the Advisory Board and the parties shall amend this agreement and immediately begin to operate in accordance with the recommendation. If the Advisory Board fails to make unanimous recommendations with the 180 day period, either party may unilaterally terminate this agreement.

THE UNITED STATES OF AMERICA

By 
Commissioner, Bureau of Reclamation

THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF CALIFORNIA

By 
Director, Department of Water Resources

APPENDIX B

2018 Coordinated Operation Agreement Addendum

TABLE OF CONTENTS

Section	Page
INTRODUCTION	B-1
Description of the 1986 COA	B-1
Key Provisions in the 1986 COA	B-1
Sacramento Valley In-Basin Uses.....	B-1
Balanced and Excess Water Conditions.....	B-2
Key Provisions of the 2018 COA Addendum.....	B-2
Article 6(c)	B-2
Article 10(b)	B-3
Article 10(i)	B-3
Article 14(a).....	B-4
Article 14(c).....	B-4
CEQA Compliance for the 2018 COA Addendum.....	B-5
Purpose of this Discussion of Environmental Effects	B-5
ENVIRONMENTAL SETTING	B-5
CVP Facilities	B-5
SWP Facilities	B-6
Hydrological Conditions Affected by CVP and SWP Operations.....	B-6
Trinity River	B-7
Lower Klamath River	B-7
Sacramento River	B-7
CVP Facilities on the Sacramento River	B-8
Sacramento River Drainage Features	B-12
Feather River.....	B-12
American River from Folsom Lake to Sacramento River	B-15
Lower San Joaquin River	B-16
Delta and Suisun Marsh	B-17
Temporary Agricultural Barriers	B-18
SWP Barker Slough Pumping Plant	B-19
South Delta Water Diversions.....	B-19
CVP Jones Pumping Plant.....	B-19
SWP Clifton Court and Banks Pumping Plant	B-20
Joint CVP and SWP Facilities in Suisun Marsh	B-22
Suisun Marsh Salinity Control Gates.....	B-22
Roaring River Distribution System	B-23

Morrow Island Distribution System	B-23
South of Delta Facilities	B-23
Delta–Mendota Canal/California Aqueduct Intertie	B-23
San Luis Reservoir	B-23
Joint Point of Diversion	B-24
SWP and CVP Conveyance Facilities Downstream from the San Luis Reservoir	B-24
Water Supplies Used by Central Valley Project and State Water Project Water Users	B-24
Water Transfers	B-26
EFFECTS OF THE 2018 COA ADDENDUM	B-27
Analysis of Effects–Hydrology and Water Supply	B-27
Sacramento River Flows Downstream from the Feather River Confluence	B-27
Sacramento–San Joaquin Delta	B-27
San Luis Reservoir	B-29
SWP Contract Deliveries	B-30
Discussion	B-31
Analysis of Effects–Water Quality	B-31
Agriculture and Forestry Resources	B-33
Population and Housing	B-33
Conclusion	B-34
LONG-TERM OPERATION OF THE CALIFORNIA STATE WATER PROJECT	B-34
CEQA Legal Requirements	B-35
Old and Middle River Flows	B-36
Delta Outflow	B-40
CalSim II Modeling Output	B-42
REFERENCES	B-44

Tables

Table 1. Annual SWP Regional Deliveries, 2018 COA Addendum Compared to the 1986 COA	B-30
Table 2. Effects of the 2018 COA Addendum on Various Environmental Resource Topics	B-32
Table 3. Delta Outflow (TAF), 1986 COA vs. 2018 COA Addendum	B-35
Table 4. SWP and CVP Exports (TAF), 1986 COA vs. 2018 COA Addendum	B-35
Table 5. Old and Middle River Flows (CFS) in Late Spring, 1986 COA vs. 2018 COA Addendum	B-36

Figures

Figure 1. Shasta Lake, Long-Term Average Storage.....	B-9
Figure 2. Shasta Lake, Critically Dry Year Average Storage	B-9
Figure 3. Sacramento River below Keswick, Long-Term Average Flow	B-10
Figure 4. Sacramento River below Keswick, Critically Dry Year Average Flow	B-10
Figure 5. Sacramento River at Freeport, Long-Term Average Flow	B-11
Figure 6. Sacramento River at Freeport, Critically Dry Year Average Flow	B-11
Figure 7. Lake Oroville, Long-Term Average Storage.....	B-13
Figure 8. Lake Oroville, Critically Dry Year Average Storage	B-13
Figure 9. Feather River near Gridley, Long-Term Average Flow.....	B-14
Figure 10. Feather River near Gridley, Critically Dry Year Average Flow	B-14
Figure 11. Folsom Lake, Long-Term Average Storage	B-15
Figure 12. Folsom Lake, Critically Dry Year Average Storage	B-16
Figure 13. Total Exports, Long-Term Average Delivery	B-21
Figure 14. Total Exports, Dry Year Average Delivery	B-21
Figure 15. Total Exports, Critically Dry Year Average Delivery	B-22
Figure 16. Exceedance Plot of Total SWP Deliveries	B-25
Figure 17. Exceedance Plot of Total CVP Deliveries	B-26
Figure 18. Delta Outflow With 2018 COA Addendum Operations	B-28
Figure 19. SWP Water Storage in San Luis Reservoir with 2018 COA Operations	B-29
Figure 20. Monthly Average OMR Flow (CFS) for the 1986 COA and the 2018 COA Addendum	B-36
Figure 21. Exceedance Plot of OMR Flow (CFS) in January for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-37
Figure 22. Exceedance Plot of OMR Flow (CFS) in February for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-37
Figure 23. Exceedance Plot of OMR Flow (CFS) in March for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-38
Figure 24. Exceedance Plot of OMR Flow (CFS) in April for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-38
Figure 25. Exceedance Plot of OMR Flow (CFS) in May for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-39
Figure 26. Exceedance Plot of OMR Flow (CFS) in June for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-39
Figure 27. Monthly Average Delta Outflow Volume (TAF) for the 1986 COA and the 2018 COA Addendum.....	B-40
Figure 28. Exceedance Plot of Delta Outflow Volume (TAF) October to January for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios....	B-40
Figure 29. Exceedance Plot of Delta Outflow Volume (TAF) December to February for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios	B-41
Figure 30. Exceedance Plot of Delta Outflow Volume (TAF) March to June for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios.....	B-41
Figure 31. Exceedance Plot of Delta Outflow Volume (TAF) June to September for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios....	B-42

Acronyms and Abbreviations

AF/yr	acre-feet per year
Banks Pumping Plant	Harvey O. Banks Pumping Plant
BO	biological opinion
BSPP	Barker Slough Pumping Plant
CALFED	California Federal Bay–Delta
CCF	Clifton Court Forebay
CEQA	California Environmental Quality Act
cfs	cubic feet per second
COA	Agreement Between the United States of America and the State of California for Coordinated Operation of the Central Valley Project and the State Water Project” (Coordinated Operations Agreement)
CVP	Central Valley Project
D-893	SWRCB Water Rights Decision 893
D-1485	SWRCB Water Rights Decision 1485
D-1641	SWRCB Water Rights Decision 1641
DCC	Delta Cross Channel
Delta	Sacramento–San Joaquin Delta
DMC	Delta–Mendota Canal
DWR	California Department of Water Resources
ESA	Federal Endangered Species Act
FERC	Federal Energy Regulatory Commission
HOR	Head of Old River
HORB	Head of Old River Barrier
JPOD	Joint Point of Diversion
MAF	million acre-feet
MIDS	Morrow Island Distribution System
NBA	North Bay Aqueduct
NOE	Notice of Exemption
OMR	Old and Middle River
Reclamation	U.S. Bureau of Reclamation
RRDS	Roaring River Distribution System
SMPA	Suisun Marsh Preservation Agreement
SMSCG	Suisun Marsh Salinity Control Gates
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TBP	Temporary Barrier Project

Trinity River ROD	Trinity River Mainstem Fishery Restoration Record of Decision
USACE	U.S. Army Corps of Engineers
USDOI	U.S. Department of the Interior
WQCP	Water Quality Control Plan

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INTRODUCTION

The 1986 Coordinated Operation Agreement (COA)¹ is the agreement between the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) that governs how the State Water Project (SWP) and federal Central Valley Project (CVP) share water under their water rights and operate to meet specific water quality and outflow requirements in the Sacramento–San Joaquin Delta (Delta) (DWR and Reclamation 2018). It was based on negotiated principles of equitable sharing, arising from the requirement that their operations be coordinated and, as a matter of practical necessity, for two large projects to be able to operate together in a complex tidal estuary.

DESCRIPTION OF THE 1986 COA

Under the 1986 COA, the parties reduced the complexities of two large water projects in exporting water from the Delta to a simple agreed-on sharing of (1) rights to unstored water for export (55 percent CVP, 45 percent SWP), and (2) responsibility for providing stored water to meet Sacramento Valley in-basin uses under “balanced conditions” (75 percent CVP, 25 percent SWP), when both projects are operating to meet Delta standards. These provisions are contained in Article 6 of the agreement.

Many changes in conditions affecting operations and delivery capabilities of both projects have occurred since 1986, particularly in Delta water quality standards set by the SWRCB and based on Biological Opinions under the ESA, in CVP and SWP demand, and under the Central Valley Project Improvement Act of 1992. The COA was designed to respond to and work under a wide range of conditions except extreme drought; and it has been implemented successfully for more than 30 years. The COA also includes a provision for the sharing formulas to be updated to incorporate changing conditions. However, one item that the COA does not expressly address is sharing of export limits that have been imposed by the SWRCB and the federal ESA agencies since 1986. By informal agreement, the CVP and SWP have shared them equally.

KEY PROVISIONS IN THE 1986 COA

Several of the key provisions in the COA are described in the following descriptions.

SACRAMENTO VALLEY IN-BASIN USES

Sacramento Valley in-basin uses are defined in the COA as legal uses of water in the Sacramento Basin and the Delta. They include both diversion uses and regulatory uses, including SWRCB water quality and outflow standards.

¹ Agreement between the United States of America and the State of California for the Coordinated Operation of the Central Valley Project and the State Water Project.

BALANCED AND EXCESS WATER CONDITIONS

The COA defines balanced water conditions as periods when it is mutually agreed that releases from upstream reservoirs plus unregulated flows approximately equal the water supply needed to meet Sacramento Valley in-basin uses plus Delta exports.

Excess water conditions are periods when it is mutually agreed that releases from upstream reservoirs plus unregulated flows exceed Sacramento Valley in-basin uses plus Delta exports. Reclamation's Central Valley Operations Office and DWR's SWP Operations Control Office jointly decide when balanced or excess water conditions exist. During excess water conditions, when sufficient water is available to meet all beneficial needs, the CVP and SWP are not required to supplement the supply with additional releases from storage.

Sharing Export Facilities and Limits

Sharing Export Facilities and Limits Article 10 of the COA contains provisions for both projects to share each other's export facilities for facility outages; for the SWP to wheel water for the CVP to make up losses from SWRCB Water Rights Decision 1485 (D-1485) striped bass pumping limits, if the SWP would not be adversely affected; for an exchange of SWP wheeling for CVP water; and for a general provision for negotiating other such agreements. Although Article 6 addresses the sharing of obligations to meet in-basin uses, the COA contains no express provision for sharing pumping limits, which have been imposed since 1995 and shared 50-50 between the two projects by informal agreement.

KEY PROVISIONS OF THE 2018 COA ADDENDUM

DWR and Reclamation executed an Addendum to the COA on December 12, 2018 (COA Addendum). The COA Addendum amended four key elements of the COA:

- Article 6(c) in-basin uses
- Article 10(b) CVP use of Harvey O. Banks Pumping Plant (Banks Pumping Plant)
- Article 10(i) export restrictions
- Article 14(a) the periodic review

These elements were amended as follows.

ARTICLE 6(C)

Article 6(c) of the 1986 COA is amended to provide:

(c) Sharing of Responsibility for Meeting Sacramento Valley In-Basin Use with Storage Withdrawals During Balanced Water Conditions: Each party's responsibility for making available storage withdrawals to meet Sacramento Valley in-basin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley in-basin use of storage withdrawals by the following percentages:

	United States	State
Wet Years	80%	20%
Above-Normal Years	80%	20%
Below-Normal Years	75%	25%
Dry Years	65%	35%
Critical Years	60%	40%

The water year classifications described in this Article 6(c) shall be based on the Sacramento Valley 40-30-30 Index as most recently published through the Department of Water Resources' Bulletin 120.

In a Dry or Critical Year following two Dry or Critical Years, the United States and State will meet to discuss additional changes to the percentage sharing of responsibility to meet in-basin use.

ARTICLE 10(b)

Article 10(b) of the 1986 COA is amended to provide:

(b) The State will transport up to 195,000 acre-feet of Central Valley Project water through the California Aqueduct Reaches 1, 2A, and 2B no later than November 30 of each year by direct diversion or by redirection of stored Central Valley Project water at times those diversions do not adversely affect the State Water Project purposes or do not conflict with State Water Project contract provisions. The State will provide available capacity at the Harvey O. Banks Pumping Plant ("Banks") to the Central Valley Project to divert or redirect 195,000 acre-feet when the diversion capacity at the south Delta intake to Clifton Court Forebay is in excess of 7,180 cubic feet per second during the July 1 through September 30, except when the Delta is in Excess Water Conditions during July 1 through September 30, the diversion capacity at the south Delta intake to Clifton Court Forebay is in excess of 7,180 cubic feet per second shall be shared equally by the State and the United States This Article does not alter the Cross-Valley Canal contractors' priority to pumping at the Harvey O. Banks Pumping Plant, as now stated in Revised Water Rights Decision.

ARTICLE 10(i)

Article 10(i) is added to the 1986 COA to provide:

(i) Sharing of Applicable Export Capacity When Exports are Constrained. During periods when exports are constrained by non-discretionary requirements imposed on the SWP and CVP south Delta exports by any federal or state agency, applicable export capacity shall be shared by the following percentages:

	United States	State
Balanced Water Condition	65%	35%
Excess Water Condition	60%	40%

ARTICLE 14(a)

Article 14(a) of the 1986 COA is amended to provide:

(a) Prior to December 31 of the fifth full year following execution of this agreement, and before December 31 of each fifth year thereafter, or within 365 days of the implementation of new or revised requirements imposed jointly on Central Valley Project and State Water Project operations by any federal or state agency, or prior to initiation of operation of a new or significantly modified facility of the United States or the State or more frequently if so requested by either party, the United States and the State jointly shall review the operations of both projects. The parties shall (1) compare the relative success which each party has had in meeting its objectives, (2) review operation studies supporting this agreement, including, but not limited to, the assumptions contained therein, and (3) assess the influence of the factors and procedures of Article 6 in meeting each party's future objectives. The parties shall agree upon revisions, if any, of the factors and procedures in Article 6, Exhibits Band D, and the Operation Study used to develop Exhibit B.

In addition to the amended articles presented above, pursuant to Article 11, COA Exhibit A also was updated to conform with Delta standards, established by the SWRCB in the 1995 Water Quality Control Plan (WQCP) for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary, as implemented by SWRCB Water Rights Decision 1641 (D-1641). COA Exhibit B also was updated, based on a joint operations study of the amendments in the 2018 COA Addendum.

ARTICLE 14(c)

A new Article 14(c) is added to the Agreement to provide:

(c) Prior to December 31 of the fifth full year following execution of this agreement, and before December 31 of each fifth year thereafter, or within 365 days of the implementation of new or revised requirements imposed jointly on Central Valley Project and State Water Project operations by any federal or state agency, or prior to initiation of operation of a new or significantly modified facility of the United States or the State or more frequently if so requested by either party, the United States and the State jointly shall review the operations of both projects. The parties shall (1) compare the relative success which each party has had in meeting its objectives, (2) review operation studies supporting this agreement, including, but not limited to, the assumptions contained therein, and (3) assess the influence of the factors and procedures of Article 6 in meeting each party's future objectives. The parties shall agree upon revisions, if any, of the

factors and procedures in Article 6, Exhibits B and D, and the Operation Study used to develop Exhibit B.

CEQA COMPLIANCE FOR THE 2018 COA ADDENDUM

As part of approving the 2018 COA Addendum, DWR completed and filed a Notice of Exemption (NOE) for the ongoing operations of the SWP, in accordance with the California Environmental Quality Act (CEQA). The NOE presented the following conclusions.

Projects that were approved and implemented before enactment of CEQA on November 23, 1970 are exempt from the act's requirements. The SWP was constructed in relevant part and was operational prior to November 23, 1970, and the operational scope of SWP activities was broad, providing DWR with wide discretion to determine how to deliver water to the SWP service area, including how to operate pumps, manage carryover storage, and coordinate with Reclamation's CVP operations.

DWR will continue to operate the SWP to deliver water within its service area, following execution of the COA addendum. The 2018 COA Addendum shifted responsibilities for meeting CVP and SWP obligations; these adjustments are within the original scope of the SWP. In other words, the provisions in the 2018 COA Addendum are a normal, intrinsic part of ongoing operations of the SWP.

Furthermore, neither exception for the exemption for ongoing project applies (see Sections 15261[a][1] and [2] of the State CEQA Guidelines). SWP operations have been ongoing for several decades, and a great amount of money has been spent to carry out these operations. Furthermore, execution of the 2018 COA Addendum was not to modify SWP operations so as to result in a new significant effect on the environment.

PURPOSE OF THIS DISCUSSION OF ENVIRONMENTAL EFFECTS

The Appendix considers whether implementation of the 2018 COA Addendum affected flows entering and exiting the Delta by assessing the operational and hydrologic conditions that occurred under the 1986 COA and the 2018 COA Addendum. This assessment was done for the purpose of determining whether the baseline conditions, as described in the EIR, sufficiently represent Delta conditions before execution of the 2018 COA Addendum as well as the existing physical conditions in the Delta. This Appendix also discusses how the 2018 COA Addendum relates to a wide range of resource areas for public information purposes only.

ENVIRONMENTAL SETTING

The area considered in this analysis is defined by CVP facilities and service areas, and by SWP facilities and service areas, as shown in Figure 1-1 in the DEIR.

CVP FACILITIES

The CVP facilities affected by the 2018 COA Addendum are reservoirs on the Trinity, Sacramento, and American rivers and associated distribution facilities; the Mendota Pool on the San Joaquin River; the Jones Pumping Plant; the Delta–Mendota Canal (DMC); the San Luis Reservoir; the San Felipe Division; and the CVP service area that is served with water from these facilities.

Stored water in CVP reservoirs north of the Delta is provided to the Delta for delivery through the Contra Costa Canal and Jones Pumping Plant. The Contra Costa Canal originates at Rock Slough near Oakley and extends to the Martinez Reservoir. Water from the Contra Costa Canal is delivered to the Contra Costa Water District.

The Jones Pumping Plant in the south Delta lifts the water into the DMC, delivering water to CVP contractors who divert water directly from the canal, and to San Joaquin River exchange contractors who also divert directly from the San Joaquin River and the Mendota Pool. In addition, CVP water is conveyed to the San Luis Reservoir for storage and subsequent delivery to CVP contractors through the San Luis Canal and the DMC. From the San Luis Reservoir, water is conveyed through the Pacheco Tunnel to CVP contractors in Santa Clara and San Benito counties.

SWP FACILITIES

The SWP facilities that were affected by the COA Addendum included Lake Oroville on the Feather River; rivers, streams, canals, and aqueducts used to convey SWP water; and the SWP service area that relies on water from these reservoirs, specifically: Lake Oroville on the Feather River; the Banks Pumping Plant in the south Delta; the North Bay Aqueduct; the South Bay Aqueduct; the California Aqueduct; SWP reservoirs, including Lake Del Valle, the San Luis Reservoir, and Pyramid, Castaic, Silverwood, and Perris lakes; the SWP service areas in the Sacramento and San Joaquin valleys, the San Francisco Bay Area, the Central Coast region, and the Southern California region.

HYDROLOGICAL CONDITIONS AFFECTED BY CVP AND SWP OPERATIONS

This discussion describes the surface water resources and water supplies managed by the SWP and CVP, and potential changes to surface water resources that occurred because of implementation of the 2018 COA Addendum. Changes to SWP and CVP operations may result in changes to surface water hydrology on the Trinity River, on the Lower Klamath River, and the the Central Valley region. Some rivers in these regions are regulated by SWP facilities, others by CVP facilities, while some others are used to convey SWP and/or CVP water supplies.

Tributaries to the Sacramento and San Joaquin rivers not affected by SWP and CVP operations also are briefly discussed, as they contribute to conditions in the Delta. Baseline CalSim II modeling results of flow conditions are provided for reservoirs and rivers that are affected by SWP and/or CVP operations.

For the San Francisco Bay Area, Central Coast, San Joaquin Valley, and Southern California water service areas, surface water streams generally are not used to convey SWP and CVP water supplies. The streams that are downstream from SWP and CVP water supply reservoirs generally receive either reservoir overflows in storm conditions or minimum instream flows related to water rights and/or aquatic resources beneficial uses. After the minimum instream flow requirements are fulfilled, the remaining volumes of water are provided to contracted water users or others. Changes in SWP and CVP water operations will not affect the need to meet minimum instream flows or high flows during storm conditions.

TRINITY RIVER

For this analysis, the Trinity River includes the reach from Trinity Lake to the confluence with the Klamath River. The Trinity River flows about 112 miles, from Lewiston Dam to the Klamath River through Trinity County, Humboldt County, and the Hoopa Indian Reservation. A large portion of flows that enter Trinity and Lewiston lakes is exported to the Sacramento River watershed through CVP facilities. In December 2000, the U.S. Department of the Interior (USDOI), adopted the Trinity River Mainstem Fishery Restoration Record of Decision (Trinity River ROD), which restored Trinity River flow and habitat to produce a healthy, functioning, alluvial river system. Variable annual instream flow releases from Lewiston Dam range from 368,600 acre-feet per year (AF/yr) in critically dry years to 815,000 AF/yr in extremely wet years.

Trinity Lake storage varies in accordance with upstream hydrology, downstream water demands, and instream flow requirements. Reclamation maintains at least 600 thousand acre-feet (TAF) in the Trinity Reservoir, except during the 10 to 15 percent of the years when Shasta Lake also is drawn down.

The Lewiston Reservoir water storage volume is more consistent throughout the year because this afterbay is used to regulate flow releases to the Trinity Powerplant, Clear Creek Tunnel, Whiskeytown Lake, and other downstream uses.

LOWER KLAMATH RIVER

The Lower Klamath River flows 43.5 miles from the confluence with the Trinity River to the Pacific Ocean (USFWS et al. 1999). Downstream from the Trinity River confluence, the Klamath River flows through Humboldt County, Del Norte County, the Hoopa Indian Reservation, the Yurok Indian Reservation, and the Resighini Indian Reservation (USDOI and CDFG 2012).

No dams are on the Klamath River downstream from the confluence with the Trinity River. About 85 percent of the flows in the Lower Klamath River occur during winter months (USDOI and CDFG 2012). The Klamath River estuary extends from about 5 miles upstream from the Pacific Ocean (USDOI and CDFG 2012). This area generally is influenced by tidal action, where salt water can intrude up to 4 miles from the coastline, when tides are high and Klamath River flows are low.

SACRAMENTO RIVER

The Sacramento River flows about 351 miles, from north near Mount Shasta to the confluence with the San Joaquin River at Collinsville in the west Delta (Reclamation 2013a). The Sacramento River receives contributing flows from numerous major and minor streams and rivers that drain the basin. The Sacramento River also receives imported flows from the Trinity River watershed, as previously discussed. Waterways in the Sacramento Valley that could be affected by SWP and CVP long-term operations include the following:

- Clear Creek, from Whiskeytown Reservoir to its confluence with the Sacramento River
- Sacramento River, from Keswick Dam to the confluence with the San Joaquin River in the Delta
- Feather River, downstream from Oroville Reservoir to the confluence with the Sacramento River
- Yuba River, from New Bullards Bar Reservoir to the confluence with the Feather River

- Bear River, from Camp Far West Reservoir to the confluence with the Feather River
- American River, from Nimbus Dam to the confluence with the Sacramento River

Other waterways entering the Sacramento River between Red Bluff and the Feather River—including Antelope, Elder, Mill, Thomes, Deer, Stony, Big Chico, and Butte creeks—would not be affected by long-term SWP or CVP operations. No major storage or diversion structures have been constructed on Antelope, Elder, Mill, and Thomes creeks, although several small seasonal diversions have been established for irrigation, domestic use, and hydroelectric power generation (Reclamation 1997).

The East Park and Stony Gorge reservoirs store water for irrigation deliveries and are operated by Reclamation as part of the Orland Project, which is independent of the SWP and CVP. Black Butte Dam is operated by the U.S. Army Corps of Engineers (USACE) for flood control and irrigation supply. These actions are coordinated with the CVP.

Flows from other tributaries to the Sacramento, Cosumnes and Mokelumne rivers in the Sacramento Valley can affect SWP and CVP operations, particularly by contributing additional flows to the Delta. However, flows in these rivers would not be affected by changes in SWP or CVP operations. Therefore, hydrologic conditions on these water bodies are not described further in this document.

CVP FACILITIES ON THE SACRAMENTO RIVER

Whiskeytown Dam, a CVP facility, is about 16.5 miles downstream from the headwaters (Reclamation 1997). Whiskeytown Lake, which is formed by the dam, has a storage capacity of 0.241 million acre-feet (MAF) and regulates local runoff from Clear Creek and water conveyed from the Trinity River watershed.

Whiskeytown Lake storage is relatively constant because of agreements between Reclamation and the National Park Service to maintain certain winter and summer lake elevations for recreation.

Whiskeytown Lake outflow variations were greater prior to 2006, when Trinity River restoration flows were implemented, reducing the amount of water available for conveyance to CVP water users.

Shasta and Keswick dams are on the Sacramento River at about River Miles 308 and 299, respectively. Shasta Lake, with a maximum storage capacity of 4.552 MAF, is formed by Shasta Dam. Water flows from Shasta Lake along the Sacramento River into the 0.0238 MAF Keswick Reservoir, which operates as an afterbay for Shasta Lake hydropower operations. A temperature control device at Shasta Dam was constructed between 1996 and 1998, to enable release of cold water without power bypass to the Sacramento River downstream from Keswick Reservoir.

Baseline long-term and critically dry-year average water storage volumes for Shasta Lake are shown in Figures 1 and 2. Shasta Lake storage varies in accordance with upstream hydrology, downstream water demands, and instream flow requirements.

Keswick Reservoir water storage volume is relatively stable because it regulates flow and is not designed to provide long-term water storage. Water released from Shasta Dam travels approximately 245 miles over 3 to 4 days to the northern Delta boundary near Freeport (Reclamation 2013a). The upper reach of the Sacramento River flows approximately 60 miles from Keswick Dam to Red Bluff. The

middle reach of the Sacramento River flows approximately 160 miles from Red Bluff to the confluence with the Feather River. The lower reach of the Sacramento River flows for approximately 20 river miles between the confluence with the Feather River and Freeport, immediately downstream from the confluence with the American River. Baseline long-term and critically dry-year average flows in the Sacramento River below Keswick and at Freeport (downstream from the American River confluence and near the northern boundary of the Delta) are shown in Figures 3 through 6. Flows in the Sacramento River generally peak during winter and spring storm events.

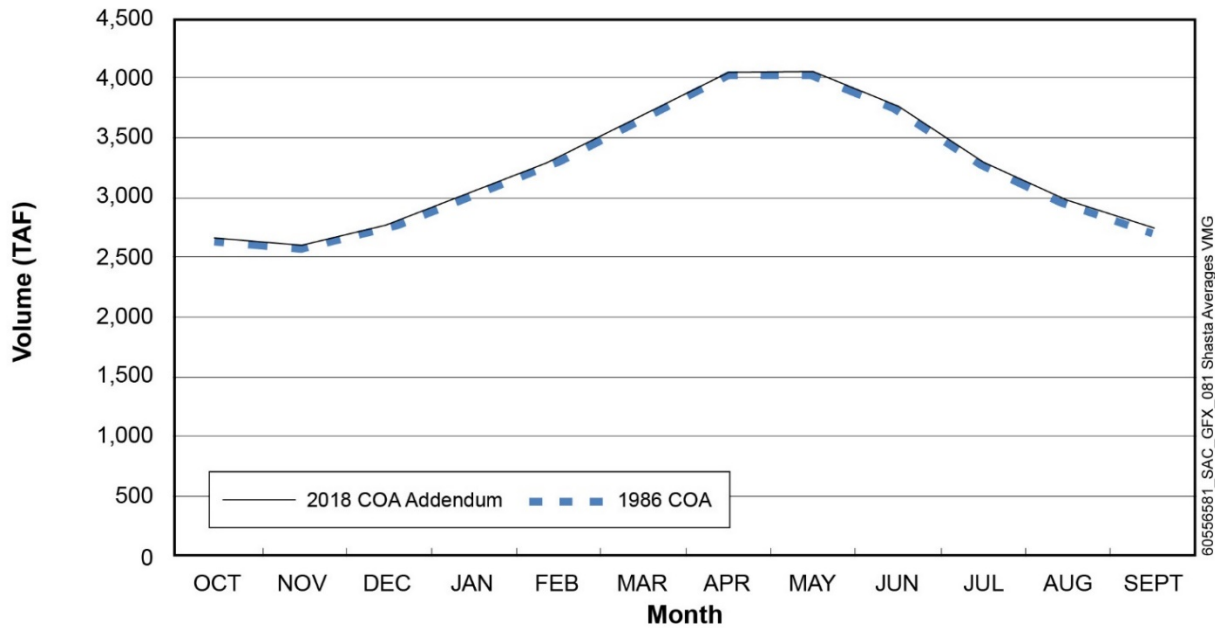


Figure 1. Shasta Lake, Long-Term Average Storage

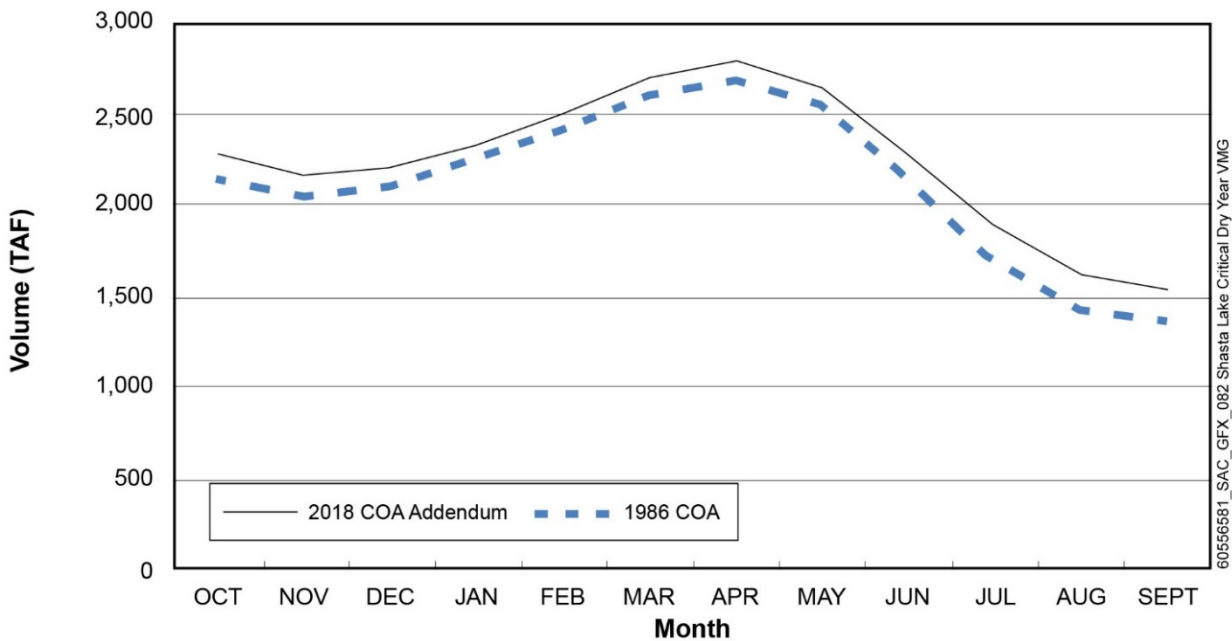


Figure 2. Shasta Lake, Critically Dry Year Average Storage

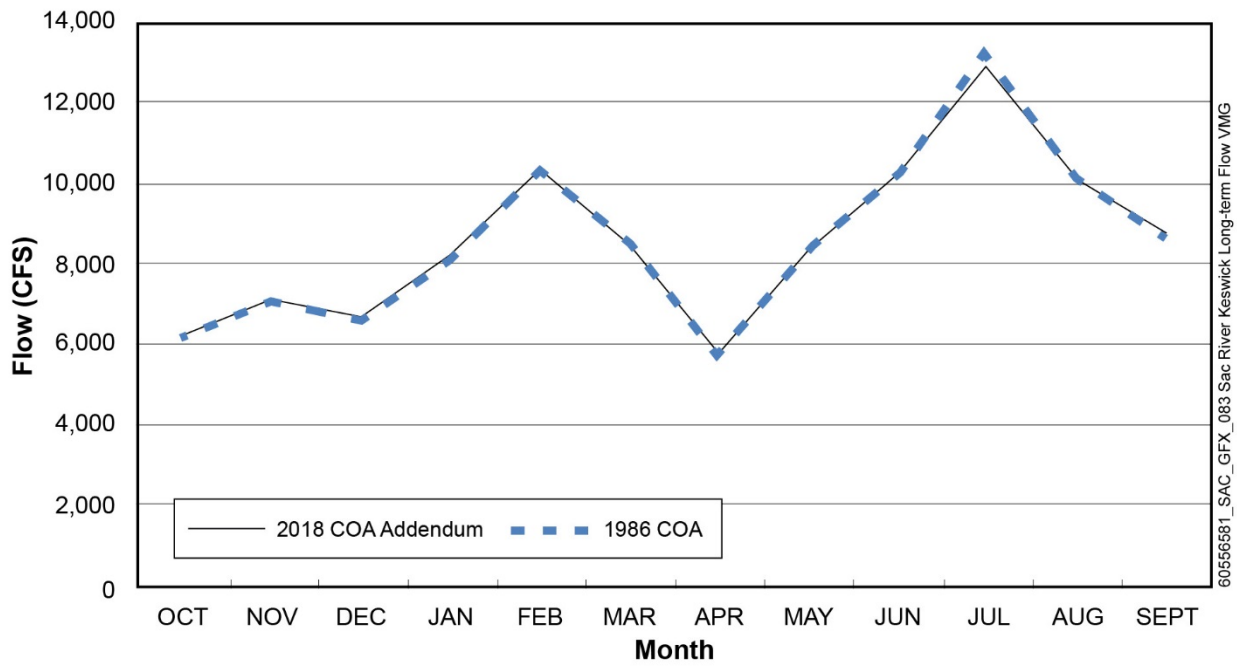


Figure 3. Sacramento River below Keswick, Long-Term Average Flow

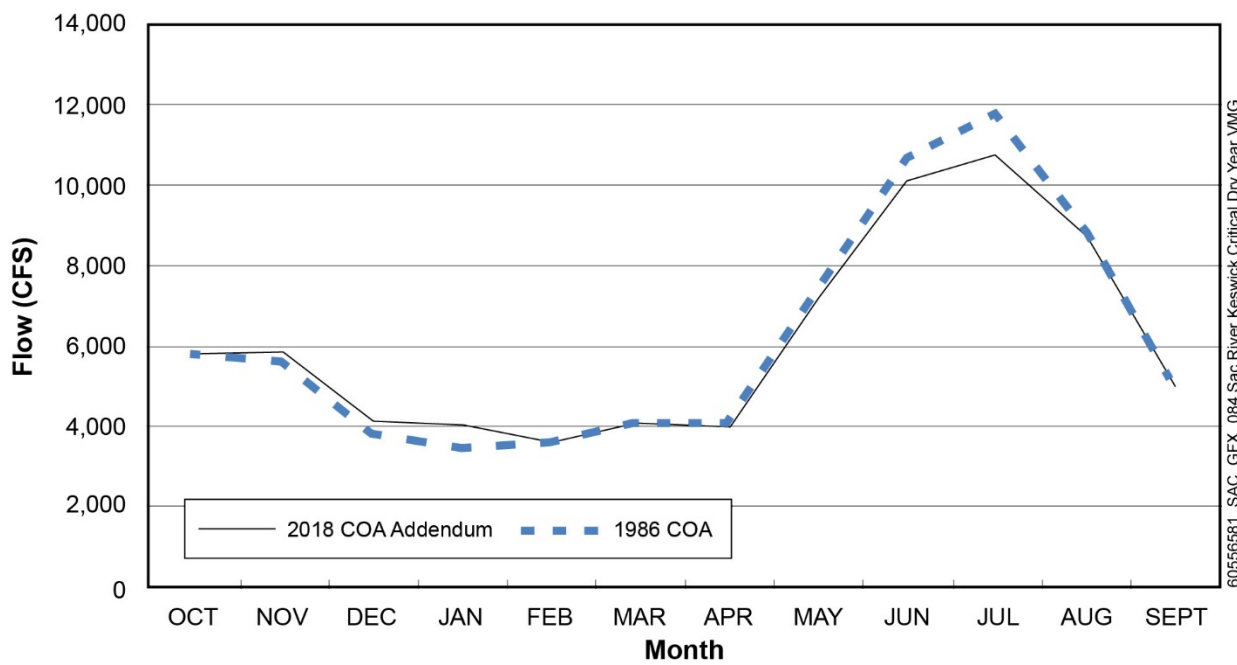


Figure 4. Sacramento River below Keswick, Critically Dry Year Average Flow

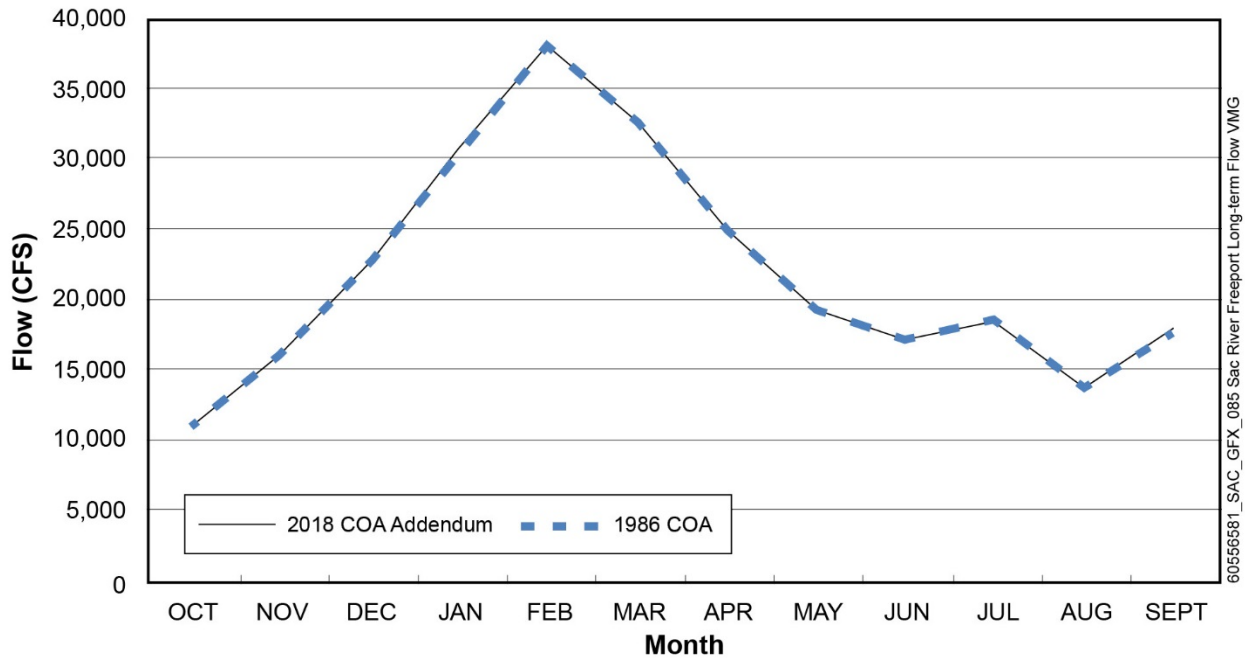


Figure 5. Sacramento River at Freeport, Long-Term Average Flow

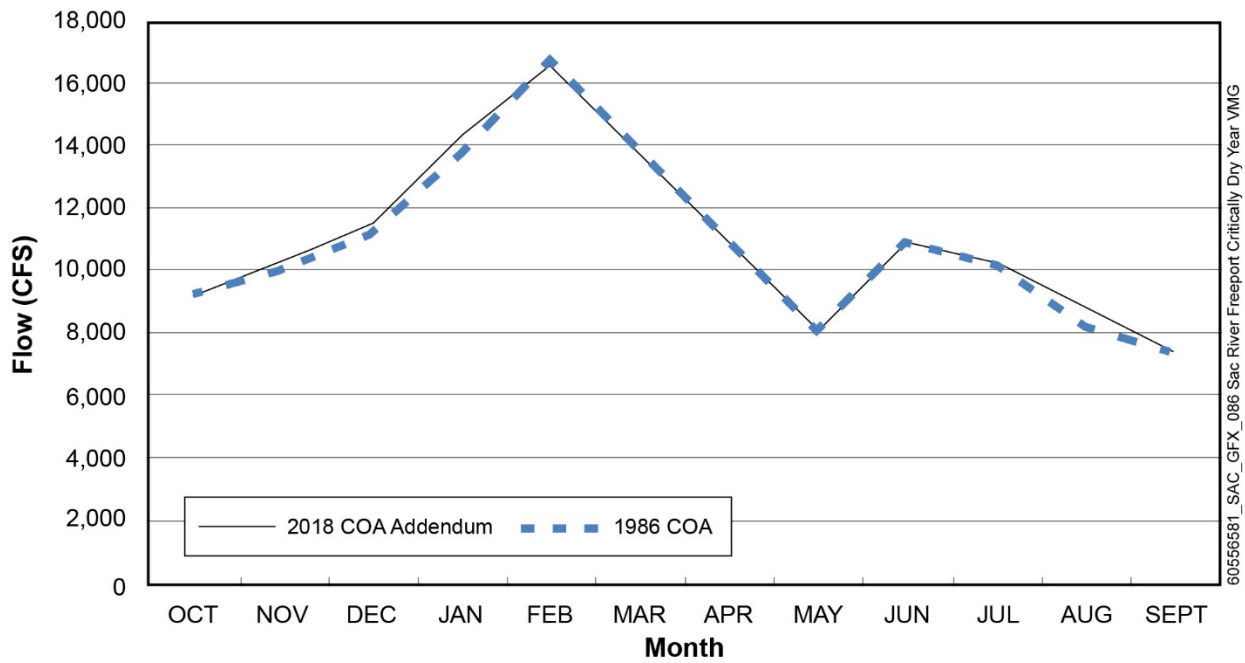


Figure 6. Sacramento River at Freeport, Critically Dry Year Average Flow

SACRAMENTO RIVER DRAINAGE FEATURES

The Sutter Basin overflow (Sutter Bypass), east of the Sacramento River and downstream from the Sutter Buttes, conveys floodwaters from the Butte Basin Overflow Area, Butte Creek, Wadsworth Canal, Reclamation Districts 1660 and 1500 drainage plants, State drainage plants, and Tisdale Weir to the confluence of the Sacramento and Feather rivers.

The Colusa Basin Drain provides drainage for a large portion of the irrigated lands on the western side of the Sacramento Valley in Glenn, Colusa, and Yolo counties; and conveys irrigation water to lands in this area. Water from the Colusa Basin Drain is discharged to the Sacramento River through the Knights Landing Outfall, a gravity flow structure, and prevents the Sacramento River from flowing into the Colusa Basin.

Flows from the Sacramento River, Feather River, Sutter Bypass, and Natomas Cross Canal join upstream from Verona. When the Sacramento River flows exceed 62,000 cubic feet per second (cfs), a large portion of the river flows over the Fremont Weir into the Yolo Bypass, a natural overflow area west of the Sacramento River. The Sacramento River Flood Control Project modified the basin, to allow Sacramento River flood flows to enter the Yolo Bypass over the Fremont and Sacramento weirs. The Yolo Bypass conveys floodwaters around the Sacramento metropolitan area and reconnects to the Sacramento River at Rio Vista. Tributaries entering the Yolo Bypass include flows from the Cache Creek Detention Basin, Willow Slough, and Putah Creek. Flows also enter the Yolo Bypass from the Colusa Basin, including flows from the Colusa Basin Drain through the Knights Landing Ridge Cut.

FEATHER RIVER

The Feather River is the largest tributary to the Sacramento River downstream from Shasta Dam (Reclamation 1997; DWR 2007). The Feather River enters the Sacramento River at Verona. At this location, the total flow of the Feather River includes water from the Yuba and Bear rivers.

Lake Oroville, the primary SWP water storage facility with a capacity of 3,500 TAF, is on the Feather River. Lake Oroville stores winter and spring runoff, which is released into the Feather River to meet SWP water demands. It also provides hydropower pump-back capability, to allow on-peak electrical generation and 750 TAF of flood control storage. Lake Oroville also provides water for recreation, freshwater releases to control salinity intrusion in the Delta, and water for fish and wildlife protection. Long-term and critically dry-year average water storage volumes for Lake Oroville are shown in Figures 7 and 8.

A maximum 17,400 cfs can be released from Lake Oroville through the Edward Hyatt Powerplant and Thermalito Power Canal into the Thermalito Diversion Pool. Water continues through the Thermalito Diversion Pool into the Feather River Fish Hatchery and the 11,768 AF Thermalito Forebay that was formed by the Thermalito Diversion Dam. Water then is released from the Thermalito Forebay through the Thermalito Powerplant into the Thermalito Afterbay and the low-flow channel of the Feather River. Water from the Thermalito Afterbay flows into the Feather River. Long-term and critically dry-year average flows in the Feather River are shown in Figures 9 and 10.

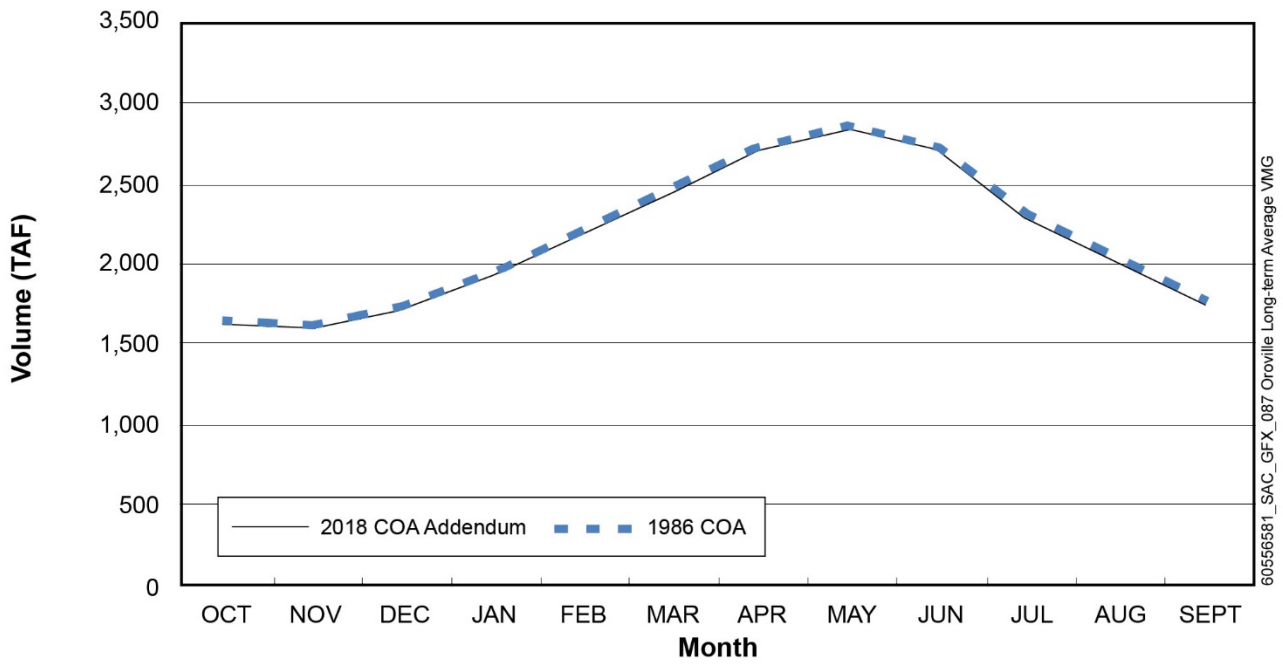


Figure 7. Lake Oroville, Long-Term Average Storage

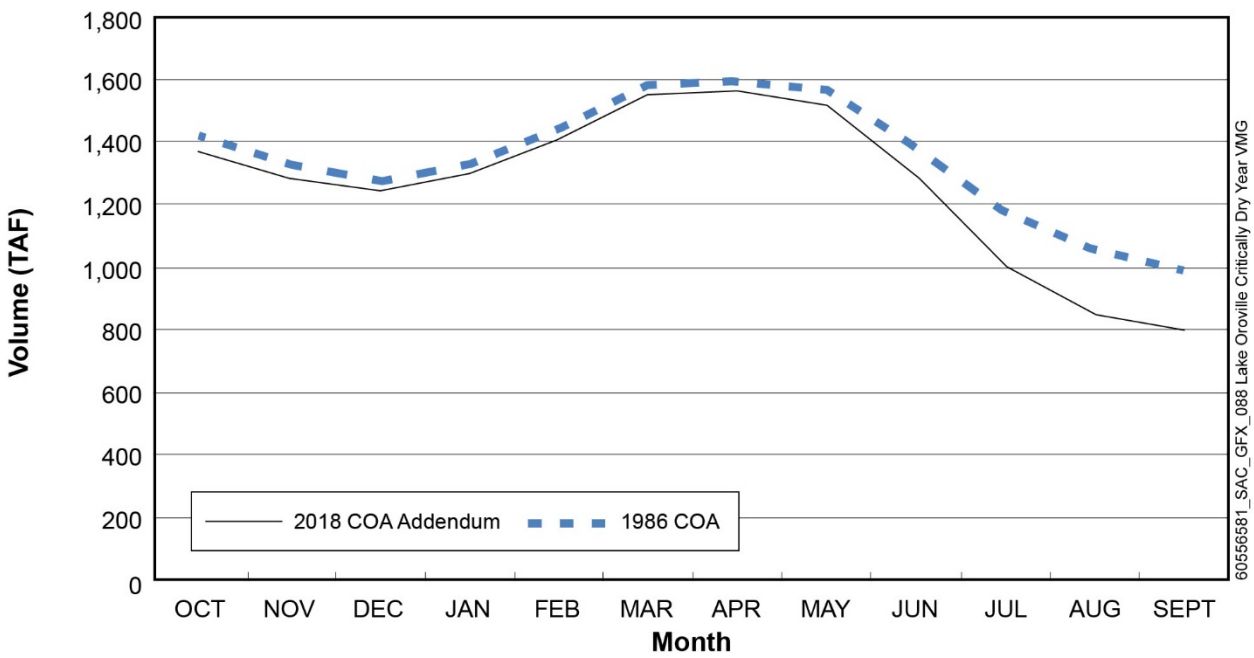


Figure 8. Lake Oroville, Critically Dry Year Average Storage

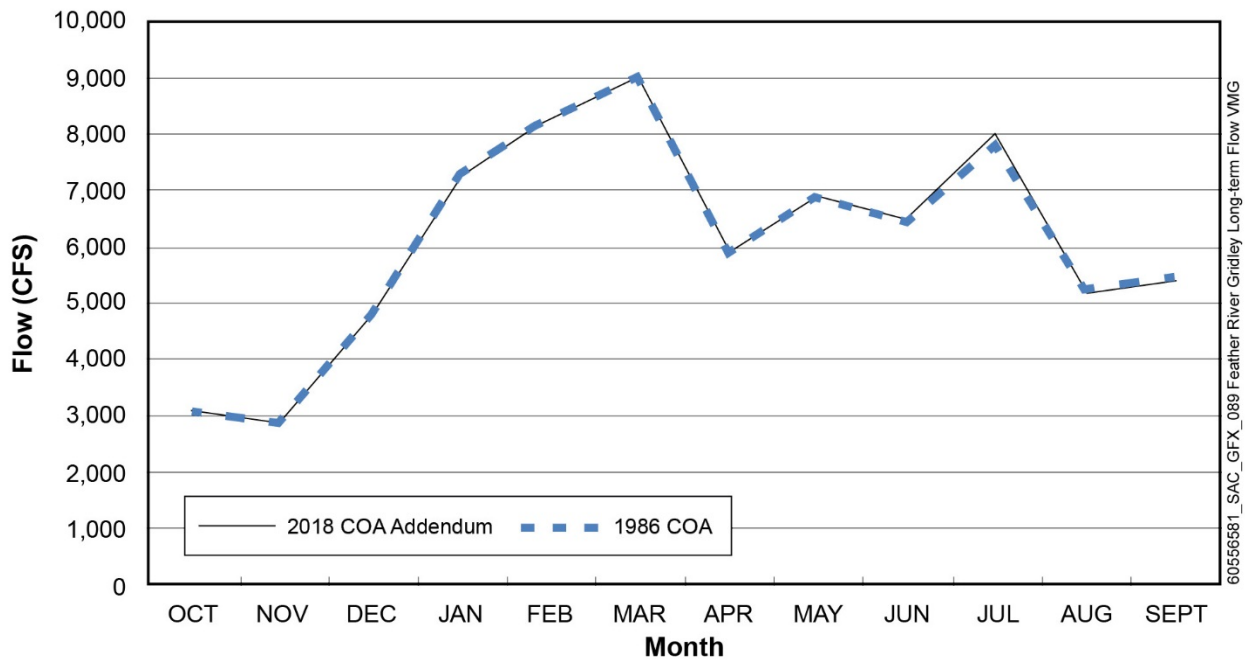


Figure 9. Feather River near Gridley, Long-Term Average Flow

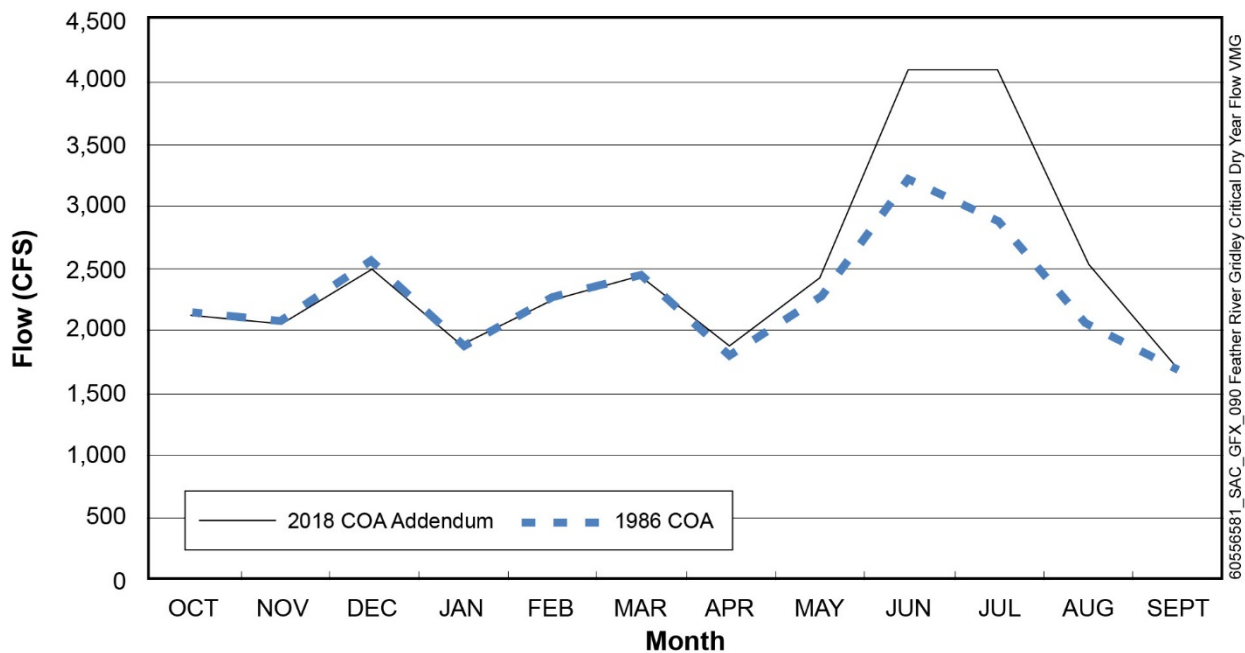


Figure 10. Feather River near Gridley, Critically Dry Year Average Flow

Operations of Oroville Dam are performed in accordance with a Federal Energy Regulatory Commission (FERC) license, Project No. 2100, which defines maximum allowable Feather River low-flow channel ramp-down release requirements to prevent rapid reductions in water levels that potentially could cause redd dewatering and stranding of juvenile salmonids and other aquatic organisms. Water releases from Lake Oroville also are affected by temperature criteria (Reclamation 2015).

AMERICAN RIVER FROM FOLSOM LAKE TO SACRAMENTO RIVER

Folsom Lake, a CVP facility formed by Folsom Dam, is 7 miles upstream from the CVP’s Nimbus Dam (Reclamation et al. 2006). Folsom Lake has a capacity of 967 TAF. The American River flows 23 miles between Nimbus Dam and the confluence with the Sacramento River. The American River contributes about 15 percent of the flow in the lower Sacramento River.

Nimbus Dam creates Lake Natoma, a forebay built to re-regulate flows of the American River and direct water into the CVP’s Folsom South Canal. Releases from Nimbus Dam to the American River pass through the Nimbus Powerplant, when releases are less than 5,000 cfs or the spillway gates for higher flows.

Historical water storage volumes for Folsom Lake for long-term and critically dry-year averages are shown in Figures 11 and 12.

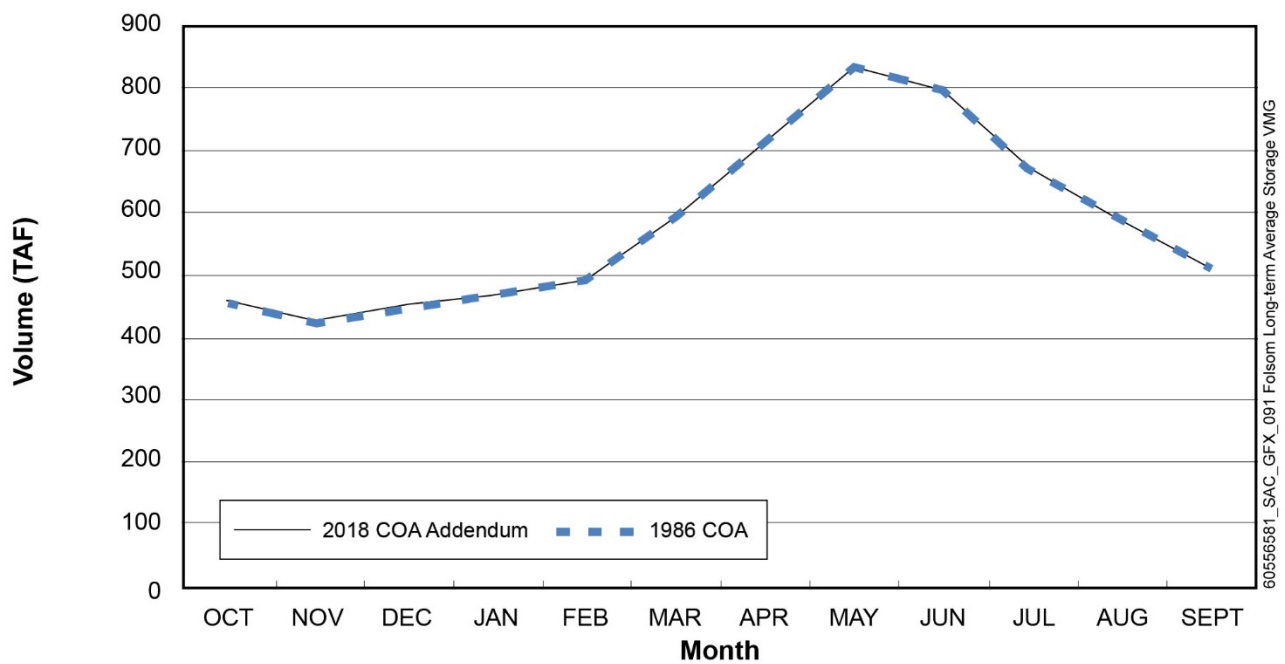


Figure 11. Folsom Lake, Long-Term Average Storage

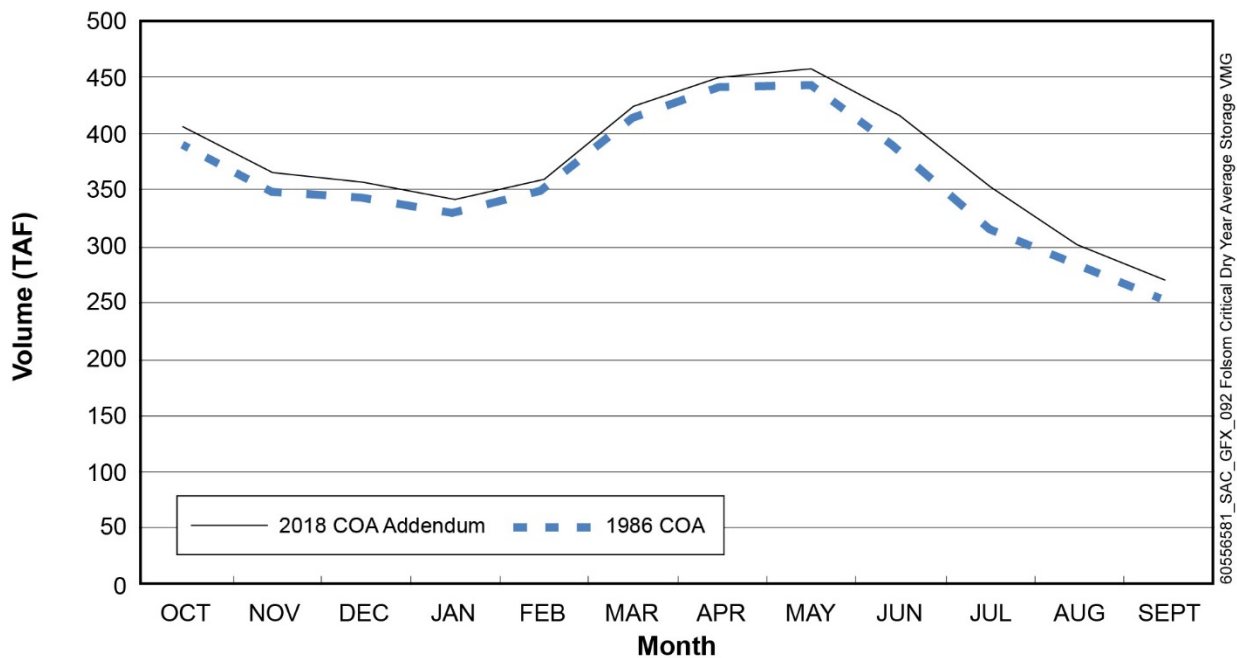


Figure 12. Folsom Lake, Critically Dry Year Average Storage

Flow patterns in the American River, downstream from Lake Natoma, are controlled by the coordinated operations of the SWP and CVP. Flows are managed to comply with American River instream flow requirements and Delta outflow and salinity requirements, as well as to contribute to CVP exports.

The minimum instream flow requirements of the lower American River are defined by SWRCB Water Rights Decision 893 (D-893), which states that releases ordinarily should not fall below 250 cfs between January 1 and September 15 or below 500 cfs at other times.

D-893 minimum flows rarely are the controlling requirements affecting CVP operations at Folsom Lake. Folsom Lake releases primarily are controlled during significant portions of a water year by flood control requirements or in coordination with other SWP and CVP releases, to meet CVP water supply and Delta water quality objectives. Folsom Lake releases generally exceed the D-893 minimum instream flow requirements, in all but the driest of conditions.

Reclamation operates Folsom Lake in compliance with Delta salinity and flow objectives, established to improve fisheries conditions. Weather conditions, combined with tidal action and local accretions from runoff and agricultural return flows, can affect Delta salinity conditions. Changes in salinity can require increases in spring Delta inflow to achieve required salinity standards. In accordance with federal and State regulatory requirements, the SWP and CVP frequently are required to release water from upstream reservoirs to maintain Delta water quality. As Folsom Lake is closer to the Delta than Lake Oroville and Shasta Lake, it generally is first to be used to meet Delta requirements.

LOWER SAN JOAQUIN RIVER

The Lower San Joaquin River flows about 100 miles from Friant Dam to the Delta. Flows in the San Joaquin River are regulated by the CVP’s Friant Dam, which forms Millerton Lake. Millerton Lake has a

capacity of 520 TAF. Flows downstream from Friant Dam are influenced by flows from tributary rivers and streams, including CVP operations at the New Melones Reservoir on the Stanislaus River. Flows on the San Joaquin River have changed since expiration of the Vernalis Adaptive Management Plan in 2012.

Operations of Millerton Lake and the CVP's Friant Division would not be modified by changes in SWP and CVP operations. Therefore, Millerton Lake and Friant Division are not addressed further in this document.

Two major tributaries, the Tuolumne and Stanislaus rivers, join the San Joaquin River between the confluence with the Merced River and Vernalis, at the southeastern boundary of the Delta. The flows in this reach are influenced by flow and water quality requirements at Vernalis as well as by discharges from the upstream reach and the two major tributaries.

The operating criteria for the New Melones Reservoir include limits set by water rights requirements, flood control operations, contractual obligations, federal requirements under the ESA, and the Central Valley Project Improvement Act. Reclamation operates the New Melones Reservoir to meet senior water rights and in-basin demands.

Required releases from the New Melones Reservoir include flows to meet flow and water quality requirements that are included in D-1641. This includes dissolved oxygen requirements in the Lower Stanislaus River, in accordance with the Central Valley Regional Water Quality Control Board's Basin Plan; minimum flow requirements, and the total dissolved solids requirement in the Lower San Joaquin River at Vernalis, in accordance with D-1641.

DELTA AND SUISUN MARSH

The Delta and Suisun Marsh encompass about 1,315 square miles and convey about 40 percent of water draining from the state (DWR 2013a). The Delta and Suisun Marsh are a complex of channels and islands at the confluence of the Sacramento and San Joaquin rivers. The SWP and CVP use the Delta to convey water to State and federal pumps in the south Delta.

Inflows to the Delta occur primarily from the Sacramento River system, the San Joaquin River, and other eastside tributaries, including the Mokelumne, Calaveras, and Cosumnes rivers. About 77 percent of water enters the Delta from the Sacramento River, about 15 percent enters from the San Joaquin River, and about 8 percent enters from the eastside tributaries (DWR 1994). The daily, seasonal, and year-to-year differences in freshwater flows from the Sacramento and San Joaquin rivers and other Delta tributaries affect the Delta's water quality, particularly with regard to salinity (DWR et al. 2013).

The Sacramento River is the primary contributor to Delta freshwater inflows. North Delta channels convey Sacramento River and Yolo Bypass flows southerly and westerly. The Delta Cross Channel (DCC) gates divert flows from the Sacramento River to Snodgrass Slough and then to the Mokelumne River, where it flows into the central and south Delta. Circulation of water in the north and central Delta is determined primarily by flows in the Sacramento River; however, SWP and CVP operations alter the

direction of natural flow in the central Delta, resulting in an altered flow path toward the south Delta pumps.

The San Joaquin River, the second largest contributor to Delta freshwater inflows, enters the Delta from the south. Although the natural direction of flow is toward the north and west, channel flows in the south Delta are sensitive to SWP and CVP export operations (DWR et al. 2013).

Tidal flows have a major influence on Delta surface water circulation. Flow in the Delta channels can change direction because of tidal exchange, ebbing, and flooding with the two tides per day. On average, tidal inflows to the Delta are approximately equal to tidal outflows. The tidal range can vary by about 30 percent between spring tide and neap tide conditions. Tidal flows at Martinez can be as high as 600,000 cfs. Because the Delta is tidally influenced, water surface elevations can vary from less than 1 foot in the east Delta to more than 5 feet in the west Delta (DWR 2013a) on a daily basis.

Tidal flows enter and leave the Delta along the combined Sacramento and San Joaquin rivers at Chipps Island. Farther upstream in the Delta, in the Old River near Bacon Island, tidal flows can be as high as 16,000 cfs, and at relatively upstream locations such as Freeport or Vernalis, riverine conditions dominate the tidal effects.

The SWP and CVP pumping plants can affect the direction of water flow in the Delta channels, particularly during periods of low freshwater inflow and large exports. Normally, net flows in the Delta travel westerly toward Suisun Bay and the San Francisco Bay. Diversion rates at the SWP and CVP south Delta intakes influence Delta hydraulics, changing direction of flow of some south Delta waterways. The most influential effects occur in the Old and Middle rivers (OMR), where flows are reversed during periods of south Delta pumping. Reverse flows also occur in the False River in the west Delta and Turner Cut in the San Joaquin River, causing more saline water to move farther inland (DWR et al. 2013).

Generally, opening the DCC gates can reduce salinity in some channels in the central and south Delta, particularly during the summer months, through transport of relatively lower salinity Sacramento River water into the central Delta (DWR et al. 2013).

TEMPORARY AGRICULTURAL BARRIERS

The DWR South Delta Temporary Barrier Project (TBP) was initiated in 1991, to seasonally construct and demolish four rock barriers across several south Delta channels. These barriers were intended to maintain water levels in south Delta waterways and promote San Joaquin River salmon migration through the south Delta. The existing TBP consists of installing and removing temporary rock barriers at the following locations:

- Middle River, near Victoria Canal, about 0.5 mile south of the confluence of Middle River, Trapper Slough, and North Canal
- Old River, near Tracy, about 0.5 mile east of the DMC intake
- Grant Line Canal, about 400 feet east of the Tracy Boulevard Bridge
- Head of Old River (HOR), at the confluence of the Old River and the San Joaquin River

The temporary barriers on the Middle River, the Old River near Tracy, and Grant Line Canal are designed to improve water levels for agricultural diversions and are installed during the irrigation season. The Head of Old River Barrier (HORB) has been installed only from early September to November 30, when requested by CDFW if improvement of dissolved oxygen in the San Joaquin River is necessary. The HORB also has been installed in the spring months to improve out-migrating conditions for juvenile salmonids.

The agricultural barriers at the Middle River and the Old River can be installed as early as March 1, if the HORB is installed, and can be fully operated as early as April 1, if the HORB is installed, or May 15, if the HORB is not installed. From May 15 to May 31 (if the HORB is removed), the Middle River and the Old River barrier gates are opened. After May 31, the Middle River, the Old River, and Grant Line Canal barriers are permitted to be operational until they are completely removed by November 30.

SWP BARKER SLOUGH PUMPING PLANT

The SWP Barker Slough Pumping Plant (BSPP) diverts water from Barker Slough into the SWP's North Bay Aqueduct (NBA) for delivery to the Solano County Water Agency and the Napa County Flood Control and Water Conservation District. The 162.5 cfs NBA intake with a positive barrier fish screen is about 10 miles from the Sacramento River at the end of Barker Slough.

The NBA was designed to convey up to 175 cfs. However, the ability of the BSPP to deliver water is limited because a bio-film growth developed on its interior, restricting water conveyance to about 142 cfs. In addition, water quality in Barker Slough often is degraded, with elevated levels of coliform bacteria, organic matter, turbidity, and other pollutants during winter and spring rainfall events. This degradation limits the period that the BSPP can be operated.

The 2008 USFWS Biological Opinion (BO) reduced the total BSPP annual diversion to 71 TAF. In 2009, CDFW issued an incidental take permit for preservation of Longfin Smelt that restricted pumping rates during dry and critical dry years from January 15 to March 31.

SOUTH DELTA WATER DIVERSIONS

Delta channels have been modified, to allow transport of Delta inflow to south Delta diversions and reduce the effects of pumping on Delta water circulation and salinity intrusion. Water conveyance from the Sacramento River southward through the Delta to the south Delta intakes is aided by the DCC.

CVP JONES PUMPING PLANT

The CVP's Jones Pumping Plant, about 5 miles north of Tracy, has a permitted diversion capacity of 4,600 cfs and is connected to the end of a 2.5-mile-long, earth-lined intake channel that extends to the Old River. Water diverted at the Jones Pumping Plant is discharged to the DMC, which conveys the water about 117 miles to the Mendota Pool. The DMC has a capacity of 4,600 cfs at the Jones Pumping Plant and decreases to about 3,200 cfs at its terminus. Water exported by the Jones Pumping Plant also may be conveyed to and re-pumped into the O'Neill Forebay. Water then can be pumped into the San Luis Reservoir by the Gianelli Pumping-Generating Plant.

SWP CLIFTON COURT AND BANKS PUMPING PLANT

The SWP facilities in the south Delta include the 31 TAF Clifton Court Forebay (CCF), about 10 miles northwest of the city of Tracy, and the Banks Pumping Plant. Water is diverted from the Old River into the CCF to provide storage for off-peak withdrawals from the CCF, moderating the effects of the pumps on flow and stage fluctuations in adjacent Delta channels, and collecting sediment before entering Banks Pumping Plant and the California Aqueduct.

The California Aqueduct transports water to the O'Neill Forebay, where it can be released either to the San Luis Canal or a portion of the California Aqueduct jointly owned by the SWP and CVP, or it can be pumped into the San Luis Reservoir. Water from the San Luis Reservoir subsequently is released to the San Luis Canal, which terminates near Kettleman City. From this location, the California Aqueduct continues to Southern California.

The capacity of the Banks Pumping Plant is 10,300 cfs. Permits issued by USACE regulate the rate of diversion of water into the CCF, normally restricted to 6,680 cfs as a 3-day average inflow to the CCF and 6,993 cfs as a 1-day average inflow. CCF diversions may be greater than these rates between December 15 and March 15, when the inflow into the CCF may be augmented by one-third of the San Joaquin River flow at Vernalis, if those flows are equal to or greater than 1,000 cfs.

In 2000, the maximum diversion rate was increased in July, August, and September, to recover export reductions resulting from actions taken to protect fisheries resources. The expanded maximum allowable daily diversion rate into the CCF was increased from 13,870 to 14,860 AF, and the 3-day average diversions from 13,250 to 14,240 AF (500 cfs per day equals 990 AF per day). Implementation of this action is contingent on meeting the conditions discussed next.

The increased diversion rate will not result in greater annual SWP water supply allocations than would occur in the absence of the increased diversion rate. Water pumped because of the increased capacity will be used only to offset reduced diversions that have occurred or will occur because of actions taken to benefit fisheries, and specifically:

- use of the increased diversion rate will be in accordance with all terms and conditions of existing BOs governing SWP operations; and
- all three temporary agricultural barriers (i.e., Middle River, Old River near Tracy, and Grant Line Canal) must be in place and operating when SWP diversions are increased.

Between July 1 and September 30, if the salvage of special-status fish species reaches a level of concern, the relevant fish regulatory agencies will determine whether the 500 cfs increased diversion may continue or will be stopped.

Banks Pumping Plant is operated to minimize its impact on power loads to the California electrical grid, to the extent practical. Generally, more pump units are operated during off-peak periods and fewer during peak periods with water stored temporarily in the CCF. Because the installed capacity of the pumping plant is 10,300 cfs, Banks Pumping Plant can be operated to reduce power grid impacts by running all available pumps at night and fewer during the higher energy-demand hours.

Long-term, dry-year, and critically dry-year average total exports (sum of Jones Pumping Plant and Banks Pumping Plant) are shown in Figures 13 through 15.

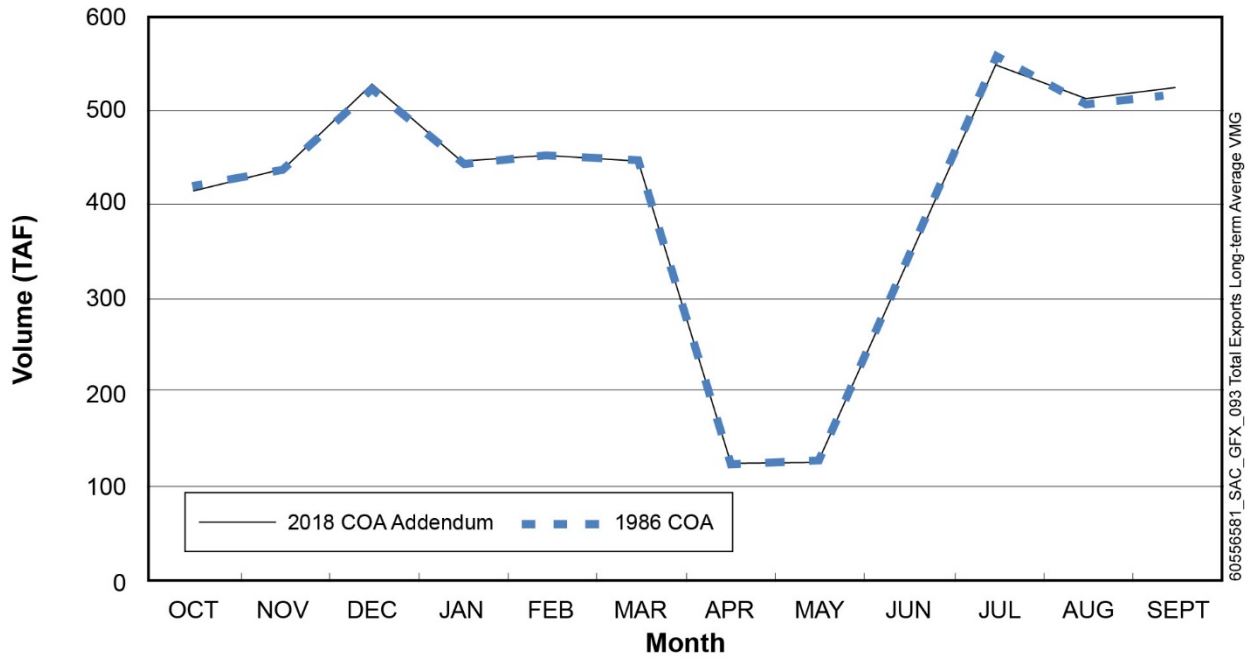


Figure 13. Total Exports, Long-Term Average Delivery

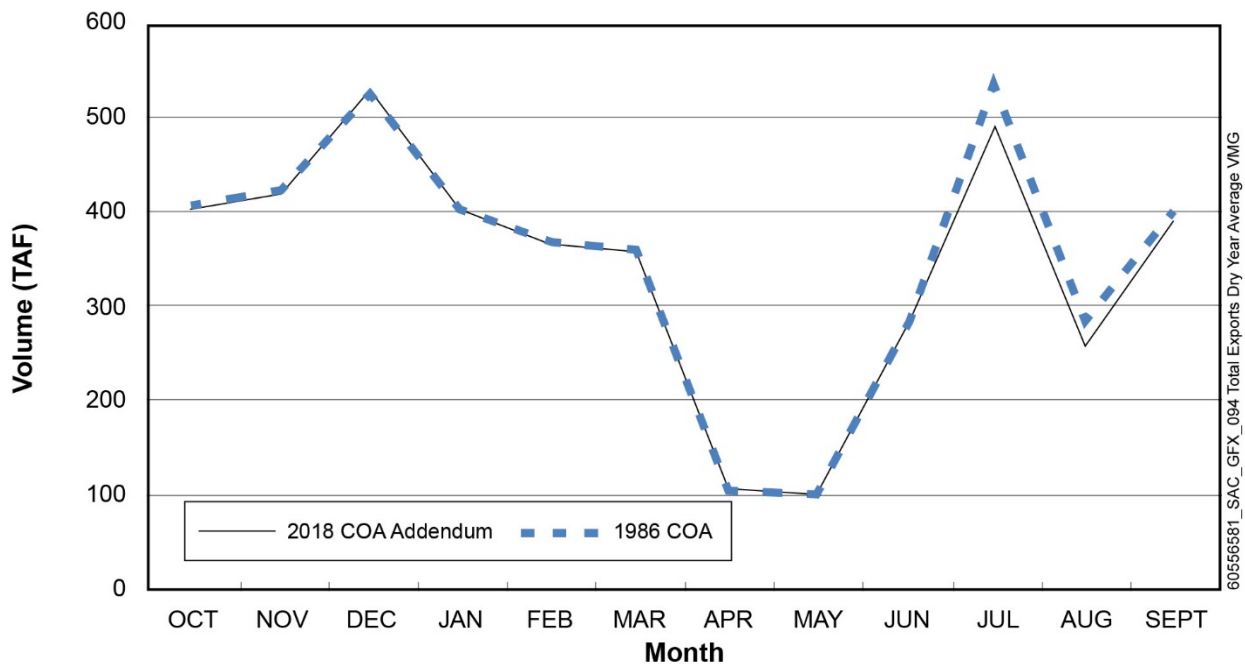


Figure 14. Total Exports, Dry Year Average Delivery

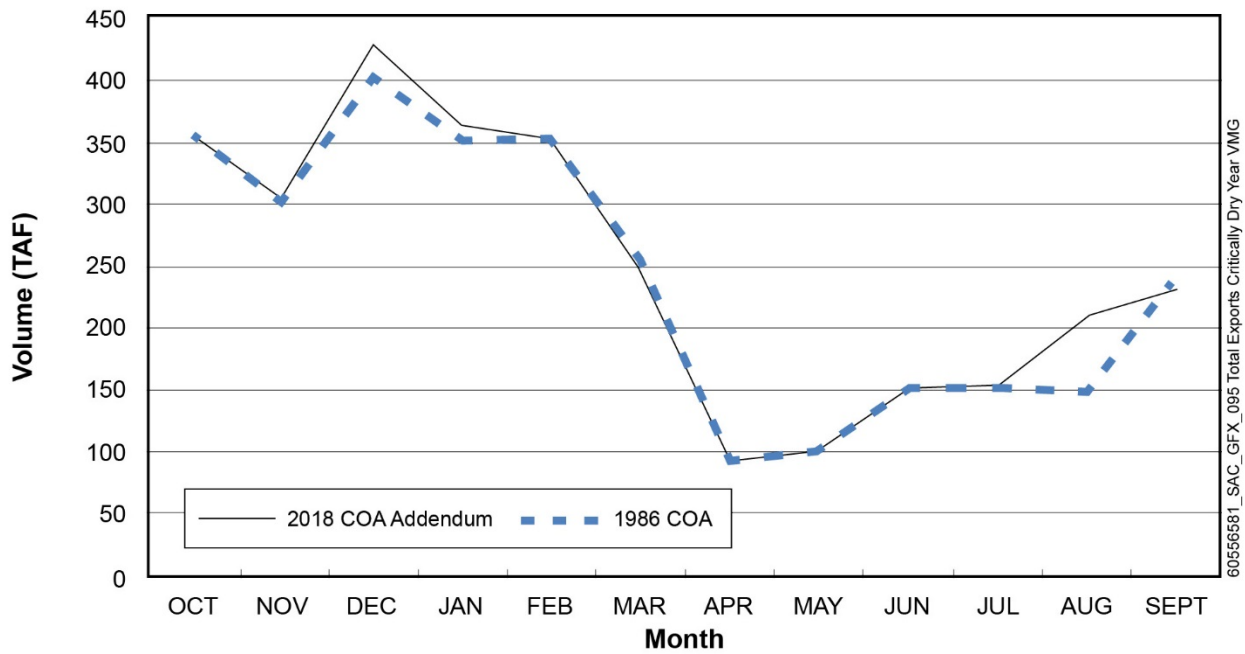


Figure 15. Total Exports, Critically Dry Year Average Delivery

JOINT CVP AND SWP FACILITIES IN SUISUN MARSH

The Suisun Marsh Preservation Agreement (SMPA) requires DWR and Reclamation to meet salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements in accordance with D-1641 to implement and operate physical facilities in the Marsh.

SUISUN MARSH SALINITY CONTROL GATES

The Suisun Marsh Salinity Control Gates (SMSCG) are on Montezuma Slough near Collinsville. The objective of SMSCG operation is to decrease the salinity of the water in Montezuma Slough by restricting the flow of higher salinity water from Grizzly Bay into Montezuma Slough during incoming tides and retaining lower salinity Sacramento River water from the previous ebb tide. This operation lowers salinity in Suisun Marsh channels and results in a net movement of water from east to west.

When Delta outflow is low to moderate and the gates are not operating, tidal flow past the gate is about 5,000 to 6,000 cfs while the net flow is near zero. When operated, flood tide flows are arrested while ebb tide flows remain in the range of 5,000 to 6,000 cfs. The net flow in Montezuma Slough becomes about 2,500 to 2,800 cfs.

The 2,800 cfs net flow induced by SMSCG operation is effective at moving higher salinity concentrations downstream in Montezuma Slough. Salinity is reduced by roughly 100 percent at Belden’s Landing, and by lesser amounts farther west along Montezuma Slough. At the same time, the salinity field in Suisun Bay moves upstream as net Delta outflow is reduced by gate operation. Net outflow through the Carquinez Strait is not affected.

The USACE permit for the SMSCG requires that it be operated between October and May, only when needed to meet Suisun Marsh salinity standards. Historically, the gate has been operated as early as

October 1, although in some years (e.g., 1996) the gate was not operated at all. When the channel water salinity decreases sufficiently below the salinity standards, or at the end of the control season, the SWP and CVP provide unrestricted flow through Montezuma Slough.

ROARING RIVER DISTRIBUTION SYSTEM

The Roaring River Distribution System (RRDS) was constructed between 1979 and 1980, to provide lower salinity water to 5,000 acres of private and 3,000 acres of CDFW-managed wetlands on Simmons, Hammond, Van Sickle, Wheeler, and Grizzly islands. The RRDS includes a 40-acre intake pond that supplies water to Roaring River Slough. Motorized slide gates in Montezuma Slough and flap gates in the pond control flows through culverts into the pond. A flap gate and flashboard riser are at the confluence of the Roaring River and Montezuma Slough, to enable drainage back into Montezuma Slough for controlling water levels in the distribution system and to provide flood protection. Water is diverted into the Roaring River intake pond on high tides, to raise the water surface elevation in RRDS above the adjacent managed wetlands. Managed wetlands north and south of the RRDS receive water, as needed.

MORROW ISLAND DISTRIBUTION SYSTEM

The Morrow Island Distribution System (MIDS) was constructed between 1979 and 1980 in southwestern Suisun Marsh, to channel drainage water from the adjacent managed wetlands for discharge into Suisun Slough and Grizzly Bay. The MIDS increases circulation and reduces salinity in Goodyear Slough.

The MIDS is used year-round but most intensively from September through June. When managed wetlands are filling and circulating, water is tidally diverted from Goodyear Slough just south of Pierce Harbor. Water is discharged into Grizzly Bay by way of the C-Line outfall and into the mouth of Suisun Slough by way of the M-Line outfall, rather than back into Goodyear Slough. This additional supply minimizes salinity increases that are caused by drainage water discharges into Goodyear Slough.

SOUTH OF DELTA FACILITIES

Both the SWP and CVP operate conveyance and storage facilities south of the Delta, conveying water supplies to their respective service areas and water users.

DELTA–MENDOTA CANAL/CALIFORNIA AQUEDUCT INTERTIE

The connection between the DMC and the California Aqueduct allows water to flow between the SWP and CVP conveyance facilities. The DMC/California Aqueduct intertie achieves multiple benefits, including meeting current water supply demands, allowing maintenance and repair of the CVP Delta export and conveyance facilities, and providing operational flexibility to respond to emergencies.

SAN LUIS RESERVOIR

The 2.027-MAF San Luis Reservoir, formed by Sisk Dam, is jointly operated by Reclamation and DWR, with about 0.965 MAF stored by the CVP and 1.062 MAF stored by the SWP. Generally, water is diverted into the San Luis Reservoir during late fall through early spring, when irrigation water

demands are lower and are being met directly by Delta exports. By April or May, demands from both agricultural and M&I SWP water service contractors usually exceed the pumping rate at Banks Pumping Plant, and releases from the San Luis Reservoir to the SWP facilities are needed to supplement the Delta pumping at Banks Pumping Plant to meet SWP contractor demands.

JOINT POINT OF DIVERSION

D-1641 authorized the SWP and CVP to jointly use the Jones and Banks pumping plants in the south Delta, with conditional limitations and required response coordination plans (referred to as Joint Point of Diversion [JPOD]). Use of JPOD is based on staged implementation. Each stage of JPOD has regulatory terms and conditions that must be satisfied to implement JPOD. All stages require a response plan to ensure that the water quality in the south and central Delta will not be significantly degraded through operations of the JPOD, to an extent that would cause injury to water users in the south and central Delta (Water Level Response Plan).

SWP AND CVP CONVEYANCE FACILITIES DOWNSTREAM FROM THE SAN LUIS RESERVOIR

Water from the San Luis Reservoir is released into the California Aqueduct, which conveys water southward to Lake Perris in Riverside County. The first segment of the California Aqueduct downstream from the San Luis Reservoir is called the San Luis Canal. This canal is owned jointly by the SWP and CVP and extends from the San Luis Reservoir to Kettleman City. Near Kettleman City, the water is diverted into the SWP's Coastal Branch Aqueduct to serve agricultural areas west of the California Aqueduct and communities in San Luis Obispo and Santa Barbara counties.

The California Aqueduct continues into Southern California through the Edmonston Pumping Plant at the foot of the Tehachapi Mountains, which raises the water into Antelope Valley. At that location, the California Aqueduct divides into two branches; the East Branch and the West Branch. The East Branch conveys the water into Silverwood Lake in the San Bernardino Mountains, with a capacity of 73,000 AF of water. From Silverwood Lake, the water flows through the San Bernardino Tunnel to Lake Perris. Lake Perris, near the city of Riverside, provides up to 131,500 AF of storage and serves as a regulatory and emergency water supply facility for the East Branch. The East Branch Extension conveys water to San Geronio Pass Water Agency and the eastern portion of the San Bernardino Valley Municipal Water District. The West Branch conveys the water to Pyramid Lake in Los Angeles County. The water from Pyramid Lake is conveyed to the 324,000-AF Castaic Lake.

WATER SUPPLIES USED BY CENTRAL VALLEY PROJECT AND STATE WATER PROJECT WATER USERS

The SWP and CVP water supplies are the only water supplies available to some water users, including many of the CVP's Sacramento River Settlement contractors, communities near Redding (Centerville, Clear Creek, and Shasta community services districts; Shasta County Water Agency), communities in the San Joaquin Valley (the cities of Avenal, Coalinga, and Huron), and some communities that are served by the Antelope Valley–East Kern Water Agency. Other SWP and CVP water users rely on other surface water supplies and groundwater. However, when the SWP and CVP water supplies are limited because of lack of precipitation, their other surface water supplies also are limited.

Several SWP and CVP water users also rely on other imported water supplies, including water from the Solano Project, used by the Solano County Water Agency; from the Hetch Hetchy Water Project used by the Alameda County Water District, Santa Clara Valley Water District, and Zone 7 Water Agency; the Mokelumne River used by the East Bay Municipal Utility District; and the Colorado River used by portions of the service area of the Metropolitan Water District of Southern California and Coachella Valley Water District.

These surface water supplies also are subject to reductions because of hydrologic conditions. In the case of water users who rely on Colorado River water supplies, Delta water is used to dilute the salts and trace elements (e.g., selenium) found in the Colorado River water supply, in addition to providing direct water supplies (Reclamation 2012).

In response to recent reductions in SWP and CVP water supply reliability, water agencies have been improving regional and local water supply reliability through enhanced water conservation efforts, wastewater effluent and stormwater recycling, construction of local surface water and groundwater storage facilities, and construction of desalination treatment plants for brackish water sources and ocean water sources. In addition, many agencies have constructed conveyance facilities to allow sharing of water supplies between communities. The Bay Area Regional Reliability partnership was formed in 2015 by six water districts and one water agency, to improve integrated regional water management and drought mitigation. This collaboration is providing conveyance opportunities between several SWP and CVP water users in the San Francisco Bay Area.

Exceedance plots of total SWP and CVP deliveries are shown in Figures 16 and 17. As shown, SWP deliveries would be reduced while CVP deliveries would increase. However, when total south of Delta exports are considered, as shown in Figure 13, total south of Delta deliveries would be reduced by about 2 TAF.

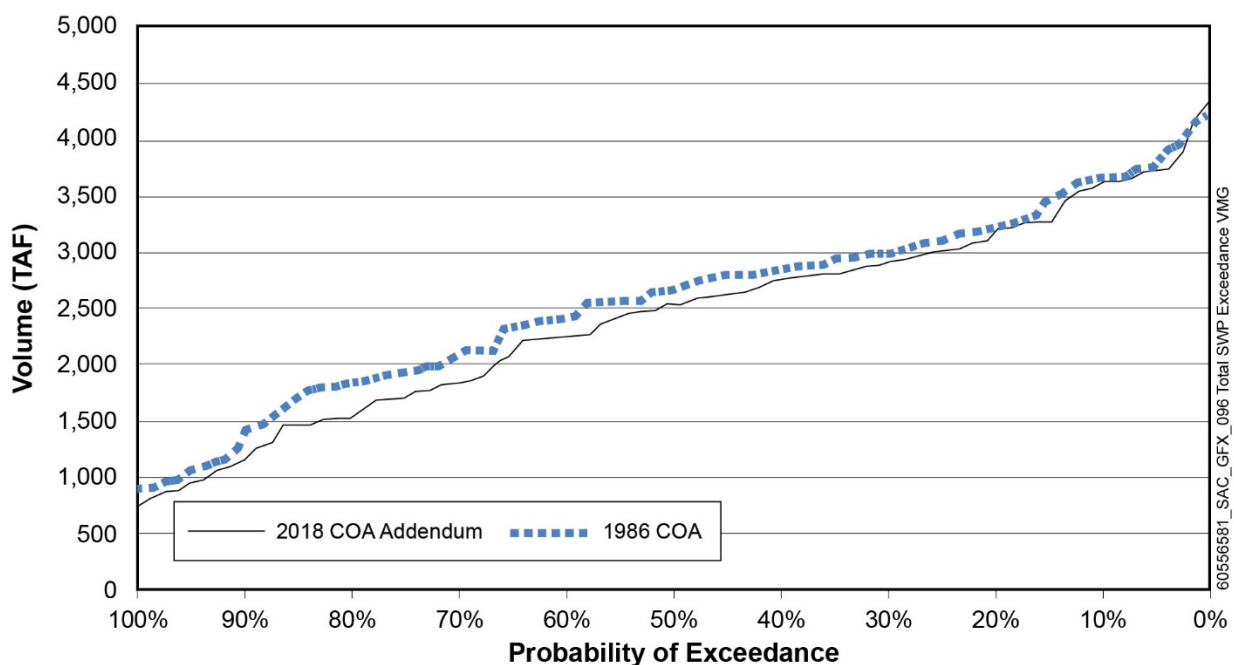


Figure 16. Exceedance Plot of Total SWP Deliveries

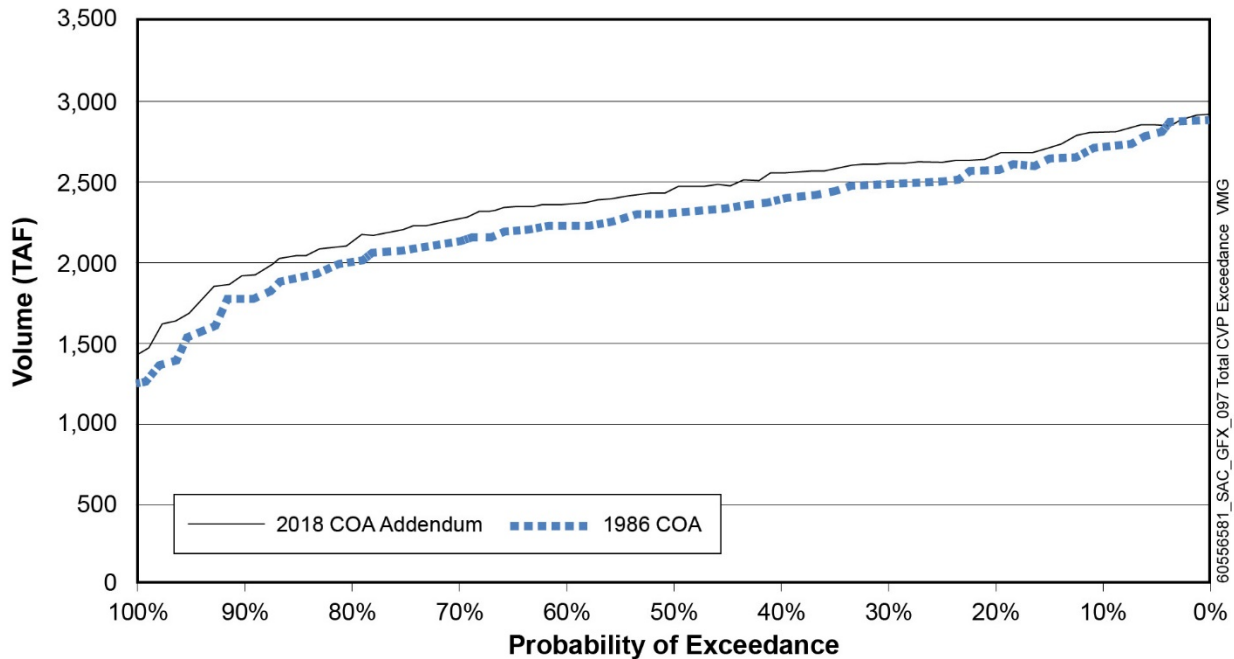


Figure 17. Exceedance Plot of Total CVP Deliveries

WATER TRANSFERS

Water transfers also are an integral part of water management. Historically, water transfers primarily were limited to in-basin transfers (e.g., Sacramento Valley to Sacramento Valley water users) (Reclamation 2013b; DWR et al. 2013). However, between 2001 and 2012, water transfers from the Sacramento Valley to areas south of the Delta increased to 298,806 AF, not including water transfers under the California Federal Bay–Delta (CALFED) Environmental Water Account Program (DWR et al. 2013). These transfers occurred in drier years, when water supplies were needed and capacity at the south Delta pumps was available.

In 2008, one of the first long-term water transfer agreements was approved by the SWRCB for the Lower Yuba River Accord. The plan was designed to protect and enhance fisheries resources in the Lower Yuba River, increase local water supply reliability, provide DWR with increased operational flexibility for protection of Delta fisheries, and provide additional dry-year water supplies to SWP and CVP water users.

In 2013, Reclamation approved an overall program for a 25-year time frame (2014 to 2038), to transfer up to 150,000 AF/yr of water from the San Joaquin River Exchange Contractors Water Authority to USDOI for refuge water supplies or SWP or CVP water users (Reclamation 2013b). Reclamation also approved a long-term water transfer program (2015 to 2024) from water sellers in the Sacramento Valley to water users in the San Francisco Bay Area and south of the Delta (Reclamation 2014b).

EFFECTS OF THE 2018 COA ADDENDUM

ANALYSIS OF EFFECTS—HYDROLOGY AND WATER SUPPLY

This section describes the changes to hydrology and water supply associated with implementation of SWP and CVP operations as regulated by the 2018 COA Addendum when compared to the 1986 COA. Detailed modeling results using the CalSim II computer model for all water-year types and long-term averages are provided in Appendix C.

The 2018 COA Addendum would modify operations and associated reservoir storage, downstream surface water flows, and diversions at selected SWP facilities and related waterways. Descriptions of estimated changes in hydrology are presented to provide a basis for understanding potential hydrologic effects on designated beneficial uses. Estimated changes in hydrology are summarized in the following discussions.

SACRAMENTO RIVER FLOWS DOWNSTREAM FROM THE FEATHER RIVER CONFLUENCE

The CalSim II model results indicate that flows of the Sacramento River downstream from the Feather River confluence would not change substantially with implementation of the 2018 COA Addendum. As shown in Figure 6, 2018 COA Addendum operations would result in surface water flows in the Sacramento River at Freeport similar to 1986 COA mean monthly flows. Changes to Sacramento River mean monthly flow would not exceed 1 percent. These changes would be within the range of model error.

During wet, above-normal, and below-normal water years, mean monthly Sacramento River flow at Freeport under 2018 COA Addendum operations is expected to vary, from a decrease of 1 percent (equal to a 6 cfs decrease in wet water years) to an increase of 2 percent (equal to a 30 cfs increase in above-normal water years), compared to 1986 COA conditions. During dry water years, mean monthly July flows would be reduced from 17,591 to 16,782 cfs (equal to 809 cfs or 5 percent), compared to 1986 COA conditions. In critical water years, mean monthly August flow would increase from 8,153 to 8,813 cfs (equal to 661 cfs or 8 percent).

SACRAMENTO—SAN JOAQUIN DELTA

To analyze conditions in the Delta, the following locations were assessed:

- Delta Outflow
- Old and Middle Rivers Flow
- Total Exports from Banks Pumping Plant

Delta Outflow

As shown in Figure 18, Delta outflow under 2018 COA Addendum operations would be similar to 1986 COA mean monthly flow conditions. Changes to Delta outflow mean monthly flow would not exceed 1 percent. These changes would be within the range of model error.

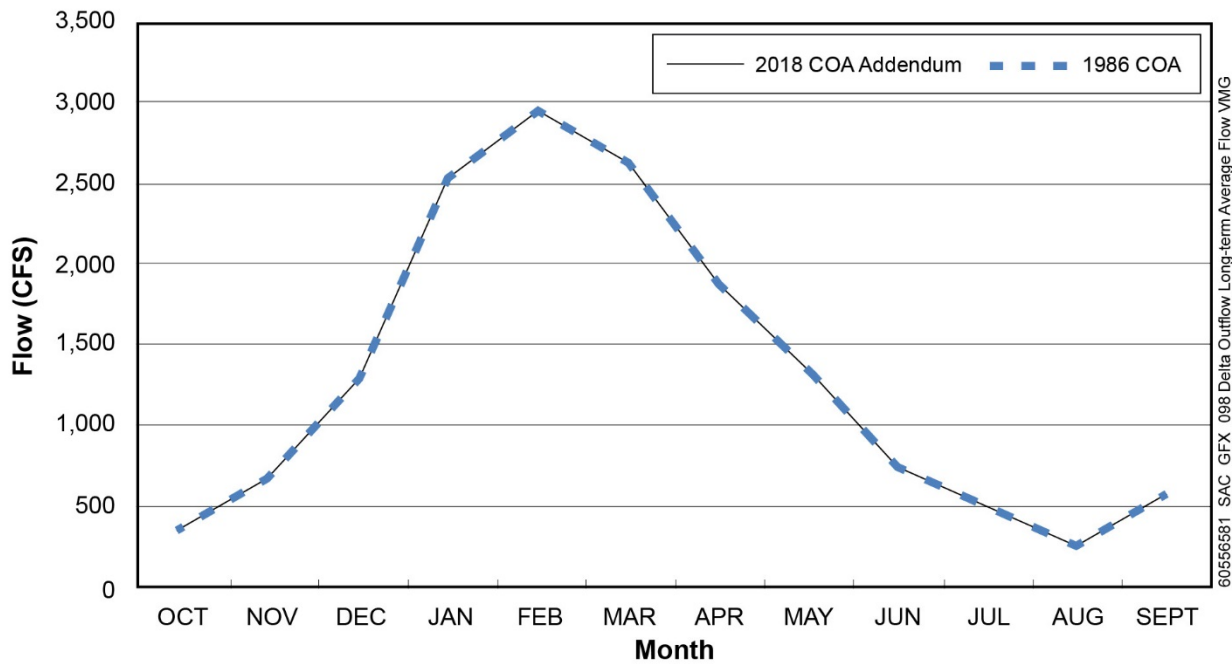


Figure 18. Delta Outflow With 2018 COA Addendum Operations

During wet, above-normal, below-normal, and dry water years, mean monthly flow at Freeport under 2018 COA Addendum operations would vary, from a decrease of 2 percent (equal to a 16 cfs decrease in above-normal water years) to an increase of 2 percent (equal to a 11 cfs increase in wet water years), compared to 1986 COA conditions. In critical water years, mean monthly August flows would be reduced by 279 cfs (7 percent).

Old and Middle Rivers Flow

Over the long term, OMR flow would be similar with the 2018 COA operations, compared to the 1986 COA conditions. The long-term average April flow would increase by 13 cfs. Changes to April OMR flow with 2018 COA Addendum operations would be within the range of model error, compared to 1986 COA conditions.

In wet water years, OMR flow would increase by 59 cfs (8 percent) in May under 2018 COA Addendum operations, compared to 1986 COA conditions. In the 11 other months, changes to OMR flow would vary from a decrease of 3 percent to an increase of 2 percent. In above-normal and below-normal water years, changes to OMR flow would vary, from a decrease of 4 percent to an increase of 3 percent. In dry water years, OMR flow would increase by 710 cfs (8 percent) in July and 391 cfs (8 percent) in August. In all other months of dry water years, changes to OMR flow would vary from a decrease of 2 percent to an increase of 1 percent. In critical water years, OMR flow would decrease by 365 cfs (7 percent) in December and 872 cfs (32 percent) in August, and would increase by 158 cfs (5 percent) in March.

Total Exports from Banks Pumping Plant

Over the long term, average annual Banks Pumping Plant exports would decrease by 190 cfs. These exports would decrease by 499 cfs (13 percent) in January, 374 cfs (9 percent) in February, 155 cfs (15

percent) in April, 142 cfs (15 percent) in May, and 400 cfs (15 percent) in June under 2018 COA operations, compared to 1986 COA conditions. In wet water years, Banks Pumping Plant exports would decrease by 358 cfs (7 percent) in January, 216 cfs (15 percent) in April, 229 cfs (15 percent) in May, 432 cfs (11 percent) in June, and 384 cfs (8 percent) in December under 2018 COA operations, compared to 1986 COA conditions. In above-normal water years, Banks Pumping Plant exports would decrease by 536 cfs (15 percent) in January, 389 cfs (9 percent) in February, 152 cfs (18 percent) in April, 123 cfs (16 percent) in May, and 510 cfs (17 percent) in June. In below-normal water years, Banks Pumping Plant exports would decrease by 547 cfs (17 percent) in January, 326 cfs (8 percent) in February, 127 cfs (16 percent) in April, 115 cfs (15 percent) in May, and 543 cfs (21 percent) in June. In dry and critical water years, Banks Pumping Plant exports would decrease by up to 602 cfs (20 percent) in January, up to 595 cfs (18 percent) in February, up to 456 cfs (17 percent) in March, up to 151 cfs (18 percent) in April, up to 112 cfs (15 percent) in May, up to 312 cfs (18 percent) in June, up to 547 cfs (24 percent) in July, and up to 700 cfs (58 percent) in August.

SAN LUIS RESERVOIR

With implementation of 2018 COA Addendum operations, maximum and minimum annual storage at the San Luis Reservoir would decrease, compared to 1986 COA conditions (Figure 19). However, for the most part, the annual San Luis Reservoir storage range under 2018 COA Addendum operations would be similar to 1986 COA conditions, as shown in Figure 19. In years with limited annual San Luis Reservoir storage range, the storage range under 2018 COA Addendum operations would decrease, compared to 1986 COA conditions. These changes would be within the range of model error. Over the long term, the average San Luis Reservoir storage would be greater under 2018 COA operations, compared to the 1986 COA conditions, except in February and March, when storage would be similar (See Appendix C).

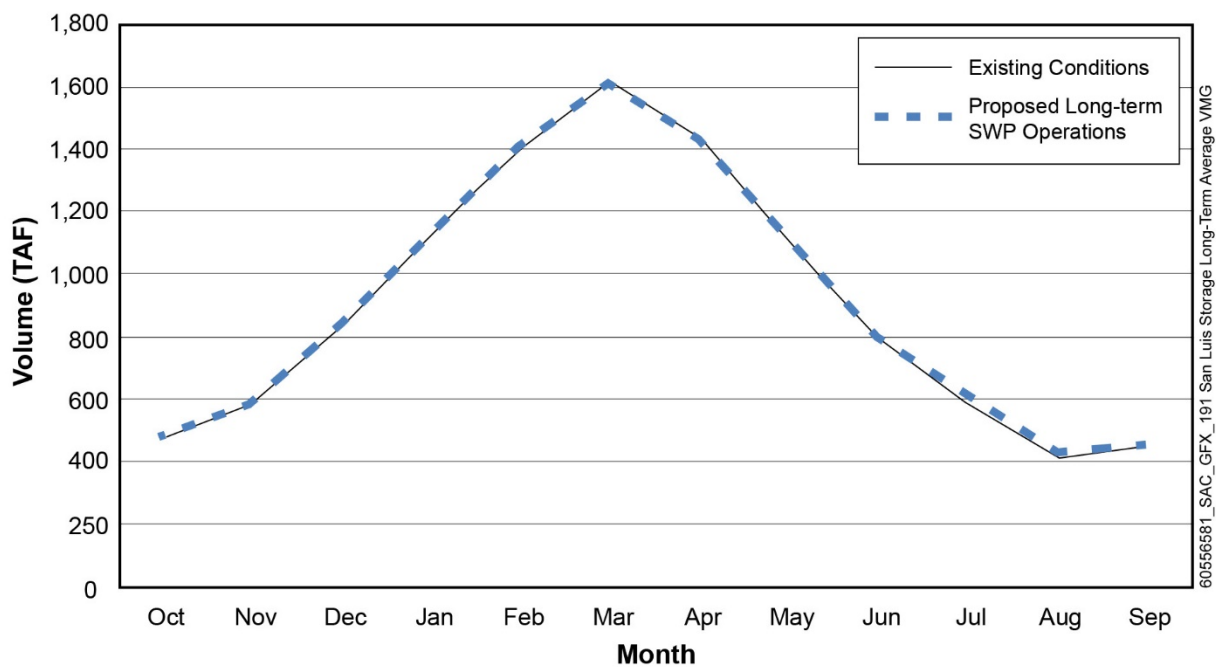


Figure 19. SWP Water Storage in San Luis Reservoir with 2018 COA Operations

SWP CONTRACT DELIVERIES

Table 1 shows the total annual SWP deliveries for 1986 COA conditions and 2018 COA operations for long-term average period and for dry and critical water years. An exceedance plot of SWP deliveries also is shown in Figure 16.

**Table 1. Annual SWP Regional Deliveries,
2018 COA Addendum Compared to the 1986 COA**

Region	Delivery Type ^a	Average (Annual)	1986 COA (TAF)	2018 COA (TAF)	Change from the 1986 COA to 2018 COA (TAF/%)
SWP FRSA	Contract Delivery	Long-Term ^b	952	952	0 (0%)
SWP FRSA	Contract Delivery	Dry and Critical ^c	908	908	0 (0%)
SWP M&I	Contract Delivery	Long-Term	31	30	-1 (-3%)
SWP M&I	Contract Delivery	Dry and Critical	22	20	-2 (-9%)
SWP Ag	Contract Delivery (including Article 21)	Long-Term	3	3	0 (-5%)
SWP Ag	Contract Delivery (including Article 21)	Dry and Critical	2	2	0 (-14%)
SWP M&I	Contract Delivery (including Article 21, includes transfers to SWP contractors)	Long-Term	209	202	-7 (-3%)
SWP M&I	Contract Delivery (including Article 21, includes transfers to SWP contractors)	Dry and Critical	134	125	-9 (-7%)
SWP M&I	Contract Delivery	Long-Term	43	40	-2 (-5%)
SWP M&I	Contract Delivery	Dry and Critical	26	22	-4 (-13%)
SWP M&I	Contract Delivery	Long-Term	82	77	-5 (-6%)
SWP M&I	Contract Delivery	Dry and Critical	50	42	-8 (-15%)
SWP Ag	Contract Delivery (including Article 21)	Long-Term	621	585	-36 (-6%)
SWP Ag	Contract Delivery (including Article 21)	Dry and Critical	365	310	-55 (-15%)
SWP M&I	Contract Delivery (including Article 21)	Long-Term	273	260	-14 (-5%)
SWP M&I	Contract Delivery (including Article 21)	Dry and Critical	175	155	-20 (-12%)
SWP M&I	Contract Delivery (including Article 21, includes transfers to SWP contractors)	Long-Term	1,311	1,242	-69 (-5%)
SWP M&I	Contract Delivery (including Article 21, includes transfers to SWP contractors)	Dry and Critical	867	763	-104 (-12%)
SWP Ag	Contract Delivery (including Article 21)	Long-Term	8	7	-1 (-6%)
SWP Ag	Contract Delivery (including Article 21)	Dry and Critical	5	4	-1 (-13%)
Total SWP Supplies	Contract Delivery (FRSA, Ag, and M&I from SWP and Sites Reservoir)	Long-Term	3,532	3,399	-133 (-4%)
Total SWP Supplies	Contract Delivery (FRSA, Ag, and M&I from SWP and Sites Reservoir)	Dry and Critical	2,555	2,352	-202 (-8%)

Notes:

a. Based on CALSIM-II modeling over an 82-year simulation period.

b. Long-Term is the average quantity from October 1921 through September 2003.

c. Dry and Critical Years Average is the average quantity for the combination of the SWRCB D-1641 40-30-30 dry and critical years from October 1921 through September 2003.

Ag = Agricultural

M&I = Municipal and Industrial

Average annual SWP deliveries would decrease by 133 TAF under 2018 COA operations, compared to the 1986 COA conditions. This decrease would be consistent with the long-term average annual decrease at Banks Pumping Plant of 135 TAF. Delivery decreases would be greatest during below-normal, dry, and critical water years. In the dry and critical water years, average annual SWP deliveries under 2018 COA operations would decrease by 202 TAF (8 percent), compared to the 1986 COA conditions.

DISCUSSION

Implementation of SWP 2018 COA Addendum operations would result in a similar hydrologic and water supply pattern, compared to 1986 COA operations. Although limited changes to surface water hydrology were observed in the model, these changes would be minimal, and usually would be limited to 1 or 2 months in a water year.

The Banks Pumping Plant exports figure is the only output parameter exhibiting a significant change. Implementation of the 2018 COA Addendum operations would result in long-term average decreases, compared to 1986 COA conditions. Decreases to exports would improve water quality, reduce fish entrainment, and benefit other environmental resources.

Therefore, the hydrologic changes discussed above do not merit further analysis to assess potential changes to designated uses and other environmental resource.

ANALYSIS OF EFFECTS—WATER QUALITY

As described in the analysis of effects on hydrology and water supply, those changes would be negligible. Therefore, changes to water quality constituents, exceedance of water quality standards, or violations of waste discharge requirements would not occur.

Implementation of the COA 2018 operations would not include construction of new or modified facilities. Therefore, no changes would occur to flows into existing drainage systems or new sources of polluted runoff. Because the flow patterns under the 2018 COA Addendum operations would be similar to COA 1986 conditions, no changes would occur that would result in a conflict with water quality control plans.

Because the SWP operations corresponding to the 2018 COA Addendum operations would be similar to 1986 COA operations, no changes would occur to water quality.

The analysis of surface water hydrology demonstrates that implementation of the 2018 COA Addendum had no effect on surface waters upstream from the Delta, as shown in Figure 3 for the Sacramento River downstream from Keswick Dam; nor had an effect on surface waters in the Delta upstream from the south Delta pumps (Figure 5) for the Sacramento River at Freeport. Total south of Delta water exports would not change substantially with implementation of the 2018 COA Addendum. As shown in Figure 13, the combined CVP and SWP water diversion is very similar to the 1986 COA operations. The 2018 COA Addendum did affect the allocation of water between the CVP and SWP at the south Delta pumping facilities, as shown in Figures 16 and 17.

Because of implementation of the 2018 COA Addendum, CVP water deliveries would increase and SWP deliveries would decrease by an average annual 130 TAF. This decrease would represent about 5 percent of the average annual SWP deliveries.

Table 2 shows the results of the analysis of impact on the environmental resource topics that are listed in Appendix G of the State CEQA Guidelines, which were used in this analysis to provide a wide range of potentially relevant environmental topics. Tribal Cultural Resources, listed in Appendix G, was not considered in this analysis. Furthermore, two environmental resource topics are further addressed in the discussion following Table 2: Agriculture and Forestry Resources; and Population and Housing.

Table 2. Effects of the 2018 COA Addendum on Various Environmental Resource Topics

Environmental Topic	Potential Environmental Effect
Aesthetics	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect aesthetic resources. No change to aesthetic values or scenic vistas would occur.
Air Quality	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect cultural resources. Re-allocation of water supplies from the SWP to CVP would not reduce the volume of water diverted and delivered to agricultural and municipal/industrial water users. Therefore, energy consumed and associated air pollutant emissions required to deliver the supply only would vary based on the relative efficiency of the CVP facilities compared to the SWP facilities. No substantive change in air pollutant emissions would occur.
Biological Resources	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect terrestrial or aquatic resources. Re-allocation of water from the SWP to CVP would have no effect on Delta hydrology and water quality, and therefore no new adverse effect on Delta aquatic species. No adverse effect on terrestrial species would occur in SWP or CVP service areas.
Cultural Resources	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect cultural resources. Re-allocation of water from the SWP to CVP would have no new impact on cultural resources.
Energy	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect cultural resources. Re-allocation of water supplies from the SWP to CVP would not reduce the volume of water diverted and delivered to agricultural and municipal/industrial water users. Therefore, energy consumed to deliver the supply only would vary based on the relative efficiency of the CVP facilities compared to the SWP facilities. No substantive change in energy use would occur.
Geology and Soils	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect geological and soil resources. Re-allocation of water from the SWP to CVP would have no new adverse effect on geology and soils.
Greenhouse Gas Emissions	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would affect greenhouse gas emissions. Re-allocation of water supplies from the SWP to CVP would not reduce the volume of water diverted and delivered to agricultural and municipal/industrial water users. Therefore, energy consumed and greenhouse gas emissions required to deliver the supply only would vary based on the relative efficiency of the CVP facilities compared to the SWP facilities. No substantive change in greenhouse gas emissions would occur.
Hazards and Hazardous Materials	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would create new hazards or cause release of hazardous materials.
Land Use and Planning	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect existing land uses or land use plans.
Mineral Resources	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect mineral resources. No change to mineral resources would occur.
Noise	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect existing noise levels. SWP and CVP facilities would continue to operate within their respective historical range and would not generate new or louder noise emissions.

Environmental Topic	Potential Environmental Effect
Public Services	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect public services.
Recreation	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect recreational facilities or recreational opportunities.
Transportation	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect existing roadways, traffic, or levels of service. No change to transportation systems would occur.
Utilities and Service System	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would adversely affect utilities or other service systems. No change to existing utilities, levels of service, or quality of service would occur.
Wildfire	No Effect – No new construction or physical effect on CVP or SWP facilities would occur that would pose a wildfire risk or exacerbate fire risk. No change to existing wildfire risk or wildfire management would occur.

AGRICULTURE AND FORESTRY RESOURCES

The 2018 COA Addendum re-allocated an annual average 130 TAF of SWP water supplies to the CVP service area. If distributed proportionally to all CVP water users, about 92 percent of this volume (or 119 TAF of water) is expected to be made available to existing agricultural lands within the CVP service area (Reclamation 2018). The remainder would be made available to municipal and industrial land uses in the CVP service area.

Because these CVP water users historically have been subject to reduced water deliveries resulting from dryer hydrologic conditions and regulatory restrictions, the 130 TAF of water is expected to be applied as irrigation supplies to existing agricultural lands, or lands that have been retired recently because of limited water supplies.

The amount of water supply made available to the CVP is equivalent water volume capable of irrigating an area ranging from about 29,400 to 41,200 acres, depending on agricultural crop type and associated evapotranspiration requirements (Hanson 2010). This acreage is equivalent to about 0.9 to 1.3 percent of the total 3 million acres that are served by CVP water supplies for agricultural purposes.

The water provided to the CVP would not exceed existing maximum contract amounts for agricultural use. The additional water supply provided to the CVP by the 2018 COA Addendum equals about 0.4 percent of the maximum CVP agricultural historical water use of about 1,945,633 acres. Therefore, the increased CVP agricultural water supply provided by the 2018 COA Addendum would not substantially affect the acreage of agricultural lands in the CVP service area.

POPULATION AND HOUSING

As previously discussed for Agriculture and Forestry Resources, if distributed proportionally to all CVP water users, about two-thirds of the average annual 130 TAF of SWP supplies (or 86 TAF of water) is expected to be made available to existing agricultural lands within the CVP service area (Reclamation 2019a). The remainder (or about 43 TAF) would be provided for M&I land uses.

Based on an average of 100 gallons per day per capita for residential water use, 43 TAF of water would meet the needs of 51,300 people or about 17,950 residences with an average household of 2.86 people. This volume of water equals about 3.7 percent of the average annual M&I CVP water deliveries. This volume of water also equals about 2.5 percent of the maximum CVP M&I historical use. Therefore, the increased CVP M&I water supply that would be provided by the 2018 COA Addendum would contribute to meeting M&I water demand to CVP water users that have been subject to reduced water deliveries resulting from dryer hydrologic conditions and regulatory restrictions. The additional water would not result in exceeding the maximum historical CVP M&I water use of 167 TAF.

The reduced water supplies available to SWP water contractors would need to be replaced by development of alternative water supplies, water conservation, or transfer of water supplies from other sources. Because the SWP provides water to about 27,000,000 people, the entire volume of water (130 TAF) re-allocated to the CVP would meet about 0.2 percent of the SWP M&I water demand. The reduced SWP volume of water would be negligible compared to the annual SWP M&I deliveries. Individual water contractors or retail water purveyors are expected to manage their respective systems accordingly, to compensate for the reduced water deliveries. Therefore, implementation of the 2018 COA Addendum would have no substantial effect on population and housing.

CONCLUSION

As concluded in the 2018 NOE, implementation of the 2018 COA Addendum would shift responsibilities for meeting obligations between the CVP and SWP. As demonstrated in this discussion, changes to surface water flow upstream from the Delta would be minimal. The shift in responsibilities would result in reduced SWP exports to south of Delta water users and an increase in export to CVP water users. These changes would be minor when compared to the total volume of water delivered by either the CVP or SWP. The minimal change to surface water hydrology and water deliveries would not induce new adverse effects on other environmental resources.

LONG-TERM OPERATION OF THE CALIFORNIA STATE WATER PROJECT

DWR is pursuing a California Endangered Species Act (CESA) Incidental Take Permit (ITP) for the long-term operations of the SWP. As a part of the analysis for the ITP, as well as for the associated CEQA environmental analysis, the proposed operations must be compared against baseline physical conditions.

One aspect of the baseline conditions is the manner in which the SWP and the CVP jointly operate to meet Delta regulatory requirements. The SWP and CVP share responsibility for these requirements as defined by the COA, which DWR and Reclamation executed in 1986 and subsequently modified in 2018 through an Addendum.

DWR has identified a baseline that includes the 2018 COA Addendum as opposed to the unmodified 1986 version of the COA. A baseline that includes the COA Addendum accurately represents the existing physical conditions in the Delta. In addition, CalSim II modeling results indicate that the flows

entering and exiting the Delta are unaffected by execution of the 2018 COA Addendum. Therefore, using the 2018 COA Addendum as a baseline condition would sufficiently represent Delta conditions under D1641 and the 2008/2009 BiOps as well as under existing conditions.

CEQA LEGAL REQUIREMENTS

Under CEQA, lead agencies refer to baseline physical conditions to determine whether a project’s impact is significant. (CEQA Guidelines §15125). Similarly, the Director of CDFW makes CESA findings that take authorized by an ITP is consistent with statutory requirements, such as finding that the impacts of take will be minimized and fully mitigated. CDFW may refer to information in the Final Environmental Impact Report in making these findings. (Environmental Protection Information Center v. California Department of Fish and Wildlife (2008) 44 Cal.4th 459, 517).

The baseline consists of existing physical conditions and, generally, should consist of the conditions that exist at the time that the Notice of Preparation (NOP) is published. A lead agency may identify a different baseline “where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project’s impacts” so long as the different baseline is supported by substantial evidence. (CEQA Guidelines §15125(a)(1)).

The baseline that DWR has identified reflects the conditions at the time of NOP publication because DWR and Reclamation were operating under the 2018 COA Addendum before April 19, 2019. COA implementation is not a fluctuating condition in the Delta. The COA has been in place since 1986 and has been modified only once, through the 2018 COA Addendum. The COA Addendum was executed over four months before the NOP was published and will have been in effect for over a year before project implementation.

Tables 3 through 5 provide CalSim II modeling results that demonstrate that the physical condition in the Delta did not significantly change as a result of executing the 2018 COA Addendum.

Table 3. Delta Outflow (TAF), 1986 COA vs. 2018 COA Addendum

Study	Annual Average	Annual Average [Dry and Critical]	Spring Average [Mar – Jun]	Spring Average [Dry and Critical]
2018 Addendum	15,752	6,335	6,588	2,607
1986 COA	15,752	6,337	6,590	2,609
Change	0	-2	-2	-2

Table 4. SWP and CVP Exports (TAF), 1986 COA vs. 2018 COA Addendum

Study	Annual Average	Spring Average [Mar – Jun]	Annual Average [SWP]	Annual Average [CVP]
2018 Addendum	4,887	1,028	2,421	2,466
1986 COA	4,887	1,031	2,556	2,331
Change	0	-3	-135	135

Table 5. Old and Middle River Flows (CFS) in Late Spring, 1986 COA vs. 2018 COA Addendum

Study	Late Spring [Mar – Jun]	Late Spring [Dry and Critical]	Late Spring [Below Normal]	Late Spring [Above Normal]
2018 Addendum	-2,094	-2,805	-2,594	-2,252
1986 COA	-2,106	-2,817	-2,579	-2,256
Change	12	12	-15	4

OLD AND MIDDLE RIVER FLOWS

The following summary graphs present a selection of Delta related output in average monthly plots as well as exceedance plots. The comparison of OMR flows between the 1986 COA and the 2018 COA Addendum show that any differences are extremely small (Figures 20 to 26).

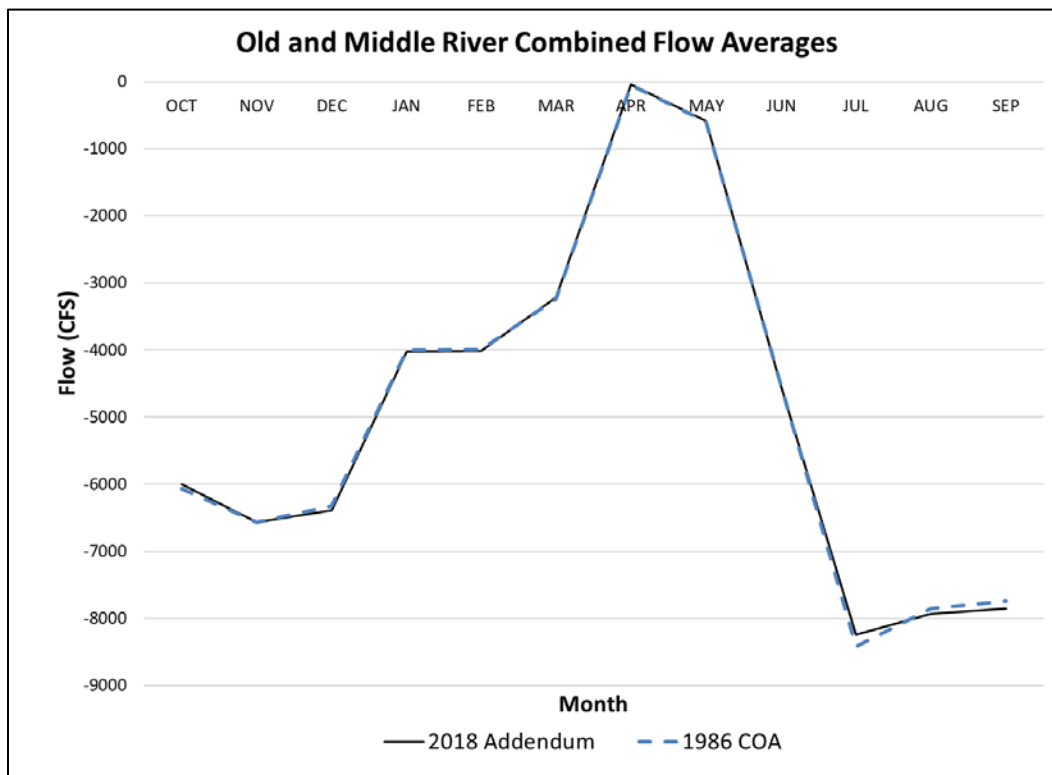


Figure 20. Monthly Average OMR Flow (CFS) for the 1986 COA and the 2018 COA Addendum

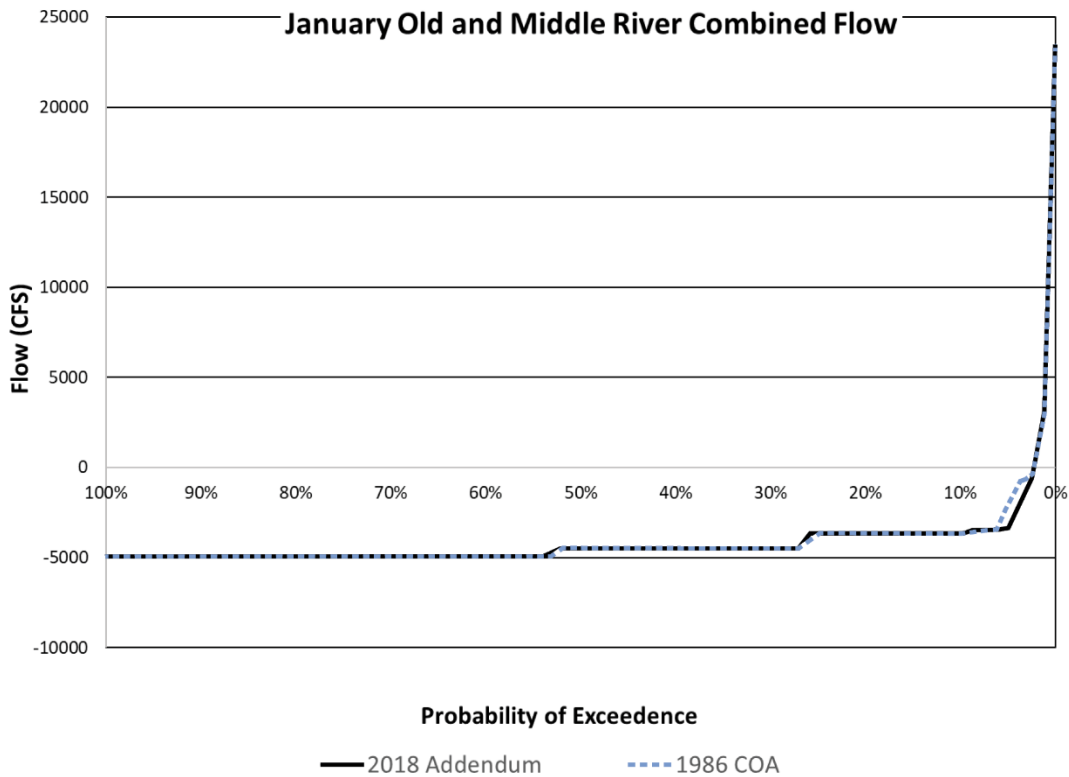


Figure 21. Exceedance Plot of OMR Flow (CFS) in January for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

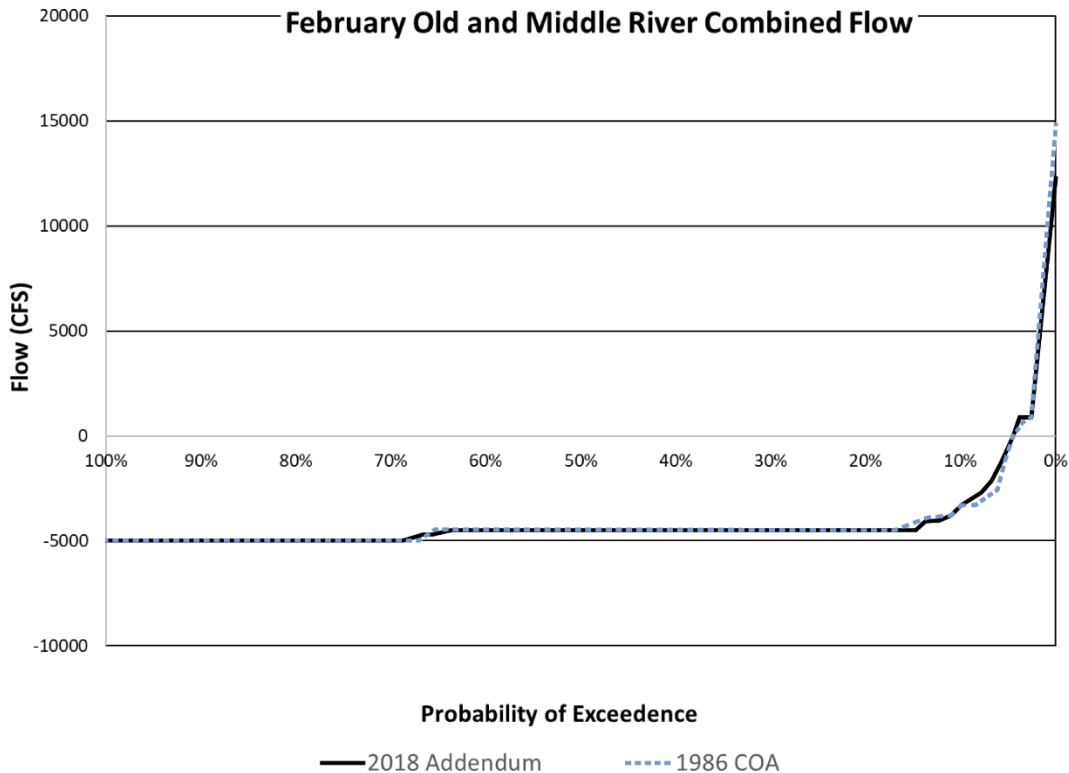


Figure 22. Exceedance Plot of OMR Flow (CFS) in February for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

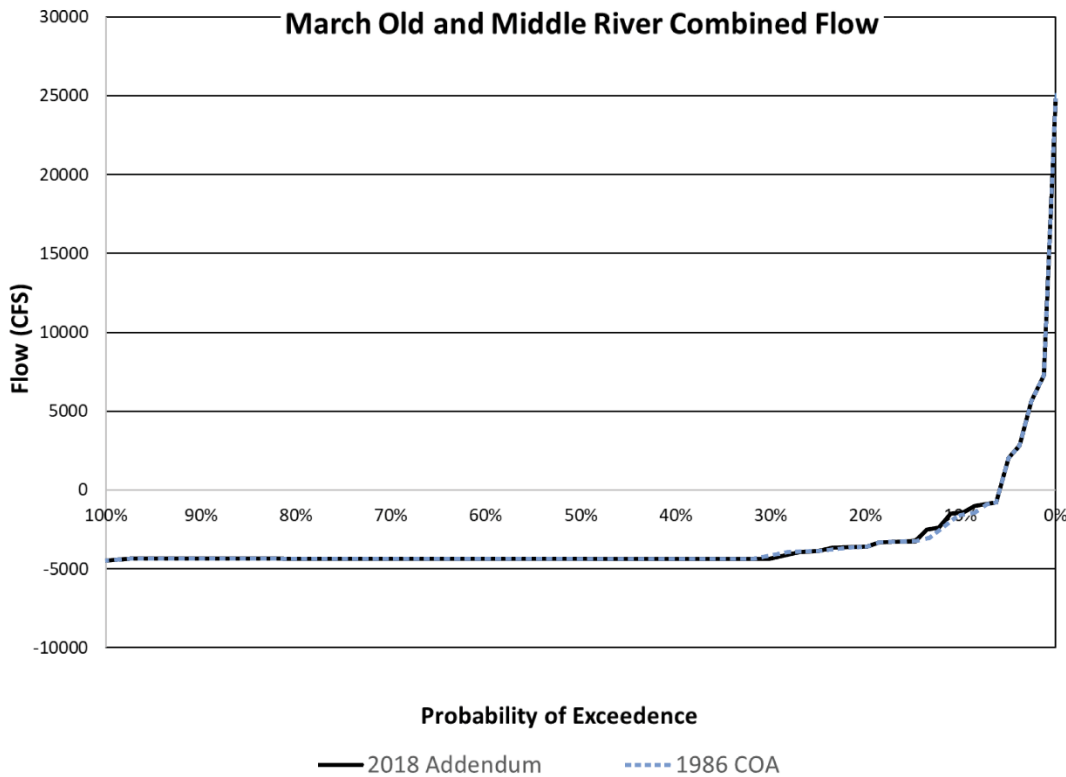


Figure 23. Exceedance Plot of OMR Flow (CFS) in March for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

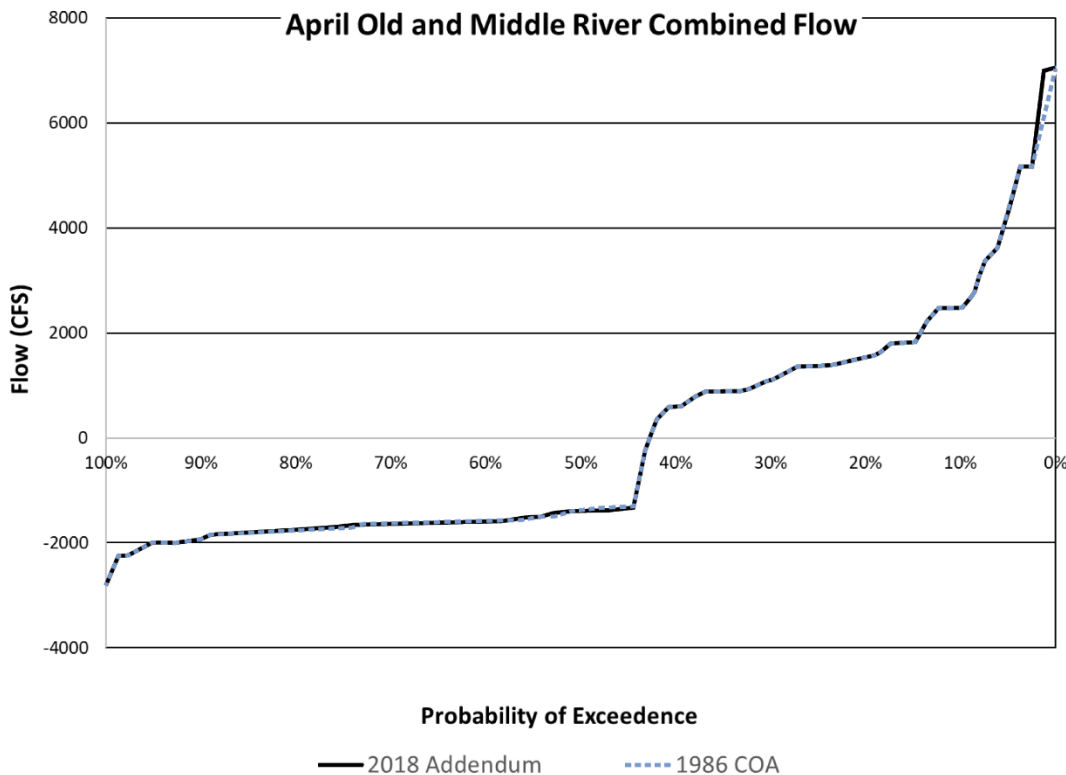


Figure 24. Exceedance Plot of OMR Flow (CFS) in April for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

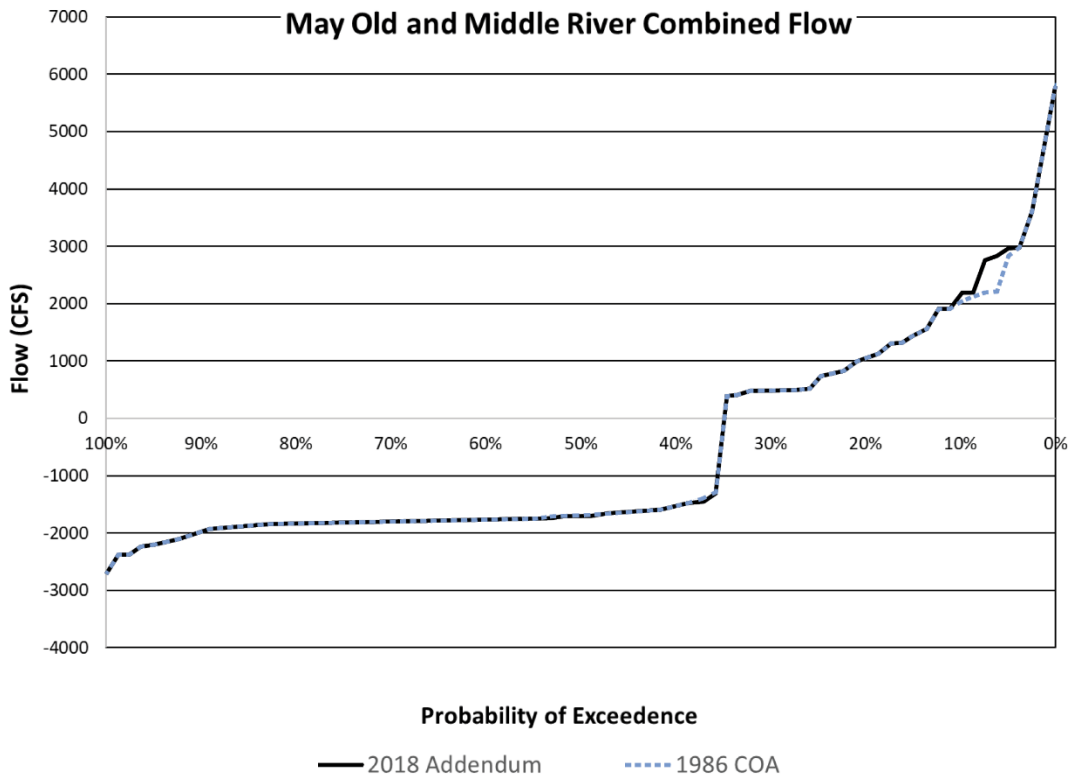


Figure 25. Exceedance Plot of OMR Flow (CFS) in May for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

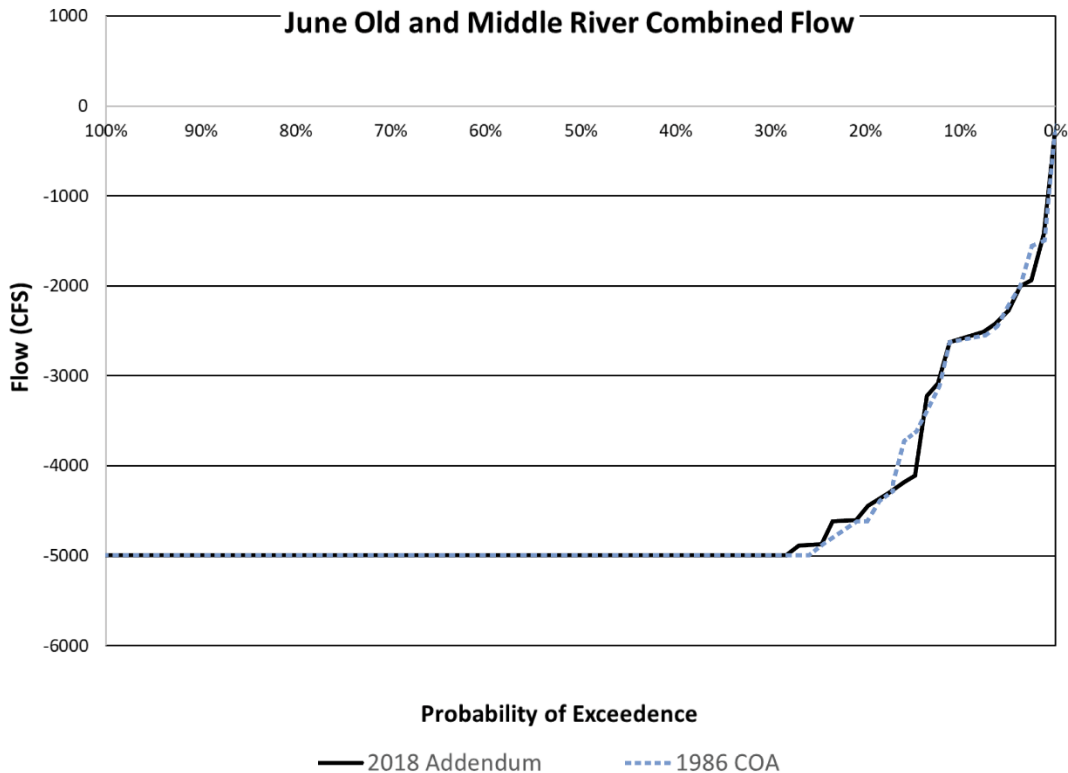


Figure 26. Exceedance Plot of OMR Flow (CFS) in June for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

DELTA OUTFLOW

The following summary graphs present a selection of Delta related output in average monthly plots as well as exceedance plots. The comparison of OMR flows between the 1986 COA and the 2018 COA Addendum show that any differences are extremely small (Figures 27 to 31).

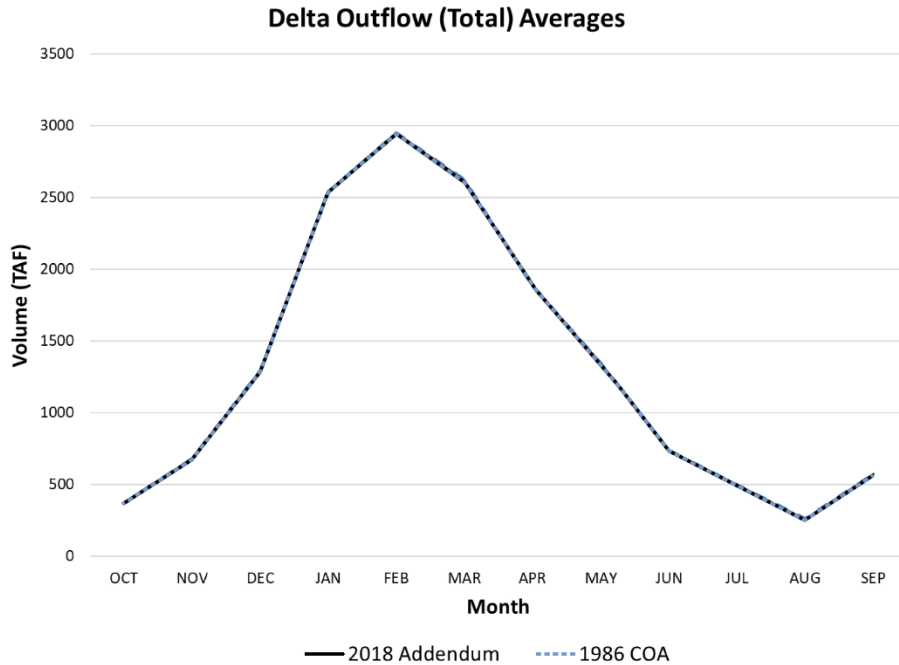


Figure 27. Monthly Average Delta Outflow Volume (TAF) for the 1986 COA and the 2018 COA Addendum

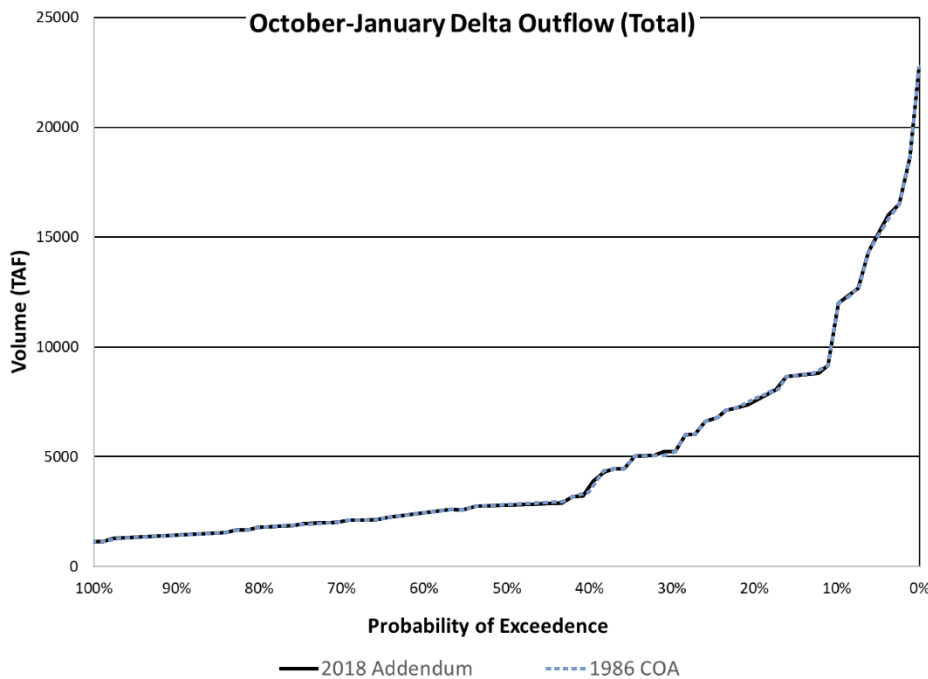


Figure 28. Exceedance Plot of Delta Outflow Volume (TAF) October to January for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

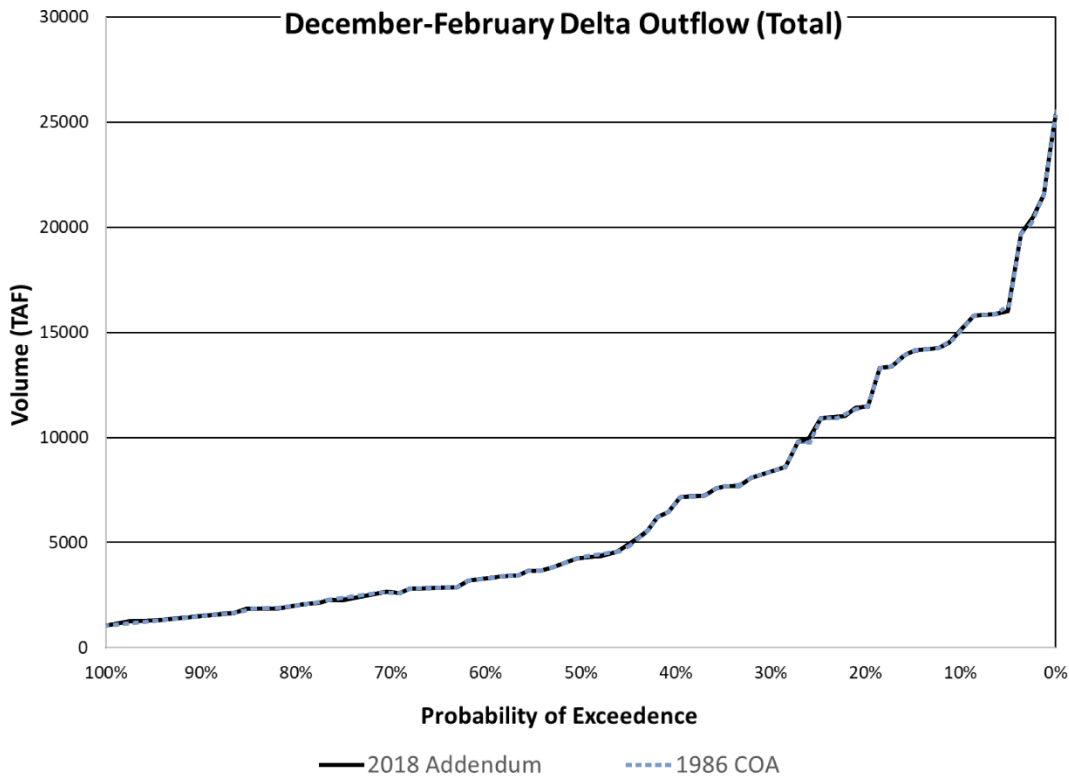


Figure 29. Exceedance Plot of Delta Outflow Volume (TAF) December to February for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

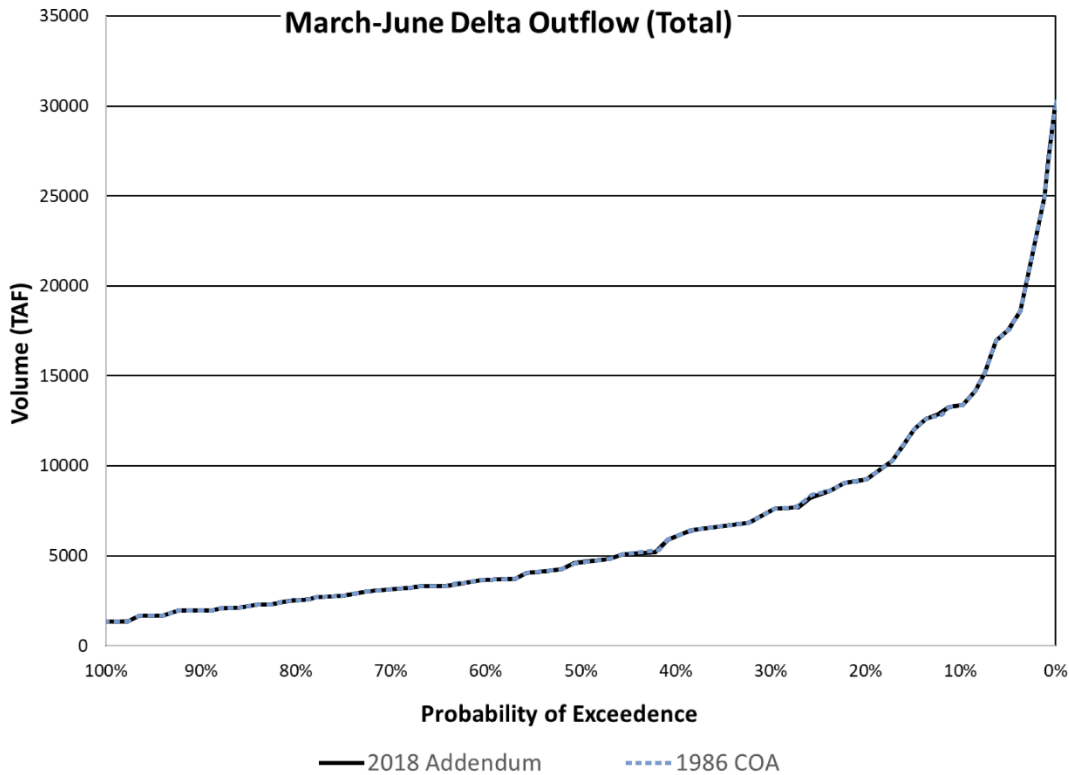


Figure 30. Exceedance Plot of Delta Outflow Volume (TAF) March to June for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

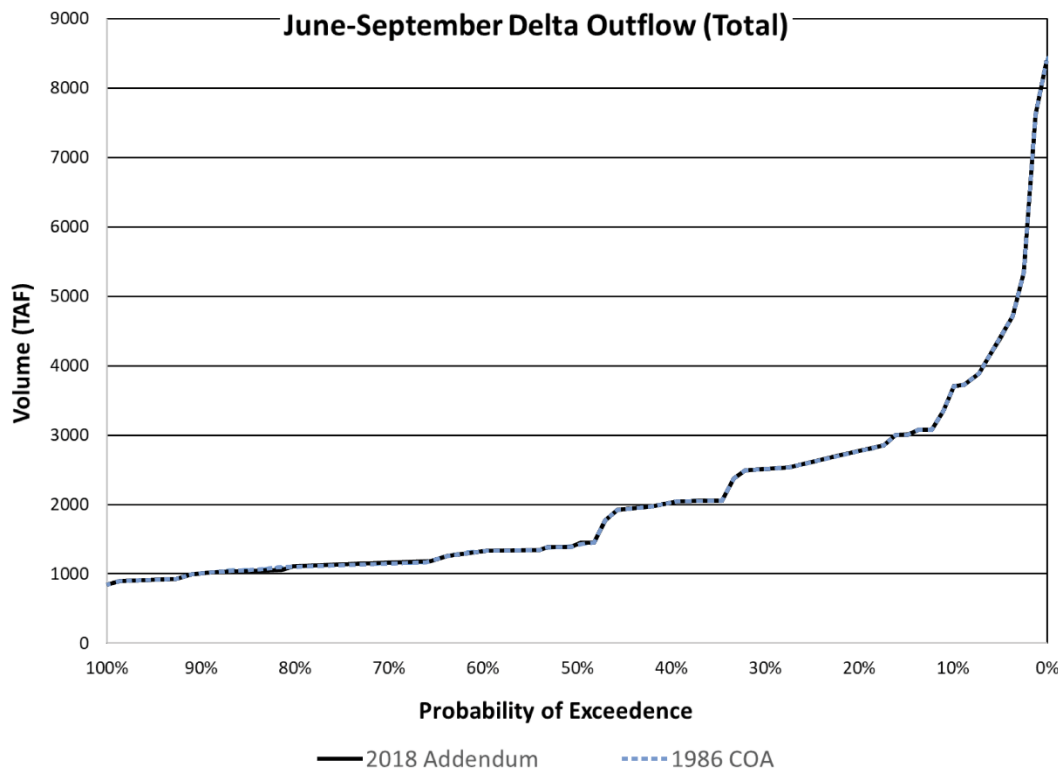


Figure 31. Exceedance Plot of Delta Outflow Volume (TAF) June to September for the 1986 COA and the 2018 COA Addendum Shows Virtually No Difference Between the Two Scenarios

CALSIM II MODELING OUTPUT

Following an initial summary review of the modeling output described above, CDFW requested additional detail. The complete CalSim II model output for the 2018 COA Addendum and the 1986 COA studies are provided at <https://cadwr.box.com/s/sic6jye14qlmat4inonj27j1syb0n8n2>. Additionally, a compiled set of outputs can be found in Appendix A. Interpreting model output must be done so in the proper context, however, as explained below.

In order to better understand and correctly interpret CalSim II model results, it is extremely important that one be familiar with the proper use of the model and its limitations. A brief discussion on the proper use of CalSim II and DSM2 models and their limitations can be found in Nader-Tehrani (2017) (SWRCB DWR Exhibit 79; See pp. 29-43).

It is generally believed that the most appropriate format to present CalSim II model results are either in the form of:

- Long term average summary and year-type based summary tables and graphics showing monthly and/or annual statistics derived from the model results, or
- Cumulative exceedance probability monthly and/or annual model results shown only by rank/order or only by probability statistic.

Comparative statistics based on these two types of presentations are generally acceptable. Relying on absolute differences computed at a point in time between model results from an alternative and a

baseline to evaluate impacts is an inappropriate use of model results (e.g. computing differences between the results from a baseline and an alternative for a particular day, month, or year within the period of record of simulation).

The modeling package in Appendix A and in the website identified above includes model results for a number of specific locations consistent with CDFW's request. CDFW also requested individual year comparisons, but those were not provided due to the reasons listed above. It is possible for CDFW or others to make those comparisons from the raw model output that is available at the provided link, but DWR has declined to provide such comparisons because drawing conclusions from absolute differences would be an inappropriate use of model results.

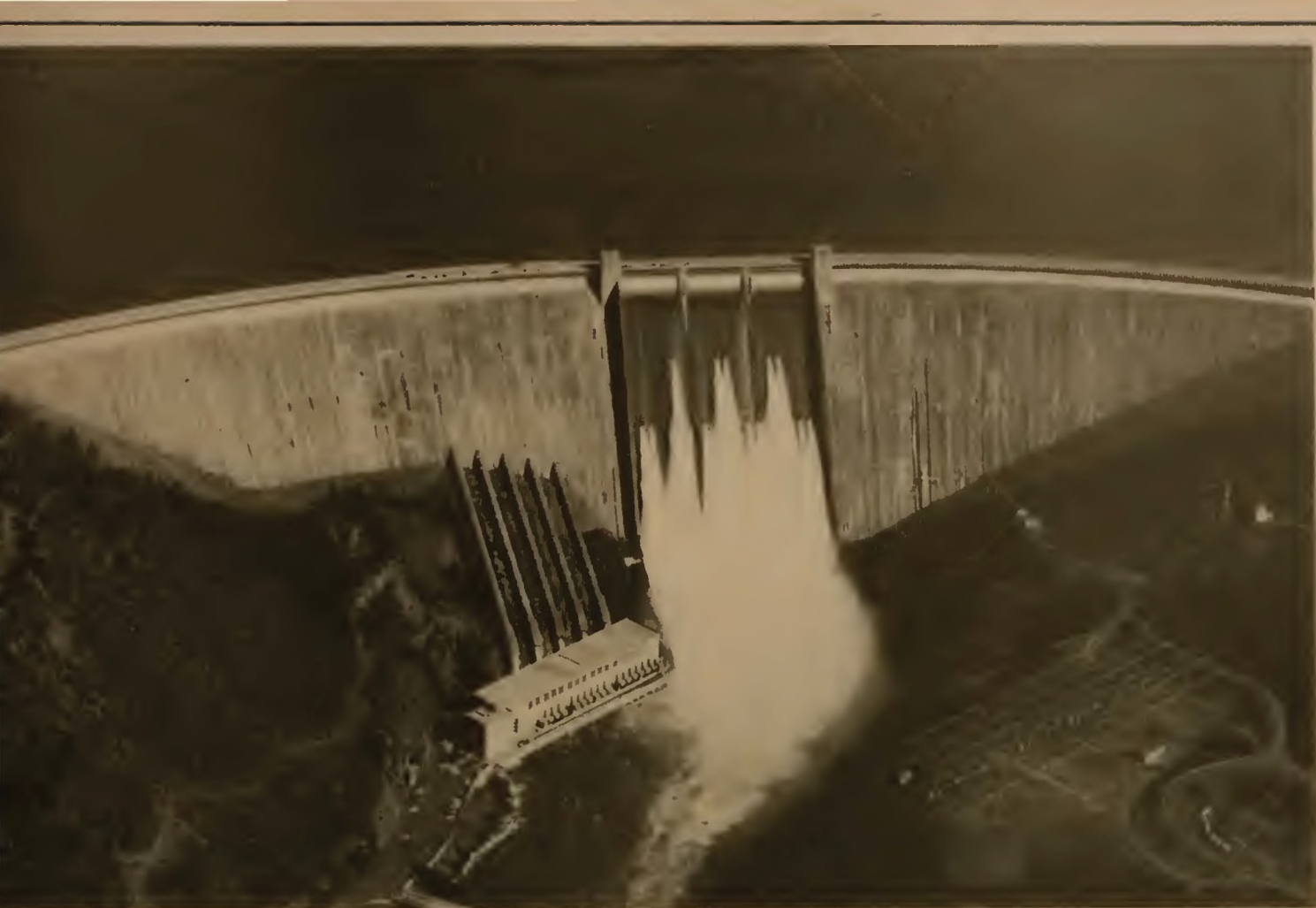
It is also important to note that, under extreme operational conditions, CalSim II will utilize a series of rules within the specified priority to reach a numerically feasible solution to allow for the continuation of the simulation. The outcome of these types of solutions in CalSim II may vary greatly depending upon the antecedent conditions from the previous time-step result. The model may reach a numerical solution, but the results of the simulation may not reflect a reasonably expected outcome (e.g., one that may occur following the exercise of judgment by authorized decision makers and coordination among appropriate agencies). In such cases, modeled flows may fall short of minimum flow criteria, salinities may exceed standards, diversions may fall short of allocated volumes and reservoir storages might reach extreme low levels, but actual flows may not reflect these conditions.

REFERENCES

- California Department of Water Resources (DWR). 1994 (October). *California Water Plan Update Volume 1*. Bulletin 160 93.
- . 2007 (May). *Oroville Facilities Relicensing Draft Environmental Impact Report*. FERC Project No. 2100.
- . 2013 (December). *North-of-the-Delta Offstream Storage Preliminary Administrative Draft Environmental Impact Report*.
- California Department of Water Resources (DWR), U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and National Marine Fisheries Service. 2013 (November). *Draft Environmental Impact Report/Environmental Impact Statement, Bay Delta Conservation Plan, Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties, California*. Available: <http://baydeltaconservationplan.com/EnvironmentalReview/EnvironmentalReview/2013-2014PublicReview/2013PublicReviewDraftEIR-EIS.aspx>. Accessed October 30, 2017.
- California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (Reclamation). 2018. *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*. December 12, 2018.
- Hanson, B. 2010. *Irrigation of Agricultural Crops in California*. Department of Land, Air and Water Resources, University of California, Davis. Available: <https://ww3.arb.ca.gov/fuels/lcfs/workgroups/lcfsustain/hanson.pdf>. Accessed September 10, 2019.
- U.S. Bureau of Reclamation (Reclamation). 1997 (September). *Draft Central Valley Project Improvement Act – Programmatic Environmental Impact Statement*.
- . 2012 (December). *Colorado River Basin Water Supply and Demand Study*.
- . 2013a (June). *Shasta Lake Water Resources Investigation Draft Environmental Impact Statement*.
- . 2013b (July 30). *Record of Decision, Water Transfer Program for the San Joaquin River Exchange Contractors Water Authority, 2014–2038*.
- . 2015 (November). *Coordinated Long-Term Operation of the Central Valley Project and State Water Project Final Environmental Impact Statement*.
- . 2018 (October 29). *CVP Contract Water Delivery Information*. Available: <https://www.usbr.gov/mp/cvp-water/docs/cvp-water-deliveries.pdf>. Accessed September 18, 2019.

- U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR). 1986 (November 24). *Agreement between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*. No. 7-07-20-W0551. Sacramento, CA.
- U.S. Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers, California Reclamation Board, Sacramento Area Flood Control Agency. 2006 (December). *Folsom Dam Safety and Flood Damage Reduction Draft Environmental Impact Statement/Environmental Impact Report*.
- U.S. Department of the Interior (USDOI) and California Department of Fish and Game (CDFG). 2012 (December). *Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report*.
- U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Reclamation, Hoopa Valley Tribe, and Trinity County. 1999. *Trinity River Mainstem Fishery Restoration Environmental Impact Statement/Report*.

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Above right: The COA signing ceremony. From left, California Secretary for Resources Gordon K. Van Vleck, California Director of Water Resources David N. Kennedy, Governor George Deukmejian, Bureau of Reclamation Regional Director David G. Houston, Commissioner of Reclamation C. Dale Duvall.

Below right: Bureau of Reclamation and Department of Water Resources staff who negotiated the agreement. Seated, from left: C. Dale Duvall, David G. Houston, David N. Kennedy, Gordon K. Van Vleck. Second row, from left: James Turner, John Budd, Brenda Washington, David Lindgren, Robert James, Rita Singer. Back row, from left: Robert Moore, Michael Cowan, Harold Meyers, James Moore, Jerry Vayder, Charles Shoemaker, William Mierke, Lawrence Mullnix, Gerald Cox, Katherine Striemer, Russell Kletzing.



**AGREEMENT
BETWEEN
THE UNITED STATES OF AMERICA
AND
THE STATE OF CALIFORNIA
FOR
COORDINATED OPERATION
OF THE
CENTRAL VALLEY PROJECT
AND THE
STATE WATER PROJECT**

(THIS COORDINATION AGREEMENT SUSPENDS THE AGREEMENT OF
MAY 16, 1960, BETWEEN THE UNITED STATES AND THE STATE OF CALIFORNIA.)



UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT CALIFORNIA



STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
STATE WATER PROJECT

AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF WATER RESOURCES OF
THE STATE OF CALIFORNIA
FOR COORDINATED OPERATION OF THE
CENTRAL VALLEY PROJECT AND THE STATE WATER PROJECT

Table of Contents

<u>Article</u>	<u>Title</u>	<u>Page</u>
1	Preamble	1
2	Explanatory Recitals	1
3	Definitions	4
4	Term of Agreement	7
5	Facilities	7
6	Coordination of Operations	8
7	Forecasting	12
8	Water Measurement Responsibilities	13
9	Reduction in United States and State Exports	13
10	Exchanges, Conveyance, and Purchases of Water Supply	14
11	Delta Standards	20
12	Monitoring	22
13	Records	22
14	Periodic Review	23
15	Relation to Agreement of May 16, 1960	25
16	New Facilities	25

Table of Contents (Continued)

<u>Article</u>	<u>Title</u>	<u>Page</u>
17	Project Service Areas	26
18	Third Party Rights Unaffected	26
19	Effect of Waiver of Breach	26
20	Equal Employment Opportunities	26
21	Contingent Provisions	29
22	Officials Not to Benefit	29
	Signature Clause	30

Exhibits

A	Standards for the Sacramento-San Joaquin Delta
B-1	Central Valley Project and State Water Project Annual Supplies
B-2	Central Valley Project and State Water Project Full Development Annual Supplies
C	Monitoring Locations
D	Exchange Procedure to Provide D-1485 Condition 3 Replacement Water (Article 10b of COA)
E	Water Shortage and Apportionment

AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF WATER RESOURCES OF
THE STATE OF CALIFORNIA
FOR COORDINATED OPERATION OF THE
CENTRAL VALLEY PROJECT AND THE STATE WATER PROJECT

1. THIS AGREEMENT, made the 24th
day of November, 1986, pursuant to the Act of
Congress approved October 27, 1986, P.L. 99-546, and pursuant
to the California Central Valley Project Act, which is Part 3,
Division 6 (commencing at Section 11100) of the California
Water Code, and the California Water Resources Development
Bond Act, Chapter 8, Part 6, Division 6 (commencing at
Section 12930) of the California Water Code, between THE
UNITED STATES OF AMERICA, herein called the United States,
acting through the Bureau of Reclamation, Department of the
Interior, represented by the Contracting Officer executing
this agreement, and THE DEPARTMENT OF WATER RESOURCES OF THE
STATE OF CALIFORNIA, herein called the State, represented by
the Director of Water Resources.

EXPLANATORY RECITALS

2. The United States has under construction and
is operating the Central Valley Project, California, for the

development, conservation, control, and utilization of water resources in California.

The State has under construction and is operating initial facilities of the State Water Resources Development System, herein called the State Water Project, for the development, conservation, control, and utilization of water resources in California.

The United States and the State entered into an agreement on May 16, 1960, Article 16 of which recognizes the need for criteria for the coordinated operation of the Central Valley Project and the State Water Project.

Certain basic assumptions of that agreement require modification in light of subsequent developments and changes in the two projects.

The United States and the State had prepared a May 13, 1971, Draft Agreement which would have supplemented the Agreement of May 16, 1960.

The United States and the State have in the past been operating under annual letter agreements implementing the May 13, 1971, Draft Agreement.

The United States and the State by entering into this agreement will suspend the Agreement of May 16, 1960; but it is recognized that the legal positions of the parties regarding any interpretation of the terms of said agreement are preserved.

The United States and the State will observe reservoir operational criteria prescribed by the United States Corps of Engineers to minimize flood hazards.

The United States and the State each plans to meet all requirements and objectives of its project and to coordinate the operation of their projects so as not to adversely affect the rights of other parties and to conserve water.

The State and the United States intend to build additional water storage and transportation facilities.

Both the United States and the State have, pursuant to applications filed with the State Water Resources Control Board (formerly State Water Rights Board), received permits for appropriation of unappropriated water in furtherance of their respective projects.

It is in the best interest of the United States and the State to agree on the use of water rights as set forth in this agreement rather than litigate such uses as between the two projects and potentially all other water users in the Central Valley of California.

Both the State and the United States are dedicated to utilizing their existing and future water conservation

facilities so as to provide the maximum benefits to the people of California and the Nation and believe that through the coordinated and cooperative operation of State and Federal facilities, these benefits can be maximized.

NOW, THEREFORE, it is agreed:

DEFINITIONS

3. When used in this agreement, the following shall have the meanings hereinafter set forth:

(a) "Sacramento Valley inbasin uses" are legal uses of water in the Sacramento Basin including the water required under the provisions of Exhibit A.

(b) "Balanced water conditions" are periods when it is agreed that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley inbasin uses, plus exports.

(c) "Excess water conditions" are periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley inbasin uses, plus exports.

(d) "United States storage withdrawal" is the sum of "Whiskeytown storage withdrawal" which is the positive daily mean flow computed by subtracting the daily mean local inflow to Whiskeytown Lake (total inflow excluding the flow through the Judge Francis Carr Powerplant) from the sum of the daily mean diversions from (i) Whiskeytown Lake to Spring Creek Powerplant, (ii) the Whiskeytown Dam releases to Clear

Creek, and (iii) measured water deliveries from Whiskeytown Lake; and the positive sum of:

(1) "Shasta storage withdrawal" which is the daily mean flow computed by subtracting the sum of (i) the daily mean inflow into Shasta Lake and (ii) the daily mean discharge from Spring Creek Powerplant from the sum of (i) the Keswick Dam releases to the Sacramento River and (ii) measured water deliveries from Shasta and Keswick Lakes; and

(2) "Folsom storage withdrawal" which is the daily mean flow computed by subtracting the daily mean inflow into Folsom Lake from the sum of (i) Nimbus Dam releases to the American River, (ii) Nimbus Dam diversions to Folsom South Canal, and (iii) measured water deliveries from Folsom Lake and Nimbus Lake.

(e) "State storage withdrawal" is the value calculated in 3(e)(1) except when specifically declared by the State that Upper Feather storage withdrawals are being made in which case "State storage withdrawal" is the sum of 3(e)(1) and (2).

(1) "Oroville Complex storage withdrawal" is the positive daily mean flow computed by subtracting the sum of the daily mean inflow into Lake Oroville and the daily mean discharge from Kelly Ridge Powerplant from the sum of the daily mean diversions at or into the following facilities:

Palermo Canal, Thermalito Diversion Dam to Feather River, Thermalito Diversion Dam to Hatchery, Diversion Structures for Butte County, Thermalito Irrigation District Diversion Structure, Richvale Canal, Western Canal, Pacific Gas and Electric Company's Lateral, Sutter Butte Canal, and the Thermalito Afterbay Outlet to Feather River.

(2) "Upper Feather River storage withdrawal" is the positive daily mean flow computed by subtracting the sum of the daily mean flow into Lake Davis and Antelope Reservoir from the sum of the daily mean releases from these reservoirs.

(f) "Export" means diversions by the United States and the State through export facilities specified in subarticle 5(b).

(g) "United States stored water" is the net increase in daily storage in Shasta Lake and Folsom Lake.

(h) "State stored water" is the net increase in daily storage in Lake Oroville and, when declared by the State, the net increase in daily storage in the Upper Feather River reservoirs.

(i) "Delta" means the Sacramento-San Joaquin Delta as described in California Water Code §12220 (Stats. 1959, C. 1766, p. 4249, § 1).

(j) "New Delta standards" are any Delta standards different from those set forth in Exhibit A.

TERM OF AGREEMENT

4. This agreement shall remain in full force and effect until terminated either by the mutual consent of the parties or as provided in subarticles 10(h), or 14(b).

FACILITIES

5. This agreement recognizes the following facilities as presently existing:

(a) Reservoirs:

<u>United States</u>	<u>State</u>
Shasta Lake	Lake Oroville
Keswick Reservoir	Thermalito Forebay
Clair Engle Lake	Thermalito Afterbay
Lewiston Lake	Thermalito Diversion Dam Reservoir
Whiskeytown Lake	San Luis Reservoir (Joint)
Folsom Lake	O'Neill Forebay (Joint)
Lake Natoma	Lake Davis
San Luis Reservoir (Joint)	Antelope Lake
O'Neill Forebay (Joint)	Lake Del Valle Pyramid Lake Castaic Lake Silverwood Lake Lake Perris
Millerton Lake	
New Melones	

(b) Export facilities:

<u>United States</u>	<u>State</u>
Contra Costa Pumping Plant #1	Harvey O. Banks Delta Pumping Plant, including Clifton Court Forebay
Tracy Pumping Plant	

COORDINATION OF OPERATIONS

6. (a) This agreement was negotiated on the basis of annual supplies reflected in Exhibit B. It is agreed that:

(1) The computations described in this article shall be the basis upon which the United States and the State shall coordinate the operations of the Central Valley Project and the State Water Project facilities specified in Article 5 in order to meet Sacramento Valley inbasin uses and maintain the respective annual water supplies specified in Exhibit B-1, or as that exhibit is revised in accordance with subarticle 6(a)(3);

(2) Nothing in this agreement shall constrain either party from moving toward full utilization of its facilities at any time;

(3) As either party proceeds toward the full utilization of its project, any changes in the underlying assumptions with respect to the development of the two projects and the demands for water from each project will be reflected by recomputing the annual water supplies specified

in Exhibits B-1 and B-2 in accordance with the provisions of subarticle 14(a). The methodology described in the document entitled "Technical Report on Determination of Annual Water Supplies for Central Valley Project and State Water Project," dated March 1984 will be used to recompute the annual water supplies and to revise, if necessary, the factors and procedures contained in this article.

(b) Determination of Sacramento Valley Inbasin Use of Storage Withdrawals and Unstored Water for Export: During period of balanced water conditions, daily computation shall be made to determine the difference between (i) the sum of the United States and State storage withdrawals adjusted for time of travel to the export facilities specified in subarticle 5(b), and (ii) the sum of the United States and State exports. If total storage withdrawals exceed total exports, the difference represents Sacramento Valley inbasin use of storage withdrawals. If total exports exceed storage withdrawals, the difference represents unstored water for export.

(c) Sharing of Responsibility for Meeting Sacramento Valley Inbasin use With Storage Withdrawals During Balanced Water Conditions: Each party's responsibility for making available storage withdrawals to meet Sacramento Valley

inbasin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley inbasin use of storage withdrawals by the following percentages:

<u>United States</u>	<u>State</u>
75	25

(d) Sharing of Responsibility During Balanced Water Conditions When Unstored Water for Export is Available: Each party's responsibility to meet Sacramento Valley inbasin use and exports shall be determined by:

(1) Allocating the sum of United States stored water, State stored water and the unstored water for export by the following percentages:

<u>United States</u>	<u>State</u>
55	45

(2) If the daily sum of United States stored water and unstored water for export is greater than the United States share as allocated in 6(d)(1), then the United States is obligated, except when either subarticle 6(h) or 6(i) is in effect, to provide water to the extent that its daily sum is greater than its allocated share.

(3) If the daily sum of United States stored water and the unstored water for export is less than its share as allocated in 6(d)(1) then the State is obligated, except when either subarticle 6(h) or 6(i) is in effect, to

provide water to the extent that the State's daily sum of State stored water and unstored water used for export is greater than its allocated share.

(e) Accounting of Accumulated Responsibilities:

During balanced conditions, except when either sub-article 6(h) or 6(i) is in effect, the daily obligation as defined in subarticle 6(c) or 6(d) shall be accumulated. The accumulation in effect when balanced conditions end shall remain in force and resume when balanced conditions are again declared. At the request of either party, the accumulation will be reduced or eliminated within a reasonable time. Otherwise, the accumulation shall continue until the agency that has the positive accumulation (has released more water than its defined responsibility) goes into a flood control operation. A flood control operation occurs when the actual storage exceeds the defined flood control permissible storage at Oroville Reservoir for the State or Shasta Reservoir for the United States. The flood control operation at Folsom Reservoir will not affect this provision because of its limited conservation storage.

(f) Changes in Sacramento Valley Inbasin Use

During Balanced Conditions: If the Sacramento Valley inbasin use changes, upstream reservoir releases and/or exports will be modified based on the current accumulation identified in subarticle 6(e) and/or the daily share of responsibility computed in subarticles 6(c) and 6(d).

(g) Responsibilities During Excess Water

Conditions: During excess water conditions each party has the responsibility to export and store as much water as possible within its physical and contractual limits.

(h) Availability of Storage Withdrawals to the

Other Party: Unless otherwise agreed, whenever a party's storage withdrawal available for export is greater than its export capability, the difference shall be available for export by the other party without affecting either party's future responsibility for providing storage withdrawals to meet Sacramento Valley inbasin use.

(i) Availability of Unstored Water for Export

to the Other Party: Unless otherwise agreed, whenever a party's share of unstored water for export exceeds its exports, the unusable portion is available for export by the other party without affecting either party's daily sum of stored water.

FORECASTING

7. Upon request, each party shall prepare and furnish to the other a forecast of its proposed operation related to the facilities specified in Article 5. The forecast shall indicate the flow available for export, storage withdrawals, and Sacramento Valley inbasin use. The forecasts shall be prepared and exchanged so as to allow sufficient time for the preparation of consolidated forecasts.

WATER MEASUREMENT RESPONSIBILITIES

8. The United States and the State, each at its own expense, shall install and maintain measuring and recording devices at its facilities specified in Article 5.

(a) Each party shall measure or compute and record daily, or at such other intervals as may be agreed upon, and provide to the other party the rates and quantities of water that will show the (1) estimated inflow to its reservoirs, (2) net releases from its reservoirs, (3) stage and change in storage of its reservoirs, (4) net amount of evaporation at its reservoirs, (5) diversions through its export facilities, and (6) its storage withdrawals.

(b) The measuring and recording devices shall be examined, tested, and serviced regularly to assure their accuracy. At any reasonable time either party may inspect the measuring and recording devices of the other party. Immediate action shall be taken to correct any deficiencies noted in such inspections. Accuracy in measurements of export diversions and releases from reservoirs shall be within commonly accepted engineering standards. All computations and correlations shall be calculated in a manner acceptable to both parties.

REDUCTION IN UNITED STATES AND STATE EXPORTS

9. If any forecast indicates that either the United States or the State, or both, will be unable to meet the anticipated demands of its water users during the balance of

the calendar year, representatives of the United States and the State shall confer on possible procedures for making joint operational changes to minimize the shortage. If agreement cannot be reached on a joint procedure for minimizing the threatened shortage, the United States and the State each shall be entitled to export the amount of water available to it according to calculations made pursuant to Article 6, and each party shall assess against its users such reductions as it deems necessary or appropriate.

EXCHANGES, CONVEYANCE, AND PURCHASES OF WATER SUPPLY

10. (a) Either party may make use of its facilities available to the other party for pumping and conveyance of water by written agreement.

(b) To the extent that operational constraints are imposed on the Central Valley Project by Exhibit A to minimize diversions of young striped bass from the Delta during May and June, which reduce Central Valley Project exports, the State will transport up to 195,000 acre-feet of Central Valley Project water through the California Aqueduct Reaches 1, 2A, and 2B no later than April 30 of the following year by direct diversion or by rediversion of stored Central Valley Project water at times that diversions do not reduce State Water Project yield.

The State agrees to transport this water subject to the following:

(1) The United States will supply power according to Exhibit D;

(2) During critical water supply years, as defined by D-1485, the State shall pump the water during Central Valley Project off-peak hours (10:01 p.m. to 6:59 a.m. Monday through Saturday and all day Sunday and national holidays);

(3) In all other water supply years, to the extent possible as determined by the State, pumping of this water shall be provided during Central Valley Project off-peak hours;

(4) The United States shall reimburse the State for incremental costs for pumping Central Valley Project water through the facilities specified in this subarticle. Incremental costs are those costs which if not reimbursed by the United States would otherwise cause increased charges to State Water Project water contractors over what they would have been charged if the State had not conveyed Central Valley Project water pursuant to this agreement, provided that the United States shall not be responsible for payment for any additional power demand charges that may result from pumping Central Valley Project water pursuant to subarticle 10(b). At present, the only incremental costs identified by the State are the replacement portions of the minimum and variable components of both the Delta Water Charge and Transportation Charge, as defined in

the November 4, 1960, State Water Supply Contract with The Metropolitan Water District of Southern California, as it now exists and may hereafter be amended. Incremental costs in 1985 amounted to \$0.21 per acre-foot of water conveyed.

(c) The State agrees to give priority to the United States to convey Central Valley Project water for scheduled or unscheduled maintenance and unforeseen outages of the Central Valley Project, from the Delta to O'Neill Forebay, not covered in subarticles 10(b) and 10(d), through the California Aqueduct Reaches 1, 2A, and 2B facilities at times that such conveyance does not reduce use of the State's facilities for the benefit of the State's long-term water supply contractors subject to the following:

(1) The United States will supply the power required to pump Central Valley Project water through the Harvey O. Banks Delta Pumping Plant;

(2) The State will be reimbursed for each of the following charges expressed as a unit rate and applied to each acre-foot of water conveyed. These charges will equal the sum of the components of the water charges for California Aqueduct Reaches 1, 2A, and 2B as defined in the State Water Supply Contract with the Metropolitan Water District of Southern California, dated November 4, 1960, as it now exists and may hereafter be amended.

(i) The capital component of the transportation charge.

(ii) The minimum component of the transportation charge.

(iii) The replacement portion of the variable component of the transportation charge.

(iv) The capital component of the Delta water charge.

(v) The minimum component of the Delta water charge.

These charges for 1985 total \$8.44 per acre-foot of water conveyed.

(d) In consideration for the conveyance of State Water Project water for scheduled or unscheduled maintenance and unforeseen outages from the Delta to O'Neill Forebay through Central Valley Project facilities, the State will convey for the United States an equal quantity of Central Valley Project water measured in acre-feet through its facilities at no charge; Provided, That such conveyance of Central Valley Project water shall be accomplished, if possible, within 12 months from the date conveyance of State Water Project water was completed. Each agency shall be responsible for supplying the power required to pump its water.

(e) The State, in an annual letter to the United States, will transmit the charges referred to in subarticles 10(b)(2) and 10(c)(2) above based upon the cost components listed therein.

(f) The State will submit invoices to the United States on or before June 30 of the year following the year in which the wheeling occurs. The United States will make payment within 30 days after receipt of such invoice.

(g) Prior to December 31 of the fifth full year following the execution of this agreement, the parties will agree upon the amount and value of the services each project has provided to the other project prior to the execution of this agreement and will agree upon the manner in which any imbalance is to be resolved. This subarticle shall not apply to services provided under a separate written agreement.

(h) (1) The parties shall promptly commence negotiating a contract for the conveyance and purchase of Central Valley Project water to assist each party in making more efficient use of the water project facilities and water supplies contemplated in this agreement. The terms and conditions of said contract shall be no less favorable to either party than the terms and conditions either party would make available to their respective long-term contractors, except as specified by this subarticle.

(2) The contract referred to in subarticle 10(h)(1) shall provide for, among other things, the sale of Central Valley Project water to the State for use by State Water Project contractors on the following conditions:

(i) When the Central Valley Project water sold to the State is needed by existing or new long-term Central Valley Project contractors, it shall be recalled by the United States for such contractors;

(ii) The United States shall impose deficiencies on water purchased by the State in a manner consistent with Exhibit E.

(3) The contract referred to in subarticle 10(h)(1) shall further provide for, among other things, the United States purchase of State Water Project conveyance services for transport of Central Valley Project water to Central Valley Project contractors on the following conditions:

(i) The State shall transport Central Valley Project water for the United States up to the amount of Central Valley Project water made available to the State for purchase each year on the same priority as water transported for State Water Project long-term contractors;

(ii) In addition, the United States shall have the first right to purchase all conveyance services that are in excess of the services being used to transport water

developed or purchased by the State or the State Water Project contractors. The conveyance of Central Valley Project water shall not diminish deliveries or increase costs of water supplies developed or purchased by the State or the State Water Project contractors.

(4) The parties recognize that to fully implement this agreement, the parties may be required to seek amendments to existing water rights permits or additional water rights permits for, (i) an additional point of diversion and rediversion at the State's Harvey O. Banks Delta Pumping Plant and the United States Tracy Pumping Plant; and (ii) consolidation and expansion of place of use. The State shall support the petition of the United States.

(5) At any time after December 31, 1988, if either party shall not have received all of the amendments or permits described in subarticle 10(h)(4) and which contain conditions satisfactory to that party, then that party may terminate this agreement on 180 days written notice, or utilize the provisions of subarticle 14(b)(2) to seek a resolution of its concerns.

DELTA STANDARDS

11. (a) The Central Valley Project and the State Water Project will be operated in conformity with the Delta standards in Exhibit A. Should the State Water Resources

Control Board establish new Delta standards, and the United States determines that operation of the Central Valley Project in conformity with the new Delta standards is not inconsistent with Congressional directives the parties shall amend Exhibit A to conform with the new Delta standards and amend this agreement to the extent necessary to provide for continued operation of both projects to accomplish the purposes of this agreement.

(b) Should the United States determine that the new Delta standards are inconsistent with Congressional directives then the United States shall promptly request the Department of Justice to bring an action for the purpose of determining the applicability of the new Delta standards to the Central Valley Project.

(c) The United States reserves the right to seek, at any time, the enactment of legislation regarding the operation of the Central Valley Project, including compliance with new Delta standards, which may supersede any final court decisions addressed in subarticle 11(b).

(d) The parties do not intend by this agreement to confer any additional authority upon either the Secretary of the Interior or the State Water Resources Control Board beyond that derived from applicable statutory and decisional law.

MONITORING

12. (a) The United States and the State recognize that certain monitoring activities must be done to ensure compliance with the Delta standards specified in Exhibit A. The necessary monitoring activities are specified in Exhibit C. The United States and the State agree to share equally the cost of those monitoring activities, including the analysis of the collected data.

(b) Exhibit C will be amended, if necessary, to ensure compliance with any Delta standards different from those set forth in Exhibit A which are applicable to the United States pursuant to Article 11.

(c) The parties agree that additional data must be collected and processed to determine the effects of the projects on the Delta and San Francisco Bay. Monitoring in addition to that specified in Exhibit C and the performance of Delta water quality studies will be covered by separate agreements.

RECORDS

13. Subject to applicable laws and regulations, the United States and the State shall have full access at all reasonable times to the books and records of the other party insofar as they pertain to this agreement, with the right to make copies thereof.

PERIODIC REVIEW

14. (a) Prior to December 31 of the fifth full year following execution of this agreement, and before December 31 of each fifth year thereafter, or more frequently if so requested by either party, the United States and the State jointly shall review the operations of both projects. The parties shall (1) compare the relative success which each party has had in meeting its objectives, (2) review operation studies supporting this agreement, including, but not limited to, the assumptions contained therein, and (3) assess the influence of the factors and procedures of Article 6 in meeting each party's future objectives. The parties shall agree upon revisions, if any, of the factors and procedures in Article 6, Exhibits B and D, and the Operation Study used to develop Exhibit B.

(b) (1) If the parties fail to enter into the contract referred to in subarticle 10(h)(1) by December 31, 1988, either party may give written Notice of Negotiation to the other party. Within 30 days of such notice, each party shall designate one member of an Advisory Board to which that problem shall be referred. The members designated by the parties shall choose a third member who shall act as chairperson. The Board shall report its unanimous recommendation to both parties with respect to all terms and conditions to be

included in said contract at a date not later than 12 months from the date of the Notice of Negotiation. The parties shall immediately implement that recommendation. If the Board fails to made a unanimous recommendation within the 12-month period, either party may unilaterally terminate this agreement.

(2) If the parties are unable to agree on changes to this agreement, or either party fails to receive all of the amendments or permits described in subarticle 10(h)(4), either party may give written Notice of Negotiation. If agreement satisfactory to both parties has not been reached within 12 months of such Notice, each party shall designate within 30 days one member of an Advisory Board to which the problem shall be referred. The members designated by the parties shall choose a third member who shall act as chairperson. The Board shall report its unanimous recommendations to both parties at a date not later than 24 months from the date of the Notice of Negotiation and the parties shall amend this agreement and immediately begin to operate in accordance with said recommendations. If the Board fails to make unanimous recommendations within the 24-month period, either party may unilaterally terminate this agreement.

RELATION TO AGREEMENT OF MAY 16, 1960

15. This agreement suspends the Agreement of May 16, 1960, and said Agreement of May 16, 1960, shall be of no force and effect whatsoever so long as this agreement remains in force. Should this agreement be terminated for any purpose, the Agreement of May 16, 1960, shall automatically become effective with both parties reserving their respective rights regarding the interpretation of the provisions thereof.

NEW FACILITIES

16. Any yield created by the construction of a new facility (not presently existing) by either party shall be attributed to the party constructing the new facility, and will require a review as provided for in Article 14. To the extent that water is exported outside the drainage of the Sacramento, Mokelumne, and Calaveras Rivers, the facilities used to convey such water shall be considered as export facilities for the purposes of Article 5.

PROJECT SERVICE AREAS

17. The State and the United States agree that they will respect each others project service areas as defined by long-term contracts of either agency for the furnishing of water.

THIRD PARTY RIGHTS UNAFFECTED

18. Nothing in this agreement is intended to define, determine, limit, or affect the rights of third parties.

EFFECT OF WAIVER OF BREACH

19. The waiver of a breach of any of the provisions of this agreement shall not be deemed to be a waiver of any other provisions hereof or of a subsequent breach of such provisions.

EQUAL EMPLOYMENT OPPORTUNITIES

20. During the performance of this agreement, the State agrees as follows:

(a) It will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. It will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment,

upgrading, demotion, or transfer; recruiting or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. It agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this Equal Opportunity clause.

(b) The State will, in all solicitations or advertisements for employees placed by or on its behalf, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(c) The State will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice, to be provided by the agency Contracting Officer, advising the labor union or workers' representative of the State's commitments under this Equal Opportunity clause, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The State will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The State will furnish all information and reports required by said Executive Order, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Bureau of Reclamation and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the State's noncompliance with the Equal Opportunity clause of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and it may be declared ineligible for further Government contracts in accordance with procedures authorized in said Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The State will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246, so that such provisions will be binding upon each subcontractor or vendor. It will take such actions with respect to any subcontract or purchase order as the Contracting

Officer may direct as a means of enforcing such provisions, including sanctions for noncompliance; Provided, however, That in the event the State becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Contracting Officer it may request the United States to enter into such litigation to protect the interests of the United States.

CONTINGENT PROVISIONS

21. Performance by the State and the United States shall be contingent on: (1) the availability of Federal funds therefor; and (2) the availability of State funds therefor.

OFFICIALS NOT TO BENEFIT

22. (a) No member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this agreement or to any benefit that may arise herefrom. This restriction shall not be construed to extend to this agreement if made with a corporation for its general benefit.

(b) No official of the State shall receive any benefit that may arise by reason of this agreement other than as a landowner within the Project and in the same manner as other landowners within the Project.

IN WITNESS WHEREOF, the parties hereto, by their respective officers thereunto duly authorized, have duly executed this supplement on the day and year first herein-
above written.

THE UNITED STATES OF AMERICA

By *[Handwritten Signature]*
Regional Director, Mid-Pacific Region
Bureau of Reclamation

DEPARTMENT OF WATER RESOURCES OF
THE STATE OF CALIFORNIA

Approved as to legal form
and sufficiency: -

[Handwritten Signature]
Chief Counsel, Department
of Water Resources

By *[Handwritten Signature]*
Director
Department of Water Resources

STANDARDS
FOR THE SACRAMENTO-SAN JOAQUIN DELTA 1/

BENEFICIAL USES PROTECTED AND LOCATION	PARAMETER	DESCRIPTION	YEAR TYPE	VALUES	
<u>MUNICIPAL AND INDUSTRIAL</u>					
Contra Costa Canal Intake at Pumping Plant No. 1	Chloride	Maximum Mean Daily Cl ⁻ 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	Number of Days Each Calendar Year Less than 150 mg/l Chloride <hr/> 240 (66%) 190 (52%) 175 (48%) 165 (45%) 155 (42%)	
City of Vallejo Intake at Cache Slough	Chloride	Maximum Mean Daily Cl ⁻ in mg/l	All	250	
Clifton Court Forebay Intake at West Canal	Chloride	Maximum Mean Daily Cl ⁻ in mg/l	All	250	
Delta Mendota Canal at Tracy Pumping Plant	Chloride	Maximum Mean Daily Cl ⁻ in mg/l	All	250	
<u>AGRICULTURE</u>				0.45 EC April 1 to Date Shown	EC from Date Shown <u>2/</u> to <u>Aug. 15</u>
<u>WESTERN DELTA</u>					
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 -- 0.63 1.14 1.67 2.78	

BENEFICIAL USES PROTECTED AND LOCATION	PARAMETER	DESCRIPTION	YEAR TYPE	VALUES	
<u>AGRICULTURE</u>				0.45 EC April 1 to Date Shown	EC from Date Shown <u>2/</u> to <u>Aug. 15</u>
WESTERN DELTA					
Jersey Point on the San Joaquin River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet	Aug. 15	--
			Ab. Normal	Aug. 15	--
			Bl. Normal	June 20	0.74
			Dry	June 15	1.35
			Critical	--	2.20
INTERIOR DELTA					
Terminous on the Mokelumne River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet	Aug. 15	--
			Ab. Normal	Aug. 15	--
			Bl. Normal	Aug. 15	--
			Dry	Aug. 15	--
			Critical	--	0.54
San Andreas Landing on the San Joaquin River	Electrical Conductivity	Maximum 14-day Running Average of Mean Daily EC in mmhos	Wet	Aug. 15	--
			Ab. Normal	Aug. 15	--
			Bl. Normal	Aug. 15	--
			Dry	June 25	0.58
			Critical	--	0.87
<u>FISH AND WILDLIFE</u>					
STRIPED BASS SPAWNING					
Prisoners Point on the San Joaquin River	Electrical Conductivity	Average of mean daily EC for the period not to exceed	All	<u>April 1 to May 5</u> 0.55 mmhos	
Chipps Island	Delta Outflow Index in cfs	Average of the daily Delta outflow index for the period, not less than	All	<u>April 1 to April 14</u> 6700 cfs	
Antioch Waterworks Intake on the San Joaquin River	Electrical Conductivity	Average of mean daily EC for the period, not more than	All	<u>April 15 to May 5</u> 1.5 mmhos	

BENEFICIAL USES PROTECTED
AND LOCATION

PARAMETER

DESCRIPTION

YEAR TYPE

VALUES

FISH AND WILDLIFE

STRIPED BASS SPAWNING

Antioch Water Works
Intake (continued)

Electical
Conductivity
(Relaxation
Provision -
replaces the
above Antioch
and Chipps
Island Stan-
dard whenever
the projects
impose defi-
ciencies in
firm supplies 3/

Average of mean Daily EC
for the period, not more
than the values correspond-
ing to the deficiencies
taken (linear interpola-
tion to be used to deter-
mine values between those
shown)

All -
whenever
the pro-
jects im-
pose defi-
ciencies
in firm
supplies 3/

Total Annual
Imposed Defi-
ciency MAF

Apr. 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

STRIPED BASS SURVIVAL

Chipps Island

Delta Outflow
Index in cfs

Average of the daily Delta
outflow index for each
period shown not less than

Wet
Ab. Normal
Bl. Normal
Subnormal
Snowmelt
Dry 4/
Dry 5/ or
Critical

May 6-31	June	July
14,000	14,000	10,000
14,000	10,700	7,700
11,400	9,500	6,500
6,500	5,400	3,600
4,300	3,600	3,200
3,300	3,100	2,900

SALMON MIGRATIONS

Rio Vista on the
Sacramento River

Computed net
stream flow
in cfs

Minimum 30-day running
average of mean daily
net flow

Wet
Ab. Normal
Bl. Normal
Dry or
Critical

Jan.	Feb. 1- Mar. 15	Mar. 16- June 30
2,500	3,000	5,000
2,500	2,000	3,000
2,500	2,000	3,000
1,500	1,000	2,000

BENEFICIAL USES PROTECTED
AND LOCATION

PARAMETER

DESCRIPTION

YEAR TYPE

VALUES

FISH AND WILDLIFE

SALMON MIGRATIONS

Rio Vista on the
Sacramento River
(continued)

	<u>July</u>	<u>Aug.</u>	<u>Sept. 1 Dec. 31</u>
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

SUISUN MARSH

Chipps Island at
O&A Ferry Landing

Electrical
Conductivity

Maximum 28-day running
average of mean daily EC

	<u>Jan.-May</u>	<u>Oct.-Dec.</u>
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 6/ otherwise the 12.5 mmhos EC remains in effect.)

Chipps Island

Delta Outflow
Index in cfs

Average of the daily
Delta outflow index for
each month, not less
than values shown

Wet	<u>February-May 10,000 cfs</u>
Subnormal Snowmelt	<u>February-April 10,000 cfs</u>

Minimum daily Delta
outflow index for 60
consecutive days in
the period

Ab. Norm and Bl. Norm.	<u>January-April 12,000 cfs</u>
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BENEFICIAL USES PROTECTED
AND LOCATION

PARAMETER

DESCRIPTION

YEAR TYPE

VALUES

FISH AND WILDLIFE

SUISUN MARSH

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 en-
velope at two out
of three of the
following: Shasta
Reservoir, Oroville
Reservoir, and CVP
storage on the
American River

Jan.-May
6,600 cfs

OPERATIONAL CONSTRAINTS *

Minimize diversion of
young striped bass
from the Delta

Diversions
in cfs

The mean monthly diver-
sions from the Delta by
the State Water Project(SWP)
(Department) not to
exceed the values shown.

All

May June July
3,000 3,000 4,600

The mean monthly diver-
sions from the Delta by
the Central Valley Project(CVP)
(Bureau), not to exceed
the values shown.

All

May June
3,000 3,000

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 consecu-
tive days at the dis-
cretion 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

BENEFICIAL USES PROTECTED
AND LOCATION

PARAMETER

DESCRIPTION

YEAR TYPE

VALUES

FISH AND WILDLIFE

OPERATIONAL CONSTRAINTS *

Minimize cross Delta move-
ment 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

*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 Central Valley Project exports, the State will, through coordinated operations, transport for the United States an amount equal to such reductions during the year by direct diversion or by redirection of stored Central Valley Project water through State Water Project facilities at such times that diversions don't reduce State Water Project yield.

FOOTNOTES

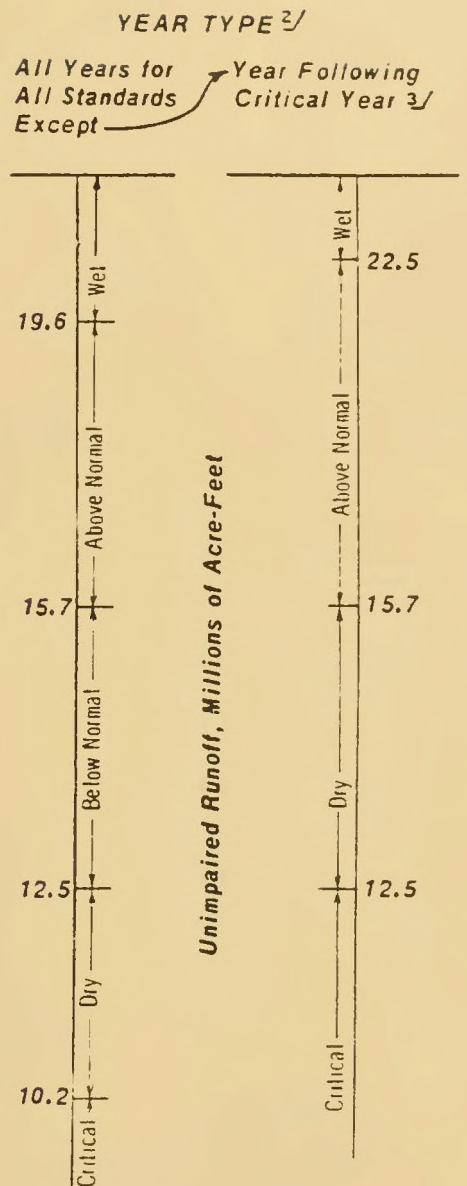
- 1/ Except for flow, all values are for surface zone measurements. Except for flow, all mean dally values are based on at least hourly measurements. All dates are inclusive.
- 2/ When no date is shown in the adjacent column, EC limit in this column begins on April 1.
- 3/ For the purpose of this provision 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.
- 4/ Dry year following a wet, above normal or below normal year.
- 5/ Dry year following a dry or critical year.
- 6/ 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.

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 ^{1/}	equal to or greater than 19.6 (except equal to or greater than 22.5 in a year following a critical year). ^{3/}
Above Normal ^{1/}	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). ^{3/}
Below Normal ^{1/}	equal to or less than 15.7 and greater than 12.5 (except in a year following a critical year). ^{3/}
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). ^{3/}
Critical	equal to or less than 10.2 (except equal to or less than 12.5 in a year following a critical year). ^{3/}



- ^{1/} 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.
- ^{2/} 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.
- ^{3/} "Year following critical year" classification does not apply to Agricultural, Municipal and Industrial standards.

EXHIBIT B-1

CENTRAL VALLEY PROJECT AND STATE WATER PROJECT ANNUAL SUPPLIES
(all figures are in thousands of acre-feet)

<u>Central Valley Project</u>	<u>State Water Project</u>	<u>Total</u>
<u>SACRAMENTO BASIN USE</u>		
Sacramento River below Shasta	2,954	Feather River below Oroville 993
American River Basin	<u>200</u>	<u> </u>
Subtotal	3,154	993 4,147
<u>EXPORT</u>		
Tracy Pumping Plant	3,113	Delta Pumping Plant 2,674
Contra Costa Pumping Plant	90	
Cross Valley Canal	128	
Incremental Supply	432	
	<u> </u>	<u> </u>
Subtotal	3,762	2,674 6,436
DELTA AREA AND OUTFLOW (JOINT RESPONSIBILITY)		<u>4,986</u>
TOTAL		15,569

- Notes: (1) Annual supplies are based on operation study USCAL-2-82.
(1928-1934 critical period)
- (2) Annual supplies in some cases include both water right entitlements and project supplemental water.
- (3) The listing of annual supplies by service areas is not intended to restrict the place of use of either party.
- (4) Cross Valley Canal supply relies on transport through State Water Project facilities.
- (5) Incremental supply is developed from remaining storage in Central Valley Project reservoirs at the end of the 1928-1931 critical period and could be made available in the Delta on a firm basis with allowable (25%) deficiencies in critical years. It would require transport through State Water Project facilities.

EXHIBIT B-2

CENTRAL VALLEY PROJECT AND STATE WATER PROJECT FULL DEVELOPMENT ANNUAL SUPPLIES
(all figures are in thousands of acre-feet)

	<u>Central Valley Project</u>		<u>State Water Project</u>		<u>Total</u>
<u>SACRAMENTO BASIN USE</u>					
Sacramento River below Shasta	3,381		Feather River below Oroville	1,031	
American River Basin	<u>1,132</u>				
Subtotal	4,513			1,031	5,544
<u>EXPORT</u>					
Tracy Pumping Plant	3,264		Delta Pumping Plant	2,059	
Contra Costa Pumping Plant	195				
Cross Valley Canal	128				
Incremental Supply	154				
Subtotal	<u>3,741</u>			<u>2,059</u>	5,800
<u>DELTA AREA AND OUTFLOW (JOINT RESPONSIBILITY)</u>					<u>4,918</u>
<u>TOTAL</u>					<u>16,262</u>

- Notes: (1) Figures are illustrative of annual supplies obtainable under the assumptions of operation study USCAL-3-82. (1928-1934 critical period) which assumes full development with existing facilities.
- (2) Annual supplies in some cases include both water right entitlements and project supplemental water.
- (3) The listing of annual supplies by service areas is not intended to restrict the place of use of either party.
- (4) Cross Valley Canal supply relies on transport through State Water Project facilities.
- (5) Incremental supply is developed from remaining storage in Central Valley Project reservoirs at the end of the 1928-1934 critical period and could be made available in the Delta on a firm basis with allowable (25%) deficiencies in critical years. It would require transport through State Water Project facilities.
- (6) American River Basin Supply includes 120 thousand acre-feet for Placer County Water Agency water rights. It is assumed delivered above Folsom.

EXHIBIT C

MONITORING LOCATIONS

<u>No.</u>	<u>*Station Identifier Code</u>	<u>State Location</u>
1	RSAN032	San Joaquin River at San Andreas Landing
2	CHCCC06	Contra Costa Canal at P.P. #1
3	CHWST0	West Canal at mouth/intake to CCFB
4	RSMKL08	Mokelumne River at Terminous
5	SLCCH16	Cache Slough at City of Vallejo intake
6	RSAC075	Sacramento River at Chipps Island (Mallard Slough)
7	RSAN007	San Joaquin River at Antioch
8	RSAN018	San Joaquin River at Jersey Point
9	RSAC092	Sacramento River at Emmaton
10	CHDMC006	Delta Mendota Canal
11	RSAC101	Sacramento River at Rio Vista
12	RSAC139	Sacramento River at Greens Landing
13	ROLD14	Old River at Holland Tract
14	RSAC081	Sacramento River at Collinsville
15	RSAN112	San Joaquin River at Vernalis
16	B9D801.9 143.2	San Joaquin River at Blind Point
17	**D29	San Joaquin River at Prisoners Point
18	B9D802.0 137.2	Piper Slough at Bethel Island

Unless otherwise agreed, a continuous electrical conductivity (EC) recorder shall be maintained at all of the sites listed above except for the San Joaquin River at Prisoners Point (D29) where only a weekly EC measurement is required between April 1 and May 5 of each year.

*Station Identifier Code used in the Environmental Protection Agency STORET data base

**Bureau of Reclamation station identifier code. STORET code not available.

Exhibit D
Exchange Procedure to Provide D-1485 Condition 3
Replacement Water (Article 10b of COA)

The California State Water Resources Control Board (SWRCB) Decision 1485 (D-1485) restricts exports from the Delta by the Central Valley Project (CVP) and the State Water Project (SWP) during May and June of each year by limiting each project to a mean monthly export of 3,000 ft³/s. However, Condition 3 of D-1485¹ allows the CVP to make up any deficiency caused by the limitation by exporting at SWP facilities (Condition 3 water). In an effort to minimize the impact of the limitation on CVP and SWP power operations and unless otherwise agreed, this exchange procedure will be followed.

During May and June of each year the CVP shall have the option to provide and the SWP will accept an amount of energy on a mutually agreed upon schedule sufficient to pump some or all Condition 3 water at H. O. Banks Delta Pumping Plant (Banks). Operation under this procedure shall not cause export from the Delta in excess of that shown in Exhibit A. Any energy supplied by the CVP under this procedure will be used for pumping of SWP water at Banks and/or any joint CVP-SWP pumping facility during May and June. Such energy shall be converted to dollars at the then current value of SWP energy and credited to a CVP exchange account (account). During months other than May and June, the SWP shall pump Condition 3 water for the CVP utilizing the account to cover

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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 period of the year by direct diversion or by redirection of releases of stored water through State Water Project facilities.

the cost of associated pumping energy at Banks at the then current value of energy to the SWP. For accounting purposes all Condition 3 water shall be deemed to have been pumped at Banks at a rate of 297 KWH/AF. This rate is based on the rated efficiency of the pumping plant. Any change in the rated efficiency of the pumping plant will result in a correlative change in this KWH/AF rate at Banks.

The CVP shall have the option to convey all Condition 3 water through SWP facilities during July and August. However, it is recognized that the value of energy is time dependent. Therefore, it is likely that the value of energy to pump an amount of water in May and June will be different than the value for pumping an equal amount of water at other times of the year. Prior to April 1 of each year operators of the SWP shall estimate the value of off-peak and on-peak energy for each week of the following twelve months. Prior to April 20 the CVP operators in coordination with the SWP operators shall determine how much CVP energy can be provided for SWP pumping during the May-June period. In the event that the account balance is insufficient to purchase the necessary energy for pumping all Condition 3 water, the CVP may provide and SWP will accept additional energy needed to effect full recovery of Condition 3 water. In the event that the entire quantity of Condition 3 water is received by the CVP prior to the depletion of the account, the SWP shall credit the CVP with energy for additional pumping at Banks Pumping Plant or any joint CVP-SWP pumping facility until the account reaches a zero balance each year.

EXHIBIT E

WATER SHORTAGE AND APPORTIONMENT

1. (a) In its operation of the Central Valley Project (CVP), the United States will use all reasonable means to guard against a condition of shortage in the quantity of water available to the State pursuant to this contract. Nevertheless, if a shortage does occur during any year because of drought, or other causes which, in the opinion of the Contracting Officer, are beyond the control of the United States, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

(b) In any year that the Contracting Officer determines there is a shortage in the quantity of water available to customers of the United States from the CVP, the Contracting Officer will apportion available water among the water users capable of receiving water from the same CVP facilities by reducing deliveries to all such water users by the same percentage, unless he is prohibited by existing contracts, CVP authorizations, or he determines that some other method of apportionment is required to prevent undue hardship. In the event reduced deliveries are necessary, the water supplies for both municipal and industrial use, and agricultural use shall be reduced by the same percentage for each contractor.

(c) If operation of the CVP to meet legally required Delta water quality control standards, including Federally adopted water quality standards, causes a shortage in water supply and requires a reduction in deliveries of water to the State under this agreement, such reductions will be made in accordance with subdivision (b) of this exhibit and shall not be deemed a breach hereof.

Ninety-ninth Congress of the United States of America
AT THE SECOND SESSION
Begun and held at the City of Washington on Tuesday,
the twenty-first day of January, one thousand nine hundred and eighty-six

An Act

To implement the Coordinated Operations Agreement, the Suisun Marsh Preservation Agreement, and to amend the Small Reclamation Projects Act of 1956, as amended, and for other purposes.

=====

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I--COORDINATED OPERATIONS

Project Operation Policy

Sec. 101. Section 2 of the Act of August 26, 1937 (50 Stat. 850) is amended by--

- (a) inserting at the beginning "(a)"; and
- (b) inserting the following new subsection:

"(b)(1) Unless the Secretary of the Interior determines that operation of the Central Valley project in conformity with State water quality standards for the San Francisco Bay/Sacramento-San Joaquin Delta and Estuary is not consistent with the congressional directives applicable to the project, the Secretary is authorized and directed to operate the project, in conjunction with the State of California water project, in conformity with such standards. Should the Secretary of the Interior so determine, then the Secretary shall promptly request the Attorney General to bring an action in the court of proper jurisdiction for the purposes of determining the applicability of such standards to the project.

"(2) The Secretary is further directed to operate the Central Valley project, in conjunction with the State water project, so that water supplied at the intake of the Contra Costa Canal is of a quality equal to the water quality standards contained in the Water Right Decision 1485 of the State of California Water Resources Control Board, dated August 16, 1978, except under drought emergency water conditions pursuant to a declaration by the Governor of California. Nothing in the previous sentence shall authorize or require the relocation of the Contra Costa Canal intake."

Reimbursable Costs

Sec. 102 Section 2 of the Act of August 26, 1937 (50 Stat. 850) is amended by inserting the following new subsection:

"(c)(1) The costs associated with providing Central Valley project water supplies for the purpose of salinity control and for complying with State water quality standards identified in exhibit A of the 'Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project' dated May 20, 1985, shall be allocated among the project purposes and shall be reimbursed in accordance with existing Reclamation law and policy. The costs of providing water for salinity control and for complying with State water quality standards above those standards identified in the previous sentence shall be nonreimbursable.

"(2) The Secretary of the Interior is authorized and directed to undertake a cost allocation study of the Central Valley project, including the provisions of this Act, and to implement such allocations no later than January 1, 1988."

Coordinated Operations Agreement

Sec. 103. Section 2 of the Act of August 26, 1937 (50 Stat. 850) is amended by inserting the following new subsection:

"(d) The Secretary of the Interior is authorized and directed to execute and implement the 'Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project' dated May 20, 1985: Provided, That--

"(1) the contract with the State of California referred to in subarticle 10(h)(1) of the agreement referred to in this subsection for the conveyance and purchase of Central Valley project water shall become final only after an Act of Congress approving the execution of the contract by the Secretary of the Interior; and,

"(2) the termination provisions of the agreement referred to in this subsection may only be exercised if the Secretary of the Interior or the State of California submits a report to Congress and sixty calendar days have elapsed (which sixty days, however, shall not include days on which either the House of Representatives or the Senate is not in session because of an adjournment of more than three days to a day certain) from the date on which said report has been submitted to the Speaker of the House of Representatives and the President of the Senate for reference to the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the Senate. The report must outline the reasons for terminating the agreement and, in the case of the report by the Secretary of the Interior, include the views of the Administrator of the Environmental Protection Agency and the Governor of the State of California on the Secretary's decision."

Refuge Water Supply Investigation

Sec. 104. The Secretary of the Interior shall not contract for the delivery of more than 75 percent of the firm annual yield of the Central Valley project not currently committed under long-term contracts until one year after the Secretary has transmitted to the Congress a feasibility report, together with his recommendations, on the "Refuge Water Supply Investigations, Central Valley Basin, California."

Adjustment of Rates and Ability to Pay

Sec. 105. The Secretary of the Interior shall include in all new or amended contracts for the delivery of water from the Central Valley project a provision providing for the automatic adjustment of rates by the Secretary of the Interior if it is found that the rate in effect may not be adequate to recover the appropriate share of the existing Federal investment in the project by the year 2030. The contracts shall also include a provision authorizing the Secretary of the Interior to adjust determinations of ability to pay every five years.

Operation and Maintenance Deficits

Sec. 106. The Secretary of the Interior shall include in each new or amended contract for the delivery of water from the Central Valley project provisions ensuring that any annual deficit (outstanding or hereafter arising) incurred by a Central Valley project water contractor in the payment of operation and maintenance costs of the Central Valley project is repaid by such contractor under the terms of such new or amended contract, together with interest on any such deficit which arises on or after October 1, 1985, at a rate equal to the average market yields on outstanding marketable obligations of the United States with remaining periods to maturity comparable to the applicable reimbursement period of the project, adjusted to the nearest one-eighth of 1 percent.

TITLE II--SUISUN MARSH PRESERVATION AGREEMENT

Authority to Enter Agreement

Sec. 201. The Secretary of the Interior is authorized to execute and implement the agreement between the Department of the Interior, the State of California and the Suisun Resources Conservation District (dated November 1, 1985).

Cost-Sharing Provisions

Sec. 202. The costs of implementing the agreement provided in section 201 of this title shall be shared by the Bureau of Reclamation and the California Department of Water Resources in strict accordance with article 12 of that agreement: Provided, That--

(a) payments made by the Secretary of the Interior shall not exceed 40 percent of the construction costs incurred under articles 6, 7, and 8 of the agreement, or \$50,000,000, whichever is less, plus or minus such amounts as are justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the types of construction involved therein;

(b) the Federal share of continuing annual operation and maintenance costs, including monitoring, shall not exceed 40 percent of the actual operation and maintenance costs; and,

(c) the costs incurred by the United States for construction and for annual operation and maintenance in connection with the implementation of said agreement shall constitute an integral part of the cost of the Central Valley project. The Secretary shall allocate such costs to the reimbursable and nonreimbursable purposes served by the project.

Costs Incurred

Sec. 203. Costs incurred both before and after the date of execution of the agreement herein authorized are to be included in the total for determining the Federal share of construction, operation, and maintenance costs.

Authorization of Appropriations

Sec. 204. There are authorized to be appropriated for the implementation of the agreement referred to in Section 201 of this title \$50,000,000 plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the types of construction involved therein and, in addition thereto, in accordance with subsection 201(b) of this title, such sums as may be required for operation and maintenance: Provided, That no Federal funds may be expended pursuant to this title in advance of appropriations therefor: Provided further, That appropriations pursuant to this title shall remain available until expended without any fiscal year limitation.

TITLE III--SMALL RECLAMATION PROJECTS ACT

Reference to Small Projects Act

Sec. 301. As used in this title, the term "the Act" means the Small Reclamation Projects Act of 1956, as amended (43 U.S.C. 422a et seq.).

Rehabilitation and Betterment

Sec. 302. Section 1 of the Act is amended by inserting after the word "laws" ", with emphasis on rehabilitation and betterment of existing projects for purposes of significant conservation of water, energy and the environment and for purpose of water quality control,".

Filing Fee

Sec. 303. The second sentence of section 3 of the Act is amended by striking "\$1,000" and inserting in lieu thereof "\$5,000".

Cost Sharing

Sec. 304. (a) Section 4(b) of the Act is amended by inserting "(1)" after (b) and by striking "by loan and grant under this Act" and inserting in lieu thereof "by loan and grant of Federal funds".

(b) Section 4(b) of the Act is amended by adding the following new paragraph at the end thereof:

"(2) The Secretary shall require each organization to contribute toward the cost of the project (other than by loan and/or grant of Federal funds) an amount equal to 25 percent or more of the allowable estimated cost of the project: Provided, That the Secretary, at his discretion, may reduce the amount of such contribution to the extent that he determines that the organization is unable to secure financing from other sources under reasonable terms and conditions, and shall include letters from lenders or other written evidence in support of any funding of an applicant's inability to secure such financing in any project proposal transmitted to the Congress: Provided further, That under no circumstances shall the Secretary reduce the amount of such contribution to less than 10 percent of the allowable estimated total project costs. In determining the amount of the contribution as required by this paragraph, the Secretary shall credit toward that amount the cost of investigations, surveys, engineering, and other services necessary to the preparation of proposals and plans for the project as required by the Secretary, and the costs of lands and rights-of-way required for the project, and the \$5,000 fee described in section 3 of this Act. In determining the allowable estimated cost of the project, the Secretary shall not include the amount of grants accorded to the organization under section 5(b)."

Soil Survey

Sec. 305. Section 4(c) of the Act is amended by inserting the following after the first sentence: "Each project proposal transmitted by the Secretary to the Congress shall include a certification by the Secretary that an adequate soil survey and land classification has been made, or that the successful irrigability of those lands and their susceptibility to sustained production of agricultural crops by means of irrigation has been demonstrated in practice. Such proposal shall also include an investigation of soil characteristics which might result in toxic or hazardous irrigation return flows."

Compatibility with Crops Projects

Sec. 306. Section 5(b) of the Act is amended by striking everything after the words "joint use facilities properly allocable to fish and wildlife enhancement or public recreation;" and substituting the following in lieu thereof:

"(5) that portion of the estimated cost of construction the project which, if it were constructed as a Federal reclamation project, would be properly allocable to functions, other than recreation and fish and wildlife enhancement and flood control, which are nonreimbursable under general provisions of law applicable to such projects; and (6) that portion of the estimated cost of constructing the project which is allocable to flood control and which would be nonreimbursable under general provisions of law applicable to projects constructed by the Secretary of the Army."

Repayment and Interest

Sec. 307. (a) Section 5(c)(1) of the Act is amended by striking "fifty" and inserting in lieu thereof "forty".

(b) Section 5(c)(2) of the Act is amended to read as follows: "interest, as determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which the contract is executed, on the basis of the average market yields on outstanding marketable obligations of the United States with remaining periods of maturity comparable to the applicable reimbursement period of the project, adjusted to the nearest one-eighth of 1 percent on the unamortized balance of any portion of the loan--

"(A) which is attributable to furnishing irrigation benefits in each particular year to land held in private ownership by a qualified recipient or by a limited recipient, as such terms are defined in section 202 of the Reclamation Reform Act of 1982, in excess of three hundred and twenty irrigable acres; or,

"(B) which is allocated to domestic, industrial, or municipal water supply, commercial power, fish and wildlife enhancement, or public recreation except that portion of such allocation attributable to furnishing benefits to a facility operated by an agency of the United States, which portion shall bear no interest."

(c) The remainder of section 5(c) of the Act is stricken in its entirety.

Fish and Wildlife Funding

Sec. 308. Section 8 of the Act is amended by adding at the end thereof the following sentence: "The Secretary shall transfer to the Fish and Wildlife Service or to the National Marine Fisheries Service, out of appropriations or other funds made available under this Act, such funds as may be necessary to conduct the investigations required to carry out the purposes of this section."

Authorization and Limitation

Sec. 309. (a) Section 10 of the Act is amended in the first sentence by inserting before ": Provided" "and, effective October 1, 1986, not to exceed an additional \$600,000,000".

(b) Section 10 of the Act is further amended by adding at the end thereof the following: "Not more than 20 percent of the total amount of additional funds authorized to be appropriated effective October 1, 1986, for loans and grants pursuant to this Act shall be for projects in any single State: Provided, That beginning five years after the date of enactment of this Act, the Secretary is authorized to waive the 20 percent limitation for loans and grants which meet the purposes set forth in section 1 of this Act: Provided further, That the decision of the Secretary to waive the limitation shall be submitted to the Congress together with the project proposal pursuant to section 4(c) of this Act and shall become effective only if the Congress has not, within 60 legislative days, passed a joint resolution of disapproval for such a waiver."

Transition Rules

Sec. 310. The provisions of Sections 303 and 308 of this title shall take effect upon enactment of this title. The provisions of sections 304(a) and 305 of this title shall be applicable to all proposals for which final applications are received by the Secretary after January 1, 1986. The provisions of Sections 302, 304(b), 306, and 307 shall be applicable to all proposals for which draft applications are received by the Secretary after August 15, 1986.

Surplus Crops Report

Sec. 311. The Secretary of the Interior and the Secretary of Agriculture shall review the effect of the Small Reclamation Projects Act of 1956, as amended, on the operation and objectives of the programs of the Department of Agriculture dealing with the production of surplus commodities as determined by the Secretary of Agriculture pursuant to the Agriculture Act of 1949, as amended, and shall jointly submit a report of their findings to the Committee on Energy and Natural Resources and the Committee on Agriculture, Nutrition and Forestry of the Senate and the Committee on Interior and Insular Affairs and the Committee on Agriculture of the House of Representatives no later than 120 days from the date of enactment of this Act together with their recommendations, if any, for any changes to either or both programs to better achieve the objectives of such programs.

TITLE IV--VALIDATION OF CONTRACTS

Sec. 401. The Federal Power Act (Act of June 10, 1920, 41 Stat. 1063; 16 U.S.C. 791a et seq., and Acts amendatory thereof and supplementary thereto) is amended in section 10(e) (16 U.S.C. 803(e)) by deleting "Commission." and inserting in lieu thereof: "Commission: Provided however, That no charge shall be assessed for the use of any Government dam or structure by any licensee if, before January 1, 1985, the Secretary of the Interior has entered into a contract with such licensee that meets each of the following requirements:

"(A) The contract covers one or more projects for which a license was issued by the Commission before January 1, 1985.

"(B) The contract contains provisions specifically providing each of the following:

"(i) A powerplant may be built by the licensee utilizing irrigation facilities constructed by the United States.

"(ii) The powerplant shall remain in the exclusive control, possession, and ownership of the licensee concerned.

"(iii) All revenue from the powerplant and from the use, sale, or disposal of electric energy from the powerplant shall be, and remain, the property of such licensee.

"(C) The contract is an amendatory, supplemental and replacement contract between the United States and: (i) the Quincy-Columbia Basin Irrigation District (Contract No. 14-06-100-6418); (ii) the East Columbia Basin Irrigation District (Contract No. 14-06-100-6419); or, (iii) the South Columbia Basin Irrigation District (Contract No. 14-06-100-6420).

This paragraph shall apply to any project covered by a contract referred to in this paragraph only during the term of such contract unless otherwise provided by subsequent Act of Congress."



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