CENTRAL DELTA WATER AGENCY
235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone (209) 465-5883 • Fax (209) 465-3956

June 30, 2014

Clerk
State Water Resources Control Board
commentletters@waterboards.ca.gov

Re: 7/1-2/14 Proposed Regulation regarding drought related emergency regulations for curtailment of diversions to protect senior water rights - Part One of Comments

Dear Ladies and Gentlemen:

These comments are submitted on behalf of the Central Delta Water Agency and the diverters of water within the boundaries within the agency including RC Farms, Inc., a holder of riparian and other water rights within the Sacramento-San Joaquin Delta.

We respectfully urge that the SWRCB not adopt the proposed regulation and further that the SWRCB not seek to curtail pre-1914 and riparian water diversions in the Delta except through a proper court adjudication.

The close interrelationship of the State Water Resources Control Board with its sister state agencies and in particular with the Resources Agency and its Department of Water Resources which operate the State Water Project and its continued collaboration with the agencies involved in operation of the Federal Central Valley Project clouds the impartiality necessary to afford due process to the senior water right holders in matters at issue with regard to the operation of the State Water Project and Central Valley Project. The proposed resolution which would delegate broad authority to curtail pre-1914 and riparian rights to SWRCB staff aggravates the issue of impartiality and eliminates the due process required by law.

Due to length our comments will be submitted in parts.

THE FINDING OF EMERGENCY IN SUPPORT OF EMERGENCY REGULATIONS FOR CURTAILMENT OF DIVERSIONS TO PROTECT SENIOR WATER RIGHTS IS, AS TO THE DELTA WATERSHED, NOT SUPPORTABLE

We continue to be very concerned that the drought actions to date and much of what is proposed, go beyond those justified pursuant to the emergency proclamations of the Governor.

Emergency actions justifiable to protect the true health and safety needs of people do not support regulatory actions to reallocate water contrary to the water right priorities , statutory priorities, water quality objectives and public trust.

There is clear evidence showing that actions of the SWRCB have strongly favored exports of water from the Delta to serve urban and agricultural interests to the south. The 2014 temporary urgency changes and actions in 2013 are the most recent. The broad authority granted to the Executive Director both as to regulating and granting temporary urgency changes and directing enforcement presents a serious conflict of interest. The inclusion of the Deputy Director in lieu of the Executive Director does not relieve the conflict.

Emergency Regulations

Emergency regulations which eliminate the due process associated with a hearing in advance of an imposition of a penalty are particularly onerous. The complexity of water rights and the wide range of differing physical conditions and impacts necessitate a proper adjudicatory type proceeding which can focus on the specific physical conditions and applicable statutory requirements to determine the water rights priority and entitlement of the impacted party. Such a proceeding must include the appropriate burdens of proof provided in water rights law.

The current drought conditions were not unexpected and have been anticipated in the water year classifications and critical year relaxations of water quality objectives encompassed in SWRCB Decision 1641 and in the planning for the SWP and CVP extending back to the 1940's. It was always recognized that continuing development of water storage projects would be necessary to generate surplus water to serve the increasing demand of water project contractors while at the same time meeting senior water rights requirements for the Delta and other Watersheds of Origin, salinity control and the public trust. The SWP plan to develop by the year 2000 sufficient water storage projects in the North Coast watersheds (See Exhibit 1) so as to supplement Delta water supplies by 5 million acre feet per year was critical to provide the necessary surplus water to serve the drought needs of the project contractors who now are being unlawfully favored by the proposed regulations. The suggestion that the current drought conditions were beyond the expectation of the water year classifications and critical year water quality relaxations in the current Water Quality Control Board Objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary is not supportable. The Water Quality Objectives

were adopted in 1995. The historical records of hydrology used for planning the SWP and CVP extended at least back to about 1917-18 and certainly included 1977.

The Northern Sierra Precipitation: 8-Station Index presented by DWR on May 6, 2014 was well above 1976-77 referred to as the "2nd Driest" year and reservoir storage for Shasta, Oroville, Folsom and Trinity was well above 1976-77. (See Exhibits 2 and 3. See also Exhibits 4, 5, 6 and 7.) DWR Delivery Reliability Reports extending back to about 2003 all show the limited ability of the SWP to export water in a year like 1977. Table B-6 SWP water delivery from the Delta for Study 4 from the State Water Project Delivery Reliability Report 2005 shows for a year like 1977 SWP delivery from the Delta of Table A water at 159,000 AF and Article 21 water at 0 AF (See Exhibit 8.) The Modeling Assumptions in such report included meeting the D-1641 "Delta Outflow Index (Flow and Salinity) and the Delta Cross Channel Gate Operation". The water year classification in D-1641 uses a weighted formula which takes into consideration the index for the prior year and was intended to address water years drier than 1977 and certainly those wetter than 1977 (See Exhibit 9) conditions such as now encountered are encompassed within the Critical Year Objectives in D-1641.

The SWP and CVP have the affirmative obligation to provide salinity control and an adequate water supply for the Delta. Additionally, no water is to be exported from the Delta unless the Delta is first provided an adequate supply. See Water Code Section 12200 et seq. D-1641 sets maintenance of specific water quality objectives as a condition of the SWP and CVP permits and licenses. The critical year relaxations in such objectives were developed to address conditions such as the current drought.

The current competition for a limited supply of water is in major part the result of deliberate operation of the SWP and CVP to maximize exports at the expense of meeting the water quality objectives which are conditions of their water rights. Unfortunately, the SWRCB directly collaborated with the project operators in 2013. Exhibit 10 includes the items of correspondence and factual support evidencing the intentional wrongful conduct in 2013 which resulted in excessive exports and depletion of water supplies in northern California. Exhibit 10 is not attached but is being provided electronically by separate email.

Attached hereto as Exhibit 11 is a summary of SWP Water Operations For the Week 06/16/14 Through 06/22/14. The current amounts of water delivered and pumped is provided along with the amounts for the corresponding periods in 1913. Substantial deliveries were made to the export areas in the San Joaquin Valley and Southern California at the expense of water storage in the north. The result is water in the south and conflict in the north.

THE SWRCB IN EXERCISING ITS AUTHORITY TO PREVENT WASTE OR UNREASONABLE USE OF WATER MUST MAKE EVERY EFFORT TO RESPECT AND ENFORCE THE RULE OF PRIORITY.

> "A solution to a dispute over water rights 'must preserve water right priorities to the extent those priorities do not lead to unreasonable use'."

(See Light v. State Water Resources Control Board (June 16, 2014, A138440) _____ Cal.App. 4th _____, 2014 WL 2724856, slip opinion, p. 23).

The proposed regulation for curtailment of pre-1914 and riparian water rights fails to provide a process to fairly determine the differing legal status and physical settings necessary to a proper determination of the priority of water right holders.

Water Quantity Is Naturally Sufficient In The Delta

For the Delta, the water available for diversion from the Delta pool by pre-1914 and riparian water right holders includes water from the Bay and (in turn the Pacific Ocean) natural surface flow from the tributaries, the accretions from groundwater, artesian flows into Delta islands and channels, precipitation, return flow from upstream use of natural surface flow and below ground flow, return flow from power diversions, physical solution flows, water provided pursuant to agreements and water provided by reason of statutory entitlements.

Except perhaps in limited areas along the edges of the Delta due to siltation, the Delta channels are of sufficient depth and size that in the absence of upstream projects water would always be available for diversion in sufficient quantities.

The Delta as defined in 12220 of the Water Code encompasses the tidal zone. With rising sea levels, the extent of the tidal zone is expected to increase. There are two high (flood) tides and two low (ebb) tides about every 25 hours. (See attached Exhibit 12 - Representative reflection of tides.)

The tidal exchange in the Delta at the western edge is typically in the range of 330,000 cfs which can be contrasted to summer inflows in the range of 10,000 cfs and net Delta outflows in the range of 5,000 cfs. (See Exhibit 13 page 21 from DWR 1993 Delta Atlas.)

In the June 1969 DWR Memorandum Report - the "Delta and the State Water Project" in describing the purpose and history of negotiations with Delta interests the Department explained:

> "During the 1950's the Department of Water Resources cooperated with the Bureau of Reclamation and the local Delta water users in studies to identify individual entitlements to the waters of the Sacramento River and the Delta. These studies, using the classical approach to solution of water rights problems, considered priority of rights to quantity of water rather than quality. No resolution was reached in the Delta using this approach. Actually, in the Delta, the question of quantity is of little concern, since the Delta is never short of water. If flow from the tributary streams were insufficient to meet Delta use, water from the Pacific Ocean would flow through the San Francisco Bay system and fill the Delta channels." *(Emphasis added)*
>
> "Since water shortage in the Delta is not a problem, it was necessary to develop a quality "yardstick" to guide project operation in the Delta."

(See Exhibit 14, pages 35 and 36 of excerpts from DWR Memorandum Report June 1969 titled *The Delta and The State Water Project.*)

The contract between the State of California Department of Water Resources and North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality dated January 28, 1981, provides further confirmation of the unique physical setting of the Delta in that it has additional natural flow from the bay and ocean. The Contract provides agreement that:

> "(e) Water problems within the Delta are unique within the State of California. As a result of the geographical location of the lands of the Delta and tidal influences, there is no physical shortage of water. Intrusion of saline ocean water and municipal, industrial and agricultural discharges and return flows, tend, however, to deteriorate the quality." (See Exhibit 15 - excerpt from said NDWA Contract.)

The proposed regulation and curtailment of Water Diversions in the Delta fails to recognize the natural flows of water from the west which are comprised of Bay water which is a mixture of ocean water, precipitation, fresh water from tributaries flowing into the Bays, groundwater accretions, artesian flows and flow from other sources. Appendix 7 and 8 to the Notice of Proposed Emergency Rulemaking - June 20, 2014, fail to include the natural flow from the Bay into the Delta. (See Exhibit 16. Appendix 7 and 8.) (See also Curtailment Analysis Methodology in Finding of Emergency.)

The water rights of diverters in the Delta clearly extend to the water naturally available in the Delta channels. While the quality may vary, the right to divert such water does not.

The proposed regulations and efforts of the SWRCB staff are purportedly to protect senior water rights but are in fact an effort to protect export diversions of water stored by the SWP and CVP which are storing such water pursuant to post 1914 water rights which are junior to the pre-1914 and riparian rights of Delta diverters and others within the Delta watershed.

The justification is arguably that because water is released from an upstream dam in a quantity greater than the natural flow into the dam that there is "stored water" entering the system and that such water thereafter enters the Delta and commingles with the naturally available water such that Delta diverters are diverting stored water to which they are not entitled.

COMMINGLED "STORED WATER"

In most reservoirs stored water is commingled with natural flow in the reservoir itself. Segregation of stored water from natural flow is complex. The already commingled stored water released from the originating reservoir must travel many miles to reach the Delta. As water passes down the river channels it is exposed to numerous diversions. Along the way water seeps, percolates and accretes between the river channels, adjoining lands and groundwater basins. Contributing flows occur from major and minor tributaries, from drainage systems, from precipitation and from groundwater. If the commingled water released from the originating reservoir reaches the Delta, it could go out as outflow or it may be dispersed through portions of the Delta depending greatly upon how the Delta cross channel and export pumps are being operated.

The applicable law which is most relevant is reflected in Water Code Section 7075 which provides:

> "§ 7075. Reclamation of water
>
> Water which has been appropriated may be turned into the channel of another stream, mingled with its water, and then reclaimed; but in reclaiming it the water already appropriated by another shall not be diminished. (Stats. 1943, c. 368, p. 1669, § 7075.)"

In Butte Canal & Ditch Co. v. Vaughn, 11 Cal. 143, the California Supreme Court made it clear that in cases of the commingling of water where it is difficult to determine with exactness the quantity of water which parties are entitled to divert:

> "The burden of proof rests with the party causing the mixture. He must show clearly to what portion he is entitled. He can claim only such portion as is established by decisive proof. The enforcement of his right must leave the opposite party in the use of the full quantity to which he was originally entitled."

The proposed regulation unlawfully attempts to avoid the burden of those claiming stored water from the Delta of proving their claim and demonstrating that Delta diverters will have the full quantity of water to which they were originally entitled.

In undertaking the role of protecting the junior water right holders (SWP and CVP in particular), claims to stored water as against senior water right diverters in the Delta, the SWRCB should have no less burden than that of the projects. The proposed regulation unlawfully deprives the Delta diverters of an impartial adjudication of the issues and relieves the burden of proof from the projects and in turn the SWRCB in advance of the Delta diverters suffering severe detriment and penalty. **The shift in the burden of proof is in direct conflict with existing law.**

STORED WATER

The Curtailment Analysis Methodology in the Finding of Emergency at page 12 provides

> "Release of stored water - any water released from storage for downstream beneficial uses, including meeting water quality or flow requirements, is not available for diversion by other water right holders, regardless of priority, unless the diverter has a contract for that water, or the released water has been abandoned, and the diversion is appropriative."

Equating releases from storage to "stored water" is contrary to law and as to the Delta ignores the rights and priorities provided by statute. Typically "stored water" is claimed by those storing the water to be that water which is stored in earlier months or earlier years. The quantification by those claiming such is the amount of outflow in excess of inflow plus losses due to reservoir evaporation. Putting aside reservoir caused losses other than evaporation the issue of "legally stored water" is much more complex.

By way of example, the SWP project is the holder of appropriative rights originally issued pursuant to State Water Resources Control Board (SWRCB) Decisions D 1275 and D 1291. The SWP permits to store water in Oroville Reservoir are subject to vested rights and numerous conditions. Currently Condition 8 to the permit provides:

"8. Water entering Oroville Reservoir or collected in the reservoir under this permit during and after the current storage season shall be released into the downstream channel to the extent necessary to satisfy downstream prior rights and to the extent that appropriation of water is not authorized under the permit.

Other conditions of relevance are:

"23. Direct diversion and storage of water under this permit for use beyond the Sacramento-San Joaquin Delta, as defined in Water Code Section 12220, or outside the watershed of the Sacramento River Basin, as defined in Decision D990 of the State Water Board, shall be subject to rights initiated by applications for beneficial use within said watershed and Delta regardless of the date of filing said applications."

"24. Direct diversion and storage of water which originates in that part of the Central Valley Basin consisting of the watershed of streams tributary to the Delta south of the American River under this permit for use outside the Central Valley Basin, shall be subject to rights initiated by applications for use within said part of the Central Valley Basin regardless of the date of filing said applications."

"39. Permittee is jointly responsible with the USBR for providing Delta flows that otherwise might be allocated to Mokelumne River water right holders."

"40. Permittee shall provide water to meet any responsibility of water right holders within the North Delta Water Agency to provide flows to help meet the 1995 Bay-Delta Water Quality Control Plan objectives as long as the 1981 contract between North Delta Water Agency and the Permittee is in effect."

"42. Permittee may divert in compliance with special conditions in this permit and all applicable laws only when it can do so without interfering with the exercise of vested rights, including those rights of the United States under permits granted by Decision D990 which have priority dates earlier than the priority dates of the permits under which Permittee is diverting."

Additionally Conditions 33 and 34 incorporate the D-1641 water quality objectives which require the maintenance of certain water qualities in the channels of the Delta or Suisun Marsh by reduction of direct diversion at the project pumps or by the release of natural flow or water in storage, or by operation of the Delta Cross Channel gates, or by any combination of these measures.

The mere fact that water is stored does not mean that it belongs to the project storing the water. The project is not entitled to any stored water that is needed to meet the conditions of its permits, to wit: protection of senior vested rights, maintenance of certain stream flows and maintenance of water quality standards in the Delta and Suisun Marsh.

By way of further example, under its permits the SWP is given broad flexibility in its operations. The SWP may, for example, store the winter and spring flows which historically flushed and freshened the Delta provided that adequate summertime water quality is maintained. In such case, the release of stored water for summertime quality maintenance would simply offset the detriment caused by the capture of flushing flows consistent with the physical solution nature of the conditions included in the SWP permits.

In order to determine whether the SWP has any entitlement to stored water in Oroville Reservoir one must focus on the specific water in question. It must be determined whether or not the specific block of stored water was or is needed to meet the conditions of the permits and whether or not the water was stored when all the conditions of the permit were being met. If the stored water is not in any way needed to meet the conditions of the permits and it was stored when all conditions were being met, then it may be surplus water to which the SWP is entitled. The SWP permits contain quantitative limits as to the total acre feet allowed to be stored and limits on the rate of diversion.

The determination of what is "stored water" for water right entitlement purposes requires an intensive examination of the facts.

THE QUALITY OF THE WATER IN THE DELTA DOES NOT LIMIT THE RIGHT OF DELTA USERS TO DIVERT.

Water quality in the Delta is the result of the quantity and quality of the many flows contributing to the Delta pool. Some of these flows originate within the Delta. Flows contributing to the Delta pool vary in quantity and quality from minute to minute. Flow into the Delta pool includes 1) natural surface flow, 2) natural groundwater flow, 3) surface return flow from groundwater, 4) precipitation, 5) discharges from agricultural, municipal and industrial sources which could include water or other liquids from out of basin sources, 6) releases from various reservoirs including, without limitation, those operated by the SWP, CVP, East Bay Municipal Utility District, City of San Francisco, P.G. & E., South San Joaquin Irrigation

District, Modesto Irrigation District, other utility, municipal, and irrigation type districts and numerous private parties, and 7) inflow from the Suisun Bay. Inflow from Suisun Bay can be induced by withdrawals from the Delta pool, two of the most significant of which occur as a result of the pumping operations of the SWP and CVP.

Fresh water flow into the Delta and the resulting quality is not a prerequisite to the right of Delta users to divert pursuant to pre-1914 and riparian rights. See Turner v. James Canal Co. 155 Cal. 82 (1909).

In concluding that riparian rights do exist in a body of water not flowing, the California Supreme Court cited (1 Farnham on Waters, Sec. 62, p. 278) as follows: "The principle upon which these rights are founded is equally applicable to all bodies of water, whether large or small, tidal or non-tidal." (*Supra* at page 88).

Absent fresh water flows into the Delta from upstream, the channels within the Delta in general will always be filled with an ample supply of water. The bottoms of the channels are typically well below sea level and as fresh water is diverted from the Delta pool, water from the ocean and bays will enter in its place.

The toxic level of salty water on crops which have matured beyond seedling stage is typically higher than at the seed germination stage. For the crops in the Delta it is the salinity build up in the soil that will affect subsequent crops that is of greatest concern. Increased efforts to facilitate leaching of salts from the upper portions of the soil profile will be required as a result of application of salty water during the growing season. The impact will vary from site to site. The salt in the applied water will mix with the groundwater near the root zone which could result in dilution. The applied water could be mixed with water from other sources and could even be desalted.

Prior to development of the CVP and SWP, salinity did not intrude into the Delta except in the driest years and then in late summer. Attached as Exhibit 17 is a map showing historical salinity intrusion into the Delta. Intrusion into the interior Delta was relatively infrequent even in the years prior to the SWP and CVP and occurred well after seedling stage of the typical crops. In 1931 the year of the greatest incursion, the intrusion reached its farthest point on September 14th.

FARMING IN THE DELTA SAVES CONSUMPTIVE USE OF WATER VERSUS A NON-FARMED CONDITION

Farming in the Delta requires drainage and periodic control of vegetation. The lands within the Delta lowlands are at or below five feet above mean sea level. Most are below the water level in the adjoining channels. As such constant drainage is required as a part of the

normal farming practices. Without such drainage, the lands would become inundated by reason of seepage and rising groundwater or would experience substantially raised groundwater. The resulting condition would be a body of water or a highly vegetated area served by a high water table.

Evaporative losses from an open body of water and from riparian vegetation are much higher than from the same area subjected to farming.

Attached hereto as Exhibit 18 is Table A-5 from DWR Bulletin 168 - October 1978, page A-10 showing the 1976-77 Estimated Crop Et Value for the Delta Service Area. For October 1976 through September 1977 the data shows:

Alfalfa	45.8 inches
Tomatoes	34.3 inches
Field Corn	33.8 inches
Riparian Veg and Water Surface	67.8 inches

California Water Plan Update 2009, Vol. 4 Reference Guide - Topic Crop Water Use, Article 19, contains the "Historical Estimates of Agricultural and Wetland Water Use in the San Joaquin-Sacramento River Delta" by Morteza N. Orang, Richard L. Snyder, Sara Sarreshteh.

The study included both uplands and lowlands and concluded:

> "For the entire Delta, the Etc for the wetlands, cattails and tules was about 16% (1998), 20% (2000) and 22% (2001) higher than the agriculture-crop land-use group, which included irrigated pasture, alfalfa, all field crops, sugar beets, irrigated grain, rice, truck crops, tomato, orchard, vineyard and non-irrigated grain (Figure 7-9)."

See Exhibit 19 which is page 7 from said study.

Curtailment of water diversions in the Delta will decrease or eliminate farming thereby resulting in substantially increased water loss due to evaporation.

FARMING OF THE DELTA LOWLANDS ENHANCES THE WATER QUALITY FOR EXPORT.

The Department of Water Resources Investigation of the Sacramento-San Joaquin Delta Report No. 4 Quantity and Quality of Waters Applied To And Drained From the Delta Lowlands - July 1956 concluded as follows:

> "The Delta Lowlands act as a salt reservoir, storing salts obtained largely from the channels during the summer, when water quality in such channels is most critical and returning such accumulated salts to the channels during the winter when water quality there is least important. Therefore agricultural practices in that area enhanced rather than degraded the good quality Sacramento river water en route to the Tracy Pumping Plant."

The Delta is unique. It would appear that curtailment of Delta diversions could result in salinity degradation at the export pumps thereby negating any savings in stored water.

STATUTORY RIGHTS OF DELTA DIVERTERS

There are a number of statutes both State and Federal intended to protect and benefit Delta diverters as related to the federal Central Valley Project and State Water Project.

The Delta Protection Act of 1959 (WC 12200-12205) requires that the water needs of the Delta be given priority over exports by the SWP and CVP. The Act has been interpreted by DWR to provide: "In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided." (See Exhibit A.) The Delta Protection Act of 1959 requires the SWP and CVP to provide salinity control and "an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export to areas of water deficiency . . ." (See WC 12201 and 12202.) In 1959 fishing was the predominant recreational use of the Delta. Since the commencement of SWP operation in the late 1960's, fish populations in the Delta have plummeted. The Water Quality Objectives define what is an adequate supply.

The contract between the State of California Department of Water Resources and the North Delta Water Agency For the Assurance of a Dependable Water Supply of Suitable Quality dated January 28, 1981, provides:

> "(d) The construction and operation of the FCVP and SWP at times have changed and will further change the regimen of rivers tributary to the Sacramento-San Joaquin Delta (Delta) and the regimen of the Delta channels from unregulated flow to regulated flow. This regulation at times improves the quality of water in the Delta and at times diminishes the quality from that which would exist in the absence of the FCVP and SWP. The regulation at times also alters the elevation of water in some Delta channels."

"(f) The general welfare, as well as the rights and requirements of the water users in the Delta, require that there be maintained in the Delta an adequate supply of good quality water for agricultural, municipal and industrial uses."

"(g) The law of the State of California requires protection of the areas within which water originates and the watersheds in which water is developed. The Delta is such an area and within such a watershed. Part 4.5 of Division 6 of the California Water Code affords a first priority to provision of salinity control and maintenance of an adequate water supply in the Delta for reasonable and beneficial uses of water and relegates to lesser priority all exports of water from the Delta to other areas for any purpose."

The Watershed Protection Act (WC 11460 et seq.) prohibits the projects from directly or indirectly depriving the Delta and other areas of origin of an adequate supply. In pertinent part the Act provides:

"**§ 11460. Prior right to watershed water**

In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein. (*Added by Stats.1943, C. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 296.*)

The Act also applies to the United States Department of Interior, Bureau of Reclamation. (See WC 11128.)

The interpretation of WC 11460 was explained in a letter dated February 17, 1945 to the Joint Committee on Rivers and Flood Control of the California State Legislature from the Acting Regional Director of the Bureau of Reclamation. The letter provided:

"The committee had asked the question: What is your policy in connection with the amount of water that can be diverted from one watershed to another in proposed diversions?" In stating the Bureau's policy, Mr. Calland quoted section 11460 of the State

> water code, which is sometimes referred to as the county of origin act, and then he said: 'As viewed by the Bureau, it is the intent of this statute that no water shall be diverted from any watershed which is or will be needed for beneficial uses within that watershed. The Bureau of Reclamation, in its studies for water resources development in the Central Valley, consistently has given full recognition to the policy expressed in this statute by the legislature and the people. The Bureau has attempted to estimate in these studies, and will continue to do so in future studies, what the present and future needs of each watershed will be. The Bureau will not divert from any watershed any water which is needed to satisfy the existing or potential needs within that watershed. For example, no water will be diverted which will be needed for the full development of all of the irrigable lands within the watershed, nor would there be water needed for municipal and industrial purposes or future maintenance of fish and wildlife resources. (See Exhibit 20.)

An adequate supply for the Delta is minimally provided by the Water Quality Control Plan Critical Year Objectives. If exports from the Delta are to take place, especially those beyond the real needs for health and safety, then the SWP and CVP must meet the D-1641 Water Quality Objectives to satisfy their statutory obligations even if it requires stored water.

The SWP and CVP have failed to properly operate the projects so as to assure that water quality objectives, senior water rights and other senior obligations will be met in the expected reoccurrence of critically dry years and multiple years of drought. Instead, the projects have been operated to maximize exports from the Delta. The likely occurrence of multiple years of drought has been well documented and the basic planning for the SWP and CVP focused on the six years of drought during the period of 1929 through 1934. Climate change has for many years been predicted to increase the frequency of droughts. The reduced availability of surplus water to serve export needs has been known for many years and yet the projects have exported water knowing that the ability to meet water quality objectives would be jeopardized.

The emergency declarations of the Governor have not mandated a change in the Water Quality Control Plan for the Bay-Delta, but rather have, as of April 25, 2014, suspended the State law mandate for compliance with water quality control plans in WC 13247 to expedite processing requests "to move water to areas of need, including requests involving voluntary water transfers, forbearance agreements, water exchanges, or other means." The declaration has general application throughout the State and does not attempt to elevate the areas of need served by exports from the Delta over the needs in the Bay or the Delta or other areas of origin. There is no objection to meeting the true health and safety emergency needs in cases where water quality control plan objectives are not needed to protect health and safety in the area covered by the plan.

The Delta Protection Act of 1959 in WC 12200 specifically provides: "It is, therefore, hereby declared that a general law cannot be made applicable to said Delta and that the enactment of this law is necessary for the protection, conservation, development, control and use of the waters in the Delta for the public good." The emergency authority shall not be used for favoring exports over needs within the Delta and other areas of origin except to meet true health and safety needs.

The degradation of water quality in the Delta adversely impacts agricultural, industrial, urban and recreational (including fish and wildlife) uses in the Delta and surrounding areas as well as areas served with exports from the Delta. The Delta Protection Act of 1959 was passed to prohibit the very wrongdoing which is now underway. Neither the Executive Director, the Deputy Director nor the State Water Resources Control Board has the authority to prefer export needs over those in the Bay-Delta except for true health and safety.

The Governor's April 25, 2014 Proclamation was not specific as to the Bay-Delta Water Quality Control Plan and in any event does not override Federal law

PL99-546 (HR3113) specifically provides:

> "(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."
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> Section (b)(1) does not allow for the Bureau of Reclamation to operate the CVP without conforming to the State water quality

standards for the San Francisco Bay/Sacramento-San Joaquin Delta and Estuary even if the Executive Director and SWRCB is willing to look the other way. (See Exhibit 21.)

There are specific processes and procedures for changes to Water Quality Control Plans including review by the United States EPA, which are not a part of the current emergency process.

Section (b)(1) is thus applicable and requires USBR and USF&WS compliance unless the Secretary of Interior makes a determination that compliance is inconsistent with congressional directives applicable to the project and then the Attorney General is to be requested to bring a legal action for a court determination of the applicability of the standards. There is no such court determination that would allow the CVP to operate without conforming to the standards.

Section (b)(2) provides an additional constraint with regard to the water quality at the intake to the Contra Costa Canal. Even if the standards were determined by the court to not be applicable to the CVP, then the D-1485 water quality standards would be applicable to the intake of the Contra Costa Canal except under drought emergency water conditions pursuant to a declaration by the Governor of California. There is nothing in the Governor's drought declaration specific to the water quality standard at the intake to the Contra Costa Canal.

In 2004 Congress passed another law to ensure that Delta water quality standards and objectives would be met.

PL 108-361 (HR 2828) in pertinent part provides:

"(D) Program to Meet Standards. -

(i) In General. - Prior to increasing export limits from the Delta for the purposes of conveying water to south-of-Delta Central Valley Project contractors or increasing deliveries through an intertie, the Secretary shall, not later than 1 year after the date of enactment of this Act, in consultation with the Governor, develop and initiate implementation of a project to meet all existing water quality standards and objectives for which the Central Valley Project has responsibility." (See Exhibit 22.)

The proposed emergency actions are clearly for the purpose of increasing exports from the Delta which to the extent such are for serving south-of-Delta Central Valley Project contractors would be directly contrary to the direction of Congress which was to assure that all existing (October 25, 2004) water quality standards and objectives would first be met.

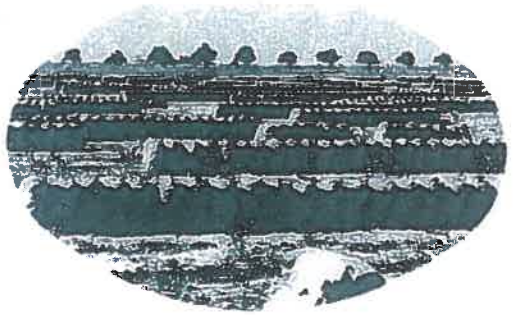
This concludes Part One of Comments. Part Two will follow.

Yours very truly,

DANTE JOHN NOMELLINI, SR.
Manager and Co-Counsel

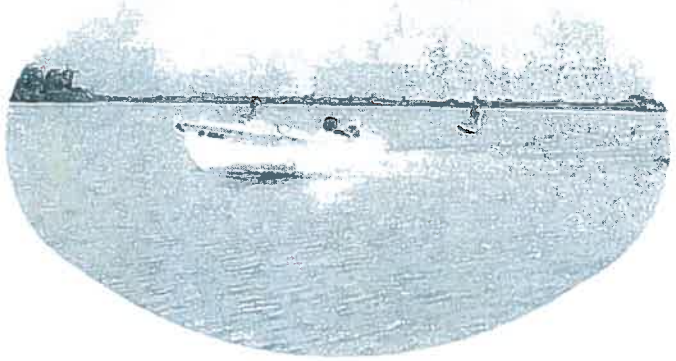
John A. Wilson

Preliminary Edition



Bulletin No. 76

DELTA WATER FACILITIES



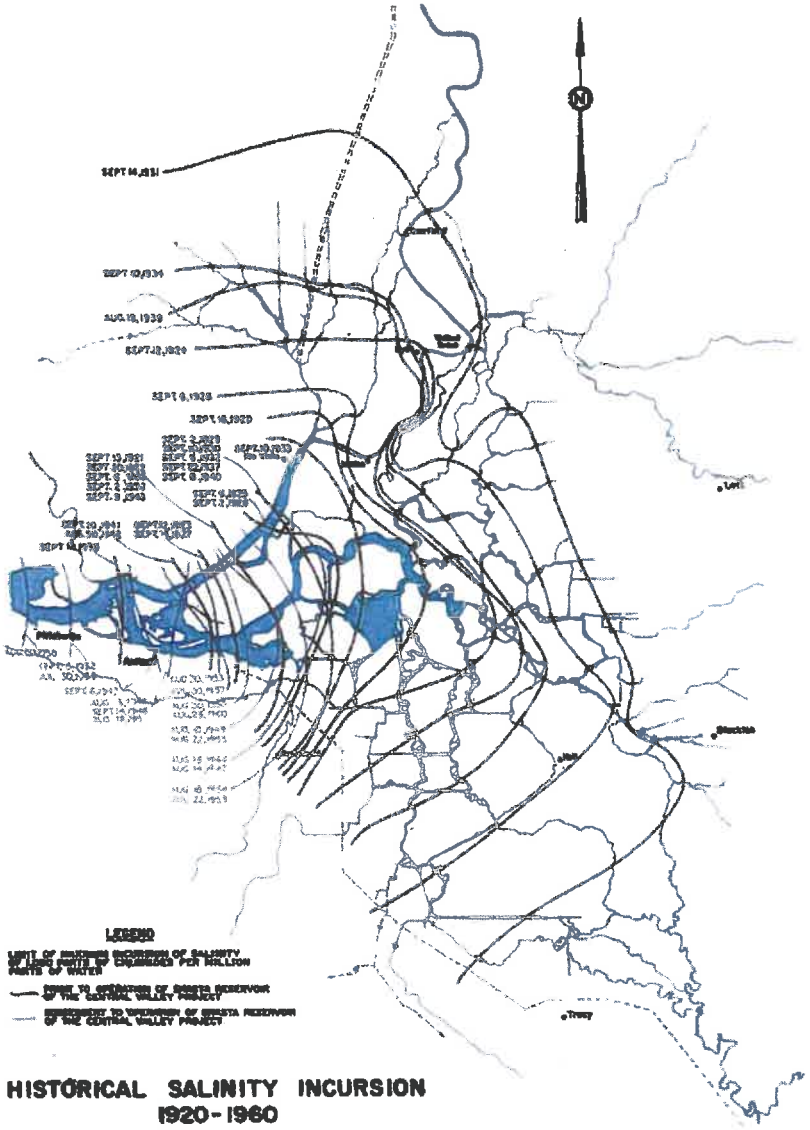
EDMUND G. BROWN
Governor
State of California

December, 1960

HARVEY O. BANKS
Director
Department of Water Resources

Exhibit 1

Delta Problems — salinity incursion and water supplies

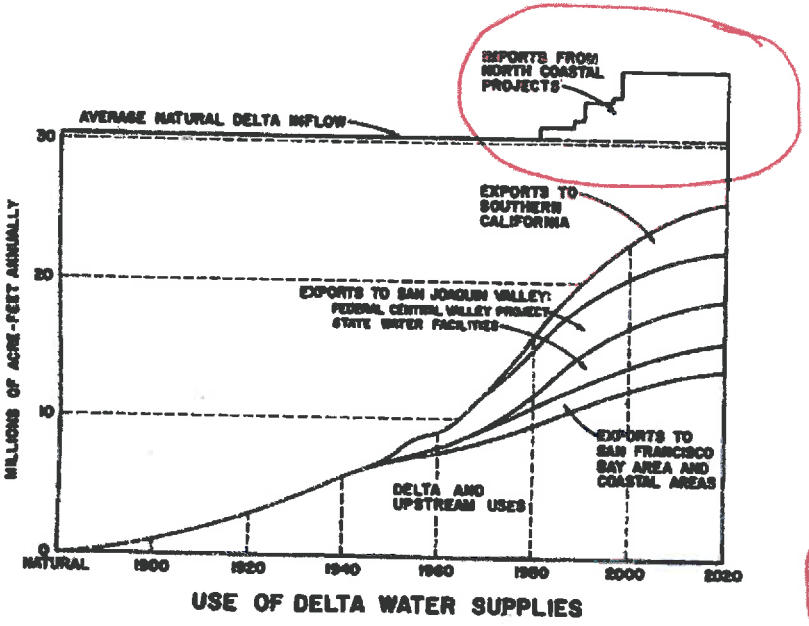


HISTORICAL SALINITY INCURSION
1920-1960

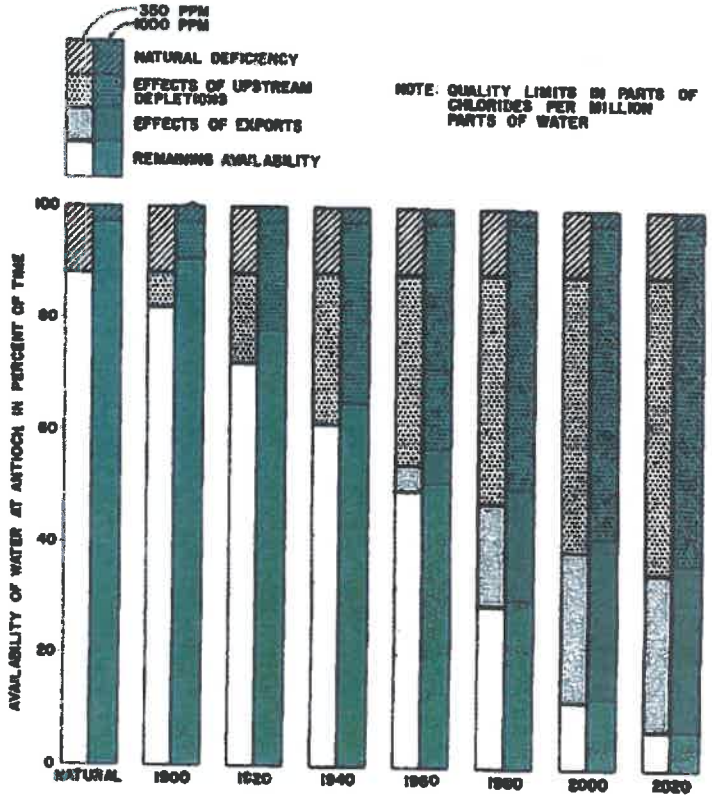
Salinity incursion into the Delta results from the flooding and ebbing of ocean tides through the San Francisco Bay and Delta system during periods when the fresh water outflow from the Delta is insufficient to repel the saline water. The natural fresh water outflow from the Central Valley was historically inadequate to repel salinity during summer months of some years. The first known record of salinity encroachment into the Delta was reported by Cmdr. Ringgold, U. S. Navy, in August 1841, whose party found the water at the site of the present city of Antioch very brackish and unfit for drinking. Since that time, and particularly after the turn of the century, with expanding upstream water use salinity incursion has become an increasingly greater problem in Delta water supplies. The maximum recorded extent of salinity incursion happened in 1931, when ocean salts reached Stockton. Since 1944 extensive incursion has been repulsed much of the time by fresh water releases from Central Valley Project storage in Shasta and Folsom Reservoirs. Without such releases, saline water would have spread through about 90 percent of the Delta channels in 1955 and 1959. Although upstream uses might not have reached present levels in the absence of the Central Valley Project, salinity problems would still have been very serious during most years.

Further increase in water use in areas tributary to the Delta will worsen the salinity incursion problem and complicate the already complex water rights situation. To maintain and expand the economy of the Delta, it will be necessary to provide an adequate supply of good quality water and protect the lands from the effects of salinity incursion. In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.

The natural availability of good quality water in the Delta is directly related to the amount of surplus water which flows to the ocean. The graph to the right indicates the historic and projected availability of water in the San Joaquin River at Antioch containing less than 350 and 1,000 parts chlorides per million parts water, under long-term average runoff and *without* specific releases for salinity control. It may be noted that even under natural conditions, before any significant upstream water developments, there was a deficiency of water supplies within the specified quality limits. It is anticipated that, without salinity control releases, upstream depletions by the year 2020 will have reduced the availability of water containing less than 1,000 ppm chlorides by about 60 percent, and that exports will have caused an additional 30 percent reduction.



USE OF DELTA WATER SUPPLIES



DELTA WATER QUALITY WITHOUT SALINITY CONTROL

The magnitude of the past and anticipated future uses of water in areas tributary to the Delta, except the Tulare Lake Basin, is indicated in the diagram to the left. It may be noted that, while the present upstream use accounts for reduction of natural inflow to the Delta by almost 25 percent, upstream development during the next 60 years will deplete the inflow by an additional 20 percent. By that date about 22 percent of the natural water supply reaching the Delta will be exported to areas of deficiency by local, state, and federal projects. In addition, economical development of water supplies will necessitate importation of about 5,000,000 acre-feet of water seasonally to the Delta from north coastal streams for transfer to areas of deficiency.

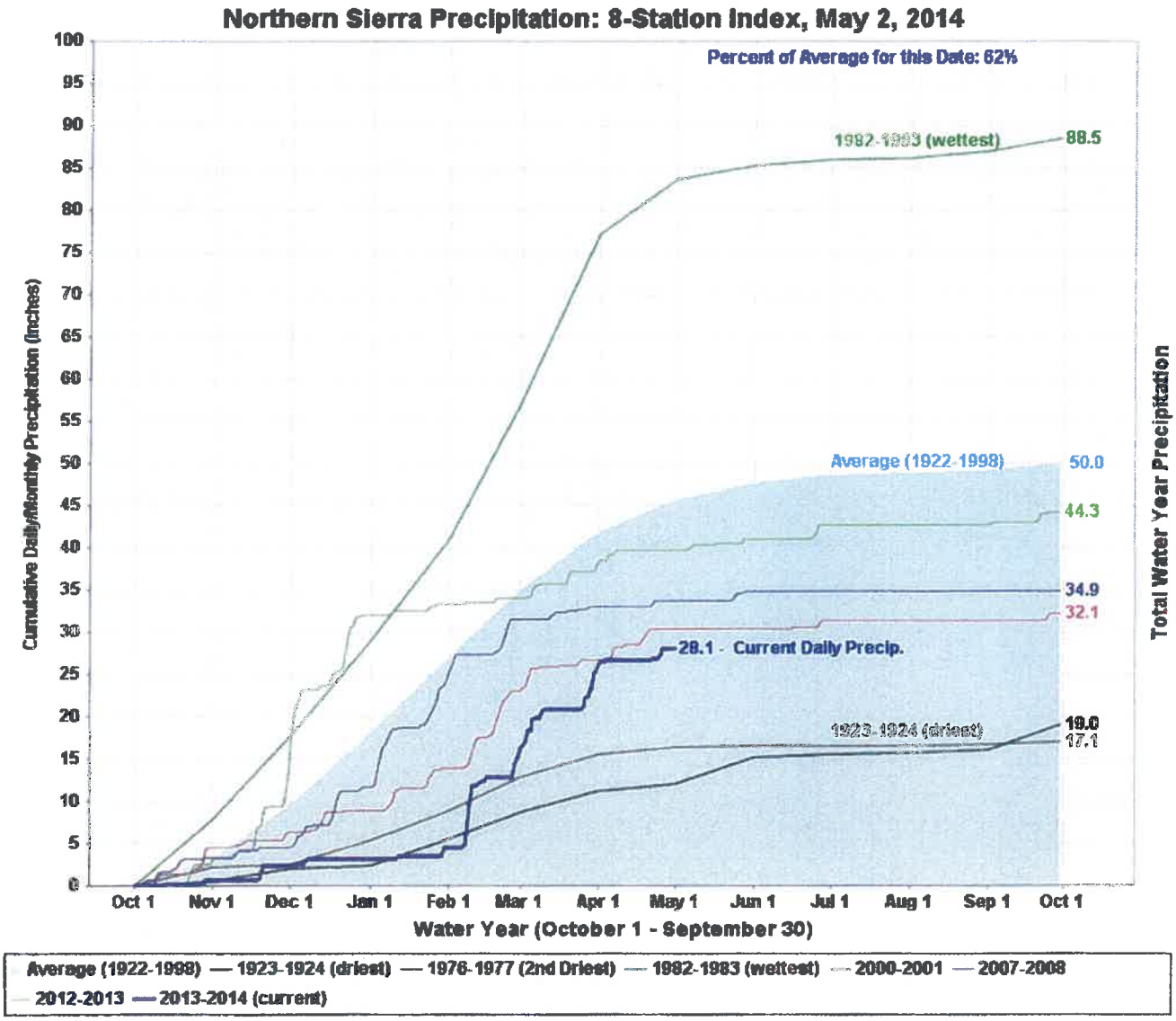

Northern Sierra Precipitation: 8-Station Index, May 2, 2014
Percent of Average for this Date: 62%
1992-1993 (wettest)
88.5
Average (1922-1998)
50.0
44.3
34.9
32.1
28.1 - Current Daily Precip.
1923-1924 (driest)
19.0
17.1
Cumulative Daily/Monthly Precipitation (Inches)
Total Water Year Precipitation
Water Year (October 1 - September 30)
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Average (1922-1998) — 1923-1924 (driest) — 1976-1977 (2nd Driest) — 1982-1983 (wettest) — 2000-2001 — 2007-2008
2012-2013 — 2013-2014 (current)

Exhibit 2

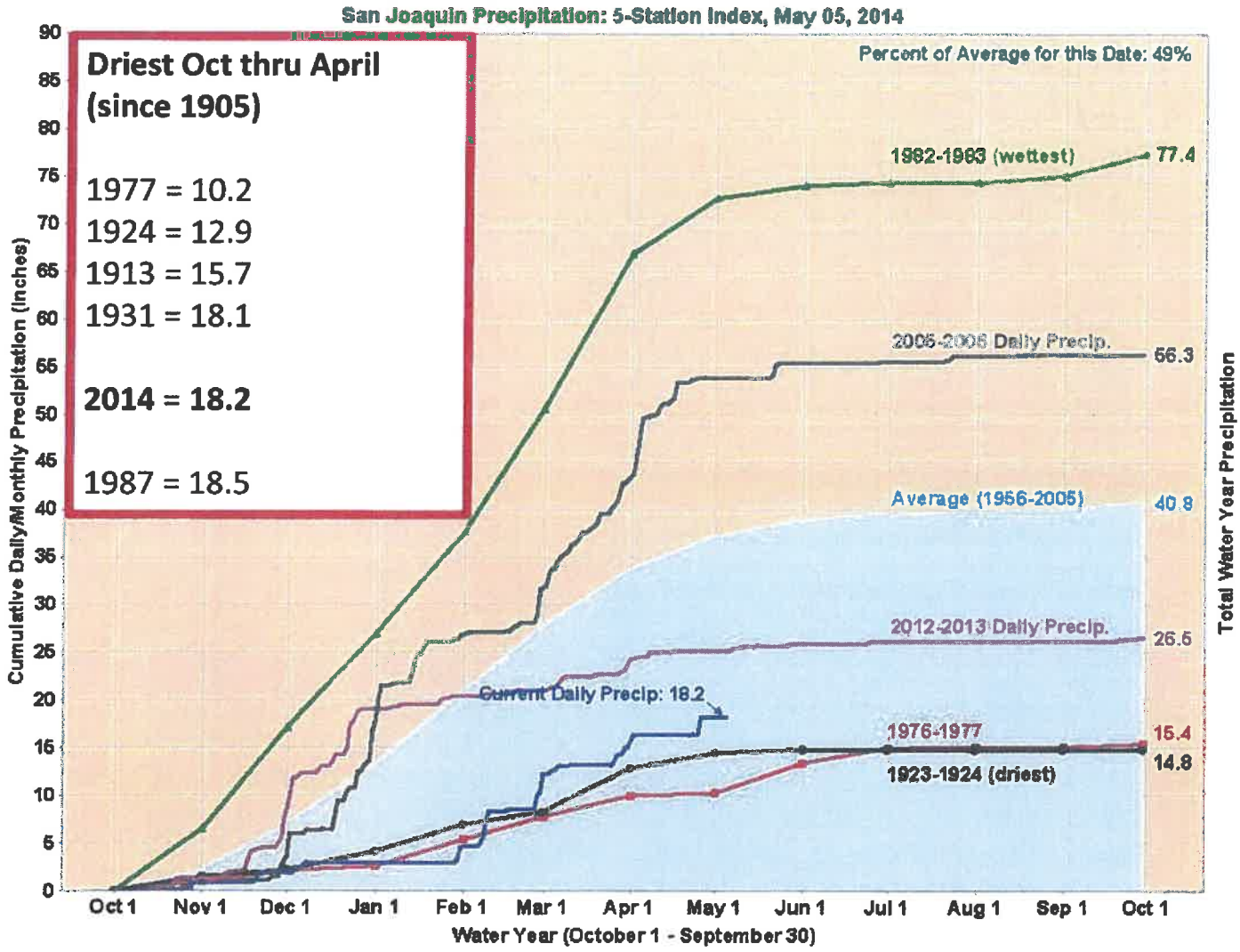

San Joaquin Precipitation: 5-Station Index, May 05, 2014
Driest Oct thru April
(since 1905)
1977 = 10.2
1924 = 12.9
1913 = 15.7
1931 = 18.1
2014 = 18.2
1987 = 18.5
Percent of Average for this Date: 49%
1982-1983 (wettest)
77.4
2005-2006 Daily Precip.
56.3
Average (1956-2005)
40.8
2012-2013 Daily Precip.
26.5
Current Daily Precip: 18.2
1976-1977
15.4
1923-1924 (driest)
14.8
Cumulative Daily/Monthly Precipitation (Inches)
Total Water Year Precipitation
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Water Year (October 1 - September 30)

Exhibit 3

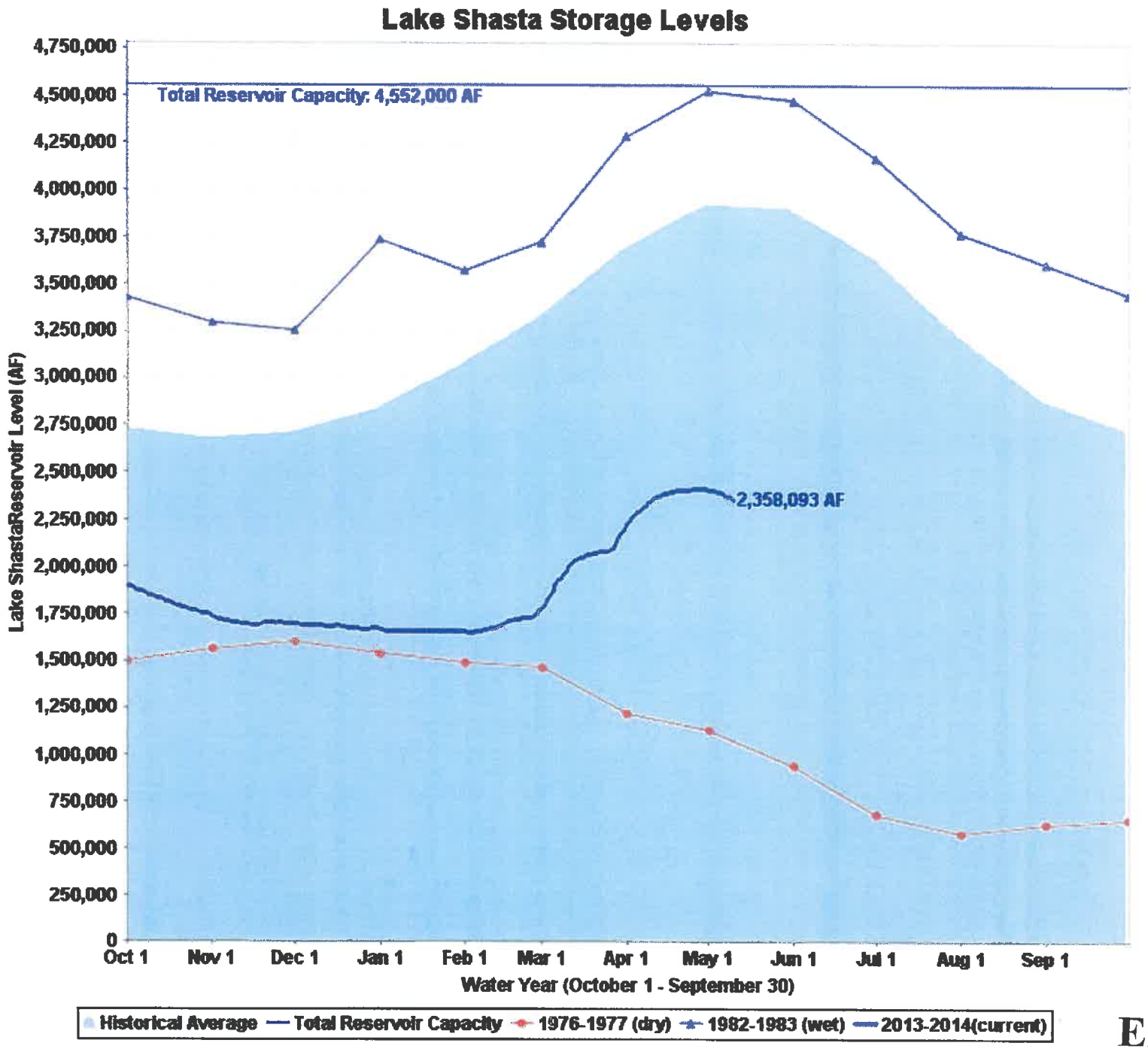

Lake Shasta Storage Levels
Total Reservoir Capacity: 4,552,000 AF
2,358,093 AF
Lake ShastaReservoir Level (AF)
4,750,000
4,500,000
4,250,000
4,000,000
3,750,000
3,500,000
3,250,000
3,000,000
2,750,000
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)
Historical Average
Total Reservoir Capacity
1976-1977 (dry)
1982-1983 (wet)
2013-2014(current)

Exhibit 4

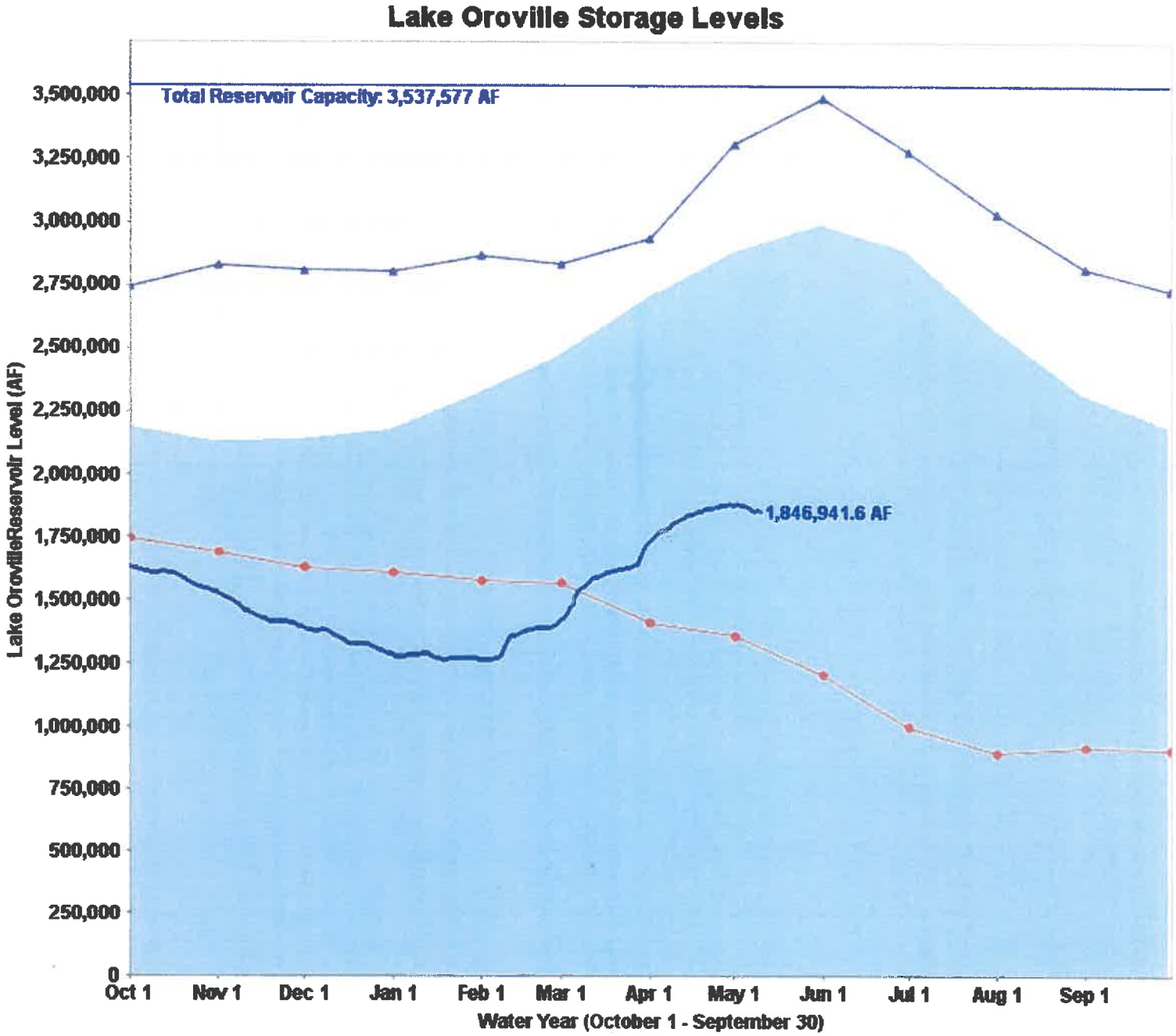

Lake Oroville Storage Levels
Total Reservoir Capacity: 3,537,577 AF
1,846,941.6 AF
Lake OrovilleReservoir Level (AF)
3,500,000
3,250,000
3,000,000
2,750,000
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)

Exhibit 5

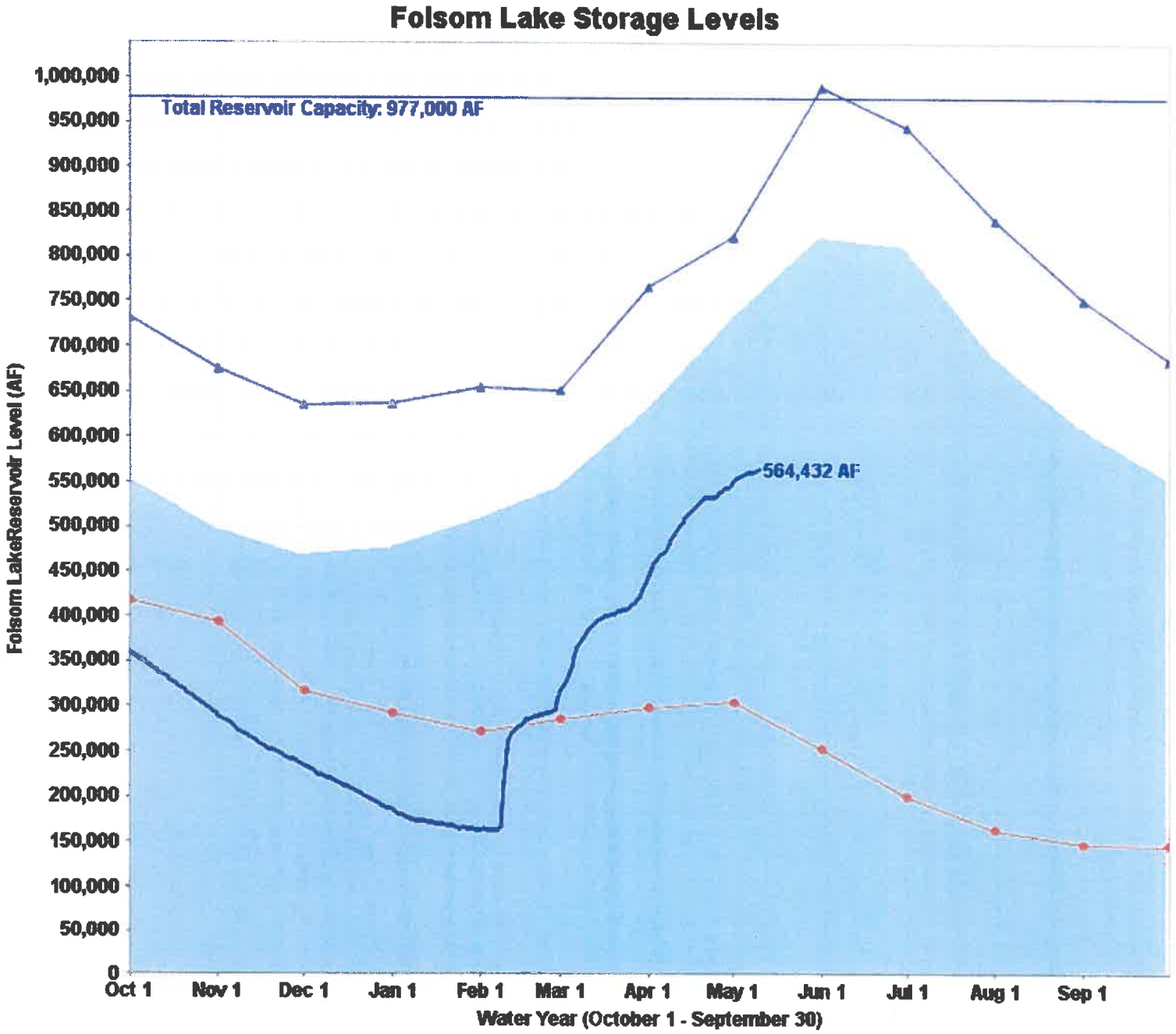

Folsom Lake Storage Levels
Total Reservoir Capacity: 977,000 AF
564,432 AF
Folsom LakeReservoir Level (AF)
1,000,000
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)

Exhibit 6

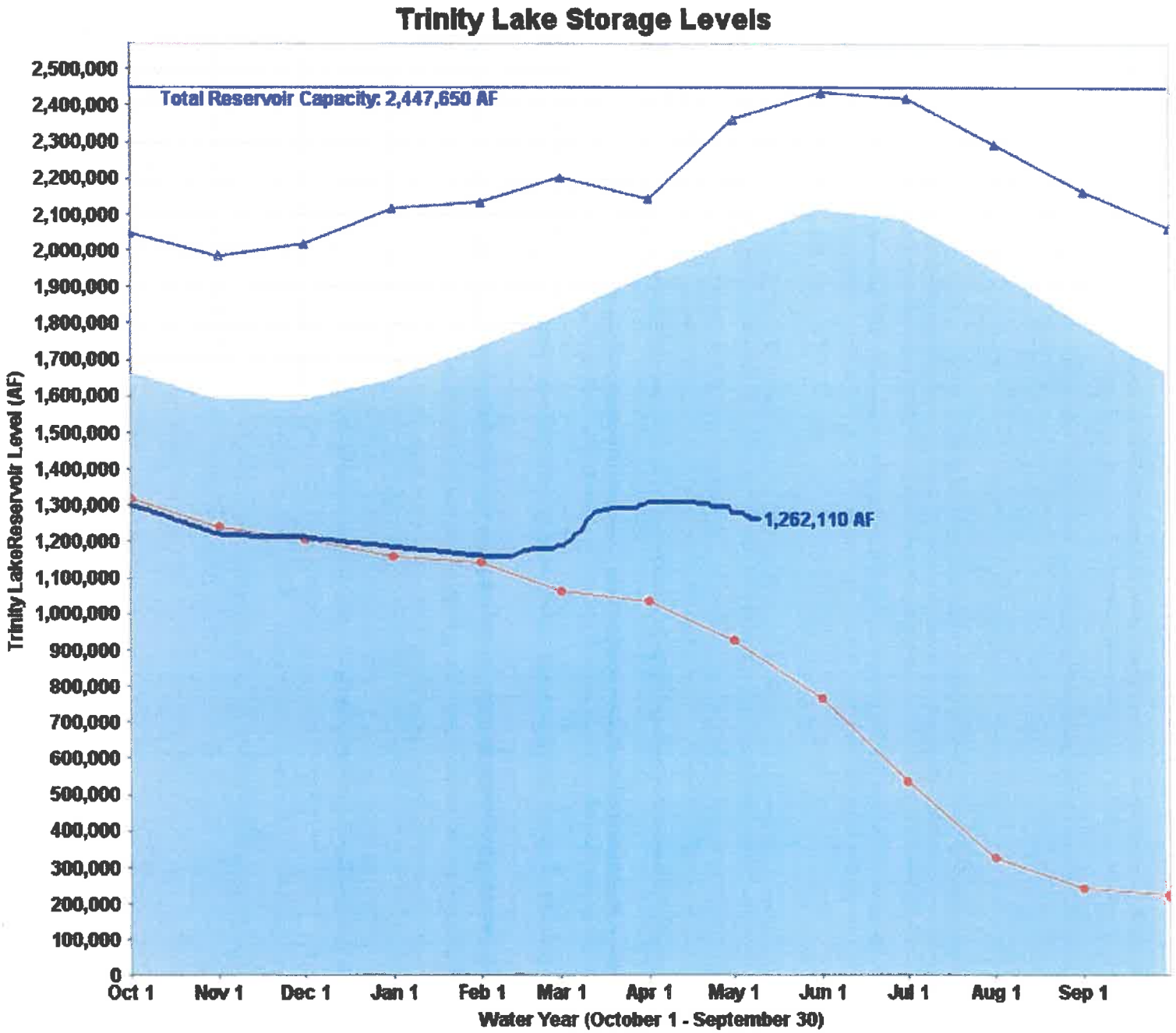
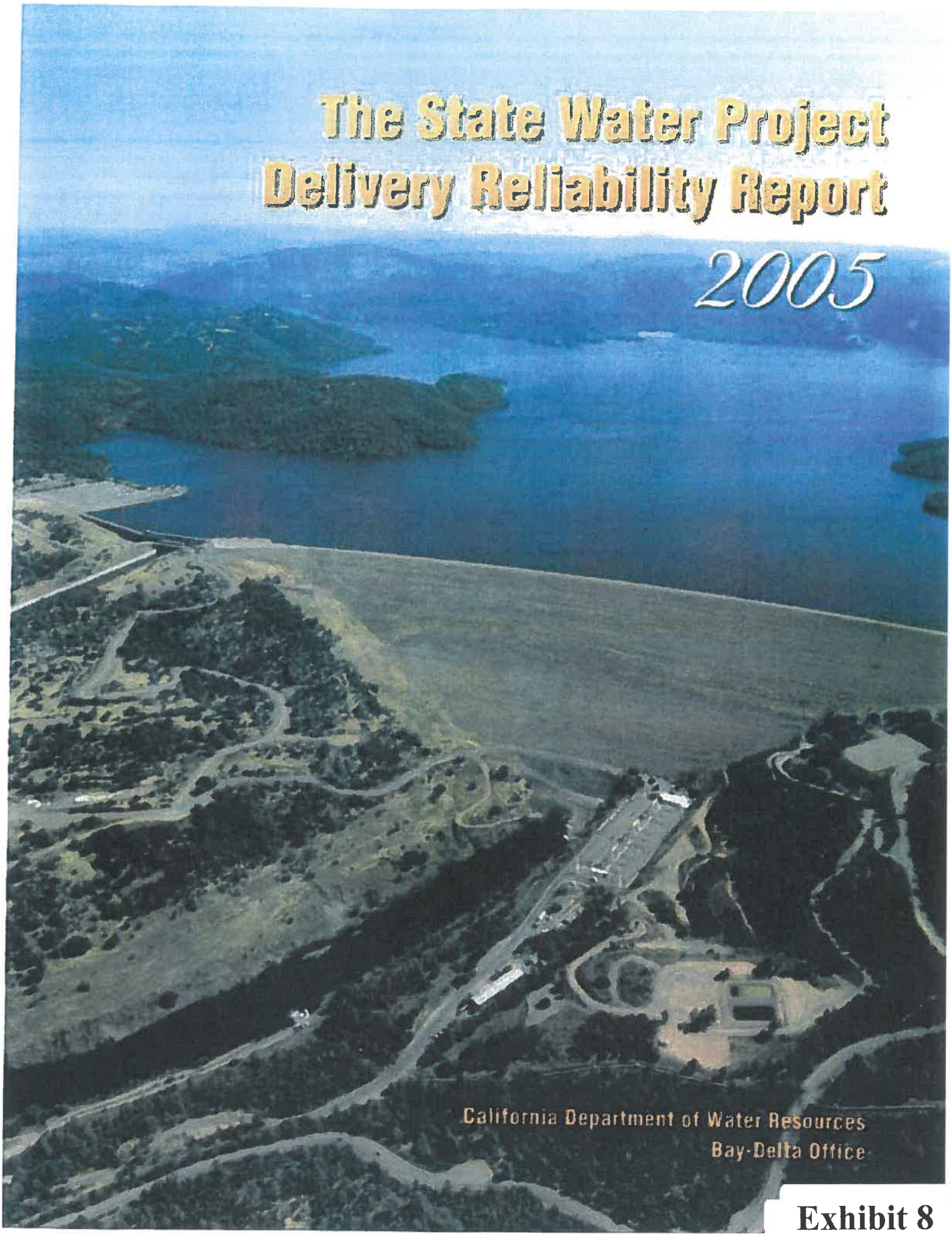

Trinity Lake Storage Levels
Total Reservoir Capacity: 2,447,650 AF
1,262,110 AF
Trinity LakeReservoir Level (AF)
2,500,000
2,400,000
2,300,000
2,200,000
2,100,000
2,000,000
1,900,000
1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)

Exhibit 7

The State Water Project Delivery Reliability Report 2005



California Department of Water Resources
Bay-Delta Office

Exhibit 8

Table B-6 SWP water delivery from the Delta for Study 4 (taf)

Year	Model variable Table A demand	Model Table A delivery	Percent of maximum Table A - 4.112 maf	Percent of future maximum Table A - 4.133 maf	Model Article 21 supply
1922	3,750	3,743	91%	91%	104
1923	3,251	3,251	79%	79%	106
1924	3,489	1,244	30%	30%	0
1925	3,353	1,870	45%	45%	0
1926	3,393	2,981	72%	72%	54
1927	3,860	3,845	93%	93%	213
1928	3,458	3,384	82%	82%	134
1929	2,907	1,108	27%	27%	0
1930	3,326	2,855	69%	69%	117
1931	2,933	1,018	25%	25%	0
1932	3,139	1,406	34%	34%	242
1933	3,427	1,330	32%	32%	512
1934	3,470	1,541	37%	37%	206
1935	3,798	3,769	92%	91%	229
1936	3,596	3,573	87%	86%	0
1937	3,492	3,362	82%	81%	80
1938	3,344	3,344	81%	81%	714
1939	3,262	3,262	79%	79%	349
1940	3,239	3,219	78%	78%	154
1941	2,526	2,527	61%	61%	246
1942	3,167	3,167	77%	77%	918
1943	3,104	3,104	75%	75%	623
1944	3,090	3,091	75%	75%	0
1945	3,112	3,101	75%	75%	359
1946	3,215	3,215	78%	78%	249
1947	3,422	3,292	80%	80%	0
1948	3,395	2,942	72%	71%	0
1949	3,313	2,264	55%	55%	0
1950	3,465	3,199	78%	77%	0
1951	3,497	3,497	85%	85%	388
1952	2,585	2,588	63%	63%	275
1953	3,323	3,323	81%	80%	513
1954	3,294	3,294	80%	80%	523
1955	3,228	2,207	54%	53%	0
1956	3,581	3,586	87%	87%	324
1957	3,235	3,235	79%	78%	257
1958	2,980	2,980	72%	72%	1,106
1959	3,547	3,480	85%	84%	366
1960	3,555	1,865	45%	45%	0
1961	3,580	2,659	65%	64%	97
1962	3,690	3,262	79%	79%	0
1963	3,823	3,818	93%	92%	202
1964	3,492	3,323	81%	80%	0
1965	3,059	3,059	74%	74%	177
1966	3,282	3,282	80%	79%	518
1967	2,950	2,946	72%	71%	923
1968	3,324	3,329	81%	81%	552
1969	2,636	2,632	64%	64%	275
1970	3,257	3,257	79%	79%	552
1971	3,341	3,341	81%	81%	0
1972	3,457	3,342	81%	81%	414
1973	3,097	3,092	75%	75%	384
1974	3,184	3,184	77%	77%	854
1975	3,229	3,229	79%	78%	903
1976	3,471	3,265	79%	79%	189
1977	3,421	159	4%	4%	0
1978	3,623	3,603	88%	87%	300
1979	3,512	3,501	85%	85%	160
1980	2,715	2,709	66%	66%	138
1981	3,358	3,358	82%	81%	546
1982	2,890	2,890	70%	70%	801
1983	2,497	2,498	61%	60%	400
1984	3,227	2,766	67%	67%	552
1985	3,214	3,214	78%	78%	0
1986	2,321	2,297	56%	56%	120
1987	2,896	2,896	70%	70%	546
1988	2,967	856	21%	21%	0
1989	3,551	3,174	77%	77%	0
1990	3,628	1,099	27%	27%	0
1991	3,425	1,052	26%	25%	0
1992	3,366	1,426	35%	34%	0
1993	3,862	3,848	94%	93%	159
1994	3,689	3,306	80%	80%	0
Average	3,290	2,818	69%	68%	262
Maximum	3,862	3,848	94%	93%	1,106
Minimum	2,321	159	4%	4%	0

Figure 1
Sacramento Valley
Water Year Hydrologic Classification

Year classification shall be determined by computation of the following equation:

$$\textbf{INDEX} = 0.4 * X + 0.3 * Y + 0.3 * Z$$

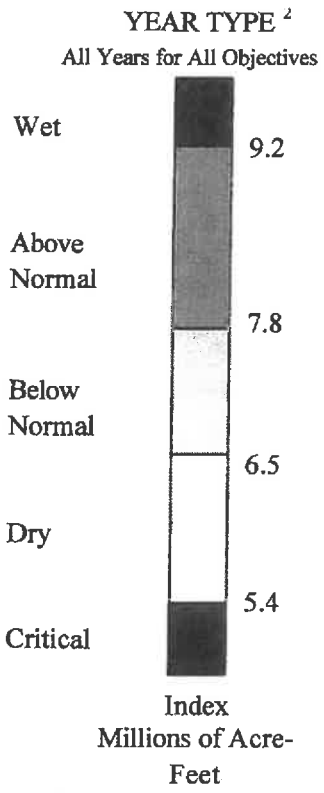
Where: X = Current year's April – July Sacramento Valley unimpaired runoff

Y = Current October – March Sacramento Valley unimpaired runoff

Z = Previous year's index[1]

The 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, is a forecast of 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.

Classification	Index Millions of Acre-Feet (MAF)
Wet.....	Equal to or greater than 9.2
Above Normal.....	Greater than 7.8 and less than 9.2
Below Normal.....	Equal to or less than 7.8 and greater than 6.5
Dry.....	Equal to or less than 6.5 and greater than 5.4
Critical.....	Equal to or less than 5.4



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[1] A cap of 10.0 MAF is put on the previous year's index (Z) to account for required flood control reservoir releases during wet years.

[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.

Exhibit 9

Figure 2
San Joaquin Valley
Water Year Hydrologic Classification

Year classification shall be determined by computation of the following equation:

$$\mathbf{INDEX = 0.6 * X + 0.2 * Y + 0.2 * Z}$$

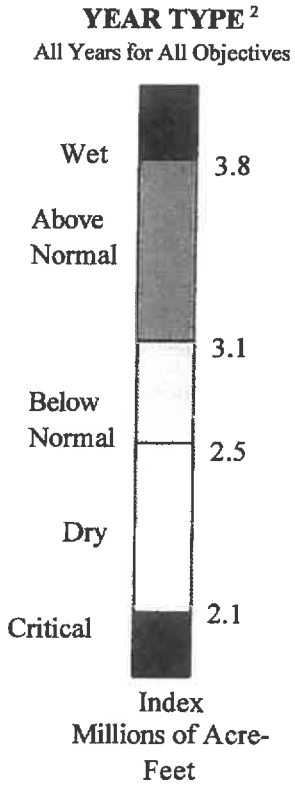
Where: X = Current year's April – July
San Joaquin Valley unimpaired runoff

Y = Current October – March
San Joaquin Valley unimpaired runoff

Z = Previous year's index[1]

The San Joaquin 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, is a forecast of the sum of the following locations: Stanislaus River, total flow to New Melones Reservoir; Tuolumne River, total inflow to Don Pedro Reservoir; Merced River, total flow to Exchequer Reservoir; San Joaquin River, total inflow to Millerton Lake. 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.

Classification	Index Millions of Acre-Feet (MAF)
Wet.....	Equal to or greater than 3.8
Above Normal.....	Greater than 3.1 and less than 3.8
Below Normal.....	Equal to or less than 3.1 and greater than 2.5
Dry.....	Equal to or less than 2.5 and greater than 2.1
Critical.....	Equal to or less than 2.1



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1 A cap of 4.5 MAF is put on the previous year's index (Z) to account for required flood control reservoir releases during wet years.

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.

Division of
Operations and Maintenance

SUMMARY OF SWP WATER OPERATIONS
For The Week 06/16/14 Through 06/22/14

Operations Control Office

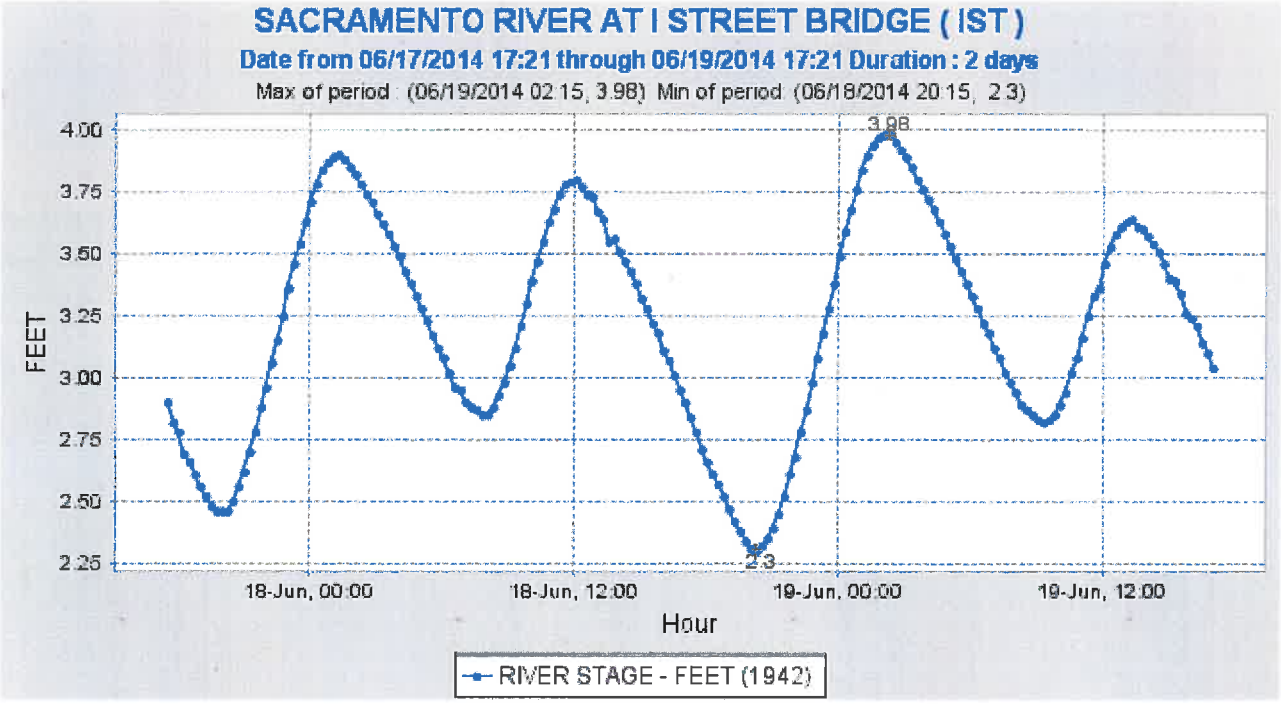
	Year to Date		Month to Date		Prior	Request	Change from
	Prior Yr 01/01/13 to 06/22/13	Request Yr 01/01/14 to 06/22/14	Prior Yr 06/01/13 to 06/22/13	Request Yr 06/01/14 to 06/22/14	Week 06/09/14 to 06/15/14	Week 06/16/14 to 06/22/14	Last Week
WATER DELIVERIES							
CDWR							
UPPER FEATHER	4,538*	3,424*	1,899*	1,035*	444*	52*	-392*
FEATHER RIVER SERVICE AREA	397,823*	305,211*	122,172*	99,323*	31,268*	32,318*	1,050*
NORTH BAY AQUEDUCT	6,915	8,652	2,640	1,473	441	395	-46
SOUTH BAY AQUEDUCT	48,207	32,138	6,347	4,597	1,923	1,567	-356
CALIFORNIA AQUEDUCT							
DELTA FD	55,336	37,218	8,768	6,041	2,468	2,076	-392
SAN LUIS FD	6,121	1,275	1,858	0	0	0	0
SAN JOAQUIN FD	167,142	16,298	74,076	31,358	13,037	9,151	-3,886
SOUTHERN FD	490,083	336,054	73,117	51,716	16,252	16,822	570
TOTAL CDWR	773,804	431,635	166,806	95,185	34,121	30,011	-4,110
USBR (via Calif. Aqued.)							
DELTA FD	308	211	63	33	13	12	-1
SAN LUIS FD	328,092	143,742	63,834	36,820	14,502	14,211	-291
SAN FELIPE UNIT	64,991	65,464	10,426	4,133	1,085	1,184	99
SAN JOAQUIN FD	4,328	1,905	0	0	0	0	0
TOTAL USBR	397,719	211,322	74,323	40,986	15,600	15,407	-193
TOTAL DELIVERED	1,171,523	642,957	241,129	136,171	49,721	45,418	-4,303
WATER PUMPED (in acre-feet)							
CORDELIA	10,898	14,792	2,701	2,257	620	623	3
BARKER SLOUGH	16,320	19,771	4,984	3,664	959	1,013	54
BANKS CDWR	604,445	313,628	58,535	9,958	3,439	2,386	-1,053
USBR	3,027	17,966	0	13,335	6,223	6,223	0
CVC	0	0	0	0	0	0	0
TOTAL	607,472	331,594	58,535	23,293	9,662	8,609	-1,053
TRACY CDWR	0	0	0	0	0	0	0
USBR	522,089	487,951	34,402	11,012	0	10	10
TOTAL	522,089	487,951	34,402	11,012	0	10	10
SOUTH BAY	67,459	51,078	12,550	6,878	2,161	1,607	-554
DEL VALLE PP TO RESERVOIR	6,178	13,485	0	1,180	308	0	-308
DEL VALLE PP TO AQUEDUCT	0	0	0	0	0	0	0
GIANELLI CDWR	155,184	157,737	0	0	0	0	0
USBR	111,260	307,218	0	0	0	0	0
TOTAL	266,444	464,955	0	0	0	0	0
DOS AMIGOS CDWR	741,440	241,147	150,247	61,954	21,591	17,482	-4,109
USBR	334,900	123,920	87,005	48,493	15,855	16,050	195
CVC	16,154	0	946	0	0	0	0
TOTAL	1,092,494	365,067	238,198	110,447	37,446	33,532	-3,914
LAS PERILLAS CDWR	50,950	43,149	13,308	12,419	3,556	5,074	1,518
USBR	0	0	0	0	0	0	0
TOTAL	50,950	43,149	13,308	12,419	3,556	5,074	1,518
BADGER HILL	48,072	42,890	11,565	12,307	3,473	5,027	1,554
DEVILS DEN	9,588	10,083	1,648	1,240	359	454	95
BLUESTONE	8,647	9,134	1,506	1,119	319	414	95
POLONIO	9,774	10,314	1,666	1,262	359	468	109
BUENA VISTA	617,761	264,229	84,167	36,550	10,719	13,044	2,325
TEERINK	577,814	243,596	70,550	25,532	7,954	9,298	1,344
CHRISMAN	544,243	224,924	64,561	22,658	6,900	8,270	1,370
EDMONSTON	534,409	216,984	62,349	20,180	6,172	7,227	1,055
OSO	262,287	123,029	30,467	160	25	0	-25
PEARBLOSSOM	236,588	79,201	25,066	14,367	4,705	4,417	-288

*VALUES NOT INCLUDED IN TOTAL DELIVERIES

PRELIMINARY DATA

PRODUCED AT 0800 ON 06/23/14

Exhibit 11

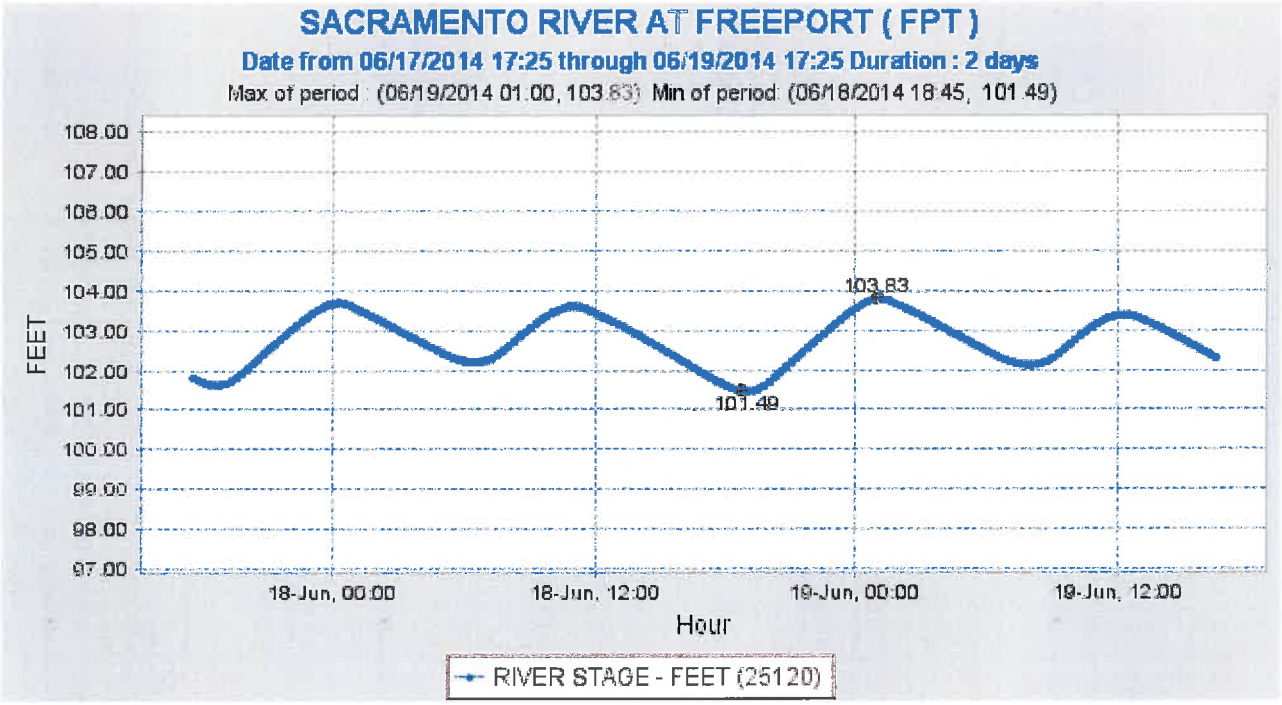


Generated on Thu Jun 19 17:21:46 PDT 2014

Plot all IST Sensors | Real-Time IST Data | IST Data | Daily IST Data | Show IST Map | IST Info

Plot from ending date: 06/19/2014 17:21 Span: 2 days Get custom plot

Exhibit 12



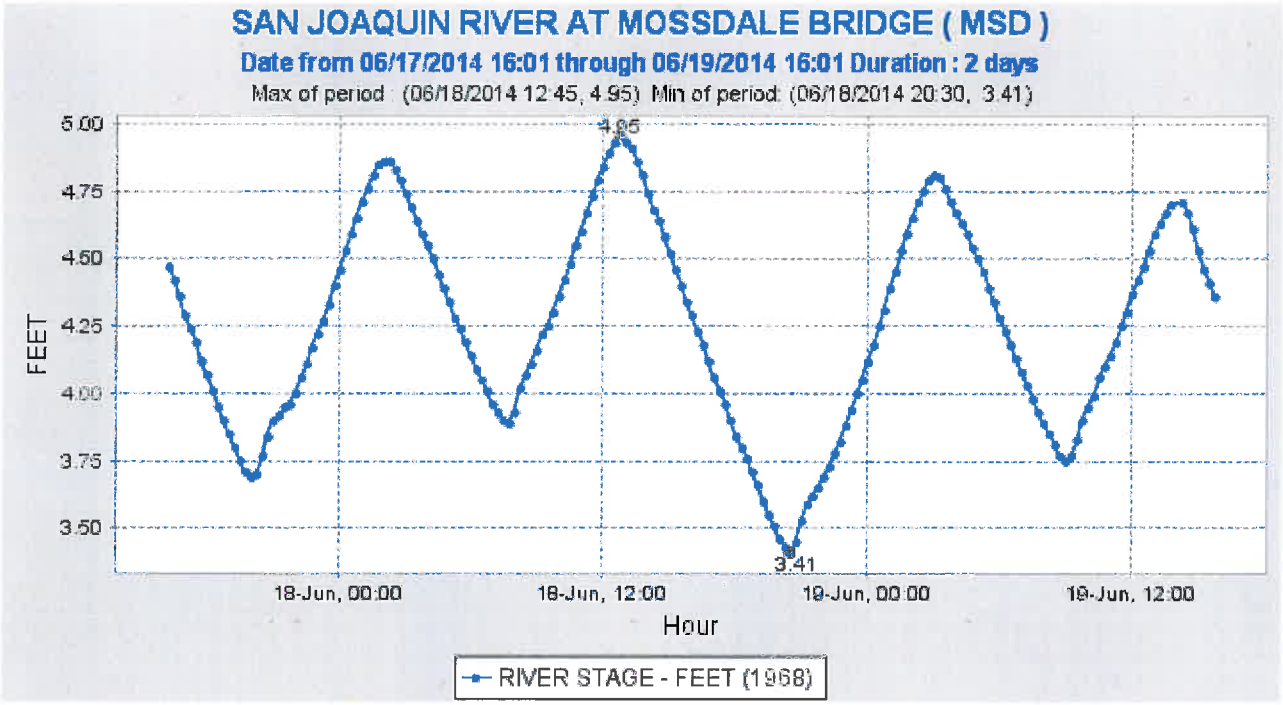
Generated on Thu Jun 19 17:25:15 PDT 2014

Plot all FPT Sensors | Real-Time FPT Data | FPT Data | Daily FPT Data | Show FPT Map | FPT Info

Plot from ending date: 06/19/2014 17:25 Span: 2 days Get custom plot

Station Comments:

09/06/2005 Freeport data back on-line as of 8/31/2005.
06/01/2005 Daily streamflow is estimate by USGS. From 5/4/2005 to present
05/06/2005 New equipment is being installed. Data not valid. At this time, we do not have an estimated return to serv
11/01/2004 Data is now valid. Data is transmitted via satellite instead of modem.
10/05/2004 Freeport data is not valid since 9-24-04. A new station will be coming on-line soon.



Generated on Thu Jun 19 16:01:35 PDT 2014

Plot all MSD Sensors | Real-Time MSD Data | MSD Data | Daily MSD Data | Show MSD Map | MSD Info

Plot from ending date: 06/19/2014 16:01 Span: 2 days Get custom plot

Station Comments:

11/05/2013 QC'd flow and velocity data are available on the Water Data Library (WDL) at: http://www.water.ca.gov/waterdatalibrary/docs/Hydstra/index.cfm. Select "Surface Water" for the Data Ty station's WDL code: B95820Q. Contact Dave Huston of the North Central Region Office for further inquir (Dave.Huston@water.ca.gov).

01/01/2013 For QA/QC'd data, contact the Division of Environmental Services (Karen.Gehrts@water.ca.gov).

12/16/2011 ADCP unit replaced with bubbler gage December 13, 2011

10/22/2008 Data collection for these sensors 1 (stage), 20 (flow) and 21 (w velocity) have been switched from satellit from DWR DES in October 2008. The rest of the hourly sensors were switched as well.

02/05/2007 Power to the station was vandalized Saturday night (2/3/07) and will be repaired ASAP

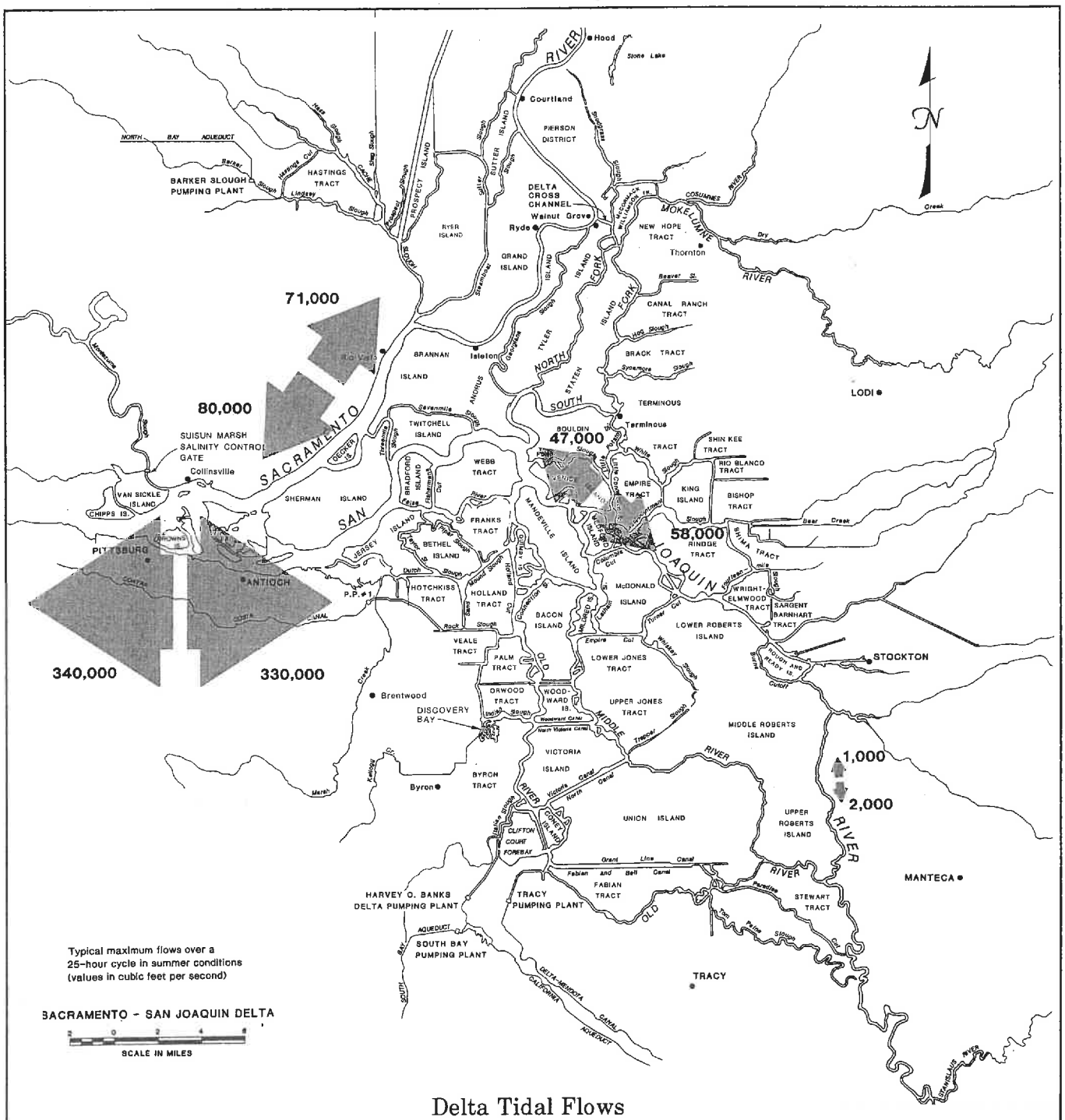
09/30/2006 The vertical datum has changed for this station as of October 1, 2006. Please see [Datum Change 2006]

01/09/2006 Modified stage correction value to -2.38 to account for the datum change.

06/01/2005 Stage datum set to NAD 88 (new staff at bridge).

Delta Tidal Flows and Levels

The Sacramento-San Joaquin Delta is at sea level. Water levels vary greatly during each tidal cycle, from less than a foot on the San Joaquin River near Interstate 5 to more than five feet near Pittsburg. During the tidal cycle, flows can also vary in direction and amount. For example and as shown on the map below, the flow near Pittsburg during a typical summer tidal cycle can vary from 330,000 cfs upstream to 340,000 cfs downstream. The "net" summer Delta outflow is a very small amount of the total water movement, generally 5,000 to 10,000 cfs.



Delta Tidal Flows

Exhibit 13

STATE OF CALIFORNIA
The Resources Agency
Department of Water Resources

THE DELTA
AND THE STATE WATER PROJECT

Memorandum Report

JUNE 1969

Exhibit 14

DELTA WATER ENTITLEMENT NEGOTIATIONS

Water entitlements in the Delta have been the subject of intense study and discussion for several years. Considerable progress has been made toward agreements to protect these entitlements.

With construction and operation of the State Water Project under way, and with works being proposed for the Delta Water Facilities, considerable concern is being expressed by some Delta interests over the effects of this development on Delta water rights, water supplies, and environment.

The Delta and Delta water users are protected by law. Provisions in the California Water Code governing the construction and operation of the State Water Project are quite explicit. Protection is based upon the fundamental law of riparian and appropriative water rights, the County of Origin Act, the Area of Origin Law (sometimes referred to as the Watershed Protection Act), the Delta Protection Act, and the Burns-Porter Act. Such protection, however, is limited to the reasonable and beneficial use of water.

Purpose and History of Negotiations

The Department is negotiating with Delta interests for two basic reasons:

(1) To meet department responsilities pursuant to the California Constitution and various laws protecting the Delta; and

(2) To avoid a complete, costly, and time-consuming adjudication of water rights of the entire Central Valley.

During the 1950's the Department of Water Resources cooperated with the Bureau of Reclamation and the local Delta water users in studies to identify individual entitlements to the waters of the Sacramento River and the Delta. These studies, using the classical approach to solution of water rights problems, considered priority of rights to quantity of water rather than quality. No resolution was reached in the Delta using this approach. Actually, in the Delta, the question of quantity is of little concern, since the Delta is never short of water. If flow from the tributary streams were insufficient to meet Delta use, water from the Pacific Ocean would flow through the San Francisco Bay system and fill the Delta channels.

Beginning in 1963, the Department of Water Resources, the Bureau of Reclamation, and representatives of two local Delta water users' organizations began negotiations specifically to resolve the Delta water entitlement problem. The local organizations are:

(1) The Sacramento River and Delta Water Association (SRDWA), representing Delta water users in Sacramento, Yolo, and Solano Counties, and parts of Contra Costa and San Joaquin Counties.

(2) The Delta Water Users Association (DWUA), acting as the San Joaquin Water Rights Committee (SJWRC) and representing water users in San Joaquin County and part of Contra Costa County.

Together, these 2 Associations represent about 90 percent of the Delta agricultural area, including about 40 percent of the agricultural lands in Contra Costa County.

In 1964, separate negotiations among the Bureau of Reclamation, the Department of Water Resources, and the Negotiating Committee for Contra Costa County's Water Requirements (NCCCCWR) were initiated. This Committee attempted to include representation of all water users in Contra Costa County interested in offshore quality -- municipal, industrial, agricultural, recreational, fish and wildlife, esthetics, etc. In the many months of discussions that followed, little progress was made with this Committee due primarily to its large size (about 50 people), and to the complex and diverse requirements and problems of the many interests involved. Consequently, at the request of individual interests within the group and with committee concurrence, some of those represented on the Committee began independent negotiations with the Department.

In essence, negotiations fall into two areas -- the main Delta, that area that will be protected by the November 19, 1965 Delta Water Quality Criteria and thereby provide irrigators an inchannel water supply of acceptable quality through such protection; and the western Delta, that area where overland water conveyance facilities or other alternative solutions will be required to provide an adequate water supply.

Main Delta Negotiations

Since water shortage in the Delta is not a problem, it was necessary to develop a quality "yardstick" to guide project operation in the Delta. This "yardstick" was established on November 19, 1965, when negotiations among the Sacramento River and Delta Water Association, the Delta Water Users Association, the Bureau of Reclamation, and the Department of Water Resources reached the first concrete achievement with agreement to the "Delta Water Quality Criteria". These criteria, summarized earlier and contained in full in Appendix A, set forth quality limits for inchannel Delta waters and specify the locations of stations to monitor conformance. Under provisions of the criteria, saltwater intrusion will continue to be repelled to approximately the same point as it has been in the summertime by the Federal Central Valley Project.

CONTRACT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND THE NORTH DELTA WATER AGENCY FOR THE ASSURANCE OF A DEPENDABLE WATER SUPPLY OF SUITABLE QUALITY

THIS CONTRACT, made this 28th day of Jan, 1981, between the STATE OF CALIFORNIA, acting by and through its DEPARTMENT OF WATER RESOURCES (State), and the NORTH DELTA WATER AGENCY (Agency), a political subdivision of the State of California, duly organized and existing pursuant to the laws thereof, with its principal place of business in Sacramento, California.

RECITALS

(a) The purpose of this contract is to assure that the State will maintain within the Agency a dependable water supply of adequate quantity and quality for agricultural uses and, consistent with the water quality standards of Attachment A, for municipal and industrial uses, that the State will recognize the right to the use of water for agricultural, municipal, and industrial uses within the Agency, and that the Agency will pay compensation for any reimbursable benefits allocated to water users within the Agency resulting from the Federal Central Valley Project and the State Water Project, and offset by any detriments caused thereby.

(b) The United States, acting through its Department of the Interior, has under construction and is operating the Federal Central Valley Project (FCVP).

(c) The State has under construction and is operating the State Water Project (SWP).

(d) The construction and operation of the FCVP and SWP at times have changed and will further change the regimen of rivers tributary to the Sacramento-San Joaquin Delta (Delta) and the regimen of the Delta channels from unregulated flow to regulated flow. This regulation at times improves the quality of water in the Delta and at times diminishes the quality from that which would exist in the absence of the FCVP and SWP. The regulation at times also alters the elevation of water in some Delta channels.

(e) Water problems within the Delta are unique within the State of California. As a result of the geographical location of the lands of the Delta and tidal influences, there is no physical shortage of water. Intrusion of saline ocean water and municipal, industrial and agricultural discharges and return flows, tend, however, to deteriorate the quality.

(f) The general welfare, as well as the rights and requirements of the water users in the Delta, require that there be maintained in the Delta an adequate supply of good quality water for agricultural, municipal and industrial uses.

(g) The law of the State of California requires protection of the areas within which water originates and the watersheds in which water is developed. The Delta is such an area and within such a watershed. Part 4.5 of Division 6 of the California Water Code affords a first priority to provision of salinity control and maintenance of an adequate water supply in the Delta for reasonable and beneficial uses of water and relegates to lesser priority all exports of water from the Delta to other areas for any purpose.

(h) The Agency asserts that water users within the Agency have the right to divert, are diverting, and will continue to divert, for reasonable beneficial use, water from the Delta that would have been available therein if the FCVP and SWP were not in existence, together with the right to enjoy or acquire such benefits to which the water users may be entitled as a result of the FCVP and SWP.

(i) Section 4.4 of the North Delta Water Agency Act, Chapter 283, Statutes of 1973, as amended, provides that the Agency has no authority or power to affect, bind, prejudice, impair, restrict, or limit vested water rights within the Agency.

(j) The State asserts that it has the right to divert, is diverting, and will continue to divert water from the Delta in connection with the operation of the SWP.

(k) Operation of SWP to provide the water quality and quantity described in this contract constitutes a reasonable and beneficial use of water.

(l) The Delta has an existing gradient or relationship in quality between the westerly portion most seriously affected by ocean salinity intrusion and the interior portions of the Delta where the effect of ocean salinity intrusion is diminished. The water quality criteria set forth in this contract establishes minimum water qualities at various monitoring locations. Although the water quality criteria at upstream locations is shown as equal in some periods of some years to the water quality at the downstream locations, a better quality will in fact exist at the upstream locations at almost all times. Similarly, a better water quality than that shown for any given monitoring location will also exist at interior points upstream from that location at almost all times.

(m) It is not the intention of the State to acquire by purchase or by proceeding in eminent domain or by any other manner the water rights of water users within the Agency, including rights acquired under this contract.

(n) The parties desire that the United States become an additional party to this contract.

AGREEMENTS

1. **Definitions.** When used herein, the term:

(a) "Agency" shall mean the North Delta Water Agency and shall include all of the lands within the boundaries at the time the contract is executed as described in Section 9.1 of the North Delta Water Agency Act, Chapter 283, Statutes of 1973, as amended.

(b) "Calendar year" shall mean the period January 1 through December 31.

(c) "Delta" shall mean the Sacramento-San Joaquin Delta as defined in Section 12220 of the California Water Code as of the date of the execution of the contract.

(d) "Electrical Conductivity" (EC) shall mean the electrical conductivity of a water sample measured in millimhos per centimeter per square centimeter corrected to a standard temperature of 25° Celsius determined in accordance with procedures set forth in the publication entitled "Standard Methods of Examination of Water and Waste Water", published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation, 13th Edition, 1971, including such revisions thereof as may be made subsequent to the date of this contract which are approved in writing by the State and the Agency.

(e) "Federal Central Valley Project" (FCVP) shall mean the Central Valley Project of the United States.

(f) "Four-River Basin Index" shall mean the most current forecast of Sacramento Valley unimpaired runoff as presently published in the California Department of Water Resources Bulletin 120 for the sum of the flows of the following: 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. The May 1 forecast shall continue in effect until the February 1 forecast of the next succeeding year.

(g) "State Water Project" (SWP) shall mean the State Water Resources Development System as defined in Section 12931 of the Water Code of the State of California.

(h) "SWRCB" shall mean the [illegible] trol Board.

(i) "Water year" shall mean the

Exhibit 15

Appendix 7: Sacramento River Watershed Hydrology Schematic

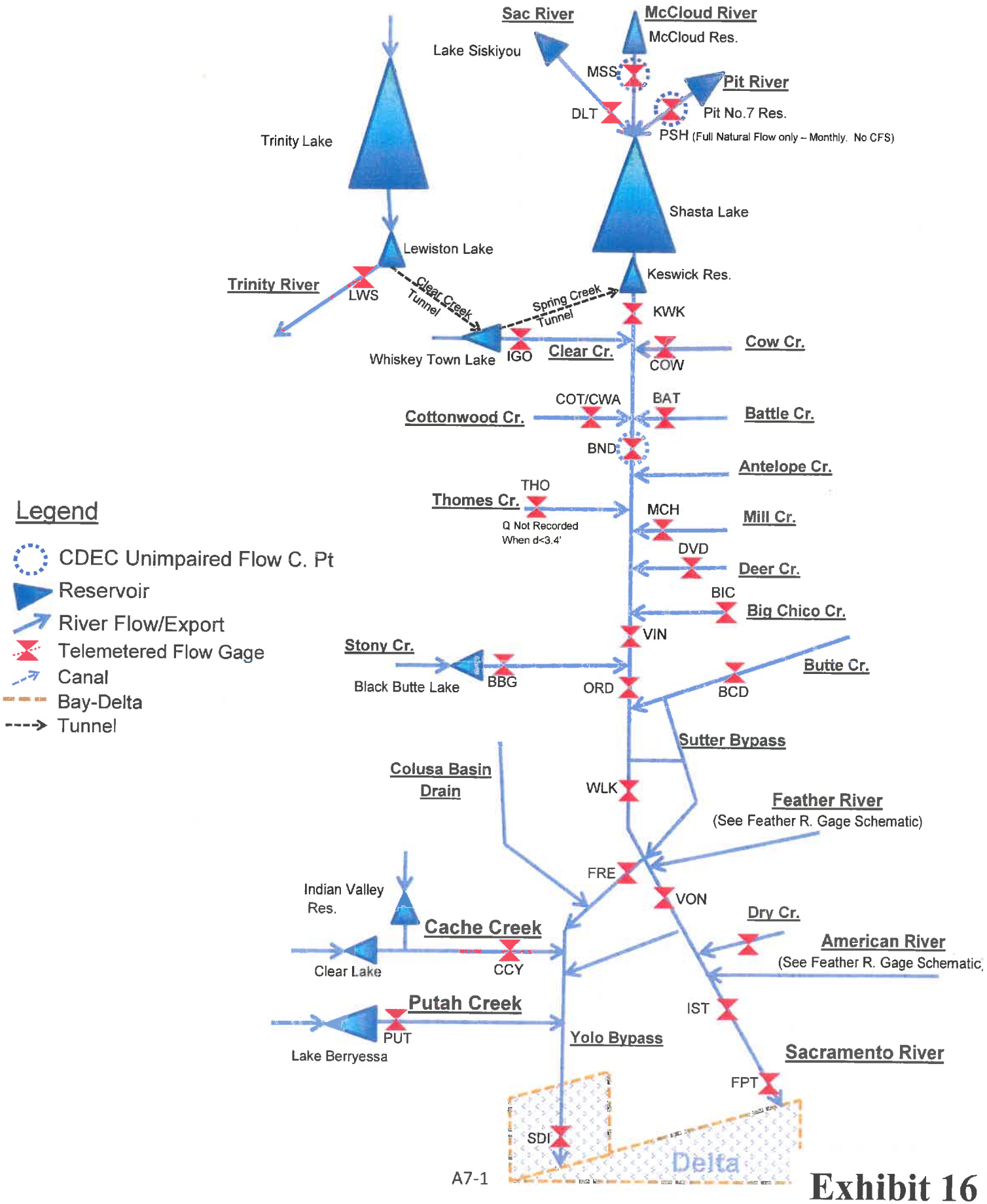
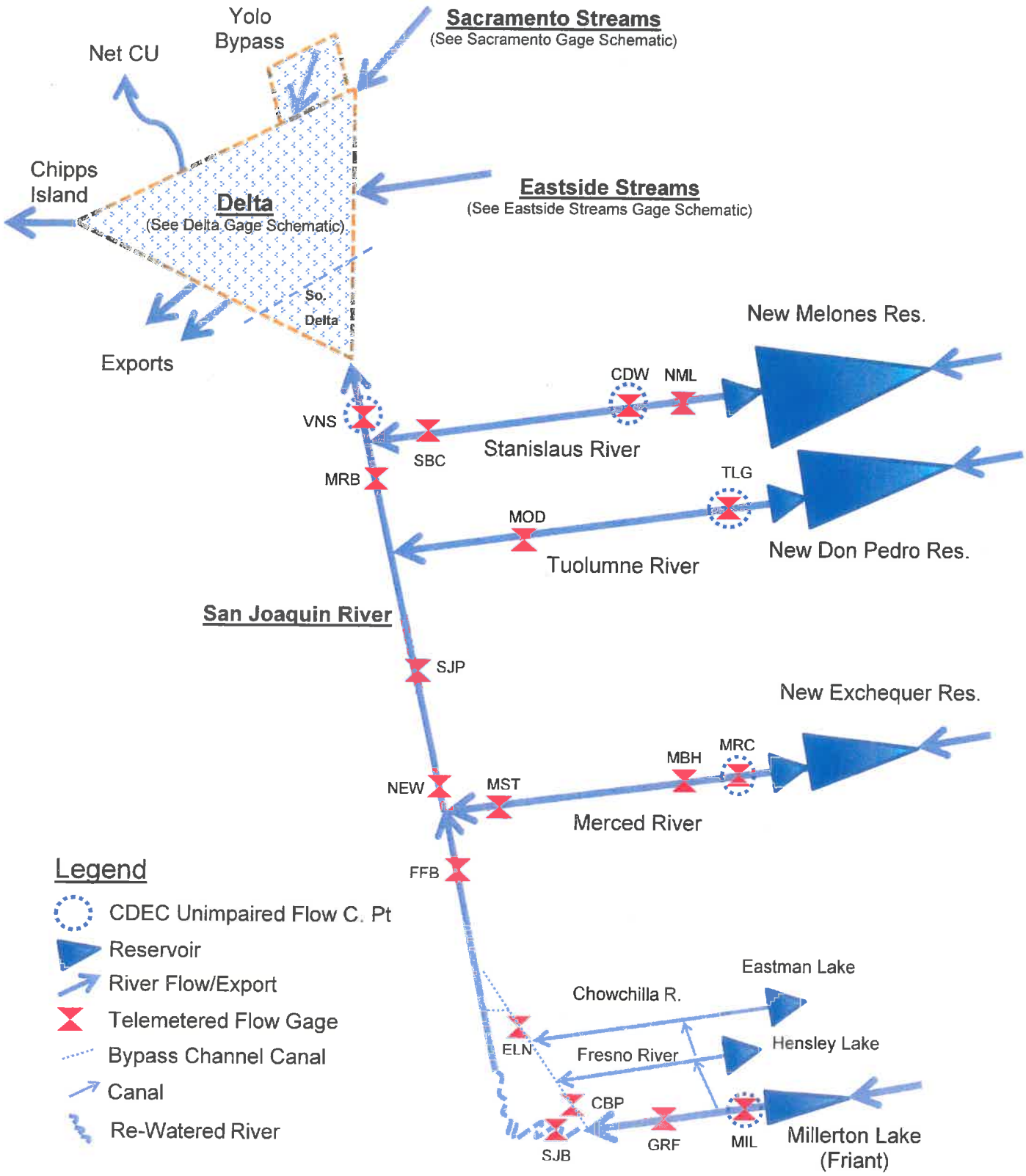
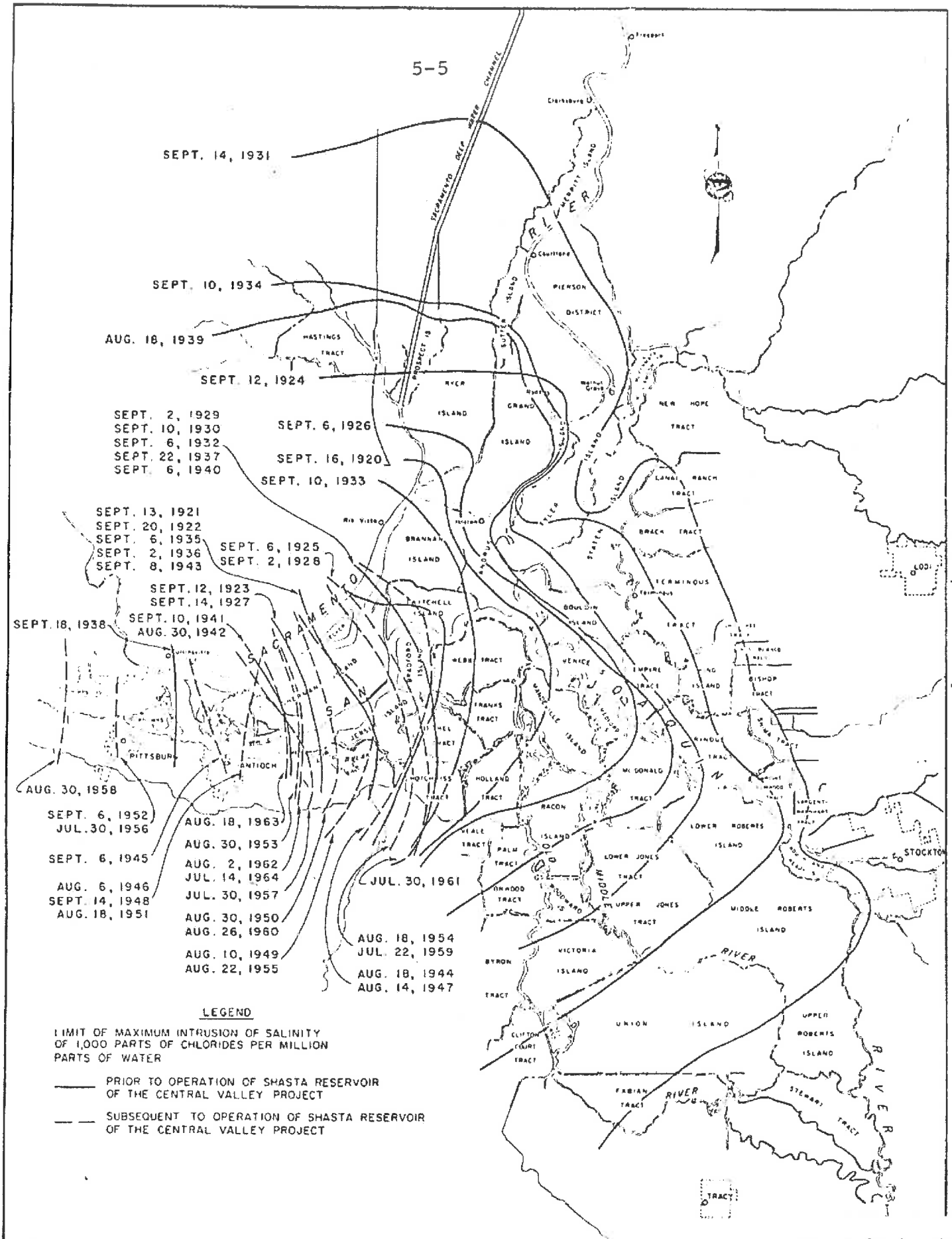


Exhibit 16

Appendix 8: Delta Watershed Hydrology Schematic





Historical salinity intrusion, 1920-1964.

Exhibit 17

TABLE A-5
1976-77 Estimated Crop Et Values
Delta Service Area
(in inches)

Land Use Category	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Total Oct.76-Sep.77	Oct.77	Total Nov.77-Oct.77
Sacramento-San Joaquin Delta															
Irrigated Pasture	3.2	1.5	1.0	0.7	1.5	3.6	5.4	4.8	6.9	7.7	6.4	4.7	47.4	3.4	47.6
Alfalfa	3.2	1.5	1.0	0.7	1.5	3.2	4.9	4.4	6.5	7.5	6.5	4.9	45.8	3.4	46.0
Deciduous Orchard (Fruits & Nuts)	2.6	1.5	1.0	0.7	1.5	2.7	3.8	4.0	6.1	7.4	6.1	4.3	41.7	2.6	41.7
Tomatoes	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.6	4.0	8.2	6.0	2.3	34.3	1.9	33.8
Sugar Beets	2.4	1.5	1.0	0.7	1.5	1.9	2.2	3.7	7.6	8.3	6.4	4.4	41.6	2.4	41.6
Grain Sorghum (Milo)	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.0	5.9	7.3	4.3	2.5	33.2	1.9	32.7
Field Corn	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.3	5.7	6.9	5.1	2.6	33.8	1.9	33.3
Dry Beans	2.4	1.5	1.0	0.7	1.5	1.9	2.2	1.7	5.7	6.2	2.7	2.5	30.0	1.9	29.5
Safflower	2.4	1.5	1.0	0.7	1.5	1.9	2.5	4.8	8.7	7.7	4.4	2.5	39.6	1.9	39.1
Asparagus	2.4	1.5	1.0	0.7	1.5	1.9	2,2	1.0	3.5	7.7	6.4	4.7	34.5	2.4	34.5
Potatoes	2.4	1.5	1.0	0.7	1.5	1.9	2.2	1.7	4.3	7.4	5.5	2.8	32.9	1.9	32.4
Irrigated Grain	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	1.0	1.0	1.6	26.1	1.6	24.7
Vineyard	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.8	5.3	6.5	5.3	3.4	34.5	2.4	34.5
Rice	3.2	1.5	1.0	0.7	1.5	1.9	2.8	5.6	8.8	9.8	8.1	5.5	50.4	3.4	50.6
Sudan	2.4	1.5	1.0	0.7	2.0	4.3	5.7	4.8	6.9	7.7	4.9	4.7	46.6	2.4	46.6
Misc. Truck	2.4	1.5	1.0	0.7	1.5	1.9	3.2	4.6	6.7	7.4	5.2	3.7	39.8	1.9	39.3
Misc. Field	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.4	6.1	7.4	5.0	1.9	34.0	1.9	33.5
Double Cropped with Grain															
Sugar Beets	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	4.2	5.2	5.8	37.7	3.4	38.7
Field Corn	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	4.3	6.3	6.1	39.2	2.7	39.5
Grain Sorghum (Milo)	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	2.7	6.1	5.2	36.5	1.9	36.0
Sudan	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	3.6	7.7	4.9	4.7	41.6	1.9	41.1
Dry Beans	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	3.1	7.6	3.5	1.5	36.4	1.9	35.9
Tomatoes	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	2.3	6.6	6.0	5.2	40.8	1.9	40.3
Lettuce	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	4.1	7.4	5.3	4.9	42.4	2.4	42.4
Misc. Truck	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	2.3	6.6	6.0	5.2	40.8	2.4	40.8
Misc. Field	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	4.1	7.4	5.3	4.9	42.4	3.4	43.4
Fallow Lands 1/	2.4	1.5	1.0	0.7	1.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	14.0	1.0	12.6
Native Vegetation 2/	2.4	1.5	1.0	0.7	1.4	3.7	3.8	2.1	2.3	2.6	2.3	2.0	25.8	1.6	25.0
Riparian Veg. & Water Surface	4.6	2.4	1.4	0.8	1.9	4.5	7.4	6.6	9.7	11.8	9.7	7.0	67.8	4.3	67.5
Urban	1.6	0.8	0.6	0.7	1.0	1.0	1.9	2.4	2.4	2.5	2.4	1.9	19.2	1.6	19.2

1/ Applies also to nonirrigated grain.
2/ Applies also to nonirrigated orchards and vineyards

Metric conversion: inches times 25.4 equals millimetres.

Exhibit 18

Historical Estimates of Agricultural and Wetland Water Use in the San Joaquin-Sacramento River Delta

By

Morteza N. Orang, Richard L. Snyder, Sara Sarreshteh

This report presents the results of a study comparing the water requirements (ET_c) of irrigated crops and wetland vegetation (tules and cattails) in the San Joaquin-Sacramento River Delta for different water years 1998 (wet), 2000 (average), and 2001 (dry). These are the most recent dry, normal, and wet years, which were used in the California Water Plan Update 2005. The main purpose of this project was to specifically customize the daily water balance program "Delta Evapotranspiration of Applied Water" or "DETAW" to analyze historical climate data to compute the water requirements of wetland vegetation that change from year-to-year. To do the analysis, DETAW was modified to sum the number of hectares of irrigated land for each of the 168 sub-areas within the Delta from 1921 to 2003. DETAW uses the product of reference evapotranspiration (ET_o) and a crop coefficient (K_c) factor to estimate well-watered evapotranspiration ($ET_c = ET_o \times K_c$). Using the surface areas, volumes of water corresponding to ET_c were computed for wetland vegetation on each the sub-areas over the period of record. The K_c values, crop type, and the percentages of the season to identifiable growth dates b, c, and d were changed to K_c factors and dates for tules and cattails to estimate daily and monthly ET data for wetland vegetation. The growth dates were b (10% ground cover), c (75% ground cover), and d (the onset of senescence). The model K_c values for tules and cattails, grown in standing water, were reported by Drexler et al. (2006). Since it is unlikely that the entire Delta area would have standing water for a full season, and the K_c factors are likely to be lower without the water, the standing-water K_c values provide an upper-limit boundary for estimating ET_c, and lower values are likely in most years. In drought years, the soil may dry out sufficiently to cause evapotranspiration (ET) reducing water stress, and a stress (K_s) coefficient might be needed to reduce the actual ET (ET_a) to a level lower than ET_c.

Exhibit 19

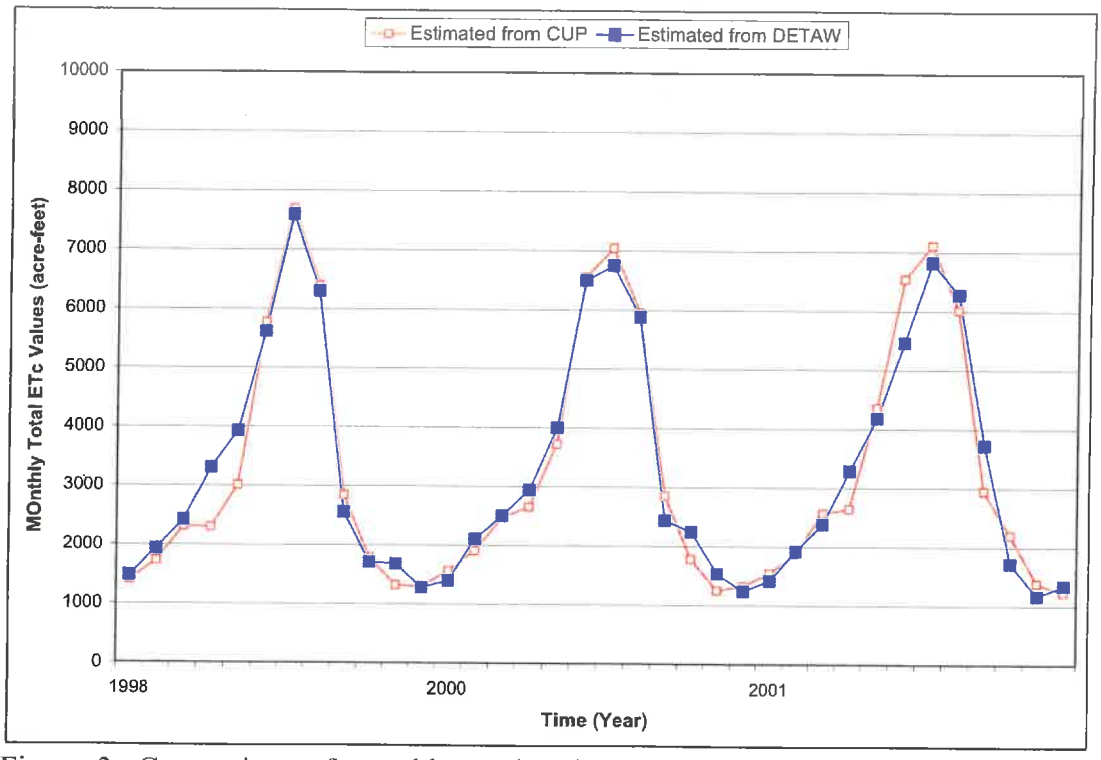


Figure 3- Comparison of monthly total estimates of evapotranspiration for agriculture from CUP and DETAW in sub-area 1 in the Delta during 1998 (wet), 2000 (average), and 2001 (dry) periods.

Results and Discussion:

The monthly cumulative values of agricultural and wetland ET_c estimated by DETAW were plotted against time (months) for 1998, 2000, and 2001 in Figures 4-6 for the Lowlands, in Figures 7-9 for the Uplands, and in Figures 10-12 for the entire Delta. For the entire Delta, the ET_c for the wetland cattails and tules was about 16% (1998), 20% (2000), and 22% (2001) higher than the agriculture-crop land-use group, which included irrigated pasture, alfalfa, all field crops, sugar beets, irrigated grain, rice, truck crops, tomato, orchard, vineyard, and non-irrigated grain (Figures 10-12). The results were similar for the Lowlands (Figures 4-6) and for the Uplands (Figures 7-9). When irrigated winter cereal and grapevine cropped areas are not converted to wetland vegetation in the Delta, the cattails and tules could increase evapotranspiration (ET_c) by about 13% in 1988 and 16% in 2000 and 2001, respectively.

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Sacramento, Calif., November 15, 1949.

HON. CLAIR ENGLE,
Red Bluff, Calif.

MY DEAR MR. ENGLE: In response to your request to Mr. Carr, we have assembled excerpts from various statements by Bureau and Department officials relating to the subject of diversion of water from the Sacramento Valley to the San Joaquin Valley through the operation of the Central Valley project.

A factual review of available water supplies over a period of more than 40 years of record and the estimates of future water requirements made by State and Federal agencies makes it clear that there is no reason for concern about the problem at this time.

For your convenience, I have summarized policy statements that have been made by Bureau of Reclamation and Department of the Interior officials. These excerpts are in the following paragraphs:

On February 20, 1942, in announcing the capacity for the Delta-Mendota Canal, Commissioner John C. Page said, as a part of his Washington, D. C., press release:

"The capacity of 4,600 cubic feet per second was approved, with the understanding that the quantity in excess of basic requirements mainly for replacement at Mendota Pool, will not be used to serve new lands in the San Joaquin Valley if the water is necessary for development in the Sacramento Valley below Shasta Dam and in the counties of origin of such waters."

On July 18, 1944, Regional Director Charles E. Carey wrote a letter to Mr. Harry Barnes, chairman of a committee of the Irrigation Districts Association of California. In that letter, speaking on the Bureau's recognition and respect for State laws, he said:

"They [Bureau officials] are proud of the historic fact that the reclamation program includes as one of its basic tenets that the irrigation development in the West by the Federal Government under the Federal reclamation laws is carried forward in conformity with State water laws."

On February 17, 1945, a more direct answer was made to the question of diversion of water in a letter by Acting Regional Director R. C. Calland, of the Bureau, to the Joint Committee on Rivers and Flood Control of the California State Legislature. The committee had asked the question, "What is your policy in connection with the amount of water that can be diverted from one watershed to another in proposed diversions?" In stating the Bureau's policy, Mr. Calland quoted section 11460 of the State water code, which is sometimes referred to as the county of origin act, and then he said:

"As viewed by the Bureau, it is the intent of this statute that no water shall be diverted from any watershed which is or will be needed for beneficial uses within that watershed. The Bureau of Reclamation, in its studies for water resources development in the Central Valley, consistently has given full recognition to the policy expressed in this statute by the legislature and the people. The Bureau has attempted to estimate in these studies, and will continue to do so in future studies, what the present and future needs of each watershed will be. The Bureau will not divert from any watershed any water which is needed to satisfy the existing or potential needs within that watershed. For example, no water will be diverted which will be needed for the full development of all of the irrigable lands within the watershed, nor would there be water needed for municipal and industrial purposes or future maintenance of fish and wildlife resources."

On February 12, 1948, Acting Commissioner Wesley R. Nelson sent a letter to Representative Clarence F. Lea, in which he said:

"You asked whether section 10505 of the California Water Code, also sometimes referred to as the county of origin law, would be applicable to the Department of the Interior, Bureau of Reclamation. The answer to this question is: No, except insofar as the Bureau of Reclamation has taken or may take assignments of applications which have been filed for the appropriation of water under the California Statutes of 1927, chapter 286, in which assignments reservations have been made in favor of the county of origin.

The policy of the Department of the Interior, Bureau of Reclamation, is evidenced in its proposed report on a Comprehensive Plan for Water Resources Development—Central Valley Basin, Calif., wherein the Department of the Interior takes the position that "In addition to respecting all existing water rights, the Bureau has complied with California's 'county of origin' legislation, which requires that water shall be reserved for the presently unirrigated lands of the areas in which the water originates, to the end that only surplus water will be exported elsewhere."

On March 1, 1948, Regional Director Richard L. Boke wrote to Mr. A. L. Burkholder, secretary of the Live Oak Subordinate Grange No. 494, Live Oak, Calif., on the same subject, and said:

"I can agree fully with the statement in your letter that it would be grossly unjust to 'take water from the watersheds of one region to supply another region until all present and all possible future needs of the first region have been fully determined and completely and adequately provided for.' That is established Bureau of Reclamation policy and, I believe, it is consistent with the water laws of the State of California under which we must operate."

On May 17, 1948, Assistant Secretary of the Interior William E. Warne wrote a letter to Representative Lea on the same subject, in which he said:

"The excess water made available by Shasta Reservoir would go first to such Sacramento Valley lands as now have no rights to water."

Assistant Secretary Warne goes on to say, in the same letter:

"As you know, the Sacramento Valley water rights are protected by: (1) Reclamation law which recognizes State water law and rights thereunder; (2) the State's counties of origin act, which is recognized by the Bureau in principle; and (3) the fact that Bureau filings on water are subject to State approval. I can assure you that the Bureau will determine the amounts of water required in the Sacramento Valley drainage basin to the best of its ability so that only surplus waters would be exported to the San Joaquin. We are proceeding toward a determination and settlement of Sacramento Valley waters which will fully protect the rights of present users; we are determining the water needs of the Sacramento Valley; and it will be the Bureau's policy to export from that valley only such waters as are in excess of its needs."

On October 12, 1948, Secretary of the Interior Krug substantiated former statements of policy in a speech given at Oroville, Calif. Secretary Krug said, with respect to diversion of water:

"Let me state, clearly and finally, the Interior Department is fully and completely committed to the policy that no water which is needed in the Sacramento Valley will be sent out of it."

He added:

"There is no intent on the part of the Bureau of Reclamation ever to divert from the Sacramento Valley a single acre-foot of water which might be used in the valley now or later."

We believe the foregoing is a summary of the main policy statements by Government officials on the subject of importation of Sacramento Valley water to the San Joaquin Valley. Please inform me if you wish additional information.

Sincerely yours,

RICHARD L. BOKE,
Regional Director.

EXHIBIT NO. 12

STATEMENT BY DONALD M. SMITH, SECRETARY, SACRAMENTO VALLEY IRRIGATION COMMITTEE, BEFORE THE JOINT HEARINGS OF SUBCOMMITTEE ON IRRIGATION AND RECLAMATION, HOUSE OF REPRESENTATIVES, AND THE JOINT INTERIM COMMITTEE ON WATER PROBLEMS, CALIFORNIA LEGISLATURE, OCTOBER 30, 1951, SACRAMENTO, CALIF.

Members of Congress, members of the State legislature, the Sacramento Valley Irrigation Committee is a four-county organization of

PL 99-546, October 27, 1986, 100 Stat 3050

UNITED STATES PUBLIC LAWS
99th Congress - Second Session
Convening January 21, 1986

DATA SUPPLIED BY THE U.S. DEPARTMENT OF JUSTICE. (SEE SCOPE)
Additions and Deletions are not identified in this document.

PL 99-546 (HR 3113)
October 27, 1986

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

Exhibit 21

(iii) evaluation of lower Mokelumne River floodway improvements.

(C) INTERTIES.—Activities under this subparagraph consist of—

(i) evaluation and construction of an intertie between the State Water Project California Aqueduct and the Central Valley Project Delta Mendota Canal, near the City of Tracy, as an operation and maintenance activity, except that the Secretary shall design and construct the intertie in a manner consistent with a possible future expansion of the intertie capacity (as described in subsection (f)(1)(B)); and

(ii) assessment of a connection of the Central Valley Project to the Clifton Court Forebay of the State Water Project, with a corresponding increase in the screened intake of the Forebay.

(D) PROGRAM TO MEET STANDARDS.—

(i) IN GENERAL.—Prior to increasing export limits from the Delta for the purposes of conveying water to south-of-Delta Central Valley Project contractors or increasing deliveries through an intertie, the Secretary shall, not later than 1 year after the date of enactment of this Act, in consultation with the Governor, develop and initiate implementation of a program to meet all existing water quality standards and objectives for which the Central Valley Project has responsibility. Deadline.

(ii) MEASURES.—In developing and implementing the program, the Secretary shall include, to the maximum extent feasible, the measures described in clauses (iii) through (vii).

(iii) RECIRCULATION PROGRAM.—The Secretary shall incorporate into the program a recirculation program to provide flow, reduce salinity concentrations in the San Joaquin River, and reduce the reliance on the New Melones Reservoir for meeting water quality and fishery flow objectives through the use of excess capacity in export pumping and conveyance facilities.

(iv) BEST MANAGEMENT PRACTICES PLAN.—

(I) IN GENERAL.—The Secretary shall develop and implement, in coordination with the State's programs to improve water quality in the San Joaquin River, a best management practices plan to reduce the water quality impacts of the discharges from wildlife refuges that receive water from the Federal Government and discharge salt or other constituents into the San Joaquin River.

(II) COORDINATION WITH INTERESTED PARTIES.—The plan shall be developed in coordination with interested parties in the San Joaquin Valley and the Delta.

(III) COORDINATION WITH ENTITIES THAT DISCHARGE WATER.—The Secretary shall also coordinate activities under this clause with other entities that discharge water into the San Joaquin River to reduce salinity concentrations discharged into

the River, including the timing of discharges to optimize their assimilation.

(v) ACQUISITION OF WATER.—The Secretary shall incorporate into the program the acquisition from willing sellers of water from streams tributary to the San Joaquin River or other sources to provide flow, dilute discharges of salt or other constituents, and to improve water quality in the San Joaquin River below the confluence of the Merced and San Joaquin Rivers, and to reduce the reliance on New Melones Reservoir for meeting water quality and fishery flow objectives.

(vi) PURPOSE.—The purpose of the authority and direction provided to the Secretary under this subparagraph is to provide greater flexibility in meeting the existing water quality standards and objectives for which the Central Valley Project has responsibility so as to reduce the demand on water from New Melones Reservoir used for that purpose and to assist the Secretary in meeting any obligations to Central Valley Project contractors from the New Melones Project.

(vii) UPDATING OF NEW MELONES OPERATING PLAN.—The Secretary shall update the New Melones operating plan to take into account, among other things, the actions described in this title that are designed to reduce the reliance on New Melones Reservoir for meeting water quality and fishery flow objectives, and to ensure that actions to enhance fisheries in the Stanislaus River are based on the best available science.

(3) WATER USE EFFICIENCY.—

(A) WATER CONSERVATION PROJECTS.—Activities under this paragraph include water conservation projects that provide water supply reliability, water quality, and ecosystem benefits to the California Bay-Delta system.

(B) TECHNICAL ASSISTANCE.—Activities under this paragraph include technical assistance for urban and agricultural water conservation projects.

(C) WATER RECYCLING AND DESALINATION PROJECTS.—Activities under this paragraph include water recycling and desalination projects, including groundwater remediation projects and projects identified in the Bay Area Water Plan and the Southern California Comprehensive Water Reclamation and Reuse Study and other projects, giving priority to projects that include regional solutions to benefit regional water supply and reliability needs.

(D) WATER MEASUREMENT AND TRANSFER ACTIONS.—Activities under this paragraph include water measurement and transfer actions.

(E) URBAN WATER CONSERVATION.—Activities under this paragraph include implementation of best management practices for urban water conservation.

(F) RECLAMATION AND RECYCLING PROJECTS.—

Applicability.

(i) PROJECTS.—This subparagraph applies to—

(I) projects identified in the Southern California Comprehensive Water Reclamation and Reuse Study, dated April 2001 and authorized by

BUREAU OF RECLAMATION
Central Valley Operation Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

DEPARTMENT OF WATER RESOURCES
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

MAY 24 2013

IN REPLY REFER TO:
CVO-100
WTR-4.10

Thomas Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

Subject: April 2013 Exceedence of Salinity Objectives at Emmaton

Dear Mr. Howard:

On April 28, 2013, the Bureau of Reclamation and the Department of Water Resources (collectively the Projects) exceeded the D-1641 salinity objective at Emmaton. Project operations staff notified State Water Resource Control Board (SWRCB) staff of the exceedence by conference call on April 29, 2013, and by e-mail notification to the SWRCB. This letter provides formal notification of the exceedence and background information relevant to the circumstances.

Background information leading to exceedence conditions:
The exceedence of the 14-day running average of 0.45 EC salinity objective at Emmaton for a Sacramento Valley Dry Year type was caused by the interaction of two conditions: low river flows on the lower Sacramento River system culminating at Freeport, and increasing tides during the period of April 21, 2013, through April 25, 2013. Tidal trends and fluctuations are conditions generally anticipated by Project operators as part of salinity objective compliance; however, the low flow conditions on the lower Sacramento River system in late April 2013 was not anticipated by Project operators and is the main factor of the exceedences that have occurred at Emmaton.

Precipitation patterns for water year 2013 have been a scenario of extremes. The months of November and December produced significant rainfall and project reservoir storage correspondingly increased without any significant flood control releases from major project reservoirs. The calendar year precipitation, however, has been dismal. The accumulation of rainfall since January 1 for the long record of the Northern Sierra 8-Station Precipitation Index is

approximately 8.8 inches. Currently, this value represents the driest calendar year period in the long precipitation record--even drier than the very dry single years of 1977 and 1924. Creek and small stream flows that enter the Sacramento River system below major reservoirs are running at historically very low levels in response to this long, dry precipitation period. (Attach 8SI plot)

Historically, the initial diversion for rice cultivation and ponding has generally occurred from late April to early May, depending on farmer cultivation and preparation practices and soil moisture conditions, to allow farmers to prepare their fields. Generally, project operators have observed this diversion to rice fields occur over several weeks from late April to early May, and have monitored river conditions and increased reservoir releases as rice cultivation diversion rates increased. It now appears that in 2013, due to the very dry hydrologic conditions since the first of the year, a very large portion of rice fields were cultivated and ready to begin their initial field flooding on a simultaneous schedule during the third week of April. This diversion to rice cultivation, although expected to occur, was unanticipated by Project operators for the sheer size and magnitude of simultaneous initial diversion for rice cultivation that actually occurred valley-wide.

Project operators responded to the increasing diversion rates during this period; by increasing reservoir releases in an attempt to catch up to the lower Sacramento River flow conditions. Figures 1 and 2 illustrate the Projects' reservoir release response to flow conditions in the lower Sacramento River during this period of unprecedented diversions. The first illustration shows Keswick's releases in response to the flow pattern at the Wilkins Slough river gage location. This section of the Sacramento River Basin is controlled exclusively with Shasta/Keswick reservoir releases with an approximate lagged travel time of 2.5 days between Keswick and Wilkins Slough. The second illustration indicates the reservoir releases in response to the flow pattern at the Verona river gage location. Verona flow is influenced by reservoir releases from Keswick Reservoir as well as Oroville Reservoir's releases to the Feather River. The approximate lagged travel time from Keswick is 3.5 days and just over one day from Oroville. Both illustrations show the dramatic increases from project reservoirs in response to low flow conditions observed along the lower Sacramento River. The dramatic increase in overall depletion rates experienced over a period of about ten days was simply not anticipated by project operators and is extreme from a historical perspective. Reservoir release rates of 11,000 cfs from Keswick Reservoir and 5,250 from Oroville Reservoir are more typical of late May than late April even in a dry condition. Folsom Reservoir releases were increased from 1,000 cfs to 1,250 cfs on April 25, 2013, to also contribute to lower Sacramento River flows.

The result of this unusual condition and timing is that Freeport flows entering the Delta were very low for a period of a week to ten days. (See Operational Report). At the same time, pulse flows were entering the Delta from the San Joaquin River at Vernalis as part of the annual pulse flow management from the San Joaquin River Basin. Due to the low flow conditions at Freeport, salinity conditions in the vicinity of Collinsville and Emmaton along the extreme lower Sacramento River and western Delta increased dramatically as tidal conditions increased. (See Operational Report). Project operators responded to the changing conditions by reducing scheduled exports that were anticipated to be near a 1:1 ratio with Vernalis flow in order to

maintain Delta outflow conditions necessary to meet X2 objectives at Collinsville. Without adequate flows at Freeport to repel salinity conditions in the lower Sacramento River, salinity levels near Emmaton inevitably exceeded the dry year objective of the maximum 14-day running average of mean at 0.45 salinity. Project reservoir releases stabilized Freeport flows at greater than 10,000 cfs beginning April 28, 2013, and averaged above this rate until compliance of the 14-day 0.45 EC objective at Emmaton was re-established on May 19.

Challenges facing project operations for the remainder of year:
By D-1641 criteria, water year 2013 is classified as a "Dry" year as published in the last Bulletin 120 update for May 1st hydrologic conditions. As previously mentioned, water year 2013 has been a year of extremes with generally wet conditions in November and December and retention of storage in upstream reservoirs, followed by extreme and possibly record dry precipitation conditions since January 1. This pattern of hydrologic conditions will very likely bring challenges for the remainder of this water year. Reservoir storage in Shasta and Oroville is in reasonably good shape, but will be relied upon heavily under adverse hydrologic conditions to balance the goals of Sacramento Valley diversion/depletion, Delta objectives, water supply delivery, and coldwater management. Folsom Reservoir management will be challenged by the overall availability of water and limited coldwater availability. The hydrologic conditions of 2013 and the early advent of significant depletion rates in the Sacramento Valley may indicate that historic high levels of Sacramento Valley depletions are likely during this year's irrigation season. (Projecting seasonal Sacramento Valley depletions, as compared to projecting full natural river flows in Bulletin 120, could be a difficult extrapolation from historic values, and uncertainty in depletion values is always a challenge to project operations.)

If you have any questions or would like more information regarding this notification, please contact Mr. Paul Fujitani of Reclamation at 916-979-2197 or Mr. John Leahigh at 916-574-2722.

Sincerely,

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation

for D. Roose
David H. Roose, Chief
SWP Operations Control Office
Department of Water Resources

Attachment -2

cc: See next page.

cc: Mr. John Herrick, Esq.
South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, California 95207

Mr. Craig M. Wilson, Delta Watermaster
State Water Resources Control Board
1001 I Street
Sacramento, California 95812

Ms. Christine Rico
Office of the Delta Watermaster
State Water Resources Control Board
1001 I Street
Sacramento, California 95812

Ms. Amy L. Aufdemberge
Assistant Regional Solicitor
Room E-1712
2800 Cottage Way
Sacramento, California 95825

Mr. Dante John Nomellini, Esq.
Nomellini, Grilli and McDaniel
Post Office Box 1461
Stockton, California 95201

Mr. Carl P. A. Nelson
Bold, Polisner, Maddow,
Nelson and Judson
500 Ygnacio Valley Road, Suite 325
Walnut Creek, California 94596-3840

Thomas J. Shephard, Sr.
Post Office Box 20
Stockton, California 95201

Michael Jackson
Post Office Box 207
429 West Main Street
Quincy, California 95971
(w/encl to each)

Clifford W. Schulz
Kronick, Moskovitz, Tiedemann & Girard
400 Capitol Mall, Suite 2700
Sacramento, California 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 9th Street
Sacramento, California 95814

Tim O'Laughlin
O'Laughlin and Paris LLP
117 Meyers Street, Suite 110
Chico, California 95928

Jon D. Rubin
San Luis-Delta Mendota Water Authority
1415 L Street, Suite 800
Sacramento, California 95814

Daniel Sodergren, City Attorney
City of Tracy
333 Civic Center Plaza
Tracy, California 95376

Patricia D. Fernandez
Division of Water Rights
1001 I Street, 14th Floor
Sacramento, California 95814

Carolee Krieger
808 Romero Canyon Road
Santa Barbara, California 93108

FIGURE 1

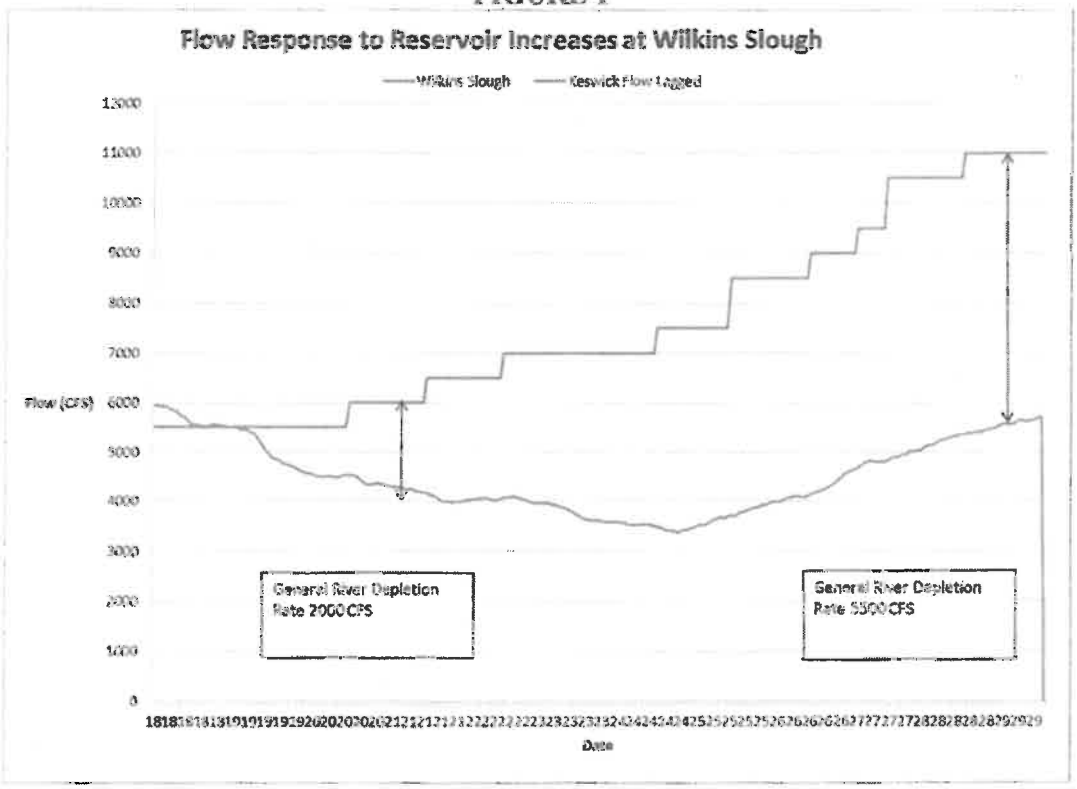
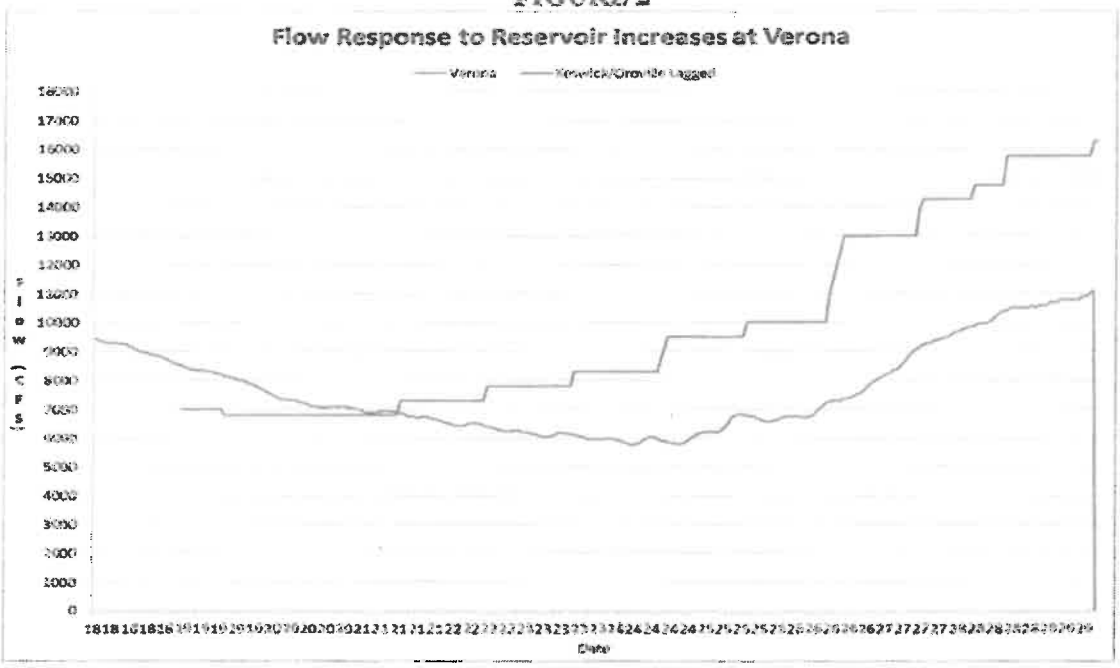
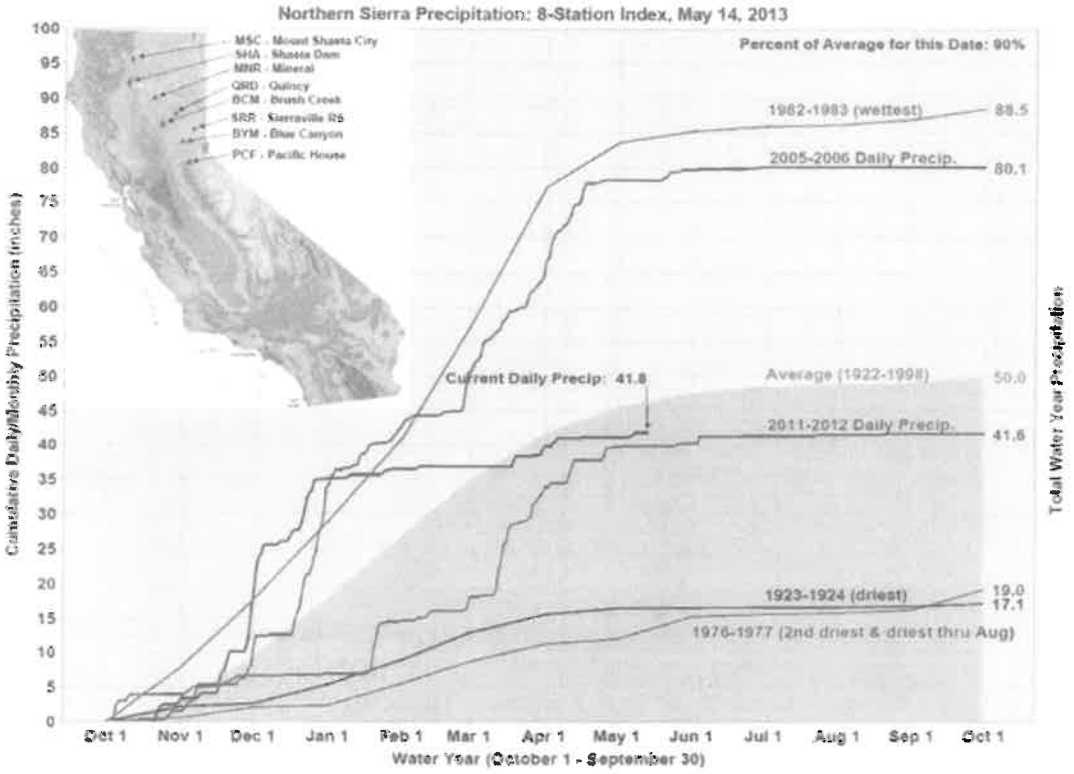
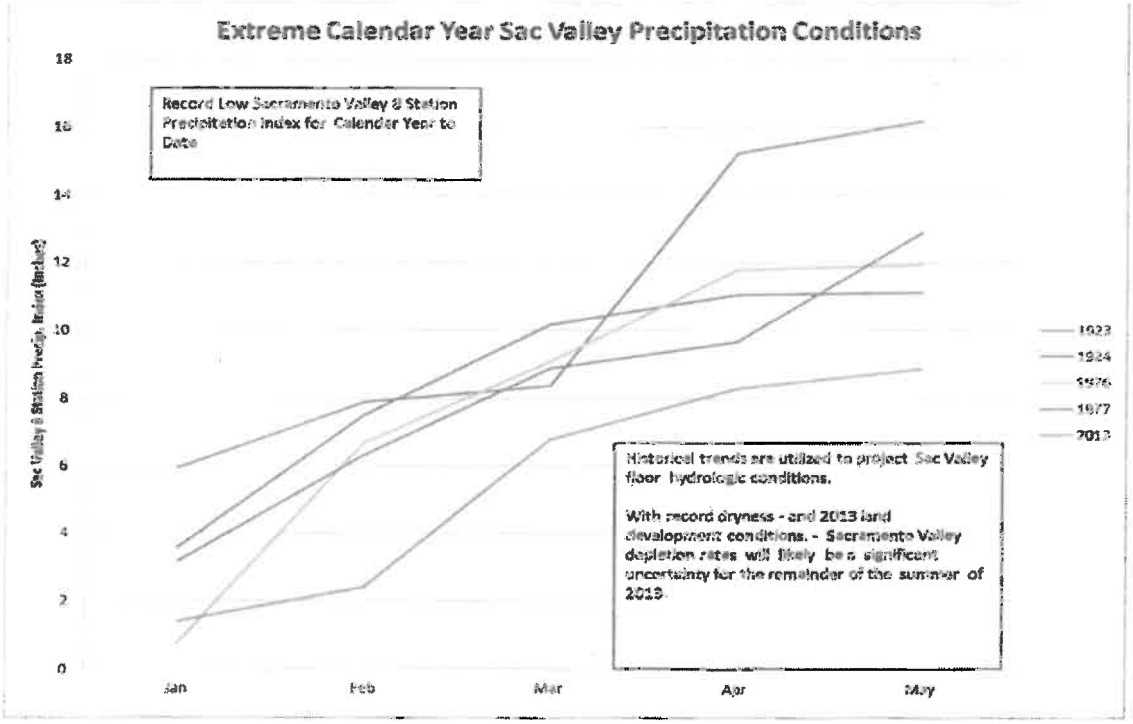


FIGURE 2



8SRI PLOT


Northern Sierra Precipitation: 8-Station Index, May 14, 2013
MSC - Mount Shasta City
SHA - Shasta Dam
MNR - Mineral
QRD - Quincy
BCM - Brush Creek
SRR - Sierraville RS
BYM - Blue Canyon
PCF - Pacific House
Percent of Average for this Date: 90%
1982-1983 (wettest)
88.5
2005-2006 Daily Precip.
80.1
Current Daily Precip: 41.8
Average (1922-1998)
50.0
2011-2012 Daily Precip.
41.6
1923-1924 (driest)
19.0
17.1
1976-1977 (2nd driest & driest thru Aug)
Cumulative Daily/Monthly Precipitation (inches)
Total Water Year Precipitation
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Water Year (October 1 - September 30)


Extreme Calendar Year Sac Valley Precipitation Conditions
Record Low Sacramento Valley 8 Station Precipitation Index for Calendar Year to Date
Historical trends are utilized to project Sac Valley floor hydrologic conditions.
With record dryness - and 2013 land development conditions. - Sacramento Valley depletion rates will likely be a significant uncertainty for the remainder of the summer of 2013.
1923
1924
1976
1977
2013
Jan
Feb
Mar
Apr
May

Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh
Sunday, May 19, 2013

Criteria	Standard	Status
Flow/Operational		
% of inflow diverted	35 %	11 %
Habitat Protection, X2 / Flow * 2days as carryover from April	1 days at Chipps Island 31 days at Collinsville	3 days 19 days
Water Quality		
Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	139 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	42 mg/l
14dm EC at Emmaton	<= 0.45 mS/cm	0.44 mS/cm
14dm EC at Jersey Point	<= 0.45 mS/cm	0.34 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.3 mS/cm
Brandt Bridge	<= 0.7 mS/cm	0.3 mS/cm
Old River Near Tracy	<=0.7 mS/cm	0.4 mS/cm
Old River Near Middle River	<=0.7 mS/cm	mS/cm
SUISUN MARSH:		
Suisun Marsh Salinity Control Gates : Flashboard Status : In Boat Lock Status : Open	1 Open / 0 Closed / 2 Full Tide Open	

California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2013)

Previous Month's Index (8R) for April.): 2.023 MAF
Water Year Type: Dry
Sacramento valley water year type index (40/30/30) @ 50%:5.8 MAF (Dry)
San Joaquin valley water year type index (60/20/20) @ 75%: 1.6 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.
Chlorides (Cl) in milligrams per liter
mtl - mean high tides
md - mean daily
14 dm - fourteen day running mean
28 dm - twenty-eight day running mean
NR - No Record
NC - Average not computed due to insufficient data.
BR : Below Rating
e - estimated value

Montezuma Slough Gate Operation:
Number of gates operating at either Open, Closed, or Full Tide Open
Flashboard Status : In, Out, or Modified In
Boat Lock Status : Open or Closed

Coordinated Operation Agreement Delta Status:
e = excess Delta conditions
b = balanced Delta cond. w/ no storage withdrawal
s = balanced Delta cond. w/ storage withdrawal
Excess Delta conditions with restrictions:
f = fish concerns
r = E/I ratio concerns

* NDOI, Rio Vista & Vernalis Flows:
- Monthly average is progressive daily mean.
- 7 day average is progressive daily mean for the first six days of the month.

Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index	Martinez	Port Chicago		Mallard	Chipps Island		Collinsville	
	High	Half	cfs	mdEC	mdEC	14dm	mdEC	mdEC	14dm	mdEC	14dm
04/20/2013	4.93	3.50	8,211	18.80	11.88	7.15	4.52	3.99	1.84	1.85	0.55
04/21/2013	5.12	3.57	7,471	21.29	13.71	7.53	6.22	5.68	1.90	2.35	0.66
04/22/2013	5.33	3.66	7,059	22.73	15.38	8.08	6.75	6.22	2.20	3.03	0.85
04/23/2013	5.73	3.88	6,849	24.39	15.62	8.80	7.88	7.37	2.65	4.18	1.12
04/24/2013	6.07	4.19	6,605	25.78	16.18	9.65	9.84	9.43	3.23	5.31	1.47
04/25/2013	6.47	4.25	7,038	26.40	16.77	10.49	10.63	10.27	3.86	6.13	1.88
04/26/2013	6.32	4.08	7,896	25.52	17.32	11.21	9.19	8.74	4.38	5.33	2.22
04/27/2013	6.31	4.02	9,030	24.92	16.30	11.84	8.76	8.29	4.86	4.95	2.54
04/28/2013	6.36	4.08	10,396	24.58	15.35	12.44	8.30	7.81	5.31	4.66	2.84
04/29/2013	6.40	4.24	10,578	24.44	14.82	12.96	8.21	7.72	5.75	4.38	3.11
04/30/2013	6.24	4.15	10,798	23.98	13.59	13.56	7.92	7.42	6.21	4.37	3.40
05/01/2013	5.94	3.99	11,146	22.44	11.37	14.10	8.67	8.13	6.60	3.97	3.66
05/02/2013	5.30	3.75	11,614	21.84	12.15	14.52	6.15	5.61	6.93	2.99	3.85
05/03/2013	5.51	3.82	10,635	21.60	12.21	14.73	6.64	6.10	7.20	3.02	4.02
05/04/2013	6.13	4.17	9,908	22.78	12.34	14.84	7.67	7.16	7.42	3.97	4.19
05/05/2013	6.32	4.48	9,485	25.15	12.95	14.79	9.37	8.93	7.66	5.28	4.40
05/06/2013	6.15	4.19	9,388	24.14	11.38	14.50	8.18	7.69	7.76	4.51	4.50
05/07/2013	6.06	4.10	9,350	23.80	11.10	14.17	8.04	7.54	7.77	4.44	4.52
05/08/2013	6.01	4.07	9,129	24.07	10.98	13.65	8.21	7.71	7.65	4.37	4.46
05/09/2013	6.05	4.08	9,895	23.57	9.40	12.98	7.95	7.45	7.45	4.07	4.31
05/10/2013	6.06	4.09	10,994	22.85	8.69	12.37	7.50	6.98	7.32	3.91	4.21
05/11/2013	5.04	4.03	11,743	21.76	7.75	11.76	6.63	6.09	7.17	3.39	4.10
05/12/2013	5.98	4.06	11,861	20.78	7.95	11.23	6.40	5.87	7.03	3.28	4.00
05/13/2013	5.94	4.12	11,402	21.10	7.48	10.70	6.19	5.65	6.88	3.12	3.91
05/14/2013	5.80	4.16	11,153	21.37	6.97	10.23	6.22	5.68	6.76	2.89	3.80
05/15/2013	5.72	4.15	10,114	21.13	5.60	9.82	6.14	5.60	6.72	2.74	3.71
05/16/2013	5.26	4.02	9,550	21.54	2.97	9.16	5.75	5.21	6.69	2.87	3.70
05/17/2013	5.18	3.95	8,987	21.04	2.33	8.46	5.39	4.85	6.60	1.99	3.63
05/18/2013	5.07	3.63	9,399	18.61	2.09	7.69	4.55	4.02	6.38	1.69	3.47
05/19/2013	5.27	3.48	9,727	18.03	1.99	6.91	4.14	3.62	6.00	1.52	3.20

Antioch Tides measured in feet above mean sea level.
Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.
Chipps Island EC calculated from measurements recorded at Mallard Slough.
Electrical Conductivity (EC) units: milliSiemens per Centimeter
md : mean daily
14dm : fourteen day running mean
NR : No Record
NC : Average not computed due to insufficient data
BR : Below Rating
e - estimated value

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Belden Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhEC	mhEC	mhEC	mhEC	mhEC
04/20/2013	0.39	0.42	0.23	0.25	0.20	0.20	0.39	5.83	5.06	5.62	5.55	2.04
04/21/2013	0.61	0.42	0.24	0.25	0.22	0.20	0.40	5.92	5.40	6.19	5.60	3.56
04/22/2013	0.87	0.44	0.24	0.25	0.25	0.20	0.42	6.13	5.97	6.77	5.93	4.39
04/23/2013	1.16	0.49	0.25	0.25	0.29	0.21	0.42	6.94	7.31	8.39	7.40	5.37
04/24/2013	1.93	0.60	0.30	0.25	0.71	0.25	0.42	8.71	8.59	10.03	9.00	6.92
04/25/2013	2.36	0.74	0.36	0.26	1.28	0.32	0.43	9.73	8.79	10.32	9.24	7.42
04/26/2013	1.91	0.85	0.33	0.26	1.06	0.39	0.43	10.74	9.36	10.77	9.23	6.54
04/27/2013	1.87	0.95	0.34	0.27	1.00	0.44	0.42	11.60	9.71	11.16	9.59	5.86
04/28/2013	1.93	1.06	0.35	0.27	0.89	0.49	0.43	11.74	9.83	10.73	10.02	5.61
04/29/2013	2.04	1.17	0.36	0.28	0.75	0.53	0.45	11.84	10.00	11.33	10.34	5.73
04/30/2013	1.90	1.28	0.37	0.29	0.64	0.56	0.46	11.91	9.92	11.63	10.50	5.40
05/01/2013	1.33	1.35	0.35	0.30	0.35	0.57	0.51	11.90	9.76	11.44	10.86	4.69
05/02/2013	1.28	1.42	0.32	0.31	0.35	0.58	0.46	11.85	9.95	11.16	10.66	3.85
05/03/2013	1.29	1.49	0.33	0.31	0.38	0.60	0.46	11.87	9.85	11.30	9.99	4.36
05/04/2013	1.55	1.57	0.36	0.32	0.44	0.61	0.48	11.74	10.13	10.74	9.79	5.88
05/05/2013	2.21	1.69	0.44	0.34	0.76	0.65	0.42	11.59	9.35	10.94	9.73	6.92
05/06/2013	1.87	1.76	0.39	0.35	0.67	0.68	0.42	11.57	9.68	10.53	8.64	5.54
05/07/2013	1.71	1.80	0.37	0.36	0.62	0.71	0.43	11.61	9.25	9.83	7.57	5.72
05/08/2013	1.66	1.78	0.36	0.36	0.63	0.70	0.45	11.64	8.67	9.42	7.11	5.77
05/09/2013	1.63	1.73	0.36	0.36	0.61	0.65	0.48	11.79	8.13	9.21	6.63	5.27
05/10/2013	1.48	1.70	0.35	0.36	0.57	0.62	0.50	11.99	7.76	8.60	6.49	5.24
05/11/2013	1.32	1.65	0.34	0.36	0.46	0.58	0.48	12.11	7.49	8.22	6.05	4.24
05/12/2013	1.32	1.61	0.34	0.36	0.41	0.54	0.45	11.82	7.10	7.63	5.50	4.49
05/13/2013	1.18	1.55	0.34	0.36	0.37	0.52	0.45	11.36	6.59	7.07	4.94	3.93
05/14/2013	1.12	1.50	0.34	0.36	0.34	0.50	0.43	11.33	6.13	6.45	4.24	4.30
05/15/2013	1.11	1.48	0.33	0.35	0.37	0.50	0.42	11.16	5.72	5.97	3.88	3.56
05/16/2013	1.03	1.46	0.32	0.35	0.32	0.50	0.40	10.60	5.18	5.67	3.68	
05/17/2013	0.91	1.44	0.31	0.35	0.29	0.49	NR	10.25	5.10	5.62	3.53	3.14
05/18/2013	0.74	1.38	0.30	0.35	0.25	0.48	NR	10.12	5.04	5.56	3.31	2.43
05/19/2013	0.70	1.27	0.29	0.34	0.23	0.44	NR	9.95	4.98	5.51	2.97	2.33

Electrical Conductivity (EC) units: milliSiemens per Centimeter
Chloride (Cl) units: milligrams per liter
mht : mean high tides
md : mean daily
NR : No Record
NC : Average not computed due to insufficient data
BR : Below Rating
e : estimated value

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Date	Bethel Island mdEC	Farrar Park mdEC	Holland Tract mdEC	Bacon Island mdEC	Contra Costa mdEC	Clifton Court mdEC	Tracy Pumping Plant mdEC	Antioch mdCl	Bacon Island mdCl	Contra Costa mdCl	Delta Status
04/20/2013	0.25	0.29	0.26	0.27	0.34	0.57	0.75	54	33	37	f
04/21/2013	0.25	0.29	0.25	0.27	0.32	0.51	0.68	124	32	36	f
04/22/2013	0.24	0.29	0.25	0.27	0.33	0.46	0.60	208	32	37	f
04/23/2013	0.24	0.29	0.25	0.27	0.33	0.43	0.50	298	31	37	f
04/24/2013	0.25	0.28	0.25	0.27	0.32	0.40	0.49	545	31	37	f
04/25/2013	0.26	0.27	0.25	0.26	0.32	0.38	0.42	683	31	36	s
04/26/2013	0.26	0.29	0.26	0.27	0.31	0.35	0.43	537	32	36	s
04/27/2013	0.25	0.29	0.26	0.26	0.32	0.32	0.40	524	34	36	s
04/28/2013	0.26	0.29	0.26	0.28	0.32	0.32	0.35	544	35	36	s
04/29/2013	0.26	0.30	0.26	0.28	0.29	0.31	0.32	581	35	36	s
04/30/2013	0.28	0.30	0.26	0.28	0.31	0.34	0.33	535	34	36	s
05/01/2013	0.27	0.29	0.26	0.27	0.30	0.32	0.33	352	32	35	s
05/02/2013	0.28	0.29	0.21	0.27	0.31	0.33	0.32	337	32	34	s
05/03/2013	0.28	0.29	0.23	0.27	0.31	0.33	0.31	341	32	35	s
05/04/2013	0.28	0.30	0.27	0.27	0.30	0.32	0.31	424	32	35 e	s
05/05/2013	0.29	0.31	0.28	0.28	0.29	0.30	0.28	635	34	35 e	s
05/06/2013	0.29	0.31	0.28	0.28	0.29	0.25	0.28	525	35	33	s
05/07/2013	0.29	0.32	0.28	0.29	0.29	0.24	NR	475	37	33	s
05/08/2013	0.30	0.33	0.29	0.29	0.28	0.24	NR	458	38	33	s
05/09/2013	0.30	0.33	0.29	0.30	0.30	0.25	NR	448	40	34	s
05/10/2013	0.31	0.34	0.30	0.30	0.30	0.26	NR	400	41	35	s
05/11/2013	0.31	0.33	0.30	0.31	0.29	0.28	NR	351	42	35 e	s
05/12/2013	0.31	0.34	0.30	0.31	0.31	0.29	NR	351	43	36 e	s
05/13/2013	0.31	0.33	0.31	0.32	0.32	0.31	NR	307	44	37	s
05/14/2013	0.31	0.33	0.31	0.32	0.32	0.30	NR	288	45	39	s
05/15/2013	0.31	0.34	0.31	0.32	0.32	0.32	NR	283	45	36	s
05/16/2013	0.31	0.34	0.31	0.32	NR	0.34	NR	257	45	40	s
05/17/2013	0.31	0.34	0.31	0.32	NR	0.35	NR	229	46	42	s
05/18/2013	0.31	0.34	0.31	0.33	NR	0.36	NR	166	47	42 e	s
05/19/2013	0.31	0.34	0.31	0.33	NR	0.39	NR	151	47	42 e	s

Electrical Conductivity (EC) units: milliSiemens per Centimeter
Chloride (Cl) units: milligrams per liter
md : mean daily
NR : No Record
NC : Average not computed due to insufficient data
BR : Below Rating
e : estimated value
Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:
c = excess Delta conditions
b = balanced Delta cond. w/ no storage withdrawal
s = balanced Delta cond. w/ storage withdrawal
Excess Delta conditions with restrictions:
f = fish concerns
r = E/I ratio concerns

Delta Water Quality Conditions

South Delta Stations

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	md EC	30 day avg	md EC	30 day avg	md EC	30 day avg	md EC	30 day avg
04/20/2013	0.39	0.79	0.52	0.88	0.90	1.10	0.40	0.87
04/21/2013	0.30	0.77	0.41	0.86	0.76	1.09	0.43	0.85
04/22/2013	0.30	0.75	0.42	0.84	0.64	1.08	0.33	0.84
04/23/2013	0.27	0.72	0.32	0.82	0.62	1.07	0.31	0.81
04/24/2013	0.25	0.70	0.30	0.80	0.47	1.05	0.28	0.79
04/25/2013	0.24	0.68	0.24	0.78	0.41	1.02	0.22	0.77
04/26/2013	0.24	0.65	0.22	0.76	0.34	1.00	0.21	0.74
04/27/2013	0.23	0.62	0.21	0.73	0.38	0.97	0.21	0.72
04/28/2013	0.23	0.60	0.21	0.71	0.38	0.94	0.21	0.69
04/29/2013	0.22	0.58	0.21	0.68	0.37	0.91	0.20	0.66
04/30/2013	0.22	0.56	0.20	0.66	0.35	0.88	0.20	0.64
05/01/2013	0.21	0.54	0.20	0.64	0.32	0.85	0.20	0.61
05/02/2013	0.21	0.52	0.20	0.61	0.36	0.82	0.19	0.59
05/03/2013	0.20	0.50	0.20	0.59	0.36	0.80	0.20	0.57
05/04/2013	0.19	0.47	0.19	0.57	0.31	0.77	0.18	0.55
05/05/2013	0.18	0.45	0.18	0.55	0.27	0.74	0.17	0.52
05/06/2013	0.19	0.43	0.17	0.52	0.25	0.72	0.17	0.50
05/07/2013	0.20	0.41	0.18	0.50	0.28	0.69	0.18	0.48
05/08/2013	0.20	0.39	0.20	0.48	0.31	0.67	0.20	0.45
05/09/2013	0.22	0.37	0.20	0.45	0.30	0.64	0.21	0.43
05/10/2013	0.22	0.35	0.22	0.43	0.29	0.62	NR	NC
05/11/2013	0.21	0.33	0.23	0.41	0.29	0.59	NR	NC
05/12/2013	0.21	0.31	0.22	0.38	0.29	0.56	NR	NC
05/13/2013	0.22	0.29	0.22	0.36	0.30	0.53	0.23	NC
05/14/2013	0.26	0.28	0.24	0.34	0.30	0.50	0.25	NC
05/15/2013	0.33	0.27	0.27	0.32	0.31	0.48	0.29	NC
05/16/2013	0.38	0.26	0.32	0.30	0.36	0.45	0.37	NC
05/17/2013	0.40	0.26	0.37	0.29	0.43	0.43	0.44	NC
05/18/2013	0.44	0.26	0.44	0.27	0.47	0.42	0.47	NC
05/19/2013	0.48	0.26	0.47	0.27	0.54	0.40	0.51	NC

Electrical Conductivity (EC) units: milliSiemens per Centimeter
md : mean daily
NR : No Record
NC : Average not computed due to insufficient data
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Delta Hydrology Conditions

Date	Sacramento River at Freeport + SRWTP cfs	Yolo Bypass cfs	East Side Streams cfs	San Joaquin River at Vernalis cfs	Rainfall inches	Clifton Court Forebay Intake cfs	Tracy Pumping Plant cfs	CCWD Pumping Plants cfs	Barker Slough Pumping Plant cfs	BBID Diversion cfs
4/20/2013	8,441	395	591	2,334	0.00	1,193	807	25	56	0
4/21/2013	7,858	398	548	2,545	0.00	1,494	810	25	62	0
4/22/2013	7,645 e	410	519	2,678	0.00	1,694	810	25	62	200
4/23/2013	7,194	439	529	2,935	0.00	1,690	813	25	48	73
4/24/2013	6,360	495	559	3,414	0.00	1,695	821	26	72	72
4/25/2013	7,006	530	570	3,582	0.00	998	817	25	70	67
4/26/2013	8,078	529	542	3,675	0.00	991	815	25	65	53
4/27/2013	9,423	585	502	3,765	0.00	995	814	24	78	66
4/28/2013	10,870	564	509	3,893	0.00	963	815	24	77	0
4/29/2013	11,478	602	512	4,130	0.00	2,421	915	26	83	66
4/30/2013	12,147	616	500	4,064	0.00	2,998	817	27	83	0
5/1/2013	12,415	623	479	3,954	0.00	3,193	814	152	88	66
5/2/2013	11,495	629	463	3,952	0.00	494	3,155	176	94	63
5/3/2013	10,056	623	466	4,043	0.00	494	3,082	226	117	67
5/4/2013	9,028	660	478	4,176	0.00	1,492	1,353	240	96	0
5/5/2013	8,414	665	456	4,105	0.00	1,490	937	245	84	0
5/6/2013	8,445	648	445	3,970	0.00	993	982	245	91	159
5/7/2013	8,390	616	456	3,838	0.00	793	980	243	84	91
5/8/2013	9,212	557	479	3,689	0.00	792	979	243	84	77
5/9/2013	10,884	510	484	3,561	0.00	793	978	257	84	70
5/10/2013	11,824	486	468	3,549	0.00	999	978	261	98	72
5/11/2013	12,068	450	478	3,509	0.00	993	983	258	101	0
5/12/2013	11,480	446	479	3,439	0.00	993	982	260	109	0
5/13/2013	11,425	500	451	3,376	0.00	993	980	266	110	206
5/14/2013	10,836	553	416	2,828	0.00	993	980	252	99	76
5/15/2013	10,928	603	400	2,090	0.00	992	979	236	97	86
5/16/2013	10,499	579	410	1,578	0.00	993	863	207	92	84
5/17/2013	11,073	605	445	1,521	0.00	688	811	190	103	65
5/18/2013	11,534	643	439	1,423	0.00	689	808	185	112	0
5/19/2013	11,854	618	418	1,309	0.00	699	808	202	103	0

SRWTP : Sacramento Regional Water Treatment Plant effluent.
Yolo Bypass : combined measurements of Cache Creek at Rumsey and Freemont Weir.
East Side Streams : combined stream flows of Cosumnes River at Michigan Bar, Mokelumne River at Woodbridge, miscellaneous streams estimated from Dry Creek at Galt (discontinued since Dec. 1997), and Calaveras River based on releases from New Hogan Dam.
Rainfall : incremental daily precipitation measured at Stockton Fire Station #4.
CCWD Pumping Plants : combined pumping at the Old River, Rock Slough and Middle River Plants.

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Delta Hydrology Conditions

Date	Banks Pumping Plant cfs	Delta Gross Channel Depletions cfs	Rio Vista Flow cfs	QWEST cfs	Net Delta Outflow Index cfs	Percent of Inflow Diverted 3 day	14 day	Delta Status
4/20/2013	1,161	1,900	7,029	1,372	8,211	13.3%	10.4%	f
4/21/2013	1,504	1,900	6,352	1,313	7,471	16.4%	12.6%	f
4/22/2013	1,504	1,900	5,950	1,404	7,059	18.7%	14.2%	f
4/23/2013	1,779	1,900	5,677	1,353	6,849	20.5%	15.7%	f
4/24/2013	1,504	1,950	5,301	1,512	6,605	21.3%	16.7%	f
4/25/2013	810	1,950	4,635	2,609	7,038	20.0%	16.0%	s
4/26/2013	895	1,950	5,229	2,868	7,893	17.7%	14.8%	s
4/27/2013	587	1,950	6,158	3,087	9,030	14.8%	13.4%	s
4/28/2013	985	2,000	7,366	3,247	10,396	13.6%	13.7%	s
4/29/2013	1,684	2,000	8,619	2,181	10,578	15.6%	17.3%	s
4/30/2013	2,348	2,000	9,164	1,856	10,798	18.7%	22.5%	s
5/1/2013	3,279	2,000	9,758	1,616	11,146	21.9%	27.7%	s
5/2/2013	1,123	2,000	9,998	1,850	11,614	22.0%	28.2%	s
5/3/2013	1,034	2,050	9,192	1,704	10,635	21.5%	26.9%	s
5/4/2013	1,654	2,100	7,925	2,226	9,906	20.2%	23.9%	s
5/5/2013	2,095	2,100	7,070	2,646	9,485	19.1%	20.8%	s
5/6/2013	596	2,100	6,543	3,083	9,388	16.4%	16.6%	s
5/7/2013	0	2,150	6,539	3,045	9,350	14.3%	13.7%	s
5/8/2013	0	2,150	6,459	2,905	9,129	12.8%	11.9%	s
5/9/2013	138	2,200	7,089	2,835	9,695	12.5%	11.5%	s
5/10/2013	1,101	2,200	8,501	2,745	10,994	12.4%	11.8%	s
5/11/2013	1,101	2,250	9,278	2,723	11,743	12.2%	12.2%	s
5/12/2013	1,101	2,300	9,440	2,691	11,861	12.1%	12.6%	s
5/13/2013	1,101	2,300	8,928	2,746	11,402	11.7%	12.3%	s
5/14/2013	1,015	2,350	8,918	2,498	11,153	11.7%	12.2%	s
5/15/2013	1,101	2,350	8,504	1,872	10,114	12.0%	12.2%	s
5/16/2013	930	2,400	8,577	1,233	9,550	12.5%	12.4%	s
5/17/2013	732	2,450	8,167	1,095	8,987	12.2%	11.6%	s
5/18/2013	732	2,450	8,690	992	9,399	11.5%	10.8%	s
5/19/2013	732	2,500	9,114	892	9,727	10.9%	10.2%	s

Delta Gross Channel Depletions from Dayflow Table 3.
Rio Vista Flow calculated from Dayflow equation.
QWEST calculated from Dayflow equation.
Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Coordinated Operation Agreement Delta Status:
- c = excess Delta conditions
- b = balanced Delta cond. w/ no storage withdrawal
- s = balanced Delta cond. w/ storage withdrawal
- Excess Delta conditions with restrictions:
  - f = fish concerns
  - r = E/I ratio concerns

BUREAU OF RECLAMATION
Central Valley Operation Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

DEPARTMENT OF WATER RESOURCES
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY REFER TO:
CVO-100
WTR-4.10

AUG 21 2013

Craig Wilson, Delta Watermaster
State Water Resources Control Board
Office of Delta Watermaster
P.O. Box 100
Sacramento, CA 95812

Subject: Response to Your May 29, 2013, Letter Regarding Shasta Reservoir Cold Water Conservation Actions for Fishery Resources

Dear Mr. Wilson:

This letter responds to a request you made in your May 29, 2013, letter regarding actions to conserve cold water in Shasta Reservoir for fishery resources. Specifically, you requested an accounting by August 22, 2013, of the volume of water conserved by changing the water year type from "Dry" to "Critical" as it pertained to the Water Quality Objectives for Agricultural Beneficial Uses under Water Rights Decision 1641 (D-1641) at the Western Delta and Interior Delta monitoring stations. Since D-1641 Western and Interior Delta agricultural objectives concluded on August 15, we are now able to estimate the effect of the conservation actions for the entire period.

The Central Valley Project and State Water Project (collectively, Project) operators estimate that approximately 55,000 acre-feet (af) of water was conserved in upstream reservoir storage due to conservation actions taken during early June to June 15, 2013. (The June 15 date is significant in D-1641 because, under the Dry Year criteria, this is the last day of the 0.45 electrical conductivity (EC) 14-day running average objective.) During this early June period, Project operators targeted the 7,100 cubic feet per second (cfs) 3-day average minimum net Delta outflow required to comply with the D-1641, Table III, Delta outflow objective in June (X2 compliance at the Collinsville location). This conservation action allowed salinity to slightly degrade in the Western Delta. (Please see Figures 1 through 5.)

For the remainder of June, Project operations continued to target the 7,100 cfs 3-day running

average minimum net Delta outflow objective for X2 at the Collinsville location. No additional conservation of water supply occurred in relationship to Dry Year Western and Interior Delta agricultural objectives, since the Delta outflow objective would have controlled under either the Dry Year or Critical Year objective.

For the month of July, Project operators targeted the D-1641 Table III minimum monthly outflow objective of 5,000 cfs for a Dry Year. Project operators projected that by operating to the 5,000 cfs target in July, it was possible that additional water supply conservation could occur if Western and Interior Delta salinity levels exceeded the Dry Year EC objectives on a 14-day running average basis by August 15, 2013. However, this did not occur, and no additional conservation of water supply can be attributed to the action.

Since August 1, 2013, project operations have been targeting Delta outflow rates consistent with managing for historical Delta salinity degradation rates at Bethel Island and Holland Tract associated with compliance of D-1641, Table I, Contra Costa Canal Chlorides objective of 250 ppm. (Please see Figure 6, Bethel Island Salinity for 2013.) We anticipate that Contra Costa chlorides will be the controlling Delta objective well into the fall of 2013. Concurrently, Reclamation is actively reducing releases at Keswick Reservoir in order to conserve storage and cold water resources into the fall. It is anticipated that this balancing of Delta salinity objectives and upstream reservoir release reductions and cold water shutter management will continue through September and into October.

In summary, our current evaluations show that approximately 55,000 af was conserved in upstream reservoirs through August 15, 2013. Delta salinity did not react as quickly to the modified operations for the Critical Year objectives as initially projected, and the conservation effect to upstream reservoir storage was less than originally anticipated.

If you have any questions regarding this notification, please contact Mr. Paul Fujitani of Reclamation at 916-979-2197 or Mr. John Leahigh of DWR at 916-574-2722.

Sincerely,

for Ronald Milligan, Operations Manager
Central Valley Operations Office
Bureau of Reclamation

for David H. Roose, Chief
SWP Operations Control Office
Department of Water Resources

cc: Thomas Howard, Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95812

Maria Rae
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, California 95814

Kim Turner
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

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USEPA Region 9
C/O NMFS 650 Capitol Mall
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Thomas J. Shephard, Sr.
Post Office Box 20
Stockton, California 95201

Dante Nomellini, Jr.
Central Delta Water Agency
Post Office Box 1461
Stockton, California 95201

Amy L. Aufdemberge
Assistant Regional Solicitor
2800 Cottage Way, Room E-1712
Sacramento, California 95825

Carl P. A. Nelson
Bold, Polisner, Maddow, Nelson and Judson
500 Ygnacio Valley Road, Suite 325
Walnut Creek, California 94596-3840

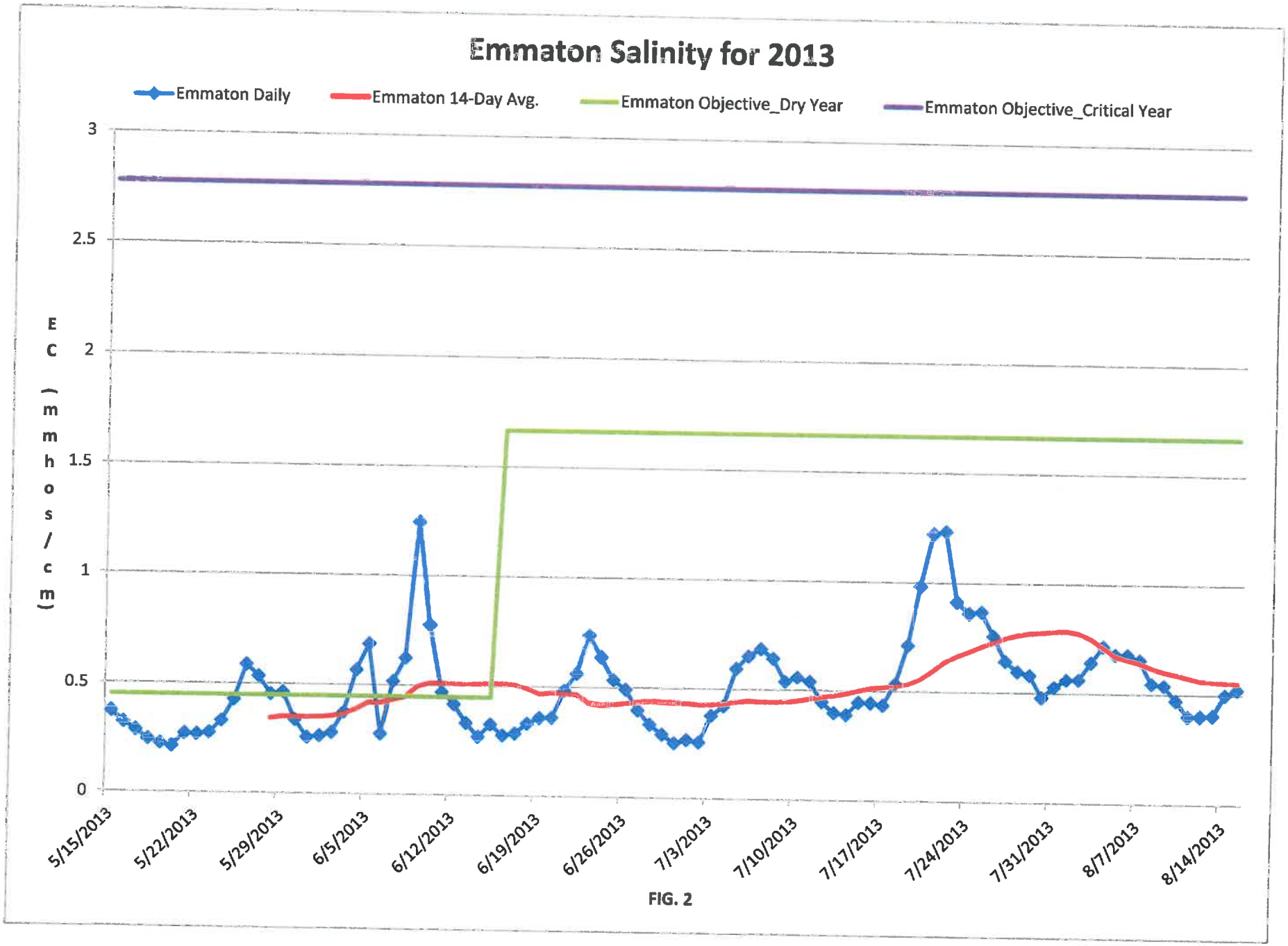
Emmaton Salinity for 2013
Emmaton Daily
Emmaton 14-Day Avg.
Emmaton Objective_Dry Year
Emmaton Objective_Critical Year
EC (mmhos/cm)
3
2.5
2
1.5
1
0.5
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 2

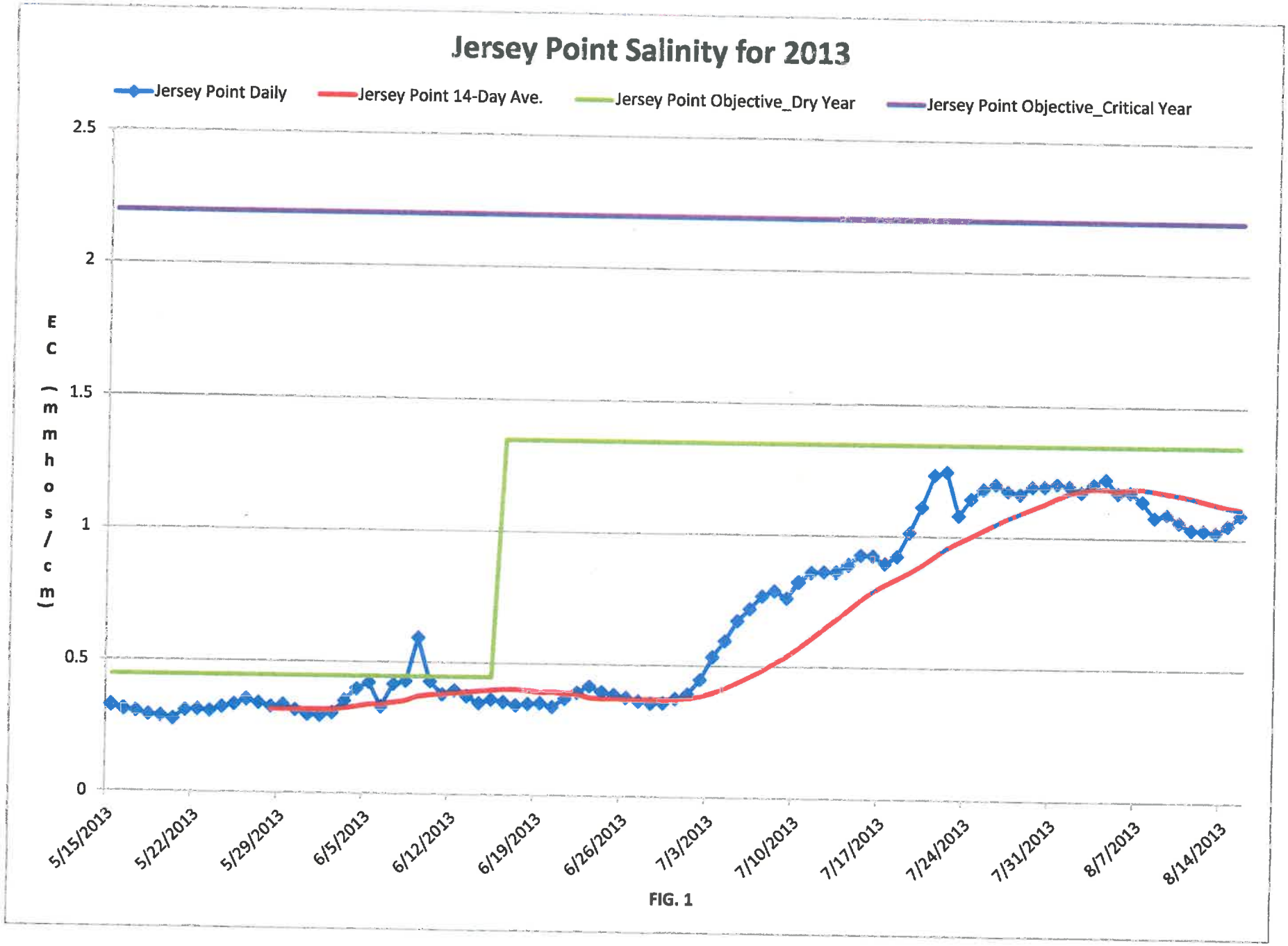
Jersey Point Salinity for 2013
Jersey Point Daily
Jersey Point 14-Day Ave.
Jersey Point Objective_Dry Year
Jersey Point Objective_Critical Year
EC (mmhos/cm)
2.5
2
1.5
1
0.5
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 1

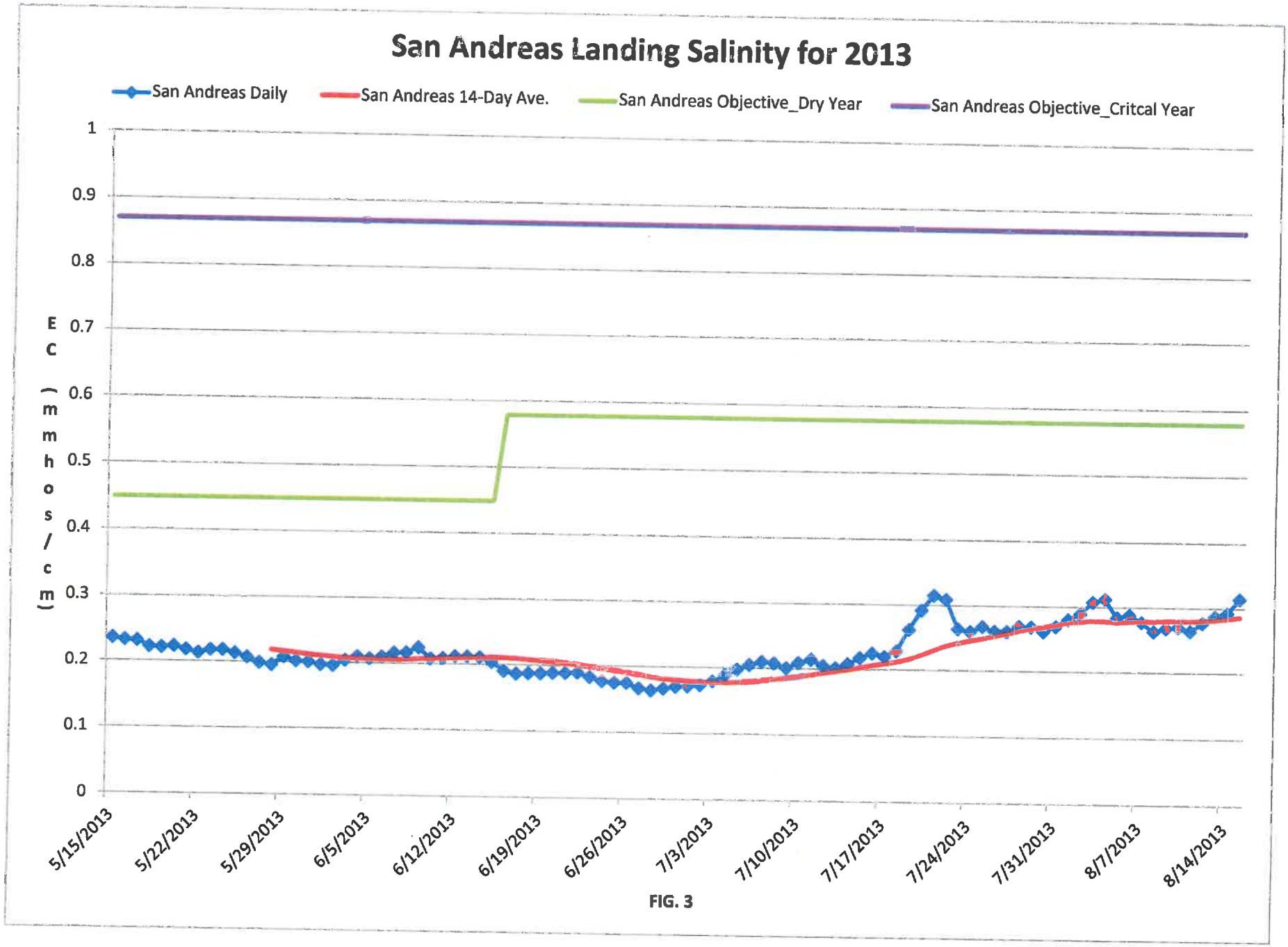
San Andreas Landing Salinity for 2013
San Andreas Daily
San Andreas 14-Day Ave.
San Andreas Objective_Dry Year
San Andreas Objective_Critcal Year
EC (mmhos/cm)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 3

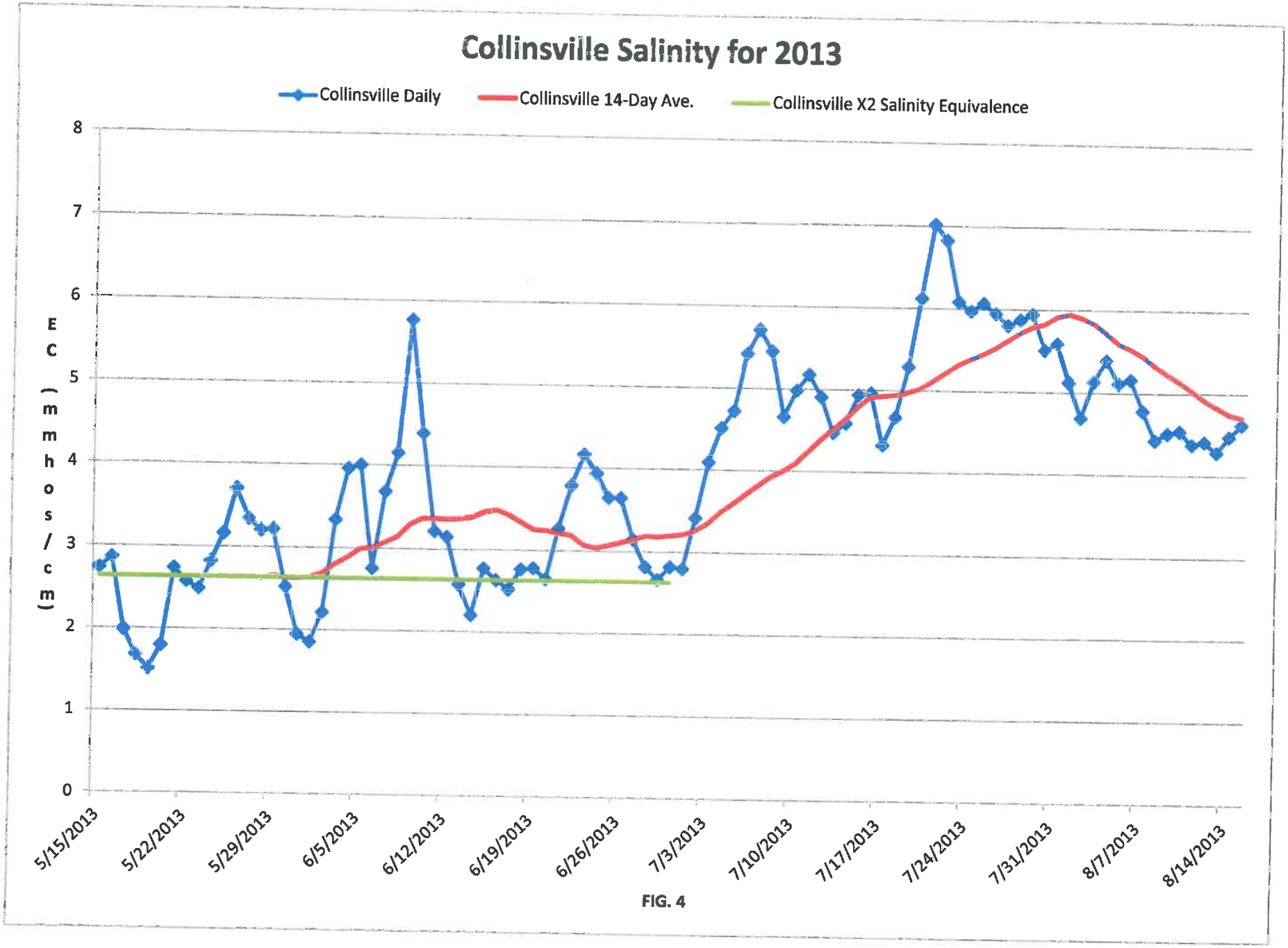
Collinsville Salinity for 2013
Collinsville Daily
Collinsville 14-Day Ave.
Collinsville X2 Salinity Equivalence
EC (mmhos/cm)
8
7
6
5
4
3
2
1
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 4

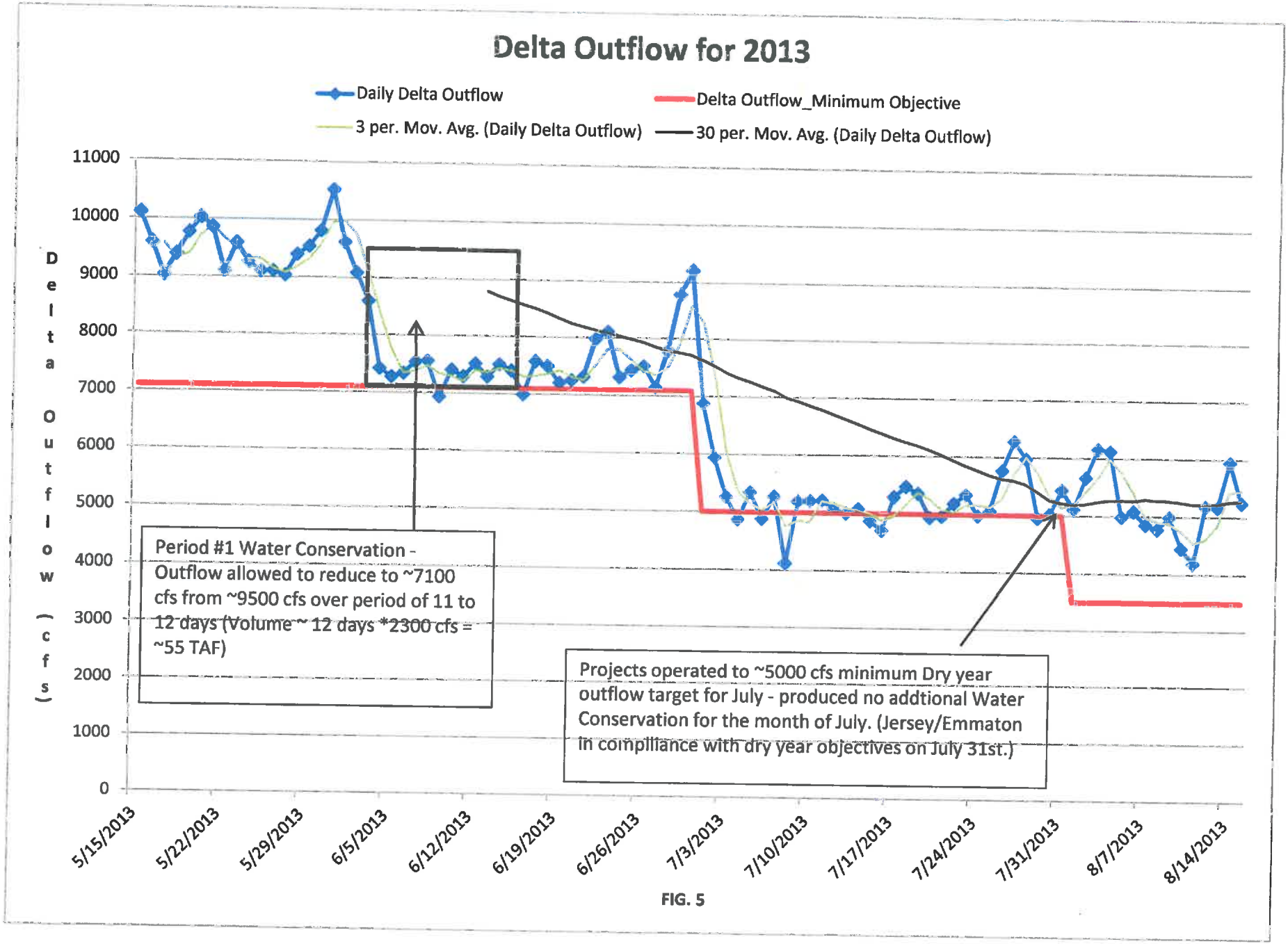
Delta Outflow for 2013
Daily Delta Outflow
Delta Outflow_Minimum Objective
3 per. Mov. Avg. (Daily Delta Outflow)
30 per. Mov. Avg. (Daily Delta Outflow)
Delta Outflow (cfs)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013
Period #1 Water Conservation - Outflow allowed to reduce to ~7100 cfs from ~9500 cfs over period of 11 to 12 days (Volume ~ 12 days *2300 cfs = ~55 TAF)
Projects operated to ~5000 cfs minimum Dry year outflow target for July - produced no addtional Water Conservation for the month of July. (Jersey/Emmaton in compliance with dry year objectives on July 31st.)

FIG. 5

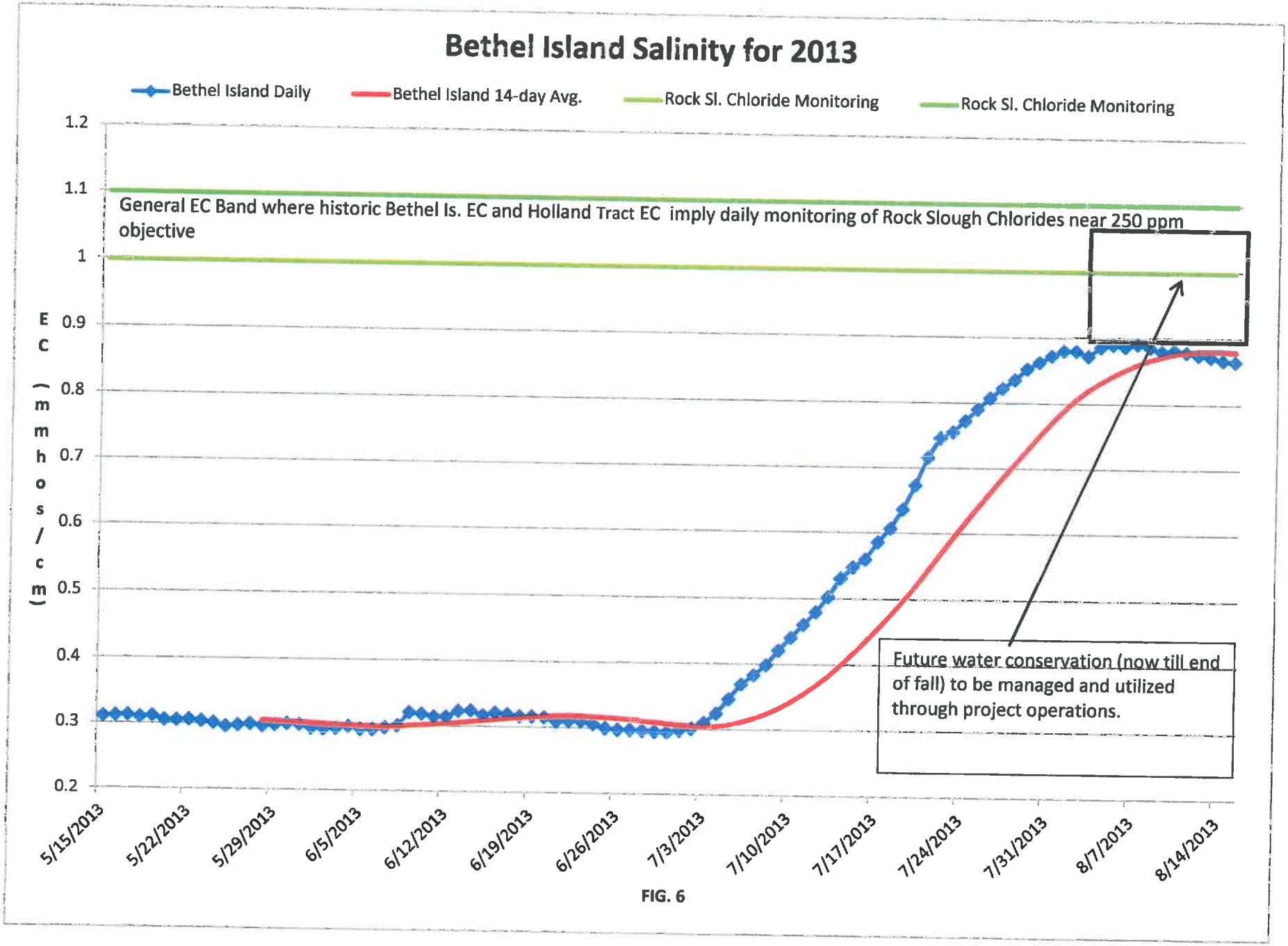
Bethel Island Salinity for 2013
Bethel Island Daily
Bethel Island 14-day Avg.
Rock Sl. Chloride Monitoring
Rock Sl. Chloride Monitoring
General EC Band where historic Bethel Is. EC and Holland Tract EC imply daily monitoring of Rock Slough Chlorides near 250 ppm objective
Future water conservation (now till end of fall) to be managed and utilized through project operations.
EC (mmhos/cm)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 6

CALIFORNIA
Water Boards

RECEIVED
SEP 23 2013
BY:

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

September 20, 2013

Dante John Nomellini
Central Delta Water Agency
235 East Weber Avenue
Stockton, CA 95201

RE: YOUR AUGUST 13, 2013 LETTER

Dear Mr. Nomellini:

Thank you for your letter of August 13, 2013, entitled "2013 SWP and CVP Violations of D-1641", addressed to Felicia Marcus, Chair of the State Water Resources Control Board (State Water Board). I have been asked to respond to the letter. As you know, the Delta Watermaster position was created as a single point-of-contact regarding water issues affecting the Delta. The State Water Board has delegated extensive authority to address these issues.

Introduction

Your main point appears to be that my letter of May 29, 2013, entitled "Actions to Conserve Cold Water Pool in Shasta Reservoir for Fishery Resources", gave tacit approval of a plan to violate water quality standards to further exports of water from the Delta. I respectfully disagree.

As you know, the May 29, 2013 letter was a response to the United States Bureau of Reclamation's (Reclamation) request to reduce releases of water form Shasta Reservoir in order to conserve water behind Shasta Reservoir. This "saved" water would be used to assure compliance with cold water temperature standards adopted to protect fishery resources on the upper Sacramento River. All of the major fishery agencies supported this request. It was anticipated that reduced releases of water from Shasta Reservoir and other upstream reservoirs would result in violations of salinity standards that apply to the Western Delta for the protection of agricultural beneficial uses. In essence what was requested was a relaxation of the salinity standards in return for operations that would conserve more water at Shasta Reservoir. My letter stated that the State Water Board would not object to or take action against Reclamation's suggested operations provided: 1) they met less stringent critically-dry year salinity standards instead of dry year standards, 2) would submit a Temperature Management Plan, and 3) would submit a water accounting regarding actual operations. I also indicated that, in the future, issues regarding compliance matters be anticipated and addressed as soon as possible.

In addition to disagreeing with the merits of the actions, your August 13, 2013 letter expressed concern with the process: that a public process should have been conducted before a decision was made and that the use of "prosecutorial discretion" is not appropriate for future actions.

Response to Major Assertions

Your point that the present system may not be capable of producing sufficient water to meet in-basin and export needs is well taken. I share your interest in developing a better process to plan for upcoming water years, including how to balance delivery allocations decisions against other needs. My understanding is that that Projects do attempt to make such decisions based on conservative estimates of projected water reservoir levels and delivery needs. The CALFED Ops and Water Operations and Management Team (WOMT) are two groups charged with coordinating the operation of the water projects with requirements set by water quality objectives and other environmental safeguards. I have begun participating in both groups and have put them on notice that I expect to engage in advance planning for next year as early as possible. The CALFED Ops group meets and discusses project operations issues in a public setting. I encourage you to participate in this process.

That being said, difficult issues are raised when even very conservative water forecasts are not borne-out by Mother Nature. The current Bay-Delta Water Quality Control Plan and implementing water rights decision (D-1614) do not provide much flexibility in addressing anomalous water years such as occurred this past year. The ability of the Projects to curtail contract water deliveries during the middle of the irrigation system is also problematic. That is why more attention should be placed on advance planning.

Turning to this year, Reclamation's change in operations did save a considerable amount of water with little impact on salinity levels in the Western Delta. I have attached Reclamation's Water Accounting Memo, dated August 21, 2013. Approximately 55,000 acre-feet (af) of water was conserved in upstream reservoirs through August 15, 2013. All of that savings occurred during early June to June 15, 2013. After June 15, 2013 salinity levels remained below dry year standards through August 15, 2013 and no additional water was conserved. None of the 55,000 af of water was used to supply water for export south of the Delta. The request from Reclamation was truly based on unique circumstances as set forth in both the request and my response. The lack of rainoff from January to June of this year was unprecedented. While technically the water year was classified as dry, the actual situation was more like a worse year. In fact, the situation led to earlier depletions and a corresponding drop in reservoir water levels. Preserving adequate storage to meet fishery needs was a legitimate concern. Based on these factors, I felt the request was reasonable, subject to the conditions outlined in my May 29, 2013 letter.

Regarding the Temperature Management Plan, it was developed and supported by all the fishery agencies. While the compliance point was moved upstream, all the fishery agencies indicated that little, if any, spawning would occur in the downstream area.

As to your procedural issues, there was simply not enough time to conduct a public process to change the standards. The initial contact from the fish agencies regarding the need to conserve water in Shasta Reservoir was on May 17, 2013; Reclamation's formal request was made on May 24, 2013, and my letter was sent on May 29, 2013. As indicated earlier, all the water savings occurred in early June. Any delay would have meant no water savings. Under the circumstances I feel that my early response to Reclamation was appropriate. That response did not change the standard and clearly indicated that enforcement actions would be considered in the future should it be determined that appropriate coordination did not take place in a timely manner.

In summary, I believe that a proper balancing of the ability to meet different water quality standards took place. Actual operations were such that all water conservation took place in early June and that there were only a few days of exceedances of the dry year salinity standards, none after June 15, 2013. None of this "saved" water was exported to the south. Export amounts during this period were based on existing contracts and were not increased because of my actions. Regarding future years, I hope to be part of a process in which advance planning is achieved.

Please contact me at (916) 445-5962 or craig.wilson@waterboards.ca.gov if you have any questions.

Sincerely,

Craig M. Wilson
Delta Watermaster

Attachment

cc: Tom Howard, Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Felicia Marcus, Board Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Frances Spivy-Weber, Vice Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenace
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento, CA 95825-1898

Tam M. Doduc
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Steven Moore
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Dorene D'Adamo
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Kim Turner, Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski, Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Continued on next page.

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95825-1898

Erin Foresman
USEPA Region 9
c/o NMFS
650 capitol Mall
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Michael Jackson
P.O. Box 207
Quincy, CA 95971

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

BUREAU OF RECLAMATION
Central Valley Operation Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

DEPARTMENT OF WATER RESOURCES
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY REFER TO:
CVO-100
WTR-4.10

AUG 21 2013

Craig Wilson, Delta Watermaster
State Water Resources Control Board
Office of Delta Watermaster
P.O. Box 100
Sacramento, CA 95812

Subject: Response to Your May 29, 2013, Letter Regarding Shasta Reservoir Cold Water Conservation Actions for Fishery Resources

Dear Mr. Wilson:

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For the remainder of June, Project operations continued to target the 7,100 cfs 3-day running

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In summary, our current evaluations show that approximately 55,000 af was conserved in upstream reservoirs through August 15, 2013. Delta salinity did not react as quickly to the modified operations for the Critical Year objectives as initially projected, and the conservation effect to upstream reservoir storage was less than originally anticipated.

If you have any questions regarding this notification, please contact Mr. Paul Fujitani of Reclamation at 916-979-2197 or Mr. John Leahigh of DWR at 916-574-2722.

Sincerely,

Paul Fujitani

for Ronald Milligan, Operations Manager
Central Valley Operations Office
Bureau of Reclamation

John Leahigh

for David H. Roose, Chief
SWP Operations Control Office
Department of Water Resources

cc: Thomas Howard, Executive Director
State Water Resources Control Board
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Maria Rae
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, California 95814

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California Department of Fish and Wildlife
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Walnut Creek, California 94596-3840

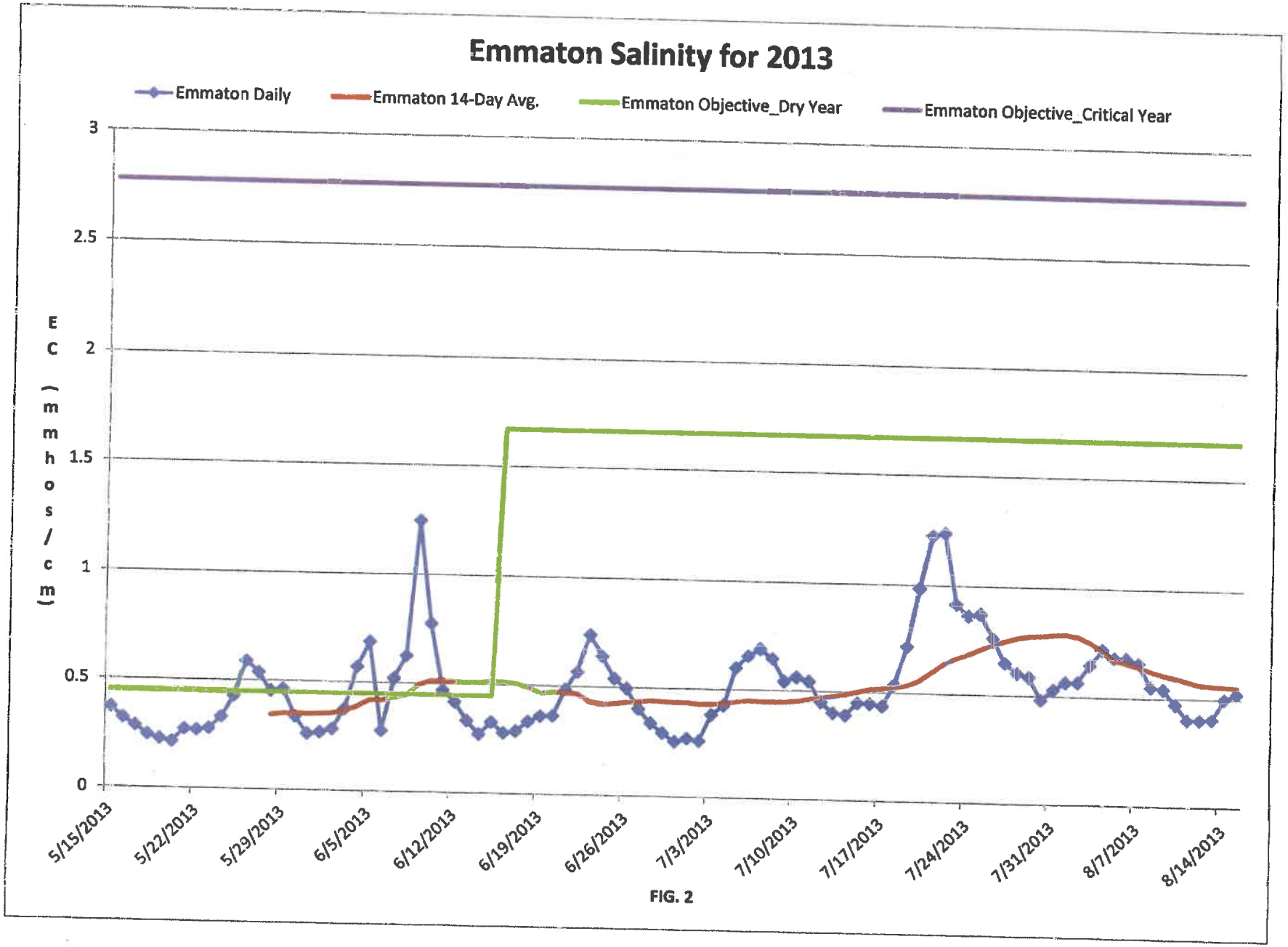

Emmaton Salinity for 2013
Emmaton Daily
Emmaton 14-Day Avg.
Emmaton Objective_Dry Year
Emmaton Objective_Critical Year
EC (mmhos/cm)
3
2.5
2
1.5
1
0.5
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 2

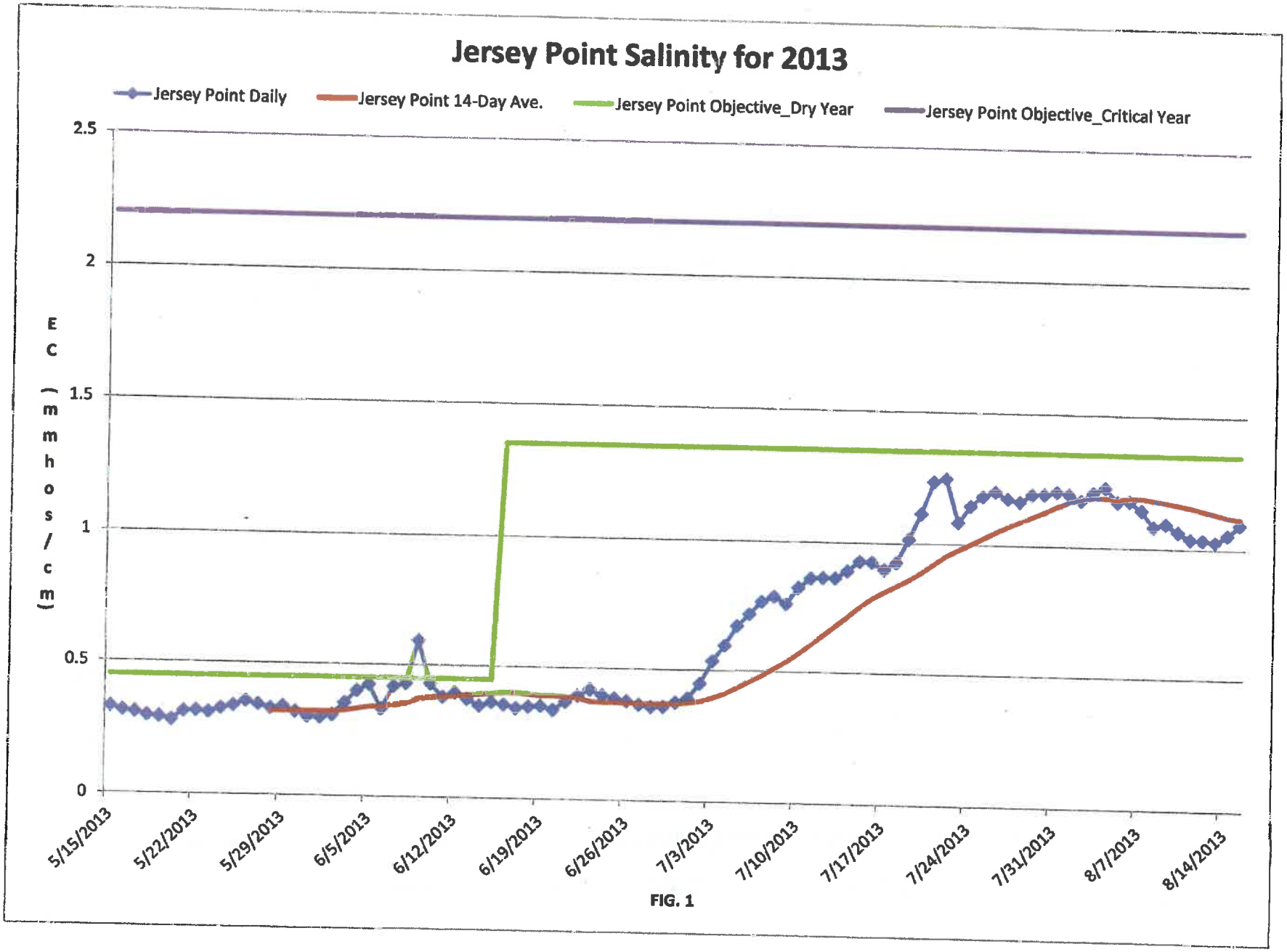

Jersey Point Salinity for 2013
Jersey Point Daily
Jersey Point 14-Day Ave.
Jersey Point Objective_Dry Year
Jersey Point Objective_Critical Year
EC (mmhos/cm)
2.5
2
1.5
1
0.5
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 1

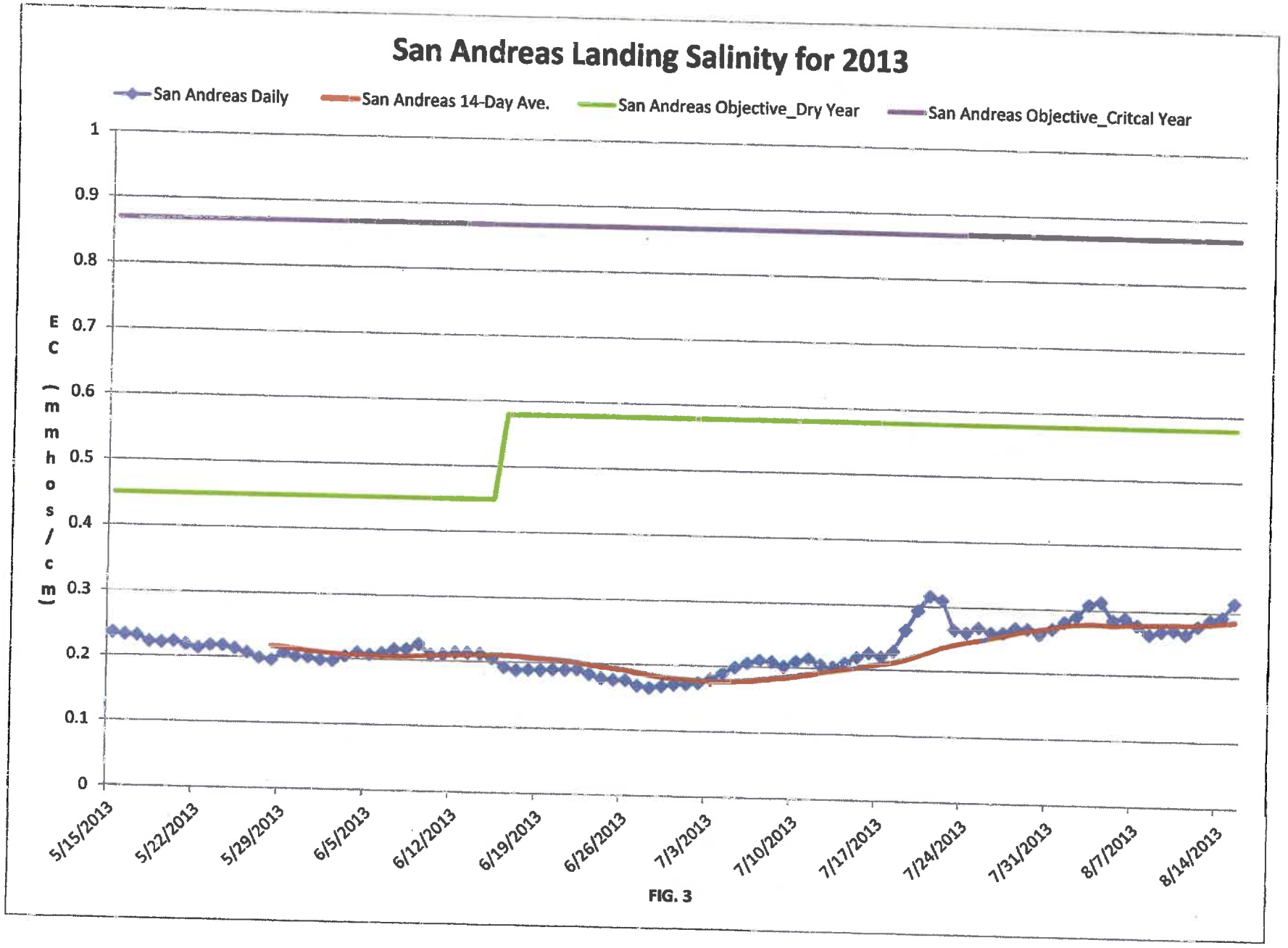

San Andreas Landing Salinity for 2013
San Andreas Daily
San Andreas 14-Day Ave.
San Andreas Objective_Dry Year
San Andreas Objective_Critcal Year
EC (mmhos/cm)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 3

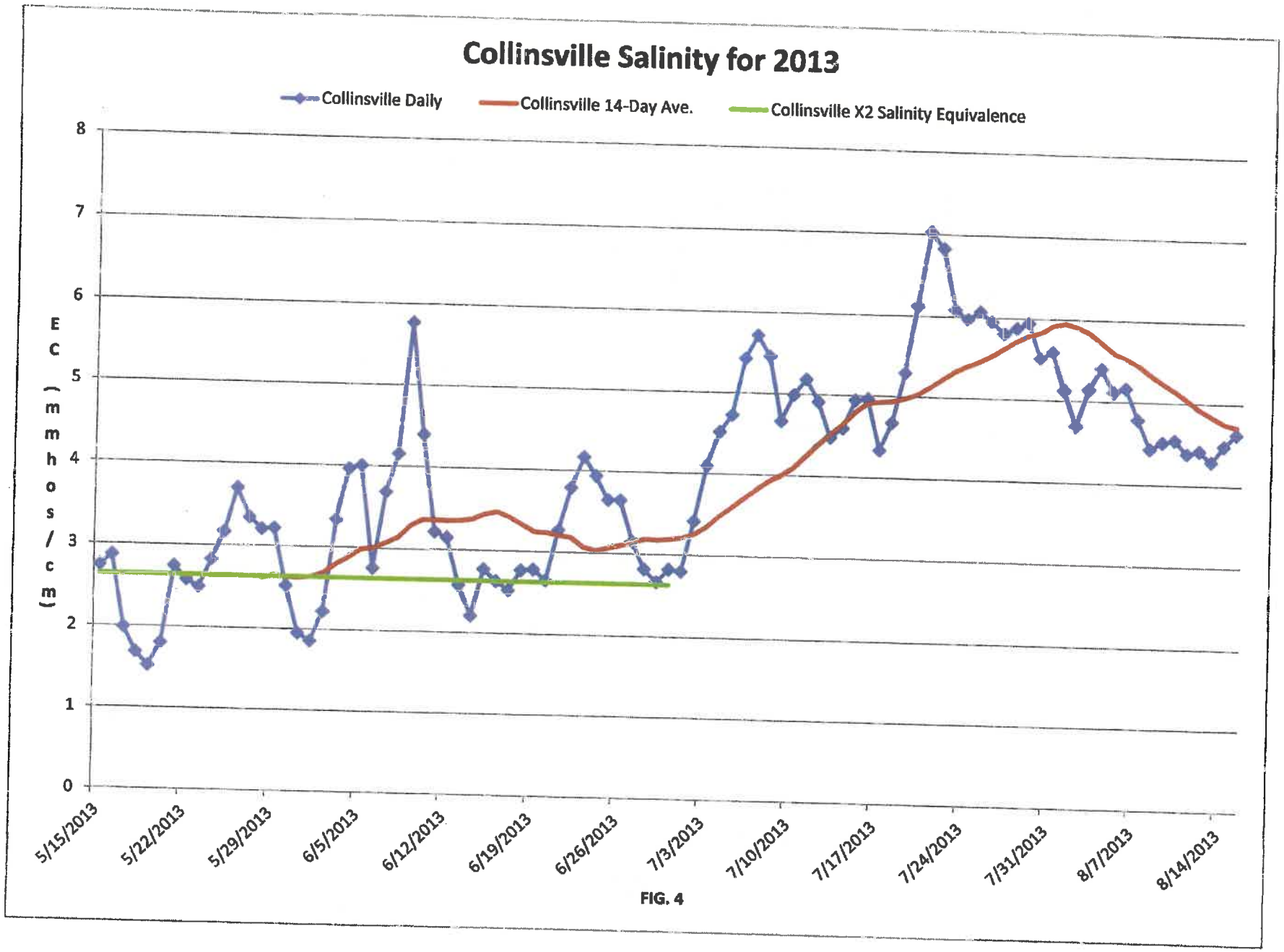

Collinsville Salinity for 2013
Collinsville Daily
Collinsville 14-Day Ave.
Collinsville X2 Salinity Equivalence
EC (mmhos/cm)
8
7
6
5
4
3
2
1
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 4

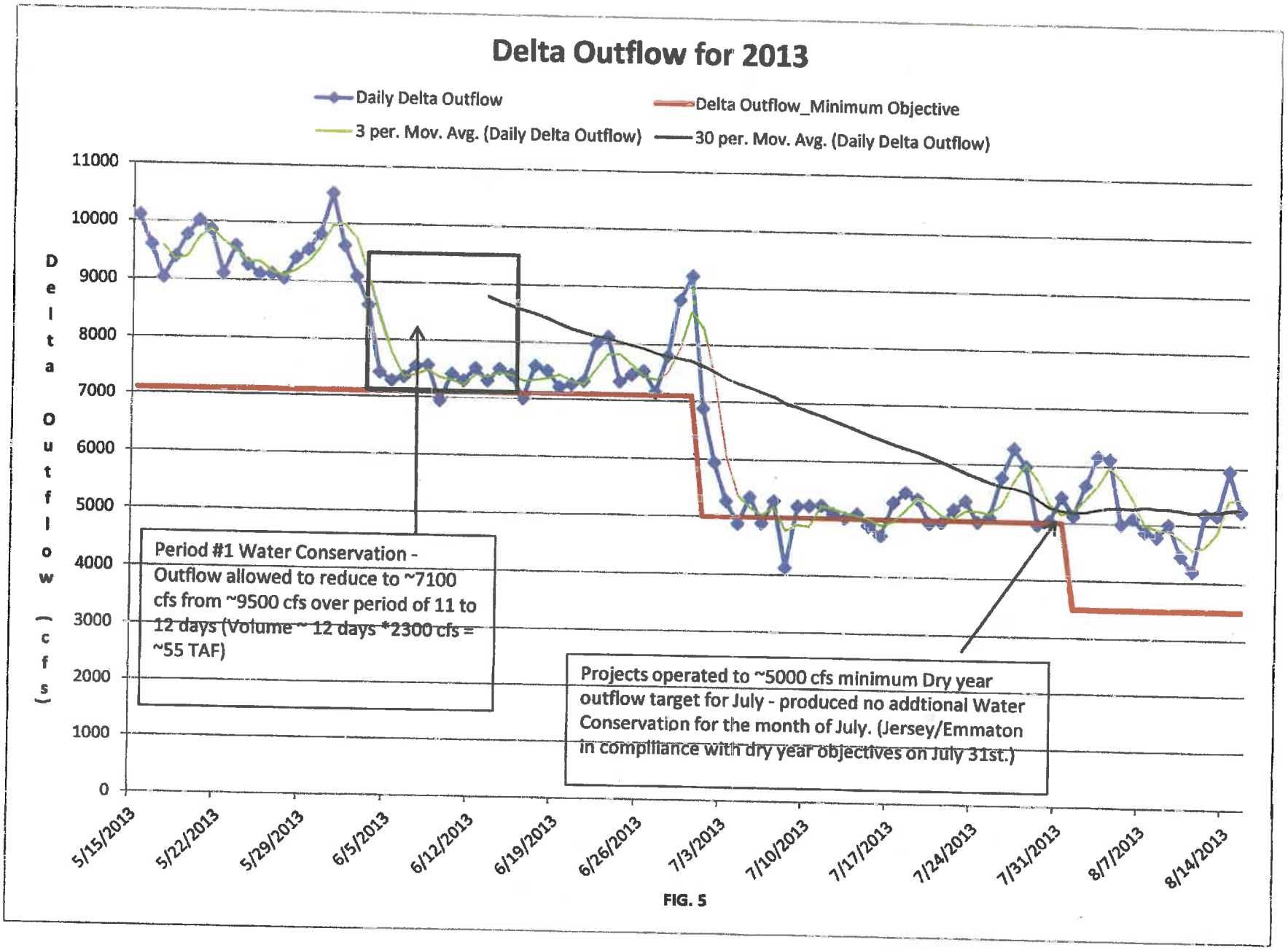

Delta Outflow for 2013
Daily Delta Outflow
Delta Outflow_Minimum Objective
3 per. Mov. Avg. (Daily Delta Outflow)
30 per. Mov. Avg. (Daily Delta Outflow)
Delta Outflow (cfs)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013
Period #1 Water Conservation - Outflow allowed to reduce to ~7100 cfs from ~9500 cfs over period of 11 to 12 days (Volume ~ 12 days *2300 cfs = ~55 TAF)
Projects operated to ~5000 cfs minimum Dry year outflow target for July - produced no addtional Water Conservation for the month of July. (Jersey/Emmaton in compliance with dry year objectives on July 31st.)

FIG. 5

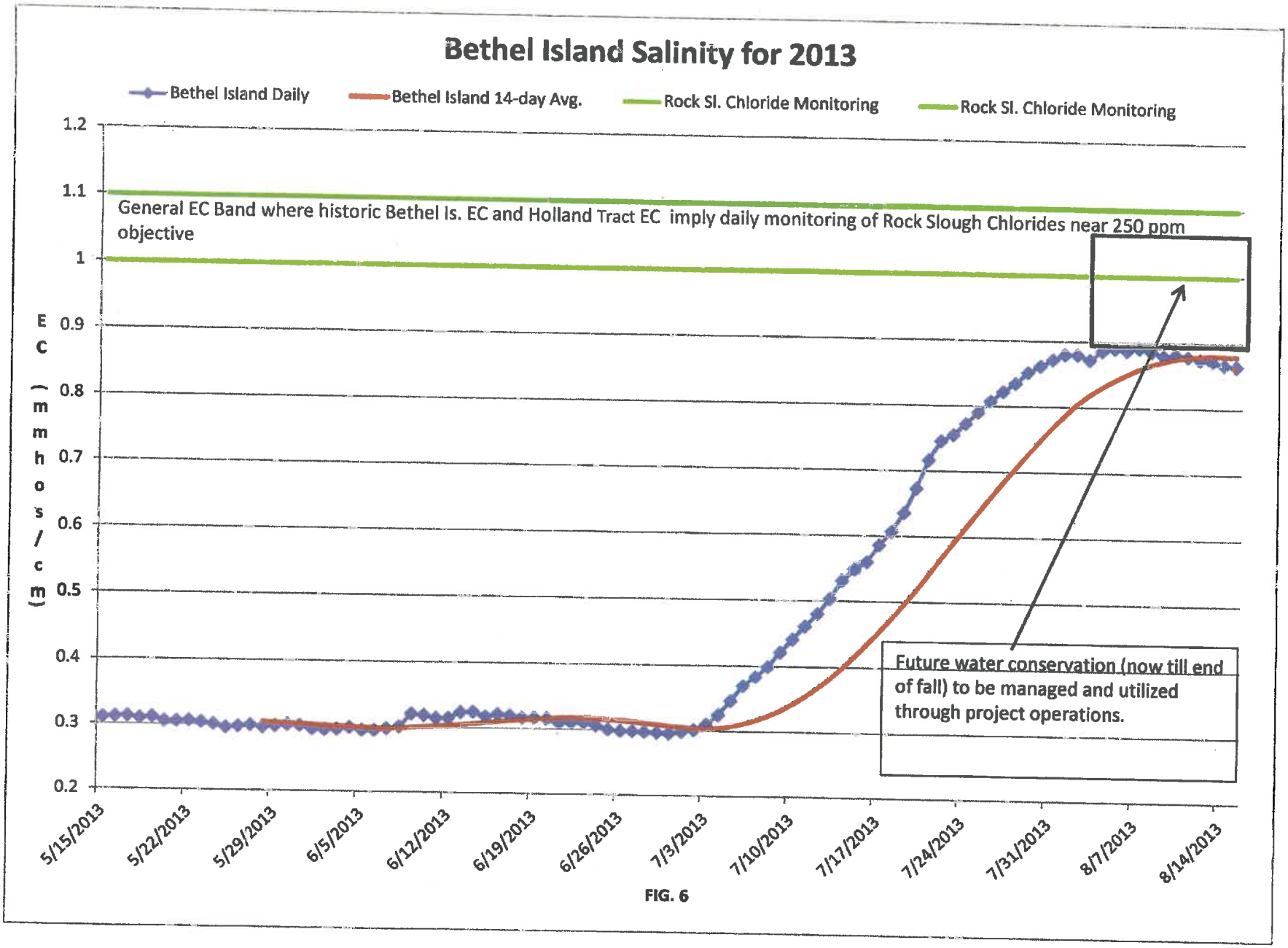

Bethel Island Salinity for 2013
Bethel Island Daily
Bethel Island 14-day Avg.
Rock Sl. Chloride Monitoring
Rock Sl. Chloride Monitoring
General EC Band where historic Bethel Is. EC and Holland Tract EC imply daily monitoring of Rock Slough Chlorides near 250 ppm objective
Future water conservation (now till end of fall) to be managed and utilized through project operations.
EC (mmhos/cm)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
5/15/2013
5/22/2013
5/29/2013
6/5/2013
6/12/2013
6/19/2013
6/26/2013
7/3/2013
7/10/2013
7/17/2013
7/24/2013
7/31/2013
8/7/2013
8/14/2013

FIG. 6

CALIFORNIA
Water Boards

RECEIVED
NOV 15 2013
BY:

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

NOV 13 2013

Dante John Nomellini
Central Delta Water Agency
235 East Weber Avenue
Stockton, CA 95201

RE: 2013 SWP AND CVP VIOLATIONS OF D-1641

Dear Mr. Nomellini:

Thank you for your letter of October 24, 2013, on the above-entitled subject as well as your earlier letters of September 9 and August 13, 2013. While I attempted to respond to your concerns in my letter of September 20, 2013 (copy attached), further dialogue is always welcome.

Your chief concern is "that actions of the operators of the SWP and CVP reflect a plan and practice of violating the Water Quality Standards to facilitate greater exports from the Delta. In support of this concern, you cite my letter of May 29, 2013 entitled "Actions to Conserve Cold Water Pool in Shasta Reservoir for Fishery Resources."

I agree with your statement that meeting water quality standards of D-1641 is a condition to the SWP and CVP rights to export water from the Delta. My letter of May 29th did not alter those standards. Rather I stated that I would exercise discretion not to enforce those standards under a very narrow and conditioned set of circumstances: I explained those conditions in my September 20, 2013 letter.

You indicate that further export restrictions could have been used to conserve Shasta Reservoir's cold water pool. That was not the issue that was presented to me. Rather, both state and federal fish agencies asked if water could be conserved in Shasta through Project operations to meet a slightly less stringent salinity standard in the Western Delta. In fact a significant amount of water was conserved and standards were only slightly exceeded for a few days. I doubt if any increased salinity was measurable.

You indicate that Shasta Storage was at 3,554,510 acre-feet which was 89% of historic average as of the date of my May 17, 2013 letter. While true, the draw down of Shasta was accelerating. As of the date of this letter, storage at Shasta is less than 1,700,000 acre-feet (68% of historic average). Exports had already been substantially reduced at the time of my letter and exports during that period were well below contracted amounts.

The lessons to be learned from this year include the need for better advance operation planning. I agree with you that project operators should be required to set forth a plan for future operation that will meet water quality standards and fish requirements. Obviously, one way to help achieve standards is to limit project exports.

Rather than further investigate past practices, I would rather focus on future operations. By copy of this letter, I am asking that both the CVP and SWP engage in advance planning at the earliest possible date based on forecasts of the upcoming water year, that I be involved in such planning, and that export restrictions as well as other operational constraints be built into the advance planning. One result would hopefully be that I will not be asked to allow operations of the CVP and SWP to result in exceedances of established standards.

Please contact me at (916) 445-5962 or craig.wilson@waterboards.ca.gov if you have any questions.

Sincerely,

Craig M. Wilson
Delta Watermaster

Attachment

cc: Felicia Marcus, Board Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Frances Spivy-Weber, Vice Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Tam M. Doduc
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenace
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Steven Moore
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dorene D'Adamo
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Tom Howard, Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento, CA 95825-1898

Continued on next page.

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Kim Turner, Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski, Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Erin Foresman
USEPA Region 9
c/o NMFS
650 Capitol Mall
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Michael Jackson
P.O. Box 207
Quincy, CA 95971

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

September 20, 2013

Dante John Nomellini
Central Delta Water Agency
235 East Weber Avenue
Stockton, CA 95201

RE: YOUR AUGUST 13, 2013 LETTER

Dear Mr. Nomellini:

Thank you for your letter of August 13, 2013, entitled "2013 SWP and CVP Violations of D-1641", addressed to Felicia Marcus, Chair of the State Water Resources Control Board (State Water Board). I have been asked to respond to the letter. As you know, the Delta Watermaster position was created as a single point-of-contact regarding water issues affecting the Delta. The State Water Board has delegated extensive authority to address these issues.

Introduction

Your main point appears to be that my letter of May 29, 2013, entitled "Actions to Conserve Cold Water Pool in Shasta Reservoir for Fishery Resources", gave tacit approval of a plan to violate water quality standards to further exports of water from the Delta. I respectfully disagree.

As you know, the May 29, 2013 letter was a response to the United States Bureau of Reclamation's (Reclamation) request to reduce releases of water form Shasta Reservoir in order to conserve water behind Shasta Reservoir. This "saved" water would be used to assure compliance with cold water temperature standards adopted to protect fishery resources on the upper Sacramento River. All of the major fishery agencies supported this request. It was anticipated that reduced releases of water from Shasta Reservoir and other upstream reservoirs would result in violations of salinity standards that apply to the Western Delta for the protection of agricultural beneficial uses. In essence what was requested was a relaxation of the salinity standards in return for operations that would conserve more water at Shasta Reservoir. My letter stated that the State Water Board would not object to or take action against Reclamation's suggested operations provided: 1) they met less stringent critically-dry year salinity standards instead of dry year standards, 2) would submit a Temperature Management Plan, and 3) would submit a water accounting regarding actual operations. I also indicated that, in the future, issues regarding compliance matters be anticipated and addressed as soon as possible.

In addition to disagreeing with the merits of the actions, your August 13, 2013 letter expressed concern with the process: that a public process should have been conducted before a decision was made and that the use of "prosecutorial discretion" is not appropriate for future actions.

Response to Major Assertions

Your point that the present system may not be capable of producing sufficient water to meet in-basin and export needs is well taken. I share your interest in developing a better process to plan for up-coming water years, including how to balance delivery allocations decisions against other needs. My understanding is that that Projects do attempt to make such decisions based on conservative estimates of projected water reservoir levels and delivery needs. The CALFED Ops and Water Operations and Management Team (WOMT) are two groups charged with coordinating the operation of the water projects with requirements set by water quality objectives and other environmental safeguards. I have begun participating in both groups and have put them on notice that I expect to engage in advance planning for next year as early as possible. The CALFED Ops group meets and discusses project operations issues in a public setting. I encourage you to participate in this process.

That being said, difficult issues are raised when even very conservative water forecasts are not borne-out by Mother Nature. The current Bay-Delta Water Quality Control Plan and implementing water rights decision (D-1614) do not provide much flexibility in addressing anomalous water years such as occurred this past year. The ability of the Projects to curtail contract water deliveries during the middle of the irrigation system is also problematic. That is why more attention should be placed on advance planning.

Turning to this year, Reclamation's change in operations did save a considerable amount of water with little impact on salinity levels in the Western Delta. I have attached Reclamation's Water Accounting Memo, dated August 21, 2013. Approximately 55,000 acre-feet (af) of water was conserved in upstream reservoirs through August 15, 2013. All of that savings occurred during early June to June 15, 2013. After June 15, 2013 salinity levels remained below dry year standards through August 15, 2013 and no additional water was conserved. None of the 55,000 af of water was used to supply water for export south of the Delta. The request from Reclamation was truly based on unique circumstances as set forth in both the request and my response. The lack of rainoff from January to June of this year was unprecedented. While technically the water year was classified as dry, the actual situation was more like a worse year. In fact, the situation led to earlier depletions and a corresponding drop in reservoir water levels. Preserving adequate storage to meet fishery needs was a legitimate concern. Based on these factors, I felt the request was reasonable, subject to the conditions outlined in my May 29, 2013 letter.

Regarding the Temperature Management Plan, it was developed and supported by all the fishery agencies. While the compliance point was moved upstream, all the fishery agencies indicated that little, if any, spawning would occur in the downstream area.

As to your procedural issues, there was simply not enough time to conduct a public process to change the standards. The initial contact from the fish agencies regarding the need to conserve water in Shasta Reservoir was on May 17, 2013; Reclamation's formal request was made on May 24, 2013, and my letter was sent on May 29, 2013. As indicated earlier, all the water savings occurred in early June. Any delay would have meant no water savings. Under the circumstances I feel that my early response to Reclamation was appropriate. That response did not change the standard and clearly indicated that enforcement actions would be considered in the future should it be determined that appropriate coordination did not take place in a timely manner.

In summary, I believe that a proper balancing of the ability to meet different water quality standards took place. Actual operations were such that all water conservation took place in early June and that there were only a few days of exceedances of the dry year salinity standards, none after June 15, 2013. None of this "saved" water was exported to the south. Export amounts during this period were based on existing contracts and were not increased because of my actions. Regarding future years, I hope to be part of a process in which advance planning is achieved.

Please contact me at (916) 445-5962 or craig.wilson@waterboards.ca.gov if you have any questions.

Sincerely,

Craig M. Wilson
Delta Watermaster

Attachment

cc: Tom Howard, Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Felicia Marcus, Board Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Frances Spivy-Weber, Vice Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenace
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento, CA 95825-1898

Tam M. Doduc
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Steven Moore
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Dorene D'Adamo
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Kim Turner, Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski, Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Suite 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Continued on next page.

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95825-1898

Erin Foresman
USEPA Region 9
c/o NMFS
650 capitol Mall
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Michael Jackson
P.O. Box 207
Quincy, CA 95971

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

CENTRAL DELTA WATER AGENCY

235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone (209) 465-5883 • Fax (209) 465-3956

May 8, 2014

Tom Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Craig Wilson
Delta Watermaster
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95814-0100

Re: SWP and CVP 2013 Violations of D-1461

Dear Tom and Craig:

It has been called to my attention that my October 24, 2013 correspondence to Craig Wilson which in part compared SWP and CVP export pumping for the water year October 1st through September 30th to SWP and CVP delivery forecasts based on contract years, was an apples to oranges error. I am informed that the contract year for the SWP is the calendar year and the CVP contract year is March 1st through February. I have reviewed my October 24, 2013 letter and submit this letter to correct and clarify the content thereof.

COMPARISON TO YEARLY FORECASTS OF DELIVERIES

For the calculations herein I used currently available CVO reports for Federal-State Operations which show the pumping at the Federal Jones Pumping Plant and the State Banks Pumping Plant. (a worksheet is attached) For the yearly SWP and CVP forecasts I used the allocation documents, copies of which are attached. The SWP Table A allocation forecast for south of Delta from the DWR 3-21-13 allocation is 1,419,674 AF. Using the 1,419,674 AF and comparing it to the State only diversions from the Banks pumping plant there appears to be State

export pumping in excess of the forecasted Table A allocation. For the calendar year the State water pumping at Banks was 1,757,573 AF. For the period 1-1-13 through 9-30-13 the State water pumping at Banks was 1,471,369 AF. The excess is 337,899 AF and 51,695 AF respectively. Banks pumping includes STATE, FED and FED BANKS XVC. The breakdown of the pumping is shown on the CVO Federal-State Operations monthly reports. Using the contract year for federal pumping compared to the federal forecast deliveries shows a substantial shortfall. Some of the fed delivery could have been from San Luis or through other arrangements. The projects are coordinated and their reports of actual deliveries for 2013 could not be located. Export pumping does not necessarily equate to deliveries. For the SWP the State only export pumping could include other than delivery of Table A water. Article 21 water and other types are possible. Using the annual project forecasts of deliveries to judge the conduct of the project operators involves a number of subjective variables and is not the best choice. The comparison of the graphic forecasts of monthly Delta Exports to the CVO reports showing the daily and monthly quantity of export pumping from Jones and Banks is more appropriate.

COMPARISON OF MONTHLY FORECASTS OF DELTA EXPORTS

For ease of reference I have reattached the Delta Export Forecast graphs from my October 24, 2013 letter. The Delta Export Forecast graphs show the forecast of the monthly average of daily exports in cubic feet per second. The monthly exports in cubic feet per second correlate with the CVO reported acre feet per month pumped at Jones and Banks pumping plants. The graphs were part of the CALFED Operations Group Meeting records and were attached to the October 24th letter. The graphs show the actual export pumping amounts for the months prior to the forecast date and a forecast for the following months. The comparison of the later graphs to the earlier graphs show that the forecast was exceeded even during the time that the D-1641 water quality standards were not being met. The graphs do not separate the SWP pumping from the CVP pumping.

THE SWP AND CVP CONTINUED EXPORT PUMPING DURING THE TIME THAT DRY YEAR WATER QUALITY STANDARDS WERE NOT BEING MET

The real-time export pumping data from CDEC and the CVO Federal-State Operations reports show that the projects were exporting water which if not exported could have contributed to outflow to meet the standards. This is not necessarily a savings of cold water in storage issue as the water in question could be flow from other sources. It is, however, clearly improper. The requests from the projects and the support from the fishery agencies sought relaxation of the interior and western Delta agricultural standards to save cold water in Shasta and did not mention reduction of exports. Whether to save water in Shasta or not, the failure to meet the D-1641 Dry Year standards appears to have resulted in greater exports from the Delta. Both state and federal law require the agencies to meet water quality standards. Water Code 13247 and PL 99-546

appear to apply regardless of the decision not to enforce. The fact that the projects were exporting water which could have been used for meeting the standards appears to be a clear violation of the law.

SWP ALLOCATIONS FOR 2013 EXCEEDED DWR DELIVERY RELIABILITY REPORTS FOR ALLOCATIONS FOR A YEAR LIKE 1977

Attached hereto is a copy of page 50 from The State Water Project FINAL DELIVERY RELIABILITY REPORT 2011 dated June 2012 issued by the Department of Water Resources. Table 6.3 provides the "Estimated Average and Dry-Period Deliveries of SWP Table A Water (Existing Conditions)". For a single dry year like 1977 the amount is 380,000 AF. This can be contrasted with the DWR 3-21-13 Table A allocation of 1,460,342 AF. The State only pumping from Banks was 1,757,573 AF. The May 24, 2013 letter from the USBR and DWR to Thomas Howard providing formal notification of the April exceedance provides: **"The accumulation of rainfall since January1 for the long record of the Northern Sierra 8–Station Precipitation Index is approximately 8.8 inches. Currently, this value represents the driest calendar year period in the long precipitation record—even drier than the very dry single years of 1977 and 1924."** The SWP 2013 allocation of Table A quantities is greatly in excess of what their own studies show can reliably be delivered. Delivery Reliability reports prior to the 2011 report show even smaller reliable Table A quantities for a year like 1977.

We renew our request for investigation and believe that it is appropriate for you to request that the USBR and DWR provide an additional accounting. Your letter agreeing not to recommend enforcement required an accounting. The accounting submitted lacked specifics and did not show that the violation of the Dry Year standards resulted in a preservation of cold water in Shasta or that the same result could not have been achieved by a reduction in exports.

Your further investigation should include a request that the SWP and CVP operators answer the following questions:

1) Was the combined pumping at the Jones Pumping Plant and Banks Pumping Plant in excess of the forecasted monthly Delta Exports shown on the Forecast Report Graph dated March 27, 2013 presented to the CALFED Operations Group? If yes, please provide the month and quantity of the excess for the State and for the Feds.

2) Was the combined pumping at the Jones Pumping Plant and Banks Pumping Plant in excess of the forecasted monthly Delta Exports shown on the Forecast Report Graph dated May 22, 2013 presented to the CALFED Operations Group? If yes, please provide the month and quantity of the excess for the State and for the Feds.

3) What amount of cold water was preserved in Shasta due to meeting the Critical Year rather than Dry Year D-1641 Western Delta Water Quality Objectives for Agricultural Beneficial Uses in 2013?

4) What amount of cold water preservation in Shasta could have been achieved by reducing exports from the Delta in 2013?

5) What amount of export curtailment in 2013 would have been required to avoid the exceedence of the D-1641 Western Delta Dry Year Water Quality Objectives for Agricultural Beneficial Use and achieve 55,000 acre feet of cold water preservation in Shasta?

6) What amount of cold water was preserved in Shasta in 2013, if any, by reason of the change in the location of the cold water requirement for salmon on the Sacramento River?

7) What amount of export curtailment in 2013 would have been required to achieve the same quantity of cold water preservation in Shasta as that achieved by the change in location of the cold water requirement for salmon on the Sacramento River?

8) What discussion, if any, took place at the CALFED Operations Meetings or otherwise with SWRCB staff during the months of April and May of 2013 regarding not curtailing and/or increasing exports from the Delta?

9) What examination, if any, was made as to the impacts of reducing Delta outflow to preserve the cold water for fish in 2013 as compared to a reduction in exports to achieve the same objective?

Thank you for your attention to this matter.

Yours very truly,

Dante John Nomellini,
Manager and co-counsel

DJN:ka
Enclosures
cc: List Attached

Felicia Marcus
Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Frances Spivy-Weber, Vice Chair SWRCB
1001 I Street
Sacramento, CA 95812

Tam M. Doduc, SWRCB
1001 I Street
Sacramento, CA 95812

Steven Moore, SWRCB
1001 I Street
Sacramento, CA 95812

Dorene D'Adamo, SWRCB
1001 I Street
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, Ca 95821

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Kim Turner
Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski
Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Ste. 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Erin Foresman
USEPA Region 9
c/o NMFS
650 Capitol Mall
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino avenue, Suite 300
Sacramento, CA 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Michael Jackson
P. O. Box 207
Quincy, CA 95971

From: CVO Federal-State Operations Reports

DJN Worksheet - 5/1/14

2012	Oct	Nov	Dec	
Jones				
State				
Fed	241156	233849	179955	**654960**
Total	241156	233849	179955	**654960**
Banks				
State	206787	178917	260252	**645956**
Fed				
Fed XVC	20256			**20256**
Total	227043	178917	260252	**666212**

2013	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
Jones													
State													
Fed	101220	144430	151202	27053	63782	46504	224925	233905	195821	139787	103532	60454	**1492615**
Total	101220	144430	151202	27053	63782	46504	224925	233905	195821	139787	103532	60454	**1492615**
Banks													
State	162455	96508	157850	74304	54793	112894	313570	339300	159695	70736	114743	100725	**1757573**
Fed				3027				9900	25026				**37953**
Fed XVC							2100	6670	10541				**19311**
Total	162455	96508	157850	77331	54793	112894	315670	355870	195262	70736	114743	100725	**1814837**

2014	Jan	Feb	
Jones			
State			
Fed	26769	71759	**98528**
Total	26769	71759	
Banks			
State	59715	68570	**128285**
Fed	4631		**4631**
Fed XVC			
Total	64346	68570	**132916**

NOTICE TO STATE WATER PROJECT CONTRACTORS

Date: **March 22, 2013**

Number: **13-09**

Subject: 2013 Table A Allocation Decrease

From: Mark Anderson for
Carl A. Torgersen
Deputy Director
Department of Water Resources

The Department of Water Resources (DWR) is adjusting its projection for meeting the State Water Project (SWP) contractors' 2013 Table A requests.

DWR is reducing its projected delivery capability from 1,668,958 acre-feet to 1,460,342 acre-feet. This reduction equates to a drop in allocations from 40 percent to 35 percent for long-term SWP contractors. Enclosed is the revised 2013 SWP Allocation Table.

This decrease is primarily due to the well below average statewide snowpack and precipitation. DWR will continue to monitor the situation and may revise the allocations if warranted by the year's developing hydrologic and water supply conditions.

Based on this updated allocation, DWR will use the contractors' current 40 percent delivery schedules in developing new schedules, unless revised schedules are submitted. DWR will send an approved monthly water delivery schedule to each long-term contractor in April.

If you have any questions or need additional information, please contact Robert Cooke, Chief of DWR's State Water Project Analysis Office, at (916) 653-4313.

Enclosure

2013 STATE WATER PROJECT ALLOCATION
(ACRE-FEET)

SWP CONTRACTORS	TABLE A (1)	INITIAL REQUEST (2)	APPROVED ALLOCATION (3)	PERCENT INITIAL REQUEST APPROVED (3)/(2) (4)
FEATHER RIVER				
County of Butte	27,500	27,500	9,625	35%
Plumas County FC&WCD	2,410	2,410	844	35%
City of Yuba City	9,600	9,600	3,360	35%
Subtotal	**39,510**	**39,510**	**13,829**	
NORTH BAY				
Napa County FC&WCD	29,025	29,025	10,159	35%
Solano County WA	47,656	47,656	16,680	35%
Subtotal	**76,681**	**76,681**	**26,839**	
SOUTH BAY				
Alameda County FC&WCD, Zone 7	80,619	80,619	28,217	35%
Alameda County WD	42,000	42,000	14,700	35%
Santa Clara Valley WD	100,000	100,000	35,000	35%
Subtotal	**222,619**	**222,619**	**77,917**	
SAN JOAQUIN VALLEY				
Oak Flat WD	5,700	5,700	1,995	35%
County of Kings	9,305	9,305	3,257	35%
Dudley Ridge WD	50,343	50,343	17,620	35%
Empire West Side ID	3,000	3,000	1,050	35%
Kern County WA	982,730	982,730	343,956	35%
Tulare Lake Basin WSD	88,922	88,922	31,123	35%
Subtotal	**1,140,000**	**1,140,000**	**399,001**	
CENTRAL COASTAL				
San Luis Obispo County FC&WCD	25,000	25,000	8,750	35%
Santa Barbara County FC&WCD	45,486	45,486	15,920	35%
Subtotal	**70,486**	**70,486**	**24,670**	
SOUTHERN CALIFORNIA				
Antelope Valley-East Kern WA	141,400	141,400	49,490	35%
Castaic Lake WA	95,200	95,200	33,320	35%
Coachella Valley WD	138,350	138,350	48,423	35%
Crestline-Lake Arrowhead WA	5,800	5,800	2,030	35%
Desert WA	55,750	55,750	19,513	35%
Littlerock Creek ID	2,300	2,300	805	35%
Metropolitan WDSC	1,911,500	1,911,500	669,025	35%
Mojave WA	82,800	82,800	28,980	35%
Palmdale WD	21,300	21,300	7,455	35%
San Bernardino Valley MWD	102,600	102,600	35,910	35%
San Gabriel Valley MWD	28,800	28,800	10,080	35%
San Gorgonio Pass WA	17,300	17,300	6,055	35%
Ventura County WPD	20,000	20,000	7,000	35%
Subtotal	**2,623,100**	**2,623,100**	**918,086**	
TOTAL	**4,172,396**	**4,172,396**	**1,460,342**	

SWPAO
3/21/2013

Central Valley Project Water Supply

~ Interpreting Water Supply Forecasts ~

Download Map PDF JPG

Up-To-Date

- Reservoir Conditions Map
- CVP Operations
- Daily CVP Reports
- Monthly Delta Operations
- Hydro Cond Exec Summ
- Water Delivery Fact Sheet
- Water Contracts Fact Sheet
- Water Transfer Fact Sheet

Statistical Information

- CVP Contractors
- CVP Historical Water Allocations
- CVP Quantities/2013 Allocation
- Central Valley Water Contractors
- Water Delivered 2006 - 2011
- Water Transfers 2005-2011
- Annual Federal-State Operations Info 2012 (pdf - 58 KB)
- Water Year Carry Over Announcement 2013

NOAA Precipitation Predictions
1 Month 3 Months

Central Valley Project
Water Plan 2013 - March Update

Annual Federal-State Operations:

2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |

- 2013 Rescheduling Guidelines San Luis Reservoir (pdf - 59 KB)
- July 15, 2013 - Friant Division Allocation Increased - *New*

Mid Pacific Region - CVP Water Year 2013 Water Supply Allocation Update: March 22, 2013									
	Sacramento Valley Water Year Type and Percentage of Average Runoff	North of Delta (percentages of contracted water supply)				South of Delta (percentages of contracted water supply)			
		AG	M&I	R	WR	AG	M&I	R	WR
Conservative Forecast (90%)	Critical 65% of Average	75	100*	100**	100***	20	70	100**	100***
Median Forecast (50%)	Dry 78% of Average	100	100	100	100	30	75	100	100
5 Yr Average Allocation		76	90	100	100	43	77	100	100

ATTACHMENT B

Ag = Agriculture M&I = Municipal and Industrial R = Refuges WR = Water Rights

* North-of-Delta M&I water service contractors who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.
* North-of-Delta M&I water service contractors who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.
* Contra Costa Water District, which receives water directly from the Delta, is allocated 75 percent of its historic use amount of 170,000 acre-feet.
**The allocation shown in the table for wildlife refuges applies to Level 2 water supplies. A full refuge water supply (including Level 2 and incremental Level 4 water) is 555,515 acre-feet. Level 2 is 422,251 acre-feet which accounts for approximately three-fourths of annual refuge needs.
*** The allocation for water rights contractors are based upon pre-CVP held water rights and wildlife refuge contractors are based upon pre-established Shasta inflow criteria.

News Release
(click to go to press release)

July 15, 2013

Reclamation Announces Update to the 2013 Central Valley Project Water Supply Allocation

Allocations Increased for Friant Division Contractors

The full CVP allocation follows, including the increased allocation for Friant Division Contractors.

North of the Delta Contractors

Sacramento River

- Agricultural water service contractors North-of-Delta are allocated 75 percent of their contract supply of 443,000 acre-feet.
- M&I water service contractors North-of-Delta who are serviced by Shasta Reservoir on the Sacramento River are allocated 100 percent of their contract supply.
- Sacramento River Settlement Contractors, whose water supply is based upon senior water rights and is subject to pre-established Shasta Reservoir inflow criteria, are allocated 100 percent of their contract supply of 2.2 million acre-feet.

American River

- M&I water service contractors North-of-Delta who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.

In-Delta

- The Contra Costa Water District, which receives water directly from the Delta, is allocated 75 percent of its historic use amount of 170,000 acre-feet.

South of the Delta Contractors

- The allocation for agricultural water service contractors South-of-Delta is decreased from 25 to 20 percent of their contract supply of 1.965 million acre-feet.
- The allocation for M&I water service contractors is decreased from 75 to 70 percent of their historic use.
- San Joaquin River Exchange and Settlement Contractors, whose CVP water supply allocation is subject to pre-established Shasta Reservoir inflow criteria, are allocated 100 percent of their contract supply of 875,000 acre-feet.

Wildlife Refuges

- Wildlife refuges (Level 2) North- and South-of-Delta, which also have allocations subject to pre-established Shasta inflow criteria, are allocated 100 percent of their contract supply of 422,000 acre-feet.

Friant Division Contractors

- ***CHANGED July 15, 2013***: Friant Division contractors' water supply is delivered from Millerton Reservoir on the upper San Joaquin River. The first 800,000 acre-feet of water supply is considered Class 1 and the next 1.4 million acre-feet is considered Class 2. The Friant Division water supply allocation is increased from 55 percent to 62 percent of Class 1. Class 2 water remains at 0 percent.

Eastside Water Service Contractors

- Eastside water service contractors (Central San Joaquin Water Conservation District and Stockton East Water District), whose water supplies are delivered from New Melones Reservoir on the Stanislaus River, are allocated their full contract supply of 155,000 acre-feet.

Reclamation determines the water allocation for agricultural, environmental and municipal and industrial purposes based upon many factors, including water quality requirements, flow objectives, relative priority of water rights, and Endangered Species Act protection measures, including operational adjustments in accordance with biological opinions to protect threatened and endangered fish species.

Water supply updates will be made as appropriate and will be posted on http://www.usbr.gov/mp/pa/water. For additional information, please contact the Public Affairs Office at 916-978-5100 (TTY 916-978-5608) or email mppublicaffairs@usbr.gov.

###

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 western states. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at http://www.usbr.gov.

Top

Learn more about the Central Valley Project

Related websites include...

FWS NOAA Calif DWR

For assistance or additional information about this website, please contact Public Affairs
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, Sacramento CA 95825-1898
Main (916) 978-5100 | FAX (916) 978-5114 | TTY (916) 978-5608
Reclamation Officials' Telephone Numbers

July 31, 2013

Central Valley Project (CVP) Water Quantities
w/2013 Allocation

Contractors	Maximum per Contract or Agreement (acre-feet)	M&I Historical Use (1) (acre-feet)	Agricultural Use (2) (acre-feet)	2013 Allocation by %	2013 Allocation by acre-feet
North of the Delta					
American River M&I	313,750	178,077		75%	133,558
Sacramento River					
Water Service	468,990				
Agriculture			423,538	75%	317,654
M&I		45,452		100%	45,452
Water Rights (3)	2,115,620			100%	2,115,620
Refuge - Level 2 (4)	151,250			100%	151,250
South of the Delta					
Water Service	2,110,648				
Agriculture			1,967,677	20%	393,535
M&I		142,971		70%	100,080
Water Rights	875,023			100%	875,023
Refuge - Level 2 (4)	271,001			100%	271,001
Contra Costa In Delta	195,000	170,000		75%	127,500
New Melones East Side (5)	155,000			100%	155,000
East-Side Water Rights (6)	600,000				600,000
Friant					
Class 1	800,000			62%	496,000
Class 2	1,401,475			0%	0
Buchanan Unit	24,000				24,000
Hidden Unit	24,000				24,000
Total Contracted Water (7) (8)	9,505,757				5,629,672

Notes:

1. M&I historical use is computed when the M&I allocation is less than 100% and is based upon the average of actual deliveries made the last 3 years of unconstrained CVP delivery. The historical use for Contra Costa Water District is 170,000 acre-feet as agreed upon in contract renewal negotiations.
2. Agricultural use computed as maximum contract amount less M&I historical use, if any.
3. Sacramento River Water Rights includes: base supply (1,775,509 a.f.) & Project supply (340,111 a.f.)
4. Project also acquires up to 133,264 a.f. incremental Level 4 from willing sellers subject to availability and funding.
5. New Melones East Side allocation is computed as a quantity, rather than a percent, since only one group receives the water allocation.
6. Oakdale I.D. and South San Joaquin I.D. receive up to 600,000 a.f. of water annually based upon a 1988 Agreement and Stipulation in recognition of the Districts Melones water rights. The Districts are not allocated water, but rather receive water based upon in-flows into New Melones and application of a formula in the 1988 Agreement.
7. Water supplied to City of Sacramento under operations agreement not included: Amer. R. (245,000 a.f.) & Sacramento R. (90,000 a.f.)
8. Total does not include 800,000 CVPIA b(2) water provided out of Project yield for mitigation purposes.

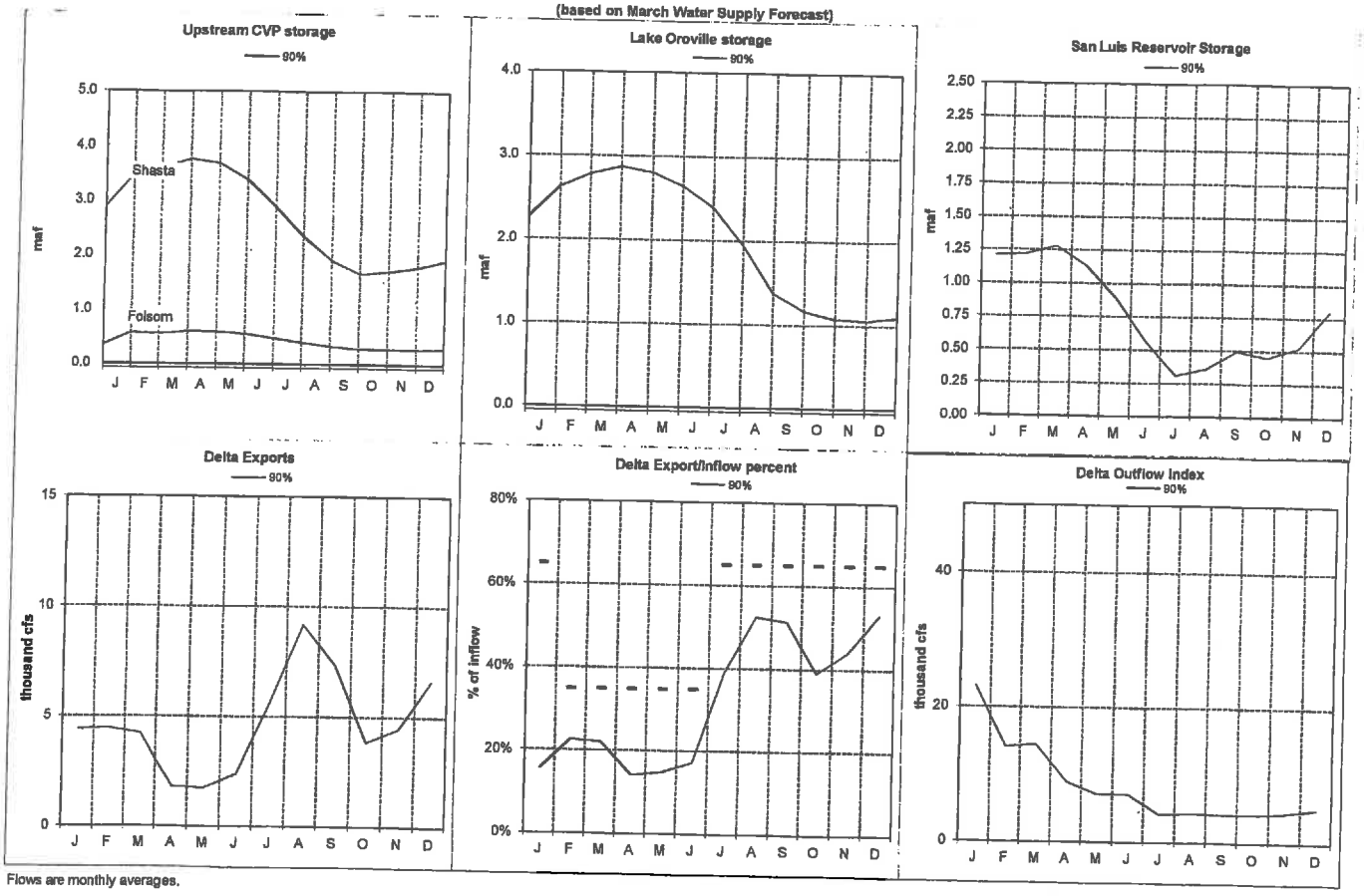
Bureau of Reclamation

ATTACHMENT C

Revised - 07/17/2013

SWP & CVP CY 2013 Forecasted Operations

(based on March Water Supply Forecast)



Flows are monthly averages.

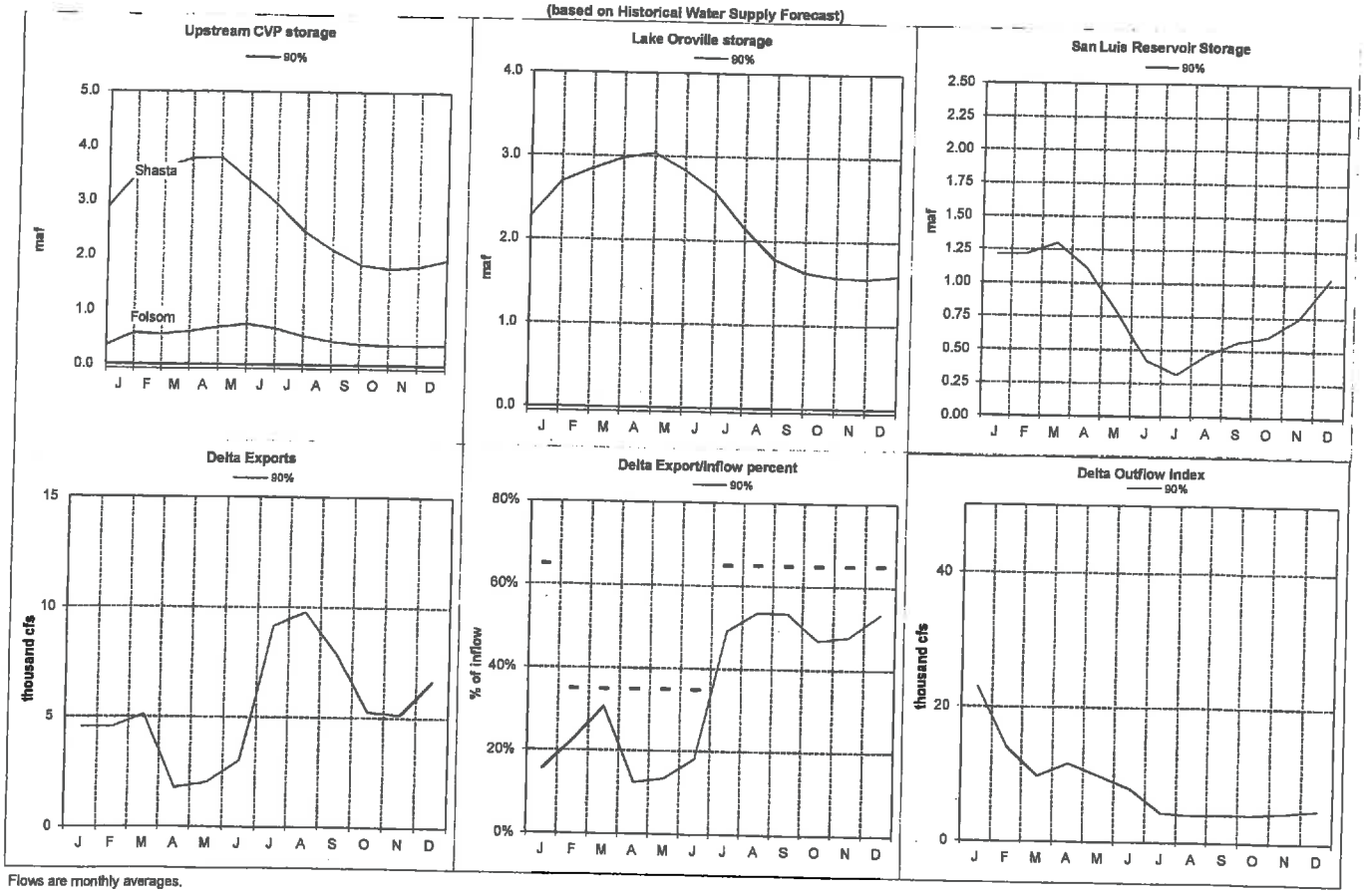
PRELIMINARY DATA - SUBJECT TO REVISION

Meeting
March 27, 2013

ATTACHMENT D

SWP & CVP CY 2013 Forecasted Operations

(based on Historical Water Supply Forecast)



Flows are monthly averages.

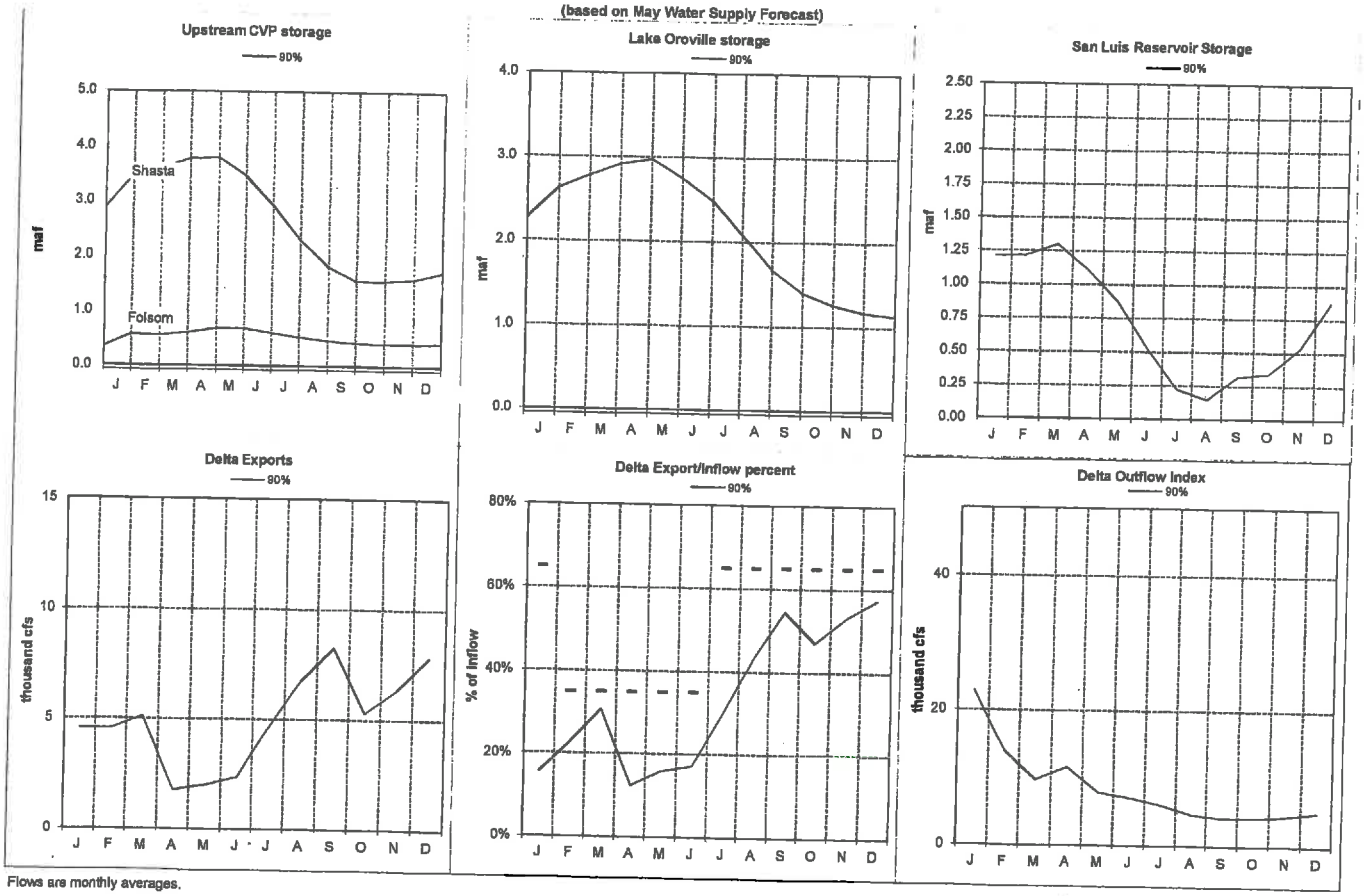
PRELIMINARY DATA - SUBJECT TO REVISION

Meeting
September 25, 2013

ATTACHMENT E

SWP & CVP CY 2013 Forecasted Operations

(based on May Water Supply Forecast)

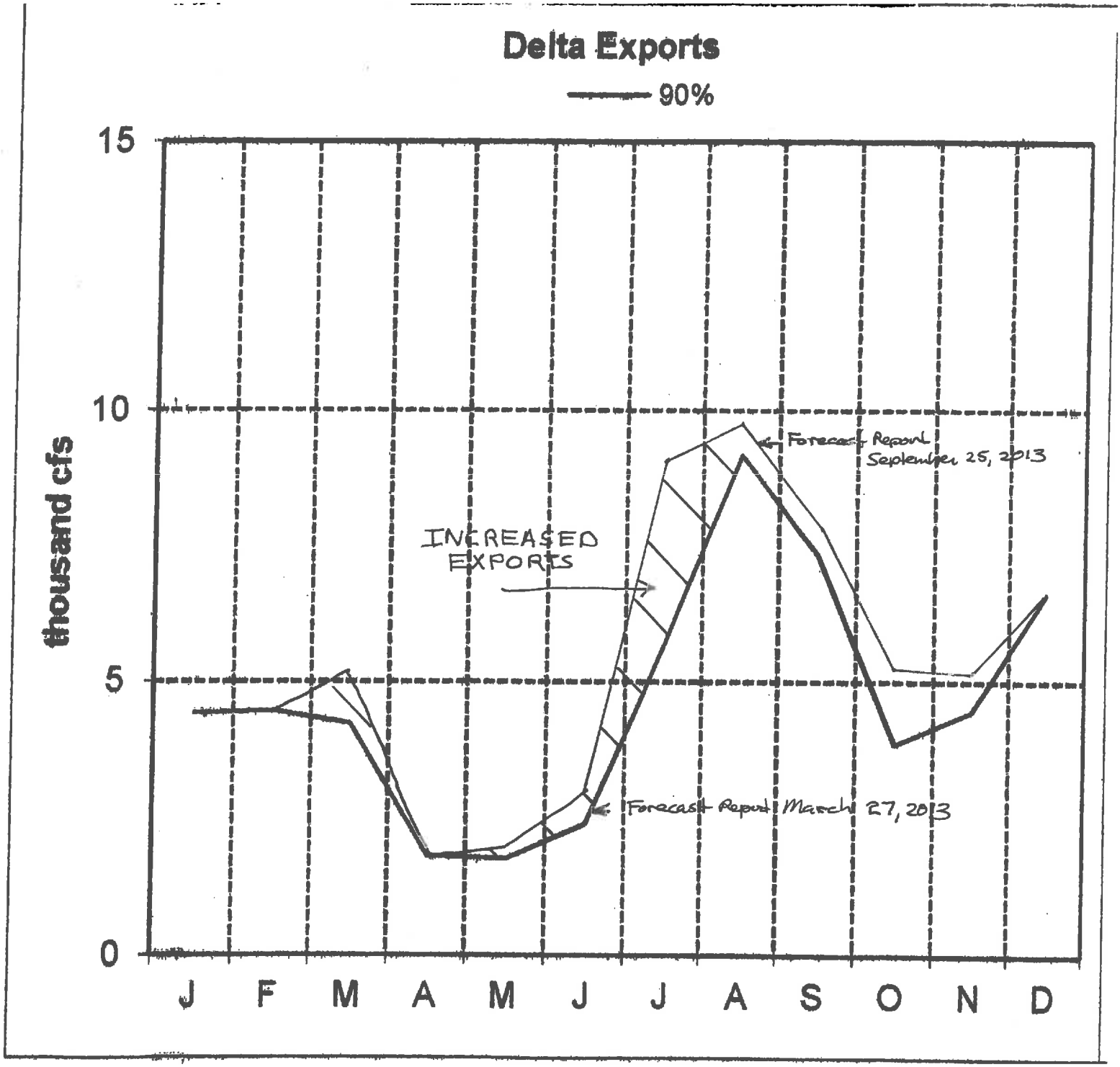


Flows are monthly averages.

PRELIMINARY DATA - SUBJECT TO REVISION

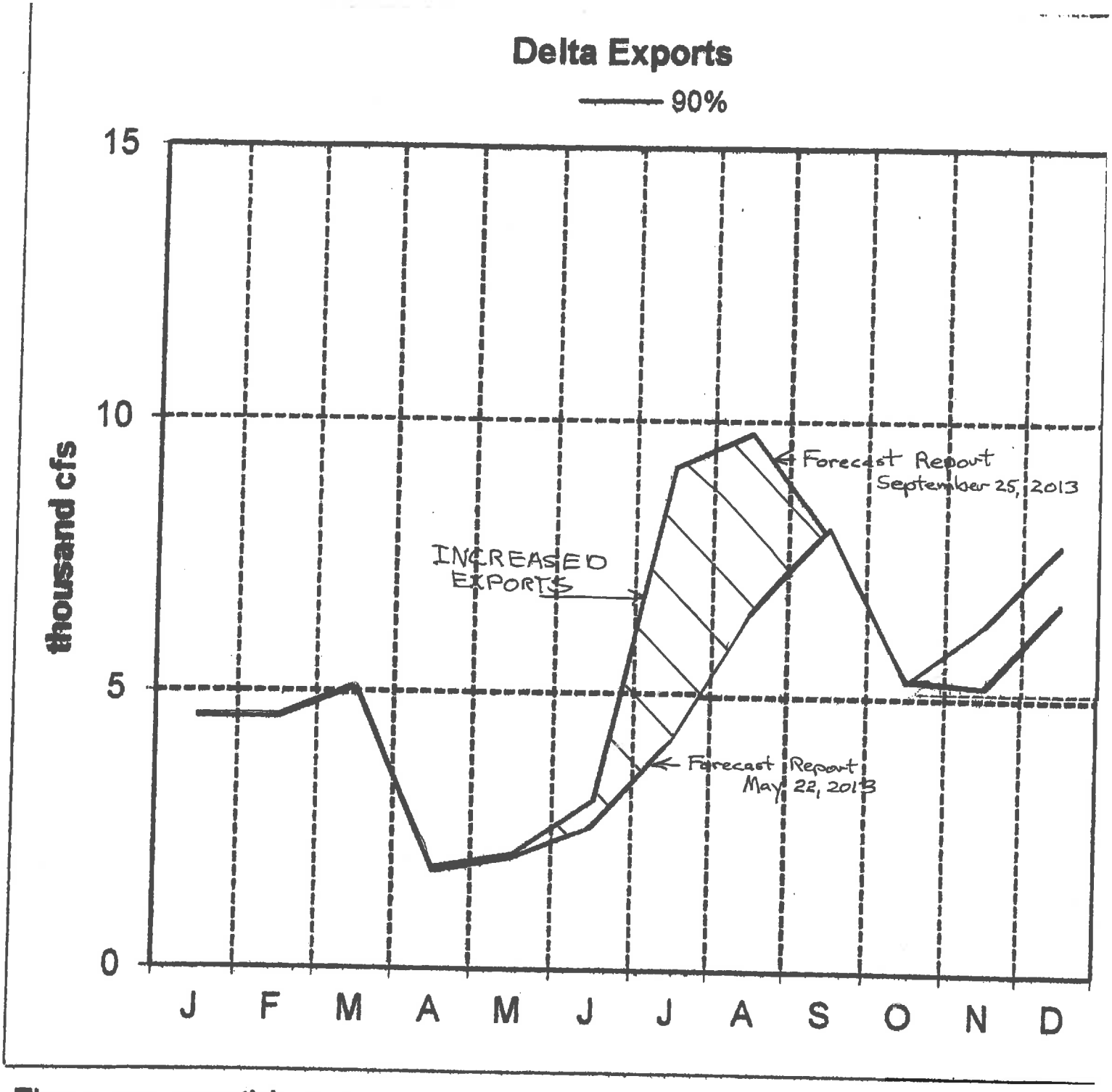
Meeting
May 22, 2013

ATTACHMENT F



Flows are monthly averages.

FIGURE ONE



Flows are monthly averages.

FIGURE TWO

The State Water Project

Final Delivery Reliability Report 2011

June 2012

State of California
Natural Resources Agency
Department of Water Resources

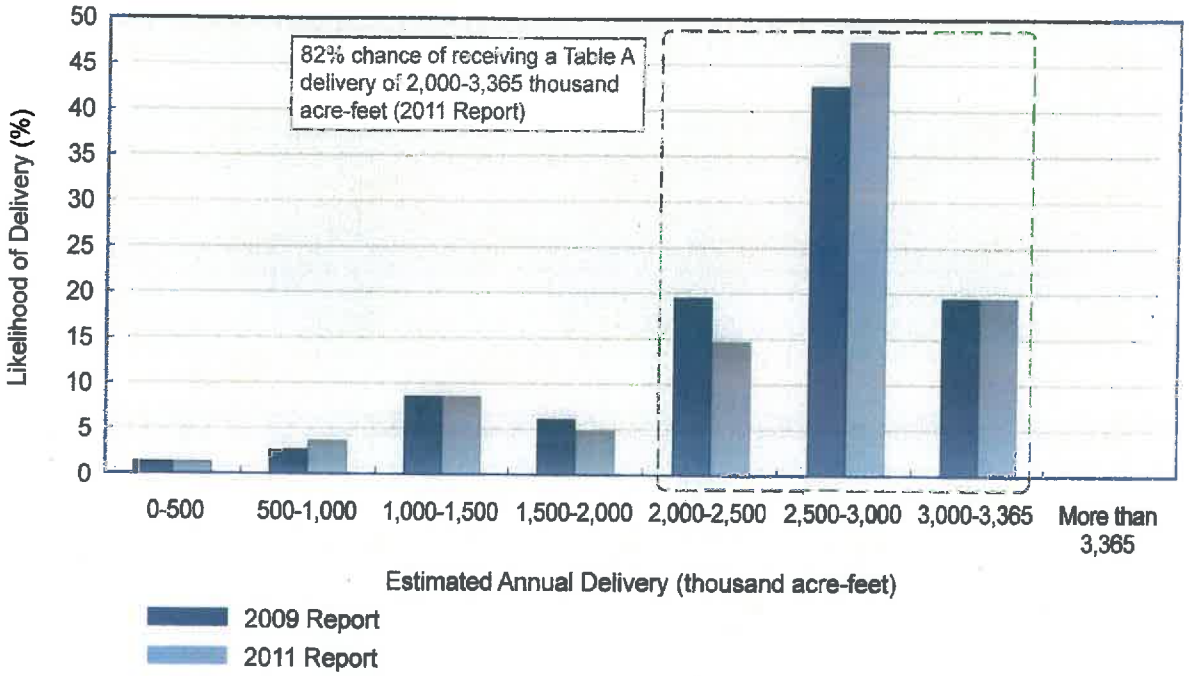


Figure 6-4. Estimated Likelihood of SWP Table A Water Deliveries (Existing Conditions)

Table 6-3. Estimated Average and Dry-Period Deliveries of SWP Table A Water (Existing Conditions), in Thousand Acre-Feet (Percent of Maximum SWP Table A Amount, 4,133 taf/year)

	Long-term Average	Single Dry Year (1977)	2-Year Drought (1976-1977)	4-Year Drought (1931-1934)	6-Year Drought (1987-1992)	6-Year Drought (1929-1934)
2009 Report	2,483 (60%)	302 (7%)	1,496 (36%)	1,402 (34%)	1,444 (35%)	1,398 (34%)
2011 Report	2,524 (61%)	380 (9%)	1,573 (38%)	1,454 (35%)	1,462 (35%)	1,433 (35%)

Table 6-4. Estimated Average and Wet-Period Deliveries of SWP Table A Water (Existing Conditions), in Thousand Acre-Feet (Percent of Maximum SWP Table A Amount, 4,133 taf/year)

	Long-term Average	Single Wet Year (1983)	2-Year Wet (1982-1983)	4-Year Wet (1980-1983)	6-Year Wet (1978-1983)	10-Year Wet (1978-1987)
2009 Report	2,483 (60%)	2,813 (68%)	2,935 (71%)	2,817 (68%)	2,817 (68%)	2,872 (67%)
2011 Report	2,524 (61%)	2,886 (70%)	2,958 (72%)	2,872 (69%)	2,873 (70%)	2,833 (69%)

CENTRAL DELTA WATER AGENCY
235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone 209/465-5883 • Fax 209/465-3956

August 13, 2013

Felicia Marcus
Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Re: 2013 SWP and CVP Violations of D-1641

Dear Madam Chair:

The Central Delta Water Agency is concerned that the current year violations of D-1641 by the SWP and CVP are indicative of a plan and practice of the United States Bureau of Reclamation and California Department of Water Resources to violate water quality standards to further exports of water from the Delta. Compliance with the standards is a condition to their right to export from the Delta.

While we appreciate the "after the fact" notification and discussion of the decision to not enforce compliance, we submit that the process was both inappropriate and contrary to law.

SWRCB staff were first contacted by the fish agencies around May 17, 2013. The Emmaton Agricultural Standard violations were first apparent on or about April 22, 2013. Our first notification was from Melinda Terry on May 28, 2013 (Exhibit A) and from Les Grober on May 29, 2013 (Exhibit B). The notification included the email from Tom Howard stating:

> "The State Water Board staff will not recommend any action if the projects operate to meet the critically dry year objectives for Western and Central Delta agricultural objectives, instead of operating to meet dry year objectives through August 15, 2013. Our intent not to take any action is conditioned on submittal of a temperature management plan pursuant to State Water Board Order 90-5 within one week of May 28, operation in accordance with the plan, and any further conditions determined by the Executive Director of the State Water Board. Furthermore, the Projects will be required to include an accounting of operations under the change in water year classification."

On May 30, 2013, we received by email from Les Grober a letter signed by Craig Wilson, Delta Watermaster (Exhibit C). The transmittal referred to the letter as dated May 29, 2013, although no date appears on the letter. The Wilson letter concurred in the Tom Howard determination that staff would not take any action if the SWP and CVP operated to Critical Year rather than Dry Year D-1641 agricultural standards for western and central Delta stations at Emmaton, Jersey Point, San Andreas Landing and Terminous.

The justification presented by the project operators and the fish agencies for the violation of the agricultural standards was the lack of rainfall in the January to May period and the desire to "conserve CWP resources in Shasta Reservoir needed to protect Chinook salmon this season." (emphasis added.) The water year classification in D-1641 is the exact classification which the SWP, CVP and their contractors wanted to facilitate their meeting the standards. The SWRCB granted their request. The ability to meet standards is not solely dependent on the January to May rainfall but is also dependent upon the precipitation in October through December and the water in storage, both of which were ample.

OBJECTION TO PROCESS

While prosecutorial discretion could be argued as a basis for not taking action with regard to a past violation, it is certainly not appropriate for future actions. The promise of no action for future violations is in effect a change in the water quality standards and terms of the CVP and SWP permits.

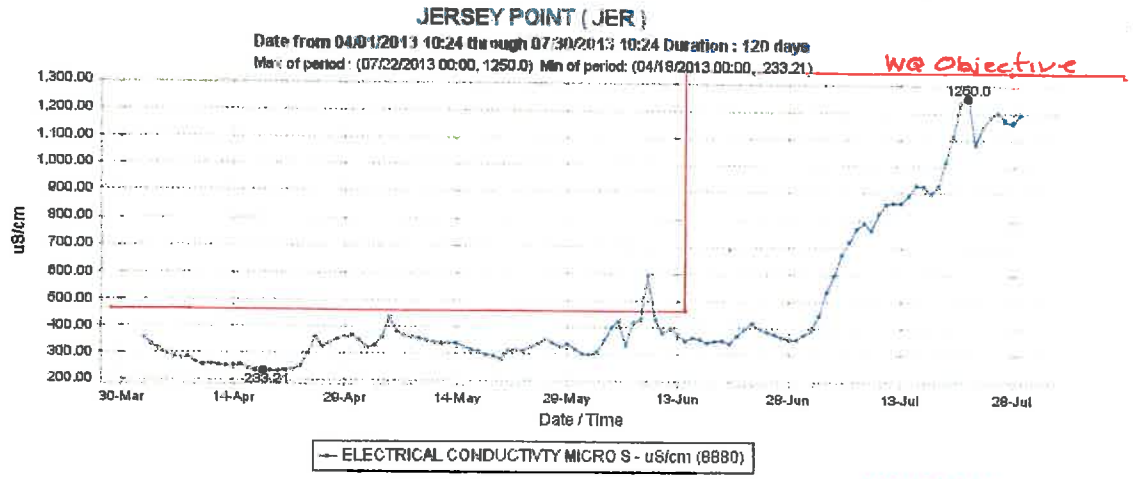
All affected interests should have been given the opportunity to participate in a public process before a decision was made.

A special meeting of the Board would have been an appropriate alternative to the action by staff.

WAS THE SAVINGS IN WATER FROM VIOLATION OF THE AGRICULTURAL STANDARDS HELD IN SHASTA FOR THE COLD WATER POOL FOR SALMON THIS SEASON OR WAS IT EXPORTED?

Figure 1 shows the periods of violation of the agricultural standards at Emmaton and Jersey Point and the corresponding rates of SWP and CVP exports from the Delta at Clifton Court and the Tracy pumping plant. During the period of April 15 to June 15, it appears that export pumping rates were higher during the periods of violations of the standards.

It is disturbing that none of the correspondence from the trust agencies responsible for protection of fish and none of the SWRCB staff correspondence addressed the need for a reduction in SWP or CVP exports or other measures to save cold water for salmon. The single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WQ Objective
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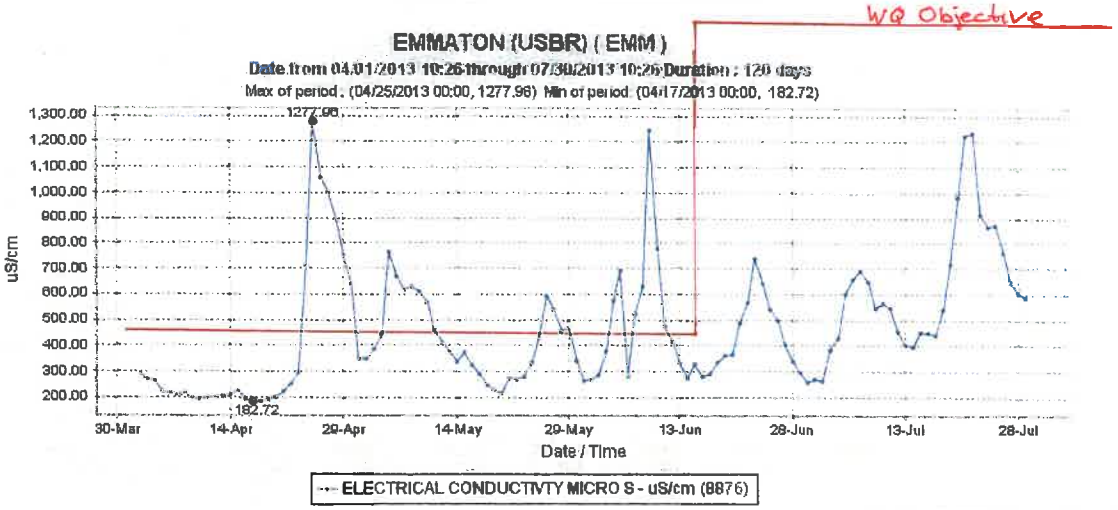
233.21
uS/cm
1,300.00
1,200.00
1,100.00
1,000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
30-Mar
14-Apr
29-Apr
14-May
29-May
13-Jun
28-Jun
13-Jul
28-Jul
Date / Time
ELECTRICAL CONDUCTIVITY MICRO S - uS/cm (8880)


WQ Objective
EMMATON (USBR) (EMM)
Date from 04/01/2013 10:26 through 07/30/2013 10:26 Duration : 120 days
Max of period : (04/25/2013 00:00, 1277.98) Min of period: (04/17/2013 00:00, 182.72)
1277.98
182.72
uS/cm
1,300.00
1,200.00
1,100.00
1,000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
30-Mar
14-Apr
29-Apr
14-May
29-May
13-Jun
28-Jun
13-Jul
28-Jul
Date / Time
ELECTRICAL CONDUCTIVITY MICRO S - uS/cm (8876)

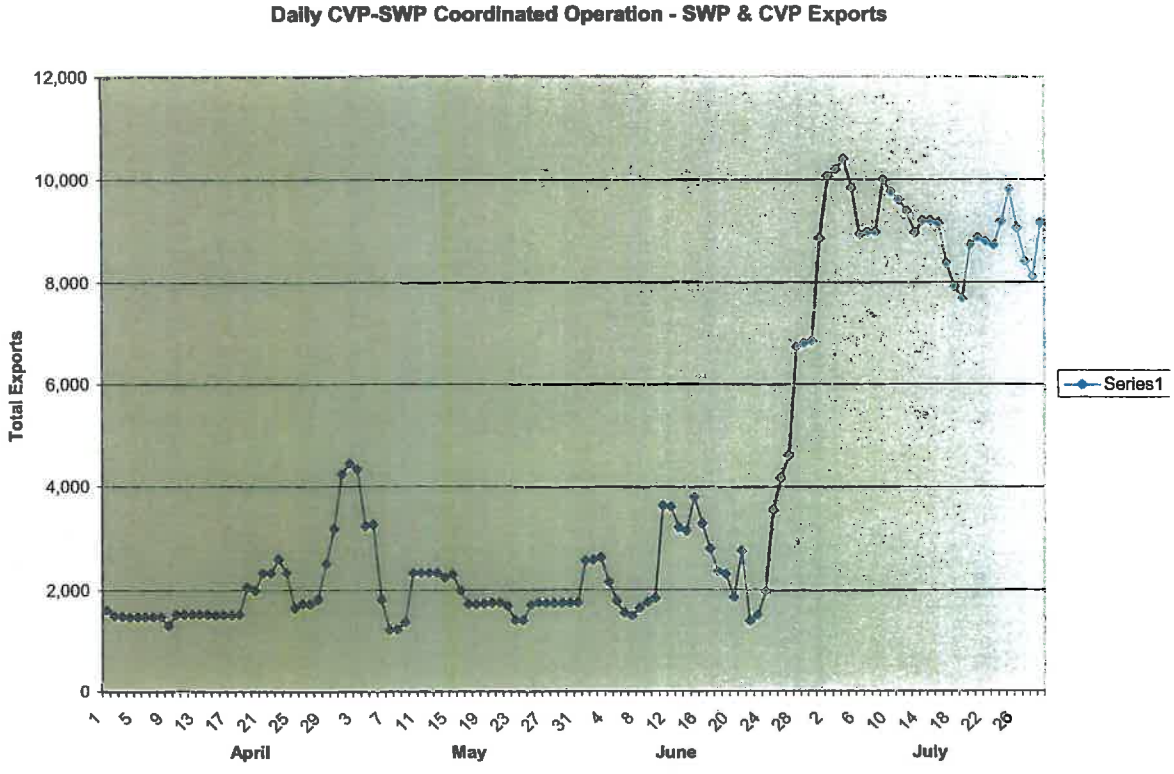
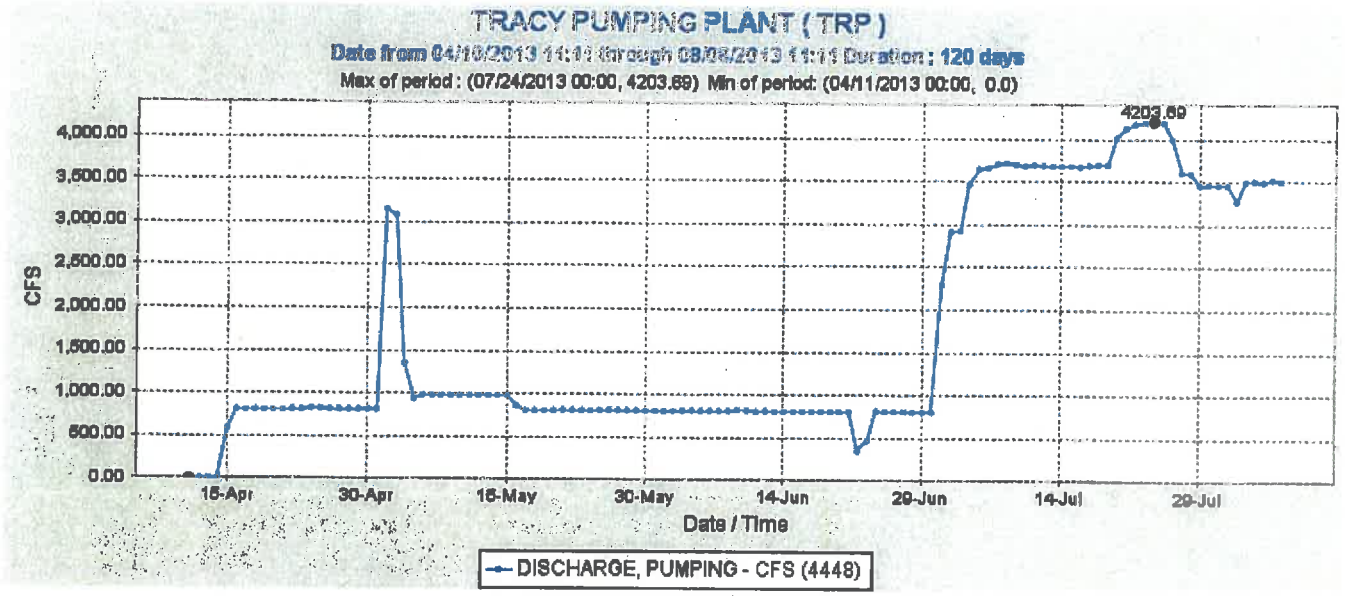

Daily CVP-SWP Coordinated Operation - SWP & CVP Exports
Total Exports
12,000
10,000
8,000
6,000
4,000
2,000
0
1 5 9 13 17 21 25 29 3 7 11 15 19 23 27 31 4 8 12 16 20 24 28 2 6 10 14 18 22 26
April
May
June
July
Series1

FIGURE 1

Welcome to California Data Exchange Center

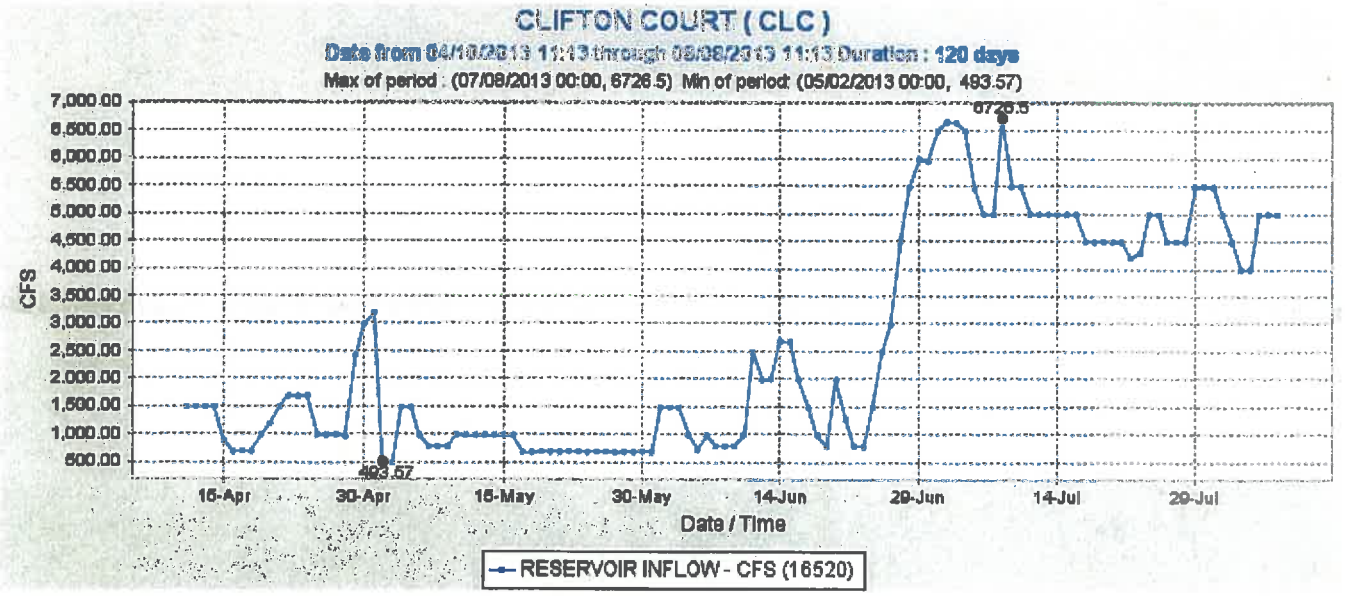


Generated on Thu Aug 08 11:11:54 PDT 2013

Plot all TRP Sensors | Real-Time TRP Data | TRP Data | Daily TRP Data | Show TRP Map | TRP Info

Plot from ending date: 08/08/2013 11:11 Span: 120 days Get custom plot

Welcome to California Data Exchange Center



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Plot all CLC Sensors | Real-Time CLC Data | CLC Data | Daily CLC Data | Show CLC Map | CLC Info

Plot from ending date: 08/08/2013 11:13 Span: 120 days Get custom plot

FIGURE 1
Page 2

focus was on reduction of the flow required to meet the agricultural standards. Compliance with the D-1641 agricultural standards is a condition of the rights for the SWP and CVP to divert.

The huge increase in exports after June 24th raises further questions as to the motivation of preserving cold water in Shasta to protect salmon this season. The exported water obviously included some stored water from Shasta.

It appears that warmer water is being released into the river for power production and/or export thereby reducing the ability to meet the cold water standard.

Exports are being elevated to a priority over protection of salmon, salinity control and adequate supplies for the Delta. Salinity control for western and central Delta agriculture is also salinity control for other uses of Delta water including those of the SWP and CVP exports. The environmental impacts of the changes to the standards needs careful analysis.

The June 3, 2013, letter from the Bureau of Reclamation to Barbara Evoy (Exhibit D) is the Temperature Management Plan pursuant to State Water Board Order 90-5 required by Tom Howard and Craig Wilson. It moves the temperature control point farther upstream but does not address the management of releases from storage to maintain the cold water for salmon.

The Temperature Management Plan (hereinafter TMP) is stated to have been developed by the Sacramento River Temperature Task Group (SRTTG) which includes representatives of the SWRCB. The TMP moves the 56 degree Fahrenheit temperature compliance point from the Red Bluff Diversion Dam upstream to the Airport Road Bridge at Anderson. The straight line distance between the two locations on the Google maps is 22.35 miles. The river spawning ground miles is much greater. The remaining spawning area in the Sacramento River which is protected has a straight line distance of about 10.0 miles. Protection for roughly 2/3 of the Sacramento River spawning area has been reduced.

Board Order WR 90-5 included a comprehensive examination of the cold water requirements on the Sacramento River which are now being significantly revised. There is an obvious need for the SWRCB to exercise its public trust responsibility to carefully review the impact of the CVP operations on the salmon spawning in the Sacramento River including in particular the exports from the Delta. The introduction of warm water from releases for power production and export should also be reviewed. The impacts on salmon are not limited to winter run but could be even more critical to other runs including the fall run. The concern is not just the current year but future years as well. The trust agencies with direct responsibility for protection of fish have in the past, such as in February of 2009, failed or were unable to assert protection of the public trust and their current failure to even mention factors other than reduction of flows for meeting the western and central Delta agricultural standards is disturbing.

The TMP provides as a finding:

> "After consultations with NMFS and review of temperature model results from March, April and May and supported by operational experience, it was determined that temperatures of 56.0°F or less cannot be met at Red Bluff Diversion Dam regardless of the water supply allocation to Central Valley Project contractors." (emphasis added.)

Are the project operators contending that releases of stored water from Shasta for delivery to project contractors do not affect their ability to meet temperature requirements on the River?

Releases from Shasta for CVP in basin or export contractors or even power production would appear to impact cold water in Shasta similar to releases to meet D-1641 agricultural standards. Why was the focus only on the western and central Delta agricultural standards?

Is there a plan and practice on the part of the State and Federal agencies to violate water quality objectives and standards to foster greater exports from the Delta to serve south of Delta interests?

In February of 2009, the SWRCB held a hearing on the failure of the SWP and CVP to meet the D-1641 minimum monthly outflow requirement for Fish and Wildlife for February. The project operators represented that the reduction in outflow was necessary to save cold water to protect salmon later in the year. The decision to violate the standard was made in an operation meeting where representatives of the trust agencies responsible for protecting fish were present. The trust agencies looked the other way and subsequently the SWRCB took no action. As the evidence clearly demonstrated the project operators were dishonest. The water necessary to meet the standard was not stored water but was unregulated flow which was being exported from the Delta.

There are other examples of deliberate violation of Delta standards including the southern Delta agricultural standards which are reflected in the SWRCB records.

LACK OF SURPLUS WATER FOR EXPORT

The shortage of water is crystal clear and there appears to be an effort to provide a priority for exports over meeting water quality standards. The projects were out of water after 2007 and 2008 and violated the February 2009 outflow requirements for fish. Now, the lack of rain in January through May has caused a crises even though on May 29, 2013, the major reservoir storage was 85% of the historic average at Shasta, 88% of the historic average at Folsom and 93% of the historic average at Oroville (See Exhibit E).

If this year is in crises, what happens if next year is dry or what will happen in a series of dry years such as 1929-34 or 1987-92? Climate change may also reduce available water supply?

Exhibit F shows the unimpaired flows for such years and other dry years demonstrating the relative frequency of water shortage.

The Sacramento-San Joaquin Delta watershed was never intended and is clearly not capable of producing sufficient water to meet in-basin and export needs. Figure 2 is a graph of the 1917 to 1947 hydrology which reflects the basis for the planning of the SWP. The planning for the SWP recognized the limitation of water availability in the Central Valley and provided that the SWP by the year 2000 was to import 5,000,000 acre feet seasonally to the Delta from development on north coastal streams for transfer to areas of deficiency.

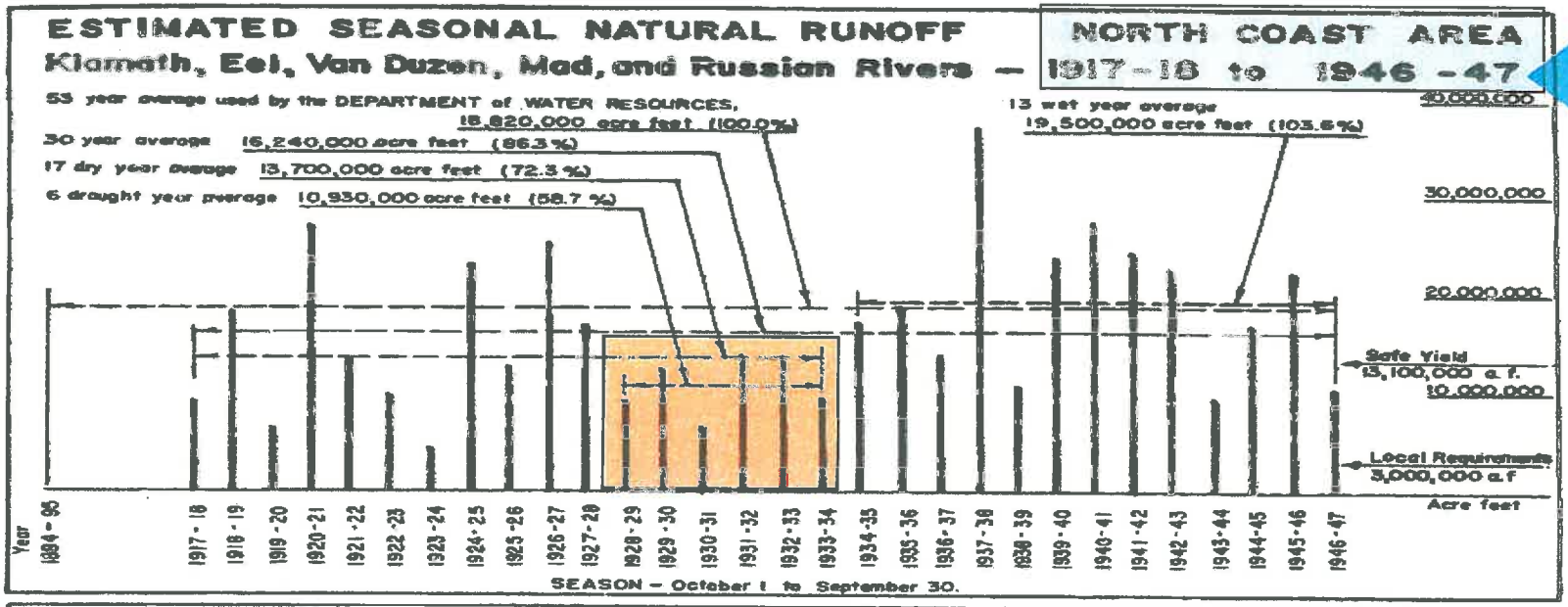
Figure 3 is a graph from the December 1960 DWR Bulletin 76 Report to the Legislature which shows the demands and timing of needed water supplies (a copy of the full report is attached as Exhibit G).

Figure 4 is a graph from the same report showing the projects and timing. Development of such water from the North Coast has not occurred. Additionally, as stated in said report at page 12, the Delta Protection Act (WC 12200 et seq.) requires that no water is to be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.

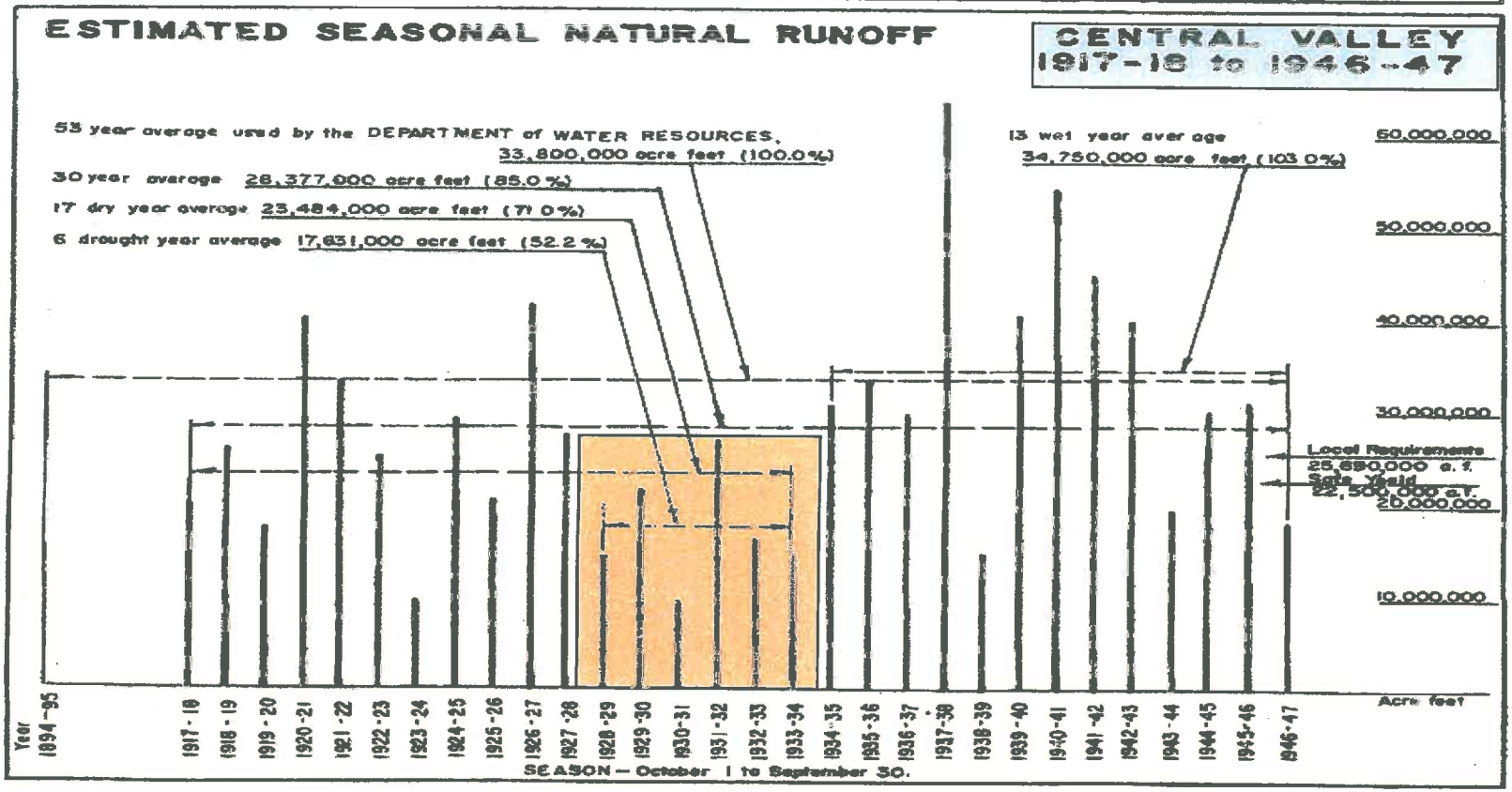
In addition to the Delta Protection Act, the Watershed Protection Act (WC 11460 et seq.) requires that project exports be limited to water which is surplus to the needs in the Delta and other watersheds of origin.

Both the Tom Howard letter and Craig Wilson letter require the projects to provide an accounting of operations under the change of water year classification. The Craig Wilson letter specifies a deadline of August 22, 2013. Such accounting should include how much water was saved by the violation of the agricultural standards and how such water was saved as cold water storage and not exported. The project operators should also be requested to present a plan for future compliance with D-1641 for the remainder of this year and in future years including the possibility of hydrology similar to 1929-34 and 1987-1992. Exports must be limited to water which is surplus to the needs within the Delta and other areas of origin including the need to comply with D-1641.

The earliest violations of the Emmaton Standards were reported to be due to unusually high depletions (presumably unexpected) in the Sacramento Valley. Aside from the need for more early season water to replace water not available from rainfall, there have been previous transfers of water from the Sacramento Valley which include water which is not limited to the actual saving in consumptive use such as those which allow for groundwater substitution. Given



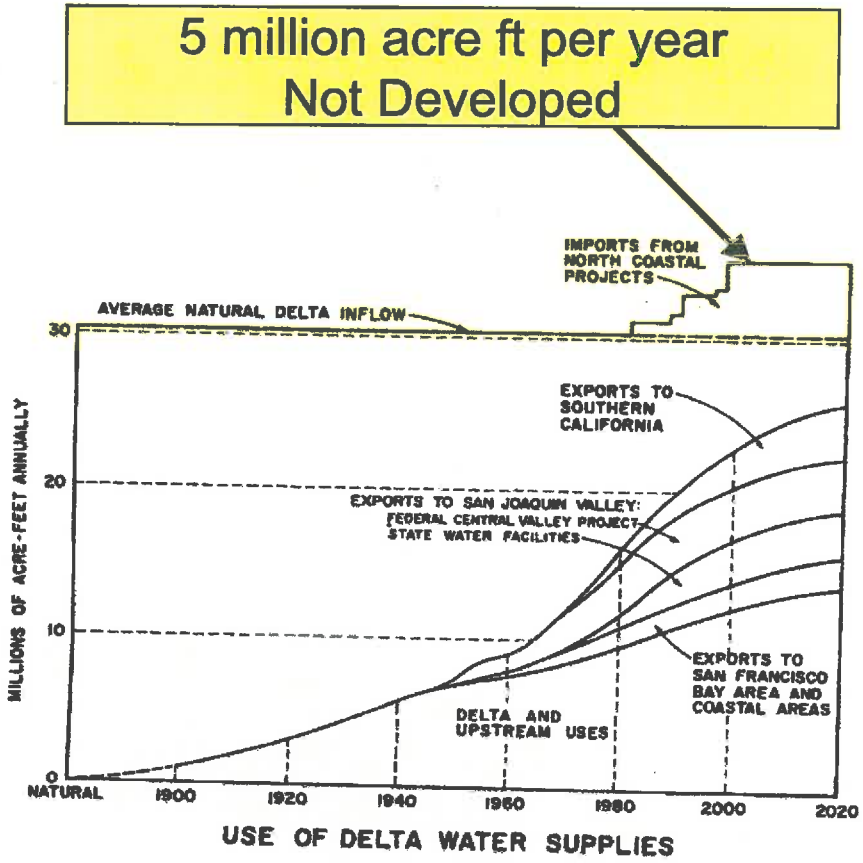
Surplus
7,930,000 AF/ YR



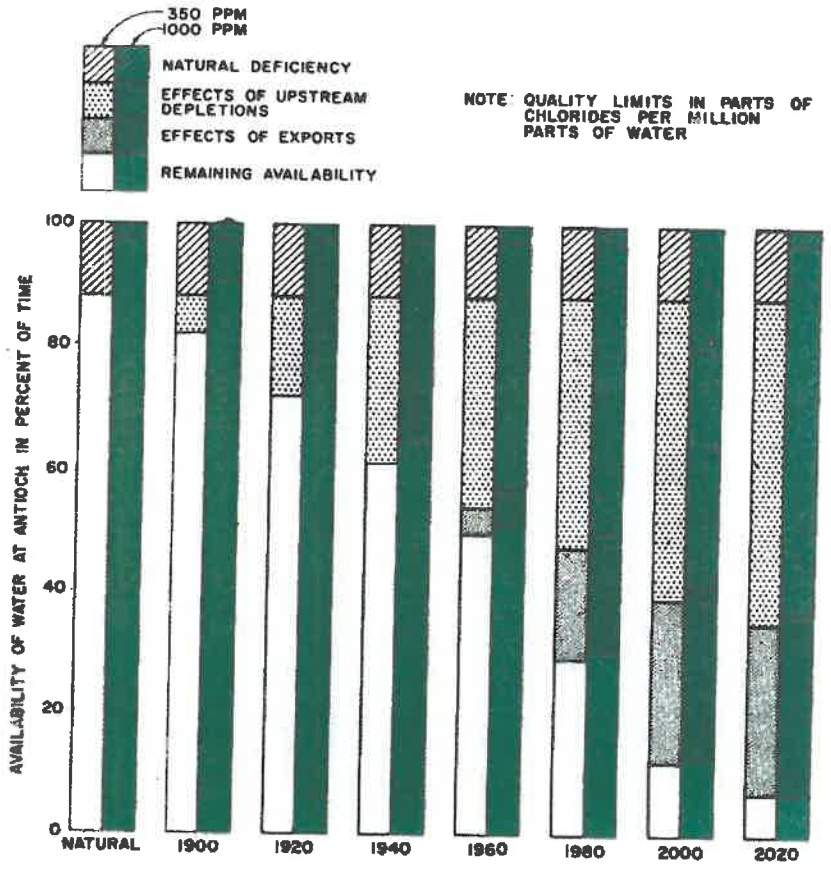
SHORTAGE
8,049,000 AF/Y

FIGURE 2

The natural availability of good quality water in the Delta is directly related to the amount of surplus water which flows to the ocean. The graph to the right indicates the historic and projected availability of water in the San Joaquin River at Antioch containing less than 350 and 1,000 parts chlorides per million parts water, under long-term average runoff and *without* specific releases for salinity control. It may be noted that even under natural conditions, before any significant upstream water developments, there was a deficiency of water supplies within the specified quality limits. It is anticipated that, without salinity control releases, upstream depletions by the year 2020 will have reduced the availability of water containing less than 1,000 ppm chlorides by about 60 percent, and that exports will have caused an additional 30 percent reduction.



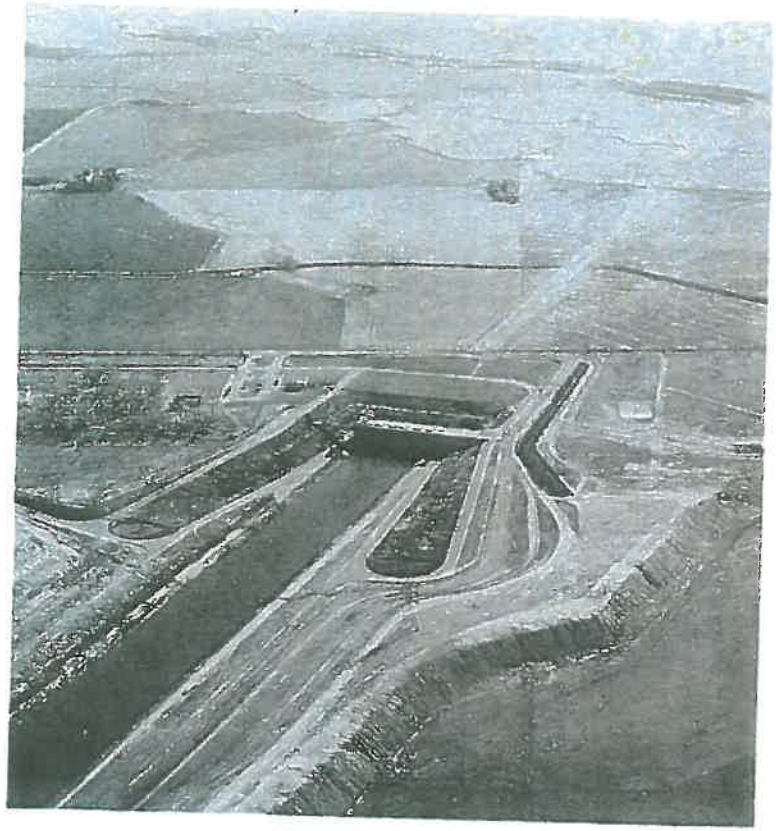
USE OF DELTA WATER SUPPLIES



DELTA WATER QUALITY WITHOUT SALINITY CONTROL

The magnitude of the past and anticipated future uses of water in areas tributary to the Delta, except the Tulare Lake Basin, is indicated in the diagram to the left. It may be noted that, while the present upstream use accounts for reduction of natural inflow to the Delta by almost 25 percent, upstream development during the next 60 years will deplete the inflow by an additional 20 percent. By that date about 22 percent of the natural water supply reaching the Delta will be exported to areas of deficiency by local, state, and federal projects. In addition, economical development of water supplies will necessitate importation of about 5,000,000 acre-feet of water seasonally to the Delta from north coastal streams for transfer to areas of deficiency.

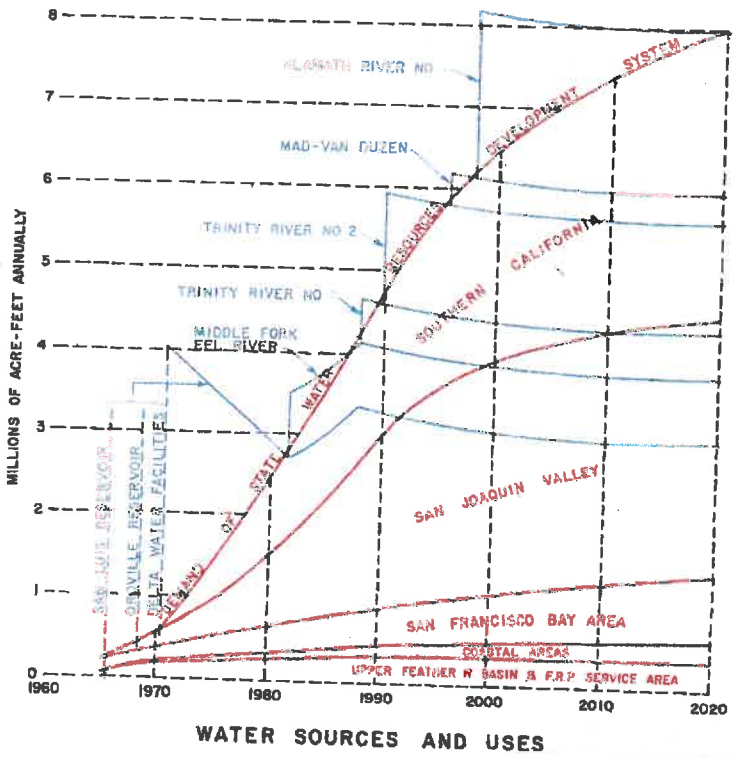
FIGURE 3



Tracy Pumping Plant

Full demands on the State Water Resources Development system can be met until about 1981 from surplus water in and tributary to the Delta with regulation by the proposed Oroville and San Luis Reservoirs. However, upstream depletions will reduce the available surplus supplies and water will have to be imported from north coastal sources after that year. It is anticipated that coordinated operation of the State Water Resources Development System and the Federal Central Valley Project will afford a limited increase in usable surplus Delta supplies beginning in 1981. As indicated in the chart, upstream depletions will continue to decrease the available surplus supplies.

The coordinated use of surplus water in and tributary to the Delta and of regulated or imported supplements to this supply, as required, is referred to as the Delta Pooling Concept. Under this concept of operation the State will ensure a continued supply of water adequate in quantity and quality to meet the needs of export water users. Advantage will be taken of surplus water available in the Delta, and as the demand for water increases and the available surplus supply is reduced by further upstream uses, the State will assume the responsibility of guaranteeing a firm supply of water, which will be accomplished by construction of additional storage facilities and import works. At the same time, the water needs of the Delta will be fully met.



WATER SOURCES AND USES

FIGURE 4

the possibility that groundwater pumping is from an aquifer recharged by the river and gradients have steepened due to extractions, such transfers should be examined as to their impacts on depletions from the river flows.

Please include the Central Delta Water Agency, the other Delta Agencies and all other interested parties in future discussions with the project operators regarding plans to intentionally violate Delta water quality standards. Thank you for your consideration of our concerns.

Yours very truly,

DANTE JOHN NOMELLINI
Manager and Co-Counsel

DJN:ju
Enclosures
cc:
Frances Spivy-Weber, Vice Chair SWRCB
1001 I Street
Sacramento, CA 95812

Tam M. Doduc, SWRCB
1001 I Street
Sacramento, CA 95812

Steven Moore, SWRCB
1001 I Street
Sacramento, CA 95812

Dorene D'Adamo, SWRCB
1001 I Street
Sacramento, CA 95812

Thomas Howard, Executive Director SWRCB
1001 I Street
Sacramento, CA 95812

Craig Wilson
Office of Delta Watermaster
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, Ca 95821

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Kim Turner
Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski
Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Ste. 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Erin Foresman
USEPA Region 9
c/o NMFS
650 Capitol Mall
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino avenue, Suite 300
Sacramento, CA 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Michael Jackson
P. O. Box 207
Quincy, CA 95971

Nomellini, Grilli McDaniel PLCs

From: Melinda Terry [melinda@northdw.com]
Sent: Tuesday, May 28, 2013 5:21 PM
To: 'Osha Meserve'; eringelberg@bskinc.com; 'Dante Nomellini Sr'; Jherrlaw@aol.com
Subject: FW: USBR and DWR request re delta standards

Importance: High

Attachments: Milligan,R. -2013-05_SWRCB Water Right Decision 1641 Water Year Classification.pdf; CDFW concurrence with proposed changes to Delta WQ standards... (3.40 KB); NMFS support for change petition to D-1641 (7.87 KB); FWS concurrence with proposed changes to Delta WQ standards,... (7.07 KB); NMFS support for change petition to D-1641 (13.1 KB)





Milligan,R. 3-05_SWRCB | CDFW Wrence with propr change petiti. | NMFS support ence with propor change petit. | FWS | NMFS support

FYI - See attached docs regarding request to relax D-1641 water quality objectives for agricultural beneficial uses by changing hydrologic classification from "dry" to "critical." MT

Melinda Terry, Manager
North Delta Water Agency
910 K Street #310
Sacramento, CA 95814
(916) 446-0197
Fax 446-2404
melinda@northdw.com

-----Original Message-----
From: Grober, Les@Waterboards [mailto:Les.Grober@waterboards.ca.gov]
Sent: Tuesday, May 28, 2013 4:36 PM
To: Terry, Melinda @northdw.com
Cc: Riddle, Diane@Waterboards
Subject: USBR and DWR request re delta standards

Melinda,

It was nice chatting with you. As we discussed, attached are the following emails/letters: the USBR/DWR request, emails from three fishery agencies, and Tom Howard's 5/24 response to the emails we had received at that point from NMFS and CDFW, as we had not yet gotten a request from USBR/DWR.

I'll send you a copy of the follow-up letter from Craig Wilson, the Delta Watermaster, tomorrow.
Please call or email if you have questions.

Les

Leslie F. Grober, Assistant Deputy Director Hearings and Special Programs Branch Division of Water Rights State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Telephone: (916) 341-5428
Fax: (916) 341-5400
E-mail: lgrober@waterboards.ca.gov<mailto:lgrober@waterboards.ca.gov>

EXHIBIT A

EXHIBIT B

Nomellini, Grilli McDaniel PLCs

From: Grober, Les@Waterboards [Les.Grober@waterboards.ca.gov]
Sent: Wednesday, May 29, 2013 8:40 AM
To: ngmplcs@pacbell.net
Subject: FW: USBR and DWR request re delta standards

Attachments: Milligan,R. -2013-05_SWRCB Water Right Decision 1641 Water Year Classification.pdf; CDFW concurrence with proposed changes to Delta WQ standards requested by DWR and Reclamation; NMFS support for change petition to D-1641; FWS concurrence with proposed changes to Delta WQ standards, as requested by Reclamation and DWR; RE: NMFS support for change petition to D-1641


Milligan,R. 3-05_SWRCB


CDFW Wrence with propr


NMFS support change petiti.


FWS ence with propport for change


RE: NMFS

Dante,

Here is the email I sent Melinda yesterday. The last attachment is the email response from Tom.

Les

From: Grober, Les@Waterboards
Sent: Tuesday, May 28, 2013 4:35 PM
To: 'Melinda Terry (melinda@northdw.com)'
Cc: Riddle, Diane@Waterboards
Subject: USBR and DWR request re delta standards

Melinda,

It was nice chatting with you. As we discussed, attached are the following emails/letters: the USBR/DWR request, emails from three fishery agencies, and Tom Howard's 5/24 response to the emails we had received at that point from NMFS and CDFW, as we had not yet gotten a request from USBR/DWR.

I'll send you a copy of the follow-up letter from Craig Wilson, the Delta Watermaster, tomorrow.

Please call or email if you have questions.

Les

Leslie F. Grober, Assistant Deputy Director Hearings and Special Programs Branch Division of Water Rights State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Telephone: (916) 341-5428
Fax: (916) 341-5400
E-mail: lgrober@waterboards.ca.gov<mailto:lgrober@waterboards.ca.gov>

BUREAU OF RECLAMATION
Central Valley Operation Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

DEPARTMENT OF WATER RESOURCES
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

MAY 24 2013

IN REPLY REFER TO:
CVO-100
WTR-4.10

Thomas Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

Subject: State Water Resources Control Board Water Right Decision 1641 Water Year Classification

Dear Mr. Howard:

The Department of Water Resources (DWR) and the United States Bureau of Reclamation (Reclamation) request that the State Water Resources Control Board (SWRCB) acknowledge that the water year classification for the Sacramento Valley based on the equation provided in Attachment 1, page 188 of Revised Water Rights Decision 1641 (D-1641) does not accurately reflect the unprecedented dry conditions experienced in 2013. Instead, the hydrologic conditions experienced between January and the present are characteristic of a "Critical" water year type. The current miscategorization in water year classification is projected to affect the storage of cold water pool for fisheries purposes due to controlling D-1641 Delta objectives in the May through August period. These objectives are:

1) EC parameters for Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas (interagency Station Number C-4) as defined in Table 2 on page 182
2) Delta Outflow, as defined on Table 3 on Page 184.

Water year classification also affects other objectives listed in D-1641 to a lesser degree, but it is not anticipated that those objectives will significantly control Delta operations in 2013.

Summary of Relevant Facts:
D-1641 imposes water quality objectives on the Central Valley Project (CVP) and State Water Project (SWP). Several of the objectives are dependent on the water year type as determined by the May 1, Sacramento Valley Index and the San Joaquin Valley Index. Although the January through April period during 2013 was the driest on record, the November and December precipitation was sufficient to result in a Sacramento Valley classification of "Dry" for water year 2013. The "Dry" water year classification is not representative of the extreme hydrological conditions in Northern California this calendar year and the water quality objectives based on this water year type could result in significant adverse impacts to the cold water pool operations at Shasta Reservoir. In fact, Governor Brown's recent executive order B-21-13 recognizes that, "much of California experienced record dry conditions in January through March 2013, registering historic lows on the Northern Sierra" and "record dry and warm conditions resulted in a snowpack substantially below average, with estimated May water content in the statewide snowpack being only 17 percent of average."

The 2013 water year has been particularly challenging with double the normal precipitation in November and December and historically low values from January into May. The current Northern Sierra 8 Station Precipitation Index from January 1, 2013 through May 15 is about 8.8 inches. Without additional measurable precipitation in May, this figure will represent the driest Northern Sierra 8-Station Precipitation Index for the January through May period on record. Attachment 1 shows the accumulated 8-station precipitation values from January through May for some of the extremely dry years including 1924, 1976, and 1977. The nearly 80 percent of this year's precipitation occurred in the first three months of the water year, and an abnormally large portion of this fell as rain rather than snow as a result of warmer than normal conditions for that time of year. This combined with critically dry conditions in the months since the first of the year has resulted in minimal snow pack in the Sierra Nevada in the critical spring months. The Northern Sierra snowpack was only about 48% of the historical April 1 value and about 17% of normal as of May 1, 2013. Creek and small stream flows that enter the Sacramento River system below major reservoirs are running at historically low levels in response to the extended dry period. DWR's May 1, 2013 Bulletin 120 forecasts an April to July runoff 48% of normal for the Sacramento Valley. Hydrological conditions are not likely to improve and the National Oceanic and Atmospheric Administration has indicated that California is in severe to extreme drought that is likely to persist or intensify into the summer (Attachment 2).

Additionally, unusually high depletions in the Sacramento Valley are adding to the operational challenges the CVP and SWP (collectively, Projects) are facing in meeting the 2013 water year type requirements. Typically, extremely dry years with low Northern Sierra 8-Station Precipitation Index values trigger the Shasta inflow shortage criteria included in water rights settlement contracts that would reduce water supplies for the senior water rights diverters in the Sacramento Valley. Yet, this year the wetter conditions in the fall months were sufficient to require full allocations to the Sacramento Valley and Feather River settlement contractors,

increasing demands on Shasta and Oroville storage. Therefore, it is expected that depletions will continue to run at a high rate into the summer. DWR and Reclamation are required to make releases in order to satisfy the senior water rights of the Sacramento River and Feather River settlement contractors, and the Exchange Contractors. These contracts specify the amount of water the Projects must deliver – for the Sacramento River and Exchange Contractors, Reclamation is required to deliver 100% of the contract total in any year where the forecasted inflow to Shasta Reservoir exceeds 3.2 million acre feet (af). This target was met in 2013 – thus Reclamation is mandated to deliver 100% of the contract total, and has no discretion under the contract to reduce these deliveries.

The unusually high stream depletions (Attachment 3) were a major cause of the exceedence of the Emmaton objective that occurred in April and May. This is described in further detail in DWR and Reclamation's letter to SWRCB dated May 24, 2013. The CVP and SWP reservoir systems were in a near normal condition in January, but Reclamation and DWR have drawn heavily on the storage since then due to the extended dry period, low unregulated flow entering the system, and high depletions in the Central Valley. Reservoir releases are currently well above average for this date.

In order to meet the Dry year water quality objectives rather than the Critical objectives, DWR and Reclamation have released significant volumes of water from Oroville, Shasta, and Folsom Reservoirs. The low reservoir inflow and increased storage withdrawal is depleting the cold water pool in the reservoirs that is important to provide adequate instream fishery habitat for anadromous fish in the rivers through the summer and fall.

SWRCB Water Rights Order 90-05 requires that Reclamation operate Shasta Reservoir to meet a daily average temperature of 56 degrees Fahrenheit in the Sacramento River at a location and through periods when higher temperatures will be detrimental to the fishery. Typically, through coordination with the Sacramento River Temperature Task Group (SRTTG), the location selected is between Balls Ferry and Bend Bridge on the Sacramento River. Without recognition of the Sacramento Valley water year type actually experienced in 2013, the projected low reservoir storage and limited cold water pool this year may result in the objective occurring well upstream of Balls Ferry and Reclamation is concerned whether the 56 degree objective can be maintained at any location in the Sacramento River through the fall. The cold water pool is vital to providing adequate habitat to salmon present in the Sacramento River through the summer and into the fall for both the winter-run Chinook salmon and fall-run Chinook salmon. The SRTTG has recommended an initial temperature compliance point of Airport Road located upstream of Balls Ferry due to the limited cold water resources this year.

Due to the unprecedented hydrologic conditions discussed above including the record dry January through May period, extremely low snowpack, and unusually high Sacramento valley depletions, conditions continue to deteriorate and it is clear that meeting the dry year objectives could jeopardize the ability to meet other fisheries objectives later in the year. The reservoir storage that accumulated in the wet fall, which was originally projected to be sufficient to meet the dry year objectives, is falling rapidly due to the abnormally large valley demands and

Reclamation is projecting CVP September carryover storages only about 63% of average.

There is a significant difference between the volume of Delta inflow needed to achieve the Dry and Critical water quality objectives for Jersey Point and Emmation through June 15. If Reclamation and DWR are able to begin operating to the Critical year water quality objectives in May it may be possible to achieve 100,000 to 200,000 af, of cold water benefits in the upstream reservoirs. This savings in cold water storage would improve the chances of meeting the temperature objective at Airport Road. This cold water benefit will help avoid temperature related fish losses in the Sacramento River.

The greatest benefits to the Project's reservoir storage would occur in the May to August 15 period. The compliance locations in the Western Delta and Interior Delta shown in Table 3 on Page 182 (Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas Landing (Interagency Station Number C-4) would most likely be the objectives controlling the Project operations during the May to June 15 period and changes at these locations would have the greatest impact on improving upstream storage in the immediate future. The objectives of the Delta outflow compliance location in Table 3 on page 184 often can control Project operations through the summer and operating to a critical year with respect to Delta outflow will also assist in preserving cold water pool.

Currently, DWR and Reclamation are maintaining a Net Delta Outflow well over 9,000 cubic feet per second (cfs) in order to achieve the Dry year objectives for Jersey Point and Emmaton. If the Dry classification is changed to Critical, the controlling D-1641 objective through June would be the Net Delta Outflow Index of at least 7,100 cfs in Table 3, or the export to inflow ratio of 35% in Table 3. From July through August 15, the controlling criteria for either water year classification would most likely shift among the minimum Net Delta Outflow objectives in Table 3, the salinity objectives for Jersey Point and Emmaton in Table 2, the Export to Inflow ratio of 65% in Table 3, or the Contra Costa 250 chloride objective in Table 1.

Table 2 of D-1641 requires an electrical conductivity (EC) no greater than 0.45 mmhos/cm for both Emmaton and Jersey point locations from April 1 to June 15, and 1.67 mmhos/cm for Emmaton and 1.35 mmhos/cm for Jersey Point from June 15 to August 15 under a Dry Year classification. For a Critical year these objectives are 2.78 mmhos/cm from April 1 to August 15 for Jersey Point and Emmaton. Since the X2 outflow objective of 7,100 cfs, which is not linked to the year type designation would probably control in May, and June, there would only be a gradual increase in salinity at Jersey Point and Emmaton through June that is reflective of a Critical year. Water quality at Jersey Point and Emmaton would fluctuate with the tidal and meteorological conditions potentially moving towards a 1.0 to 2.0 mmhos/cm EC range in July. Compliance with the water quality objectives at the Jersey Point and Emmaton locations typically achieves the objectives at Terminous and San Andreas Landing. This gradual increase in salinity levels would be commensurate with those experienced in years with similar hydrologic conditions as those observed in recent months.

Reclamation estimates that from May through August 15 a change in the water year classification from Dry to Critical in the Western Delta and Interior Delta locations in Table 2 could result in a gain of about 115,000 af, in upstream reservoir carryover storage at the end of September. Including the Delta outflow compliance in Table 3 for the same period would increase the gain in reservoir carryover storage to about 185,000 af. There could be reductions in the release from Keswick Reservoir up to about 1,000 cubic feet second in late May and June under a Critical year classification.

D-1641 requires that the number of days less than or equal to 150 mg/l chloride at Contra Costa Pumping Plant be greater than 165 days for a Dry year and 155 days for a Critical year. DWR and Reclamation do not anticipate that this objective would be a controlling criteria for the Projects under either year classification and both objectives would be met. The minimum Net Delta Outflow required from February through June (Collinsville X2 at 7,100 cfs) should be adequate to achieve the Contra Costa objective under either the Dry or Critical classification.

SWRCB recognition of the change in water year type is in the public interest. The change will provide for a water year classification reflective of the extremely dry hydrologic conditions in 2013 and allow the projects to operate in a manner that will provide the maximum benefit to critical beneficial users without unreasonably affecting other designated beneficial uses. As noted above there will be no significant impacts to agricultural or municipal uses, and the change will provide significant benefit to fisheries resources. State and federal agencies have been focused on the protection and improvement of fishery conditions in the Delta watershed, and are in the process of analyzing options for balancing project operations for the numerous different beneficial uses. Approval of the following request would result in water quality conditions in the North Delta that are consistent with the hydrology we are currently experiencing, while preserving cold water storage critical to salmon survival.

Requested Action:
Reclamation and DWR request that the SWRCB recognize the change in year classification need and act immediately. Delaying such recognition to even June 1 will significantly impair Reclamation's ability to meet cold water temperature objectives on the Sacramento River. At present, the controlling D-1641 Delta water quality objectives for the Projects that are linked to the Sacramento Valley Index are Jersey Point in Table 2, Emmaton in Table 2. In addition, Delta Outflow in Table 3, may become a controlling standard and will also impact cold water pool storage starting in the middle of June.

We believe the SWRCB may balance protection of the beneficial uses in light of the critical water year type experienced on the Sacramento River in 2013. Immediate benefits to cold water pool storage can be achieved through the Projects meeting critical water year standards for the Interior and Western Delta salinity standards in Table 2. The compliance points at issue are Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey

Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas Landing (Interagency Station Number C-4).

Additional cold water pool benefits can be achieved in July through September with recognition of the critical water year type in Table 3, Water Quality Objectives for Fish and Wildlife Beneficial Uses. As noted above; Delta outflow objectives will likely control project operations in July through September, where agricultural objectives are met under a critical water year designation. A Delta outflow standard reflective of the critical water year type may produce an additional 70,000 af of cold water pool storage.

If you have any questions or would like more information regarding this notification, please contact Mr. Paul Fujitani of Reclamation at 916-979-2197 or Mr. John Leahigh at 916-574-2722.

Sincerely,

Ronald Milligan

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation

for D. Roose

David H. Roose, Chief
SWP Operations Control Office
Department of Water Resources

Attachment -4

cc: Mr. Craig M. Wilson, Delta Watermaster
State Water Resources Control Board
1001 I Street
Sacramento, California 95812

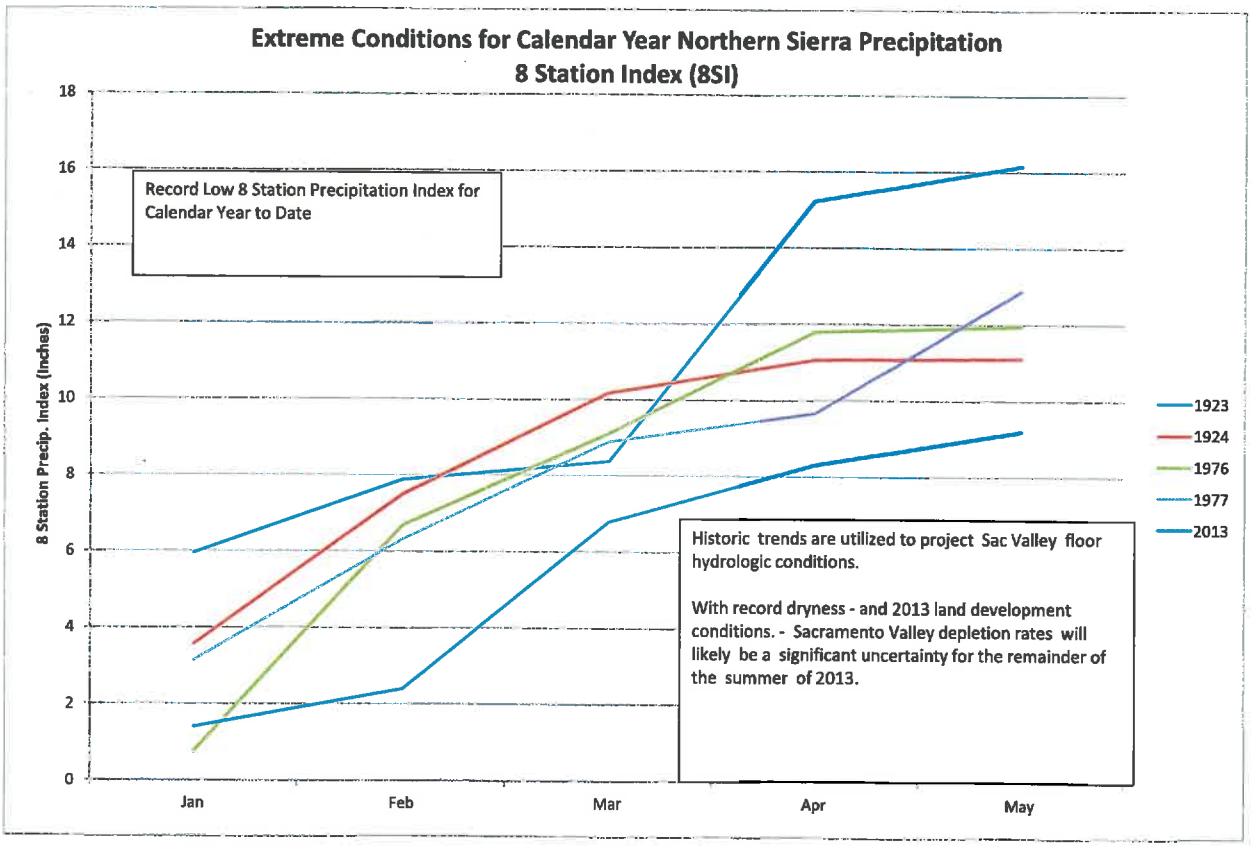
Ms. Maria Rae
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, California 95814

Mr. Les Grober
State Water Resources Control Board
Division of Water Rights
1001 I Street
Sacramento, California 95812
(w/encl to each)

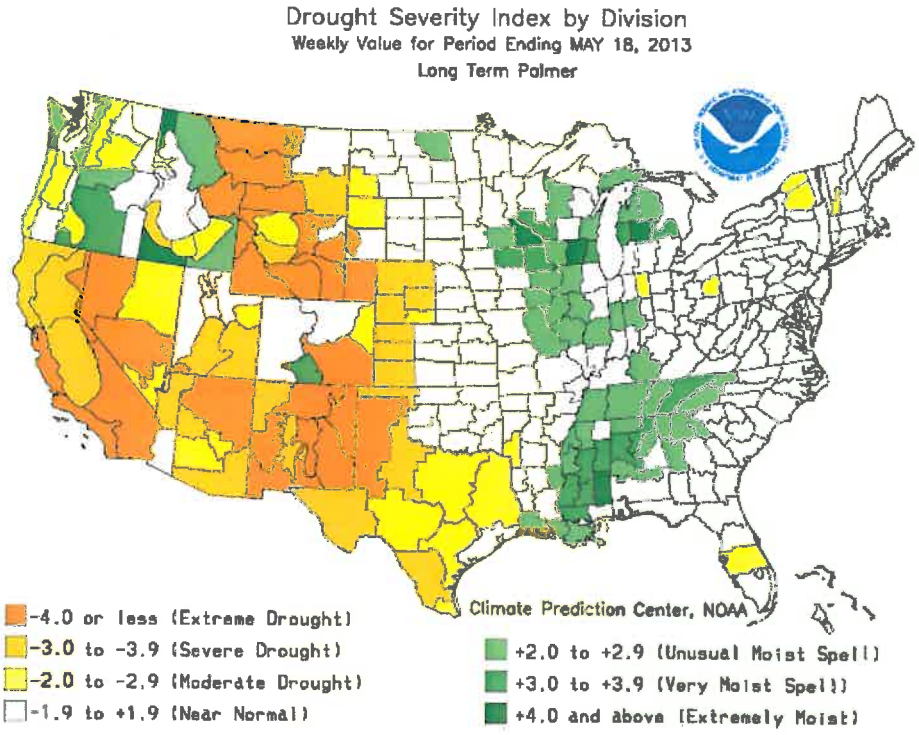
Carl Wilcox
California Department of Fish and Wildlife
1416 9th Street
Sacramento, California 95814

Ms. Kim Turner
Assistant Field Supervisor
Bay-Delta Fish & Wildlife Office
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

Attachment 1



Attachment 2

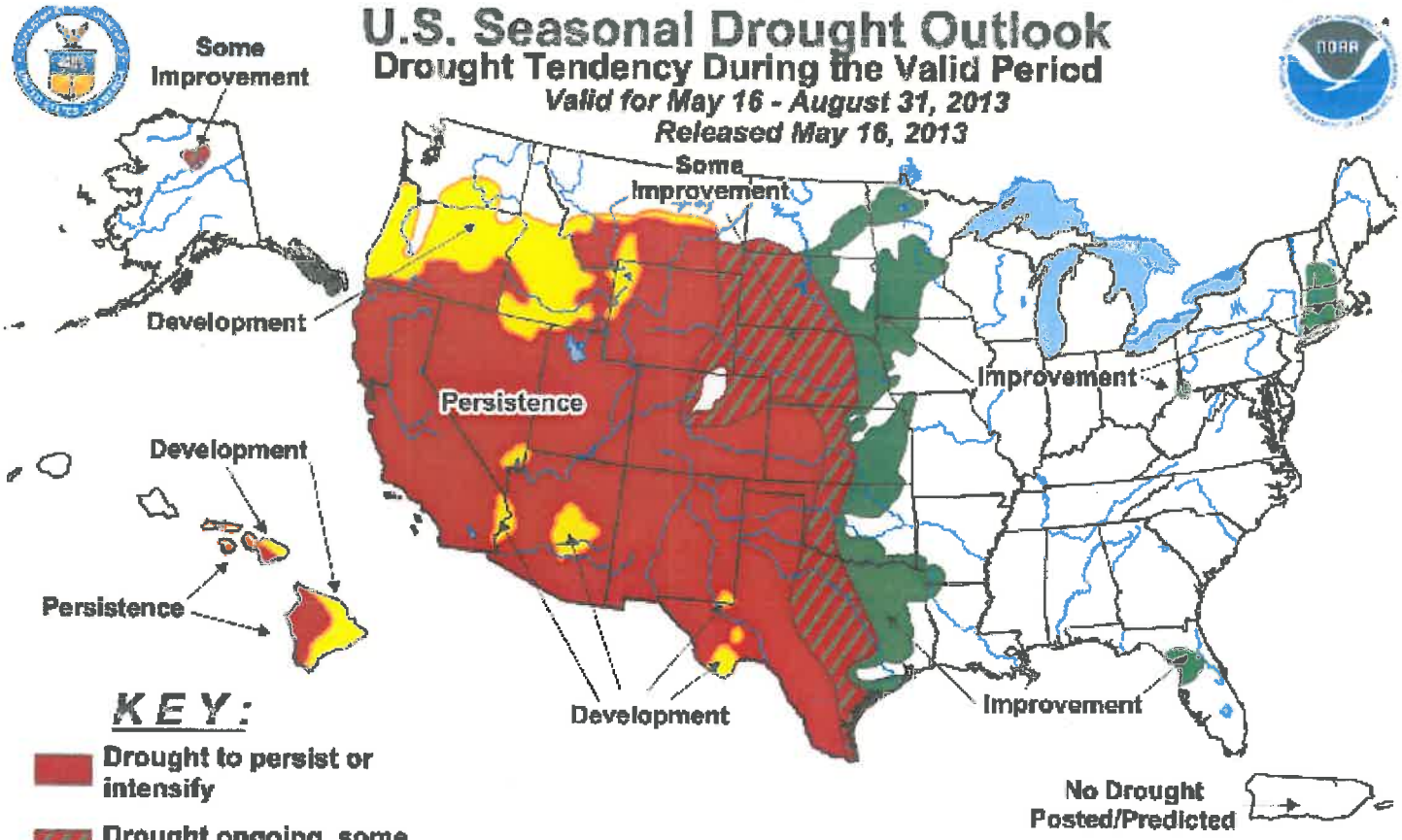


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for May 16 - August 31, 2013

Released May 16, 2013



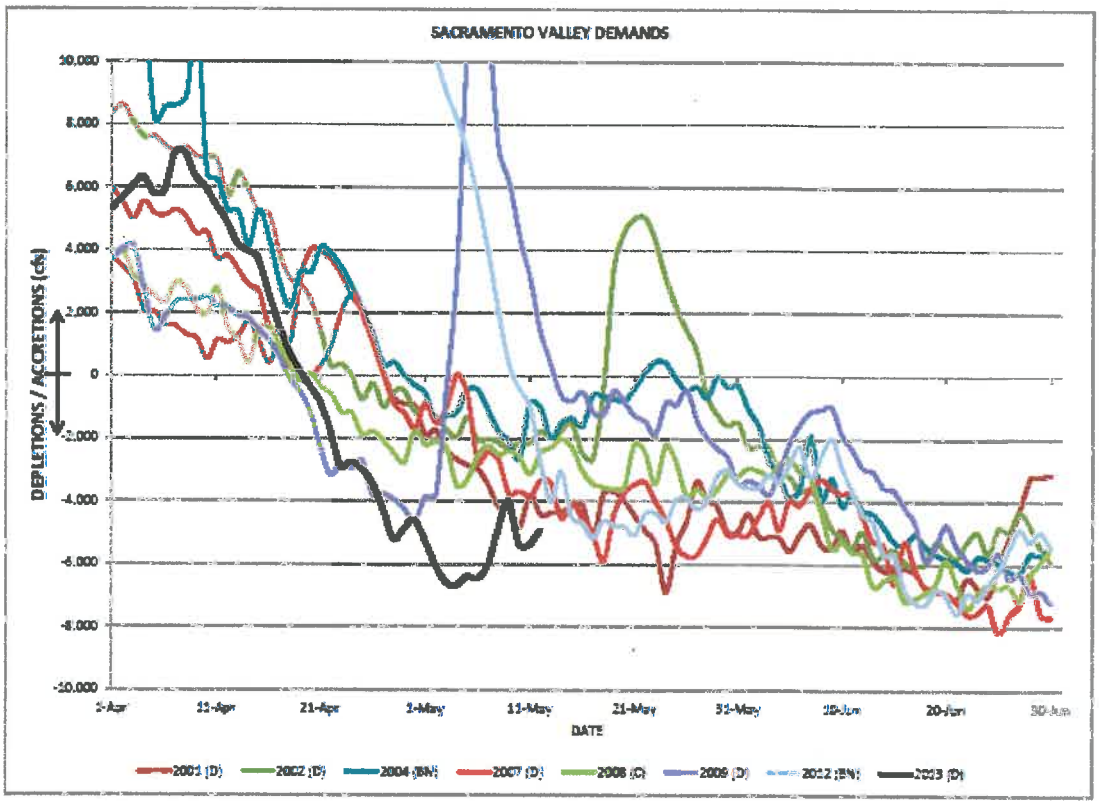
KEY:

- **Drought to persist or intensify**
- **Drought ongoing, some improvement**
- **Drought likely to improve, impacts ease**
- **Drought development likely**

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Attachment 3

Attachment 4



Nomellini, Grilli McDaniel PLCs

From: Wilcox, Carl@Wildlife [Carl.Wilcox@wildlife.ca.gov]
Sent: Friday, May 24, 2013 4:04 PM
To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards
Cc: Riddle, Diane@Waterboards; Leahigh, John@DWR; pfujitani@usbr.gov; Dibble, Chad@Wildlife; Maria Rea - NOAA Federal; Garwin.Yip@noaa.gov; Jennifer_norris@fws.gov; Kim_S_Turner@fws.gov
Subject: CDFW concurrence with proposed changes to Delta WQ standards requested by DWR and Reclamation

Board Chair Marcus,

This e-mail is to provide California Department of Fish & Wildlife (CDFW) support/concurrence regarding the U.S. Bureau of Reclamation's (Reclamation) and California Department of Water Resources' (DWR) proposal that the SWRCB change the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30) water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

* Sacramento River at Emmaton, Station D-22;
* San Joaquin River at Jersey Point, Station D-15;
* South Fork Mokelumne River at Terminus, Station C-13; and
* San Joaquin River at San Andreas Landing, Station C-4.

This request is to support applying the new water year classification as soon as possible, through August 15, 2013. The biggest benefit to changing the water year type for the specific water quality stations is increased storage in (or conversely, reducing the rate of drawdown of) Shasta Reservoir. This will likely benefit the life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014.

The proposal was discussed on a conference call today, Friday, May 24, among members of the SWRCB, Reclamation, DWR, U.S. Fish and Wildlife Service (USFWS), CDFW, and National Marine Fisheries Service (NMFS). In addition, the fish agencies conferred on the proposal and concur. The USFWS and NMFS will send separate e-mails expressing their support for the proposal. It is our understanding that a letter making the subject request will be forthcoming this afternoon. CDFW is providing this email concurrence to allow for a timely decision to maximize protection of Shasta storage to protect Chinook salmon. Any change in the formal submission by DWR and Reclamation to the SWRCB this afternoon from what is described above, will require re-evaluation by the CDFW before we could provide our concurrence.

Carl Wilcox
Policy Advisor to the Director for the Delta California Department of Fish and Wildlife
7329 Silverado Trail
Napa, CA 94558
Cell 707-738-4134
Office 707-944-5584
Carl.Wilcox@wildlife.ca.gov

Nomellini, Grilli & McDaniel PLCs

From: Maria Rea - NOAA Federal [maria.rea@noaa.gov]

Sent: Friday, May 24, 2013 4:50 PM

To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards; Riddle, Diane@Waterboards

Cc: Garwin.Yip@noaa.gov; RMILLIGAN@usbr.gov; pfujitani@usbr.gov; Leahigh, John@DWR; Dan_Castleberry@r1. Gov; Wilcox, Carl@Wildlife

Subject: NMFS support for change petition to D-1641

Dear Felicia and Tom:

This e-mail is to provide NOAA's National Marine Fisheries Service's (NMFS) support/concurrence regarding the U.S. Bureau of Reclamation's (Reclamation) and California Department of Water Resources' (DWR) proposal. As I understand it, and as discussed on a conference call this morning among members of the SWRCB, Reclamation, DWR, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and NMFS, Reclamation and DWR will request that the SWRCB change the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30) water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

- Sacramento River at Emmaton, Station D-22;
- San Joaquin River at Jersey Point, Station D-15;
- South Fork Mokelumne River at Terminus, Station C-13; and
- San Joaquin River at San Andreas Landing, Station C-4.

This request is to support applying the new water year classification as soon as possible, through August 15, 2013. The biggest benefit to changing the water year type for the specific water quality stations is increased storage in (or conversely, reducing the rate of drawdown of) Shasta Reservoir. This will likely benefit the life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014. For example, Reclamation is currently releasing 13,000 cfs from Keswick Dam partly as a result of the Delta Cross Channel being open over the Memorial Day weekend and partly because of the spring tide, but largely to maintain compliance with the Emmaton water quality standard. In addition, the May forecast at the 90% exceedance hydrology indicates that the projected end of September (EOS) carryover storage at Shasta Reservoir is 1.527 million acre feet (MAF). The NMFS biological opinion on the long-term operations of the Central Valley Project and State Water Project does not have a minimum EOS carryover storage requirement in Shasta Reservoir. However, although the requirements in Action I.2.3.C pertain to the February forecast, it does acknowledge and provide for drought exception procedures if a Clear Creek Temperature Compliance Point or 1.9 MAF EOS storage is not achievable, indicating that the forecasted carryover storage of 1.527 MAF is very low.

In addition, the fish agencies conferred on the proposal as discussed this morning, and also concur. The USFWS and CDFW will send separate e-mails expressing their support for the proposal.

Please let me know if you have any questions or need more information. My cell phone number is (916) 799-2359.

- Maria

Maria Rea
Supervisor, Central Valley Office, NOAA Fisheries

Nomellini, Grilli & McDaniel PLCs

From: michael_chotkowski@fws.gov

Sent: Tuesday, May 28, 2013 2:08 PM

To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards

Cc: Riddle, Diane@Waterboards; Leahigh, John@DWR; pfujitani@usbr.gov; Dibble, Chad@Wildlife; Maria Rea - NOAA Federal; Garwin.Yip@noaa.gov; Jennifer_norris@fws.gov; Kim_S_Turner@fws.gov

Subject: FWS concurrence with proposed changes to Delta WQ standards, as requested by Reclamation and DWR

Board Chair Marcus,

This email expresses the U.S. Fish and Wildlife Service's (Service) support for the State Water Board's proposal to implement the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) request to change the 40-30-30 Sacramento Valley water year type from "dry" to "critical," specifically as it pertains to relaxing the D-1641 water quality objectives for agricultural beneficial uses at four stations in the western Delta:

* Sacramento River at Emmaton, Station D-22;
* San Joaquin River at Jersey Point, Station D-15;
* South Fork Mokelumne River at Terminus, Station C-13; and
* San Joaquin River at San Andreas Landing, Station C-4.

The proposed change to the water year type for the specific water quality stations would reduce drawdown of Shasta Reservoir. This will likely benefit the early life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014. In this unusual year, the biological benefits to imperiled salmon appear large enough to outweigh our concern about the potentially adverse effects of the concomitant reduction in Delta outflow during these months.

The change in EC standard at these stations would occur immediately and last through August 15, 2013. The Service supports implementation of the proposal on a one-time basis that reflects unusual winter-run Chinook concerns this year, so long as implementation does not affect management of OMR flow to protect juvenile delta smelt in accordance with the Service's 2008 OCAP Biological Opinion.

The Service will continue to work cooperatively with its Federal and State partners to ensure that the CVP and SWP operations provide adequate protection for Threatened and Endangered species while delivering water that benefits 25 million agricultural and urban water users throughout California.

Mike Chotkowski
Field Supervisor, Bay-Delta Fish and Wildlife Office
650 Capitol Mall
Sacramento, CA 95814
(916) 930-5632

Nomellini, Grilli & McDaniel PLCs

From: Howard, Tom@Waterboards [Tom.Howard@waterboards.ca.gov]
Sent: Friday, May 24, 2013 5:56 PM
To: Maria Rea - NOAA Federal; Marcus, Felicia@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards; Riddle, Diane@Waterboards
Cc: Garwin.Yip@noaa.gov; RMILLIGAN@usbr.gov; pfujitani@usbr.gov; Leahigh, John@DWR; Dan_Castleberry@r1. Gov; Wilcox, Carl@Wildlife
Subject: RE: NMFS support for change petition to D-1641

In the interest of making the best use of limited water supplies, and maintaining cold water pool storage in Shasta Reservoir, I want to provide a timely initial response to emails from the National Marine Fisheries Service and the California Department of Fish and Wildlife (fish agencies). The fish agencies support a change in the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30) water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

- Sacramento River at Emmaton, Station D-22;
- San Joaquin River at Jersey Point, Station D-15;
- South Fork Mokelumne River at Terminus, Station C-13; and
- San Joaquin River at San Andreas Landing, Station C-4.

The State Water Board staff will not recommend any action if the projects operate to meet the critically dry year objectives for Western and Central Delta agricultural objectives, instead of operating to meet dry year objectives through August 15, 2013. Our intent to not take any action is conditioned on submittal of a temperature management plan pursuant to State Water Board Order 90-5 within one week of May 28, operation in accordance with the plan, and any further conditions determined by the Executive Director of the State Water Board. Furthermore, the Projects will be required to include an accounting of operations under the change in water year classification.

I will follow-up with an expanded response on Tuesday May 28 after receipt of any requests related to these Delta operations from the Department of Water resources and the United States Bureau of Reclamation.

I believe in the future that more timely exchange of information regarding operational issues will alleviate situations of this nature.

From: Maria Rea - NOAA Federal [mailto:maria.rea@noaa.gov]
Sent: Friday, May 24, 2013 4:50 PM
To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards; Riddle, Diane@Waterboards
Cc: Garwin.Yip@noaa.gov; RMILLIGAN@usbr.gov; pfujitani@usbr.gov; Leahigh, John@DWR; Dan_Castleberry@r1. Gov; Wilcox, Carl@Wildlife
Subject: NMFS support for change petition to D-1641

Dear Felicia and Tom:
This e-mail is to provide NOAA's National Marine Fisheries Service's (NMFS) support/concurrence regarding the U.S. Bureau of Reclamation's (Reclamation) and California Department of Water Resources' (DWR) proposal. As I understand it, and as discussed on a conference call this morning among members of the SWRCB, Reclamation, DWR, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and NMFS, Reclamation and DWR will request that the SWRCB change the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30)

water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

- Sacramento River at Emmaton, Station D-22;
- San Joaquin River at Jersey Point, Station D-15;
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- San Joaquin River at San Andreas Landing, Station C-4.

This request is to support applying the new water year classification as soon as possible, through August 15, 2013. The biggest benefit to changing the water year type for the specific water quality stations is increased storage in (or conversely, reducing the rate of drawdown of) Shasta Reservoir. This will likely benefit the life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014. For example, Reclamation is currently releasing 13,000 cfs from Keswick Dam partly as a result of the Delta Cross Channel being open over the Memorial Day weekend and partly because of the spring tide, but largely to maintain compliance with the Emmaton water quality standard. In addition, the May forecast at the 90% exceedance hydrology indicates that the projected end of September (EOS) carryover storage at Shasta Reservoir is 1.527 million acre feet (MAF). The NMFS biological opinion on the long-term operations of the Central Valley Project and State Water Project does not have a minimum EOS carryover storage requirement in Shasta Reservoir. However, although the requirements in Action I.2.3.C pertain to the February forecast, it does acknowledge and provide for drought exception procedures if a Clear Creek Temperature Compliance Point or 1.9 MAF EOS storage is not achievable, indicating that the forecasted carryover storage of 1.527 MAF is very low.

In addition, the fish agencies conferred on the proposal as discussed this morning, and also concur. The USFWS and CDFW will send separate e-mails expressing their support for the proposal.

Please let me know if you have any questions or need more information. My cell phone number is (916) 799-2359.

- Maria

Maria Rea
Supervisor, Central Valley Office, NOAA Fisheries

EXHIBIT C

Nomellini, Grilli _McDaniel PLCs

From: Grober, Les@Waterboards [Les.Grober@waterboards.ca.gov]
Sent: Thursday, May 30, 2013 10:16 AM
To: Terry, Melinda @northdw.com; ngmplcs@pacbell.net
Subject: FW: May 29 2013 Letter to USBR and DWR on Actions to Conserve Cold Water Pool

Attachments: signed response letter 5-29-13.pdf; Milligan,R. -2013-05_SWRCB Water Right Decision 1641 Water Year Classification.pdf


signed
Milligan,R.
ɔnse letter 5-29-3-05_SWRCB W

Here is the follow-up letter.

From: Saechao, Dramy@Waterboards
Sent: Wednesday, May 29, 2013 5:12 PM
To: Roose, David@DWR; RMILLIGAN@usbr.gov
Cc: Howard, Tom@Waterboards; maria.rea@noaa.gov; Wilcox, Carl@Wildlife; Kim_S_Turner@fws.gov; Foresman.Erin@epamail.epa.gov; Terry, Melinda @northdw.com; ngmplcs@pacbell.net; pfujitani@usbr.gov; Leahigh, John@DWR
Subject: May 29 2013 Letter to USBR and DWR on Actions to Conserve Cold Water Pool

Please see the attached May 29, 2013 letter from Craig Wilson, the Delta Watermaster, to the U.S. Bureau of Reclamation and California Department of Water Resources regarding actions to conserve cold water pool in Shasta Reservoir for fishery resources. The letter from the Bureau and Department is also attached.

Questions regarding this matter should be directed to Craig Wilson at cwilson@waterboards.ca.gov<mailto:cwilson@waterboards.ca.gov> or 916-445-5962.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Dear Messrs. Milligan and Rosse:

ACTIONS TO CONSERVE COLD WATER POOL IN SHASTA RESERVOIR FOR FISHERY RESOURCES

This letter responds to your May 24, 2013 letter to Thomas Howard, Executive Director for the State Water Resources Control Board (State Water Board) regarding unprecedented dry conditions in the Sacramento Valley and needed actions to protect cold water pool (CWP) resources for fisheries purposes. In your letter you request that the State Water Board acknowledge that the water year classification for the Sacramento Valley contained in State Water Board Decision 1641 (D-1641, Figure 1, page 188) does not accurately reflect the unprecedented dry conditions that have occurred since January of this year, which are characteristic of a critically dry year determination. Specifically, you propose that the Bureau and Department comply with critically dry water year requirements for certain Delta water quality objectives instead of dry year requirements in order to conserve CWP resources in Shasta Reservoir needed to protect Chinook salmon this season.

Background

The State Water Board was first contacted regarding this matter on May 17, 2013, by Maria Rea, Supervisor of the Central Valley Office of the National Marine Fisheries Service (NOAA Fisheries). Ms. Rea emailed Mr. Howard expressing concerns that planned Shasta Reservoir releases to meet Delta water quality objectives required by D-1641 would impact winter-run Chinook salmon by depleting already low Shasta Reservoir CWP resources. Ms. Rea requested that the agencies meet as soon as possible to discuss this matter.

In the midst of these discussions, on May 20, 2013, Governor Edmund G. Brown Jr. issued an Executive Order (B-21-13) outlining California's exceptionally dry water year conditions and ordering that the Department and the State Water Board expedite the review of water transfers to address the dry conditions and water delivery limitations. As outlined in Executive Order B-21-13:

- much of California experienced record dry conditions in January through March 2013, registering historic lows on the Northern Sierra and the San Joaquin precipitation indices; and

- record dry and warm conditions resulted in a snowpack substantially below average, with estimated May water content in the statewide snowpack being only 17 percent of average and with the spring snowmelt season now being well underway.

On May 22, 2013, State Water Board staff met with staff from the Bureau and Department to discuss possible Shasta Reservoir CWP actions. On May 24, 2013, State Water Board staff again met with staff from the Department and Bureau as well as staff from NOAA Fisheries, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW) (collectively fisheries agencies) to discuss Shasta Reservoir CWP actions. The fisheries agencies agreed on the need to take actions to conserve CWP resources in Shasta Reservoir and concurred with a proposal that the Department and Bureau operate to meet critically dry year requirements for the Western and Interior Delta water quality objectives for the protection of agriculture included in Table 2 of D-1641 (page 182), which include the following stations:

- Sacramento River at Emmaton, Station D-22;
- San Joaquin River at Jersey Point, Station D-15;
- South Fork Mokelumne River at Terminus, Station C-13; and
- San Joaquin River at San Andreas Landing, Station C-4.

The fisheries agencies requested additional time and discussion to consider any further actions related to Delta outflow or other requirements due to potential fisheries related impacts. On May 24 , 2013, Carl Wilcox of the CDFW and Maria Rea of NOAA Fisheries sent emails to State Water Board staff in support of the proposal that the Bureau and Department operate to meet critically dry year conditions for the above mentioned Western and Interior Delta compliance stations through August 15, 2013 (attached). On May 28, 2013, Michael Chotkowski with the USFWS also submitted an email of support for the changes mentioned above (attached).

Prior to receipt of your letter on May 24, 2013, Mr. Howard sent an initial response regarding this matter indicating that, in the interest of making the best use of limited water supplies and maintaining cold water pool storage in Shasta Reservoir, the State Water Board staff will not recommend taking any action if the projects operate to meet the critically dry year objectives for the Western and Interior Delta agricultural objectives, instead of operating to meet dry year objectives through August 15, 2013. Mr. Howard indicated that the intent to not take any action was conditioned on submittal of a temperature management plan pursuant to State Water Board Order 90-5 within one week of May 28, 2013, and operation in accordance with the plan, and any further conditions determined by the Executive Director of the State Water Board. Mr. Howard also indicated that the Bureau and Department will be required to include a water accounting under the change in operations. Mr. Howard indicated that we would follow up after receipt of a specific request from the Bureau and Department.

Proposal

In your letter you propose to meet critically dry year requirements pursuant to D-1641 for the Sacramento Valley, including requirements included in Table 3 for the protection of fish and wildlife, in order to conserve CWP resources. In your letter, you state that, although the January through April period during 2013 was the driest on record, the November and December

precipitation was sufficient to result in a Sacramento Valley classification of "dry" for water year 2013. Your letter further states that nearly 80 percent of this water year's precipitation occurred in October, November and December 2012, and an abnormally large portion of this fell as rain rather than snow as a result of warmer than normal conditions for that time of year. This combined with critically dry conditions in the months since the first of the year has resulted in minimal snow pack in the Sierra Nevada in the critical spring months. As of May 1, 2013, the Northern Sierra snowpack was only about 48 percent of the historical April 1 value and about 17 percent of normal. Further, you point out that unusually high stream depletions in the Sacramento Valley have also contributed to reduced storage levels.

Your letter explains that meeting dry year objectives could jeopardize the Bureau and Department's ability to meet objectives designed to protect fisheries later in the year. In particular, the Bureau has expressed concern that it may not be able meet the temperature requirement necessary to protect salmon present in the Sacramento River during the summer and fall if the CWP in Shasta Reservoir continues to be depleted. You state that operating to meet critically dry water year requirements for the Western and Interior Delta from May through August 15 of this year could result in a gain of approximately 115 thousand acre-feet (TAF) of water in upstream reservoirs at the end of September. You indicate that including the Delta outflow requirement (included in Table 3 of D-1641) for the same period would increase the gain in reservoir carryover storage to approximately 185 TAF. You further indicate that compliance with critically dry conditions will result in water quality conditions in the North Delta that are consistent with the current hydrology.

Response to Proposal

Article X, section 2 of the California Constitution sets forth a directive to maximize the reasonable and beneficial use of the State's waters. As such, this constitutional mandate provides an important consideration where statutory water rights provisions vest discretion in the State Water Board. We have reviewed the unique factors of your request and the recommendations of the fisheries agencies. As the person delegated by the State Water Board to act on water right permit terms that apply to conditions in the Delta, I will not object or take any action if the Bureau and Department operate to meet critically dry year objectives for Western and Interior Delta agricultural beneficial uses included in Table 2 of D-1641 instead of operating to meet dry year objectives through August 15, 2013. This conclusion is conditioned as specified in the above mentioned email from the State Water Board's Executive Director Thomas Howard. Specifically, the Bureau and Department shall submit a temperature management plan pursuant to State Water Board Order 90-5 **by June 4, 2013**, and shall operate in accordance with the approved plan to maximize temperature benefits to fisheries resources. The Bureau and Department shall consult with the fisheries agencies concerning temperature management decisions and shall immediately inform the State Water Board regarding any fisheries agencies concerns and proposed resolution of those concerns. The Bureau and Department shall implement additional actions as determined by me or the Executive Director of the State Water Board. The Bureau and Department shall also submit a water accounting to the State Water Board under the change in operations **by August 22, 2013**.

I understand that Delta outflow requirements are not currently controlling operational decisions related to releases from Shasta Reservoir, but likely will be in the next several weeks. In order to determine whether any additional changes to operations to meet Delta outflow or other objectives required by D-1641 should be made to protect CWP resources, the Bureau and Department should immediately consult with the fisheries agencies and State Water Board staff.

I will consider additional actions to conserve CWP resources upon receipt of input from the fisheries agencies on those matters.

In the future, the State Water Board staff and I expect discussions regarding compliance matters to begin as soon as potential issues are identified in order to allow the greatest flexibility to address these issues. The State Water Board will consider whether appropriate coordination took place in a timely manner when considering future enforcement action.

If you have any questions, please contact me at cwilson@waterboards.ca.gov or 916-445-5962. Written correspondence should be addressed as follows:

State Water Resources Control Board
Office of Delta Watermaster
Attn: Craig Wilson
P.O. Box 100
Sacramento, CA 95812

Sincerely,

Craig M. Wilson

Craig Wilson, Delta Watermaster
State Water Resources Control Board

Enclosures

cc: Thomas Howard, Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95812

Maria Rea,Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 9th Street
Sacramento, CA 95814

Kim Turner, Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

cc: Continues on next page.

cc: Erin Foresman
USEPA Region 9
C/O NMFS 650 Capitol Mall
Sacramento, CA 95814

Melinda Terry, Manager
North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Dante Nomellini Jr.
Central Delta Water Agency
P.O. Box 1461
Stockton, CA 95201

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

From: Wilcox, Carl@Wildlife [mailto:Carl.Wilcox@wildlife.ca.gov]
Sent: Friday, May 24, 2013 4:04 PM
To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards
Cc: Riddle, Diane@Waterboards; Leahigh, John@DWR; pfujitani@usbr.gov; Dibble, Chad@Wildlife; Maria Rea - NOAA Federal; Garwin.Yip@noaa.gov; Jennifer_norris@fws.gov; Kim_S_Turner@fws.gov
Subject: CDFW concurrence with proposed changes to Delta WQ standards requested by DWR and Reclamation

Board Chair Marcus,

This e-mail is to provide California Department of Fish & Wildlife (CDFW) support/concurrence regarding the U.S. Bureau of Reclamation's (Reclamation) and California Department of Water Resources' (DWR) proposal that the SWRCB change the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30) water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

* Sacramento River at Emmaton, Station D-22;
* San Joaquin River at Jersey Point, Station D-15;
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* San Joaquin River at San Andreas Landing, Station C-4.

This request is to support applying the new water year classification as soon as possible, through August 15, 2013. The biggest benefit to changing the water year type for the specific water quality stations is increased storage in (or conversely, reducing the rate of drawdown of) Shasta Reservoir. This will likely benefit the life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014.

The proposal was discussed on a conference call today, Friday, May 24, among members of the SWRCB, Reclamation, DWR, U.S. Fish and Wildlife Service (USFWS), CDFW, and National Marine Fisheries Service (NMFS). In addition, the fish agencies conferred on the proposal and concur. The USFWS and NMFS will send separate e-mails expressing their support for the proposal. It is our understanding that a letter making the subject request will be forthcoming this afternoon. CDFW is providing this email concurrence to allow for a timely decision to maximize protection of Shasta storage to protect Chinook salmon. Any change in the formal submission by DWR and Reclamation to the SWRCB this afternoon from what is described above, will require re-evaluation by the CDFW before we could provide our concurrence.

Carl Wilcox
Policy Advisor to the Director for the Delta California Department of Fish and Wildlife
7329 Silverado Trail
Napa, CA 94558
Cell 707-738-4134
Office 707-944-5584
Carl.Wilcox@wildlife.ca.gov

From: Maria Rea - NOAA Federal [mailto:maria.rea@noaa.gov]
Sent: Friday, May 24, 2013 4:50 PM
To: Marcus, Felicia@Waterboards; Howard, Tom@Waterboards; Wilson, Craig@Waterboards; Grober, Les@Waterboards; Riddle, Diane@Waterboards
Cc: Garwin.Yip@noaa.gov; RMILLIGAN@usbr.gov; pfujitani@usbr.gov; Leahigh, John@DWR; Dan_Castleberry@r1. Gov; Wilcox, Carl@Wildlife
Subject: NMFS support for change petition to D-1641

Dear Felicia and Tom:

This e-mail is to provide NOAA's National Marine Fisheries Service's (NMFS) support/concurrence regarding the U.S. Bureau of Reclamation's (Reclamation) and California Department of Water Resources' (DWR) proposal. As I understand it, and as discussed on a conference call this morning among members of the SWRCB, Reclamation, DWR, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and NMFS, Reclamation and DWR will request that the SWRCB change the Sacramento Valley Water Year Hydrologic Classification Index (40-30-30) water year type from "dry" to "critical" as it pertains to the Water Quality Objectives for Agricultural Beneficial Uses under D-1641 at the following Western Delta and Interior Delta monitoring stations:

- Sacramento River at Emmaton, Station D-22;
- San Joaquin River at Jersey Point, Station D-15;
- South Fork Mokelumne River at Terminus, Station C-13; and
- San Joaquin River at San Andreas Landing, Station C-4.

This request is to support applying the new water year classification as soon as possible, through August 15, 2013. The biggest benefit to changing the water year type for the specific water quality stations is increased storage in (or conversely, reducing the rate of drawdown of) Shasta Reservoir. This will likely benefit the life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014. For example, Reclamation is currently releasing 13,000 cfs from Keswick Dam partly as a result of the Delta Cross Channel being open over the Memorial Day weekend and partly because of the spring tide, but largely to maintain compliance with the Emmaton water quality standard. In addition, the May forecast at the 90% exceedance hydrology indicates that the projected end of September (EOS) carryover storage at Shasta Reservoir is 1.527 million acre feet (MAF). The NMFS biological opinion on the long-term operations of the Central Valley Project and State Water Project does not have a minimum EOS carryover storage requirement in Shasta Reservoir. However, although the requirements in Action I.2.3.C pertain to the February forecast, it does acknowledge and provide for drought exception procedures if a Clear Creek Temperature Compliance Point or 1.9 MAF EOS storage is not achievable, indicating that the forecasted carryover storage of 1.527 MAF is very low.

In addition, the fish agencies conferred on the proposal as discussed this morning, and also concur. The USFWS and CDFW will send separate e-mails expressing their support for the proposal.

Please let me know if you have any questions or need more information. My cell phone number is (916) 799-2359.

- Maria

Maria Rea

Supervisor, Central Valley Office, NOAA Fisheries

From: "Chotkowski, Michael" <michael_chotkowski@fws.gov>
Date: May 28, 2013 6:21:50 PM PDT
To: <Felicia.Marcus@waterboards.ca.gov>, <Tom.Howard@waterboards.ca.gov>, <Craig.Wilson@waterboards.ca.gov>, <Les.Grober@waterboards.ca.gov>
Cc: <Diane.Riddle@waterboards.ca.gov>, "Leahigh, John@DWR" <John.Leahigh@water.ca.gov>, PAUL FUJITANI <PFujitani@usbr.gov>, "Dibble, Chad@Wildlife" <Chad.Dibble@wildlife.ca.gov>, Maria Rea - NOAA Federal <maria.rea@noaa.gov>, Garwin Yip - NOAA Federal <garwin.yip@noaa.gov>, "Jen Norris" <jennifer_norris@fws.gov>, Kim <kim_s_turner@fws.gov>, Roger Guinee <roger_guinee@fws.gov>
Subject: Update to: FWS concurrence with proposed changes to Delta WQ standards, as requested by Reclamation and DWR

Board Chair Marcus,

Note: This email supersedes one I sent earlier today, which reflected a misunderstanding on my part. Apologies. Please discard the earlier email and substitute this one.

This email expresses the U.S. Fish and Wildlife Service's (Service) support for the State Water Board's proposal to implement the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) request to change the 40-30-30 Sacramento Valley water year type from "dry" to "critical," specifically as it pertains to relaxing the D-1641 water quality objectives for agricultural beneficial uses at four stations in the western Delta:

* Sacramento River at Emmaton, Station D-22;
* San Joaquin River at Jersey Point, Station D-15;
* South Fork Mokelumne River at Terminus, Station C-13; and
* San Joaquin River at San Andreas Landing, Station C-4.

The proposed change to the water year type for the specific water quality stations would reduce drawdown of Shasta Reservoir. This will likely benefit the early life history needs of the 2013 cohorts of Chinook salmon, in addition to providing higher carryover storage (than otherwise would be realized) to begin water year 2014.

The change in EC standard at these stations would occur immediately and last through August 15, 2013. The Service supports implementation of the proposal on a one-time basis, so long as implementation does not affect management of OMR flow to protect juvenile delta smelt in accordance with the Service's 2008 OCAP Biological Opinion.

It is our understanding that some discussions related to possible changes in Delta outflow have yet to occur. We will evaluate proposals related to deviations from the D-1641 Delta outflow standards when/if they are proposed.

The Service will continue to work cooperatively with its Federal and State partners to ensure that the CVP and SWP operations provide adequate protection for Threatened and Endangered species while delivering water that benefits 25 million agricultural and urban water users throughout California.

--

Mike Chotkowski
Field Supervisor, Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento CA 95814
(916) 930-5632 Office
(916) 812-0155 Cell

BUREAU OF RECLAMATION
Central Valley Operation Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

DEPARTMENT OF WATER RESOURCES
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

MAY 24 2013

IN REPLY REFER TO:
CVO-100
WTR-4.10

Thomas Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

Subject: State Water Resources Control Board Water Right Decision 1641 Water Year Classification

Dear Mr. Howard:

The Department of Water Resources (DWR) and the United States Bureau of Reclamation (Reclamation) request that the State Water Resources Control Board (SWRCB) acknowledge that the water year classification for the Sacramento Valley based on the equation provided in Attachment 1, page 188 of Revised Water Rights Decision 1641 (D-1641) does not accurately reflect the unprecedented dry conditions experienced in 2013. Instead, the hydrologic conditions experienced between January and the present are characteristic of a "Critical" water year type. The current miscategorization in water year classification is projected to affect the storage of cold water pool for fisheries purposes due to controlling D-1641 Delta objectives in the May through August period. These objectives are:

1) EC parameters for Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas (interagency Station Number C-4) as defined in Table 2 on page 182
2) Delta Outflow, as defined on Table 3 on Page 184.

Water year classification also affects other objectives listed in D-1641 to a lesser degree, but it is not anticipated that those objectives will significantly control Delta operations in 2013.

Summary of Relevant Facts:
D-1641 imposes water quality objectives on the Central Valley Project (CVP) and State Water Project (SWP). Several of the objectives are dependent on the water year type as determined by the May 1, Sacramento Valley Index and the San Joaquin Valley Index. Although the January through April period during 2013 was the driest on record, the November and December precipitation was sufficient to result in a Sacramento Valley classification of "Dry" for water year 2013. The "Dry" water year classification is not representative of the extreme hydrological conditions in Northern California this calendar year and the water quality objectives based on this water year type could result in significant adverse impacts to the cold water pool operations at Shasta Reservoir. In fact, Governor Brown's recent executive order B-21-13 recognizes that, "much of California experienced record dry conditions in January through March 2013, registering historic lows on the Northern Sierra" and "record dry and warm conditions resulted in a snowpack substantially below average, with estimated May water content in the statewide snowpack being only 17 percent of average."

The 2013 water year has been particularly challenging with double the normal precipitation in November and December and historically low values from January into May. The current Northern Sierra 8 Station Precipitation Index from January 1, 2013 through May 15 is about 8.8 inches. Without additional measurable precipitation in May, this figure will represent the driest Northern Sierra 8-Station Precipitation Index for the January through May period on record. Attachment 1 shows the accumulated 8-station precipitation values from January through May for some of the extremely dry years including 1924, 1976, and 1977. The nearly 80 percent of this year's precipitation occurred in the first three months of the water year, and an abnormally large portion of this fell as rain rather than snow as a result of warmer than normal conditions for that time of year. This combined with critically dry conditions in the months since the first of the year has resulted in minimal snow pack in the Sierra Nevada in the critical spring months. The Northern Sierra snowpack was only about 48% of the historical April 1 value and about 17% of normal as of May 1, 2013. Creek and small stream flows that enter the Sacramento River system below major reservoirs are running at historically low levels in response to the extended dry period. DWR's May 1, 2013 Bulletin 120 forecasts an April to July runoff 48% of normal for the Sacramento Valley. Hydrological conditions are not likely to improve and the National Oceanic and Atmospheric Administration has indicated that California is in severe to extreme drought that is likely to persist or intensify into the summer (Attachment 2).

Additionally, unusually high depletions in the Sacramento Valley are adding to the operational challenges the CVP and SWP (collectively, Projects) are facing in meeting the 2013 water year type requirements. Typically, extremely dry years with low Northern Sierra 8-Station Precipitation Index values trigger the Shasta inflow shortage criteria included in water rights settlement contracts that would reduce water supplies for the senior water rights diverters in the Sacramento Valley. Yet, this year the wetter conditions in the fall months were sufficient to require full allocations to the Sacramento Valley and Feather River settlement contractors,

increasing demands on Shasta and Oroville storage. Therefore, it is expected that depletions will continue to run at a high rate into the summer. DWR and Reclamation are required to make releases in order to satisfy the senior water rights of the Sacramento River and Feather River settlement contractors, and the Exchange Contractors. These contracts specify the amount of water the Projects must deliver – for the Sacramento River and Exchange Contractors, Reclamation is required to deliver 100% of the contract total in any year where the forecasted inflow to Shasta Reservoir exceeds 3.2 million acre feet (af). This target was met in 2013 – thus Reclamation is mandated to deliver 100% of the contract total, and has no discretion under the contract to reduce these deliveries.

The unusually high stream depletions (Attachment 3) were a major cause of the exceedence of the Emmaton objective that occurred in April and May. This is described in further detail in DWR and Reclamation's letter to SWRCB dated May 24, 2013. The CVP and SWP reservoir systems were in a near normal condition in January, but Reclamation and DWR have drawn heavily on the storage since then due to the extended dry period, low unregulated flow entering the system, and high depletions in the Central Valley. Reservoir releases are currently well above average for this date.

In order to meet the Dry year water quality objectives rather than the Critical objectives, DWR and Reclamation have released significant volumes of water from Oroville, Shasta, and Folsom Reservoirs. The low reservoir inflow and increased storage withdrawal is depleting the cold water pool in the reservoirs that is important to provide adequate instream fishery habitat for anadromous fish in the rivers through the summer and fall.

SWRCB Water Rights Order 90-05 requires that Reclamation operate Shasta Reservoir to meet a daily average temperature of 56 degrees Fahrenheit in the Sacramento River at a location and through periods when higher temperatures will be detrimental to the fishery. Typically, through coordination with the Sacramento River Temperature Task Group (SRTTG), the location selected is between Balls Ferry and Bend Bridge on the Sacramento River. Without recognition of the Sacramento Valley water year type actually experienced in 2013, the projected low reservoir storage and limited cold water pool this year may result in the objective occurring well upstream of Balls Ferry and Reclamation is concerned whether the 56 degree objective can be maintained at any location in the Sacramento River through the fall. The cold water pool is vital to providing adequate habitat to salmon present in the Sacramento River through the summer and into the fall for both the winter-run Chinook salmon and fall-run Chinook salmon. The SRTTG has recommended an initial temperature compliance point of Airport Road located upstream of Balls Ferry due to the limited cold water resources this year.

Due to the unprecedented hydrologic conditions discussed above including the record dry January through May period, extremely low snowpack, and unusually high Sacramento valley depletions, conditions continue to deteriorate and it is clear that meeting the dry year objectives could jeopardize the ability to meet other fisheries objectives later in the year. The reservoir storage that accumulated in the wet fall, which was originally projected to be sufficient to meet the dry year objectives, is falling rapidly due to the abnormally large valley demands and

Reclamation is projecting CVP September carryover storages only about 63% of average.

There is a significant difference between the volume of Delta inflow needed to achieve the Dry and Critical water quality objectives for Jersey Point and Emmation through June 15. If Reclamation and DWR are able to begin operating to the Critical year water quality objectives in May it may be possible to achieve 100,000 to 200,000 af, of cold water benefits in the upstream reservoirs. This savings in cold water storage would improve the chances of meeting the temperature objective at Airport Road. This cold water benefit will help avoid temperature related fish losses in the Sacramento River.

The greatest benefits to the Project's reservoir storage would occur in the May to August 15 period. The compliance locations in the Western Delta and Interior Delta shown in Table 3 on Page 182 (Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas Landing (Interagency Station Number C-4) would most likely be the objectives controlling the Project operations during the May to June 15 period and changes at these locations would have the greatest impact on improving upstream storage in the immediate future. The objectives of the Delta outflow compliance location in Table 3 on page 184 often can control Project operations through the summer and operating to a critical year with respect to Delta outflow will also assist in preserving cold water pool.

Currently, DWR and Reclamation are maintaining a Net Delta Outflow well over 9,000 cubic feet per second (cfs) in order to achieve the Dry year objectives for Jersey Point and Emmaton. If the Dry classification is changed to Critical, the controlling D-1641 objective through June would be the Net Delta Outflow Index of at least 7,100 cfs in Table 3, or the export to inflow ratio of 35% in Table 3. From July through August 15, the controlling criteria for either water year classification would most likely shift among the minimum Net Delta Outflow objectives in Table 3, the salinity objectives for Jersey Point and Emmaton in Table 2, the Export to Inflow ratio of 65% in Table 3, or the Contra Costa 250 chloride objective in Table 1.

Table 2 of D-1641 requires an electrical conductivity (EC) no greater than 0.45 mmhos/cm for both Emmaton and Jersey point locations from April 1 to June 15, and 1.67 mmhos/cm for Emmaton and 1.35 mmhos/cm for Jersey Point from June 15 to August 15 under a Dry Year classification. For a Critical year these objectives are 2.78 mmhos/cm from April 1 to August 15 for Jersey Point and Emmaton. Since the X2 outflow objective of 7,100 cfs, which is not linked to the year type designation would probably control in May, and June, there would only be a gradual increase in salinity at Jersey Point and Emmaton through June that is reflective of a Critical year. Water quality at Jersey Point and Emmaton would fluctuate with the tidal and meteorological conditions potentially moving towards a 1.0 to 2.0 mmhos/cm EC range in July. Compliance with the water quality objectives at the Jersey Point and Emmaton locations typically achieves the objectives at Terminous and San Andreas Landing. This gradual increase in salinity levels would be commensurate with those experienced in years with similar hydrologic conditions as those observed in recent months.

Reclamation estimates that from May through August 15 a change in the water year classification from Dry to Critical in the Western Delta and Interior Delta locations in Table 2 could result in a gain of about 115,000 af, in upstream reservoir carryover storage at the end of September. Including the Delta outflow compliance in Table 3 for the same period would increase the gain in reservoir carryover storage to about 185,000 af. There could be reductions in the release from Keswick Reservoir up to about 1,000 cubic feet second in late May and June under a Critical year classification.

D-1641 requires that the number of days less than or equal to 150 mg/l chloride at Contra Costa Pumping Plant be greater than 165 days for a Dry year and 155 days for a Critical year. DWR and Reclamation do not anticipate that this objective would be a controlling criteria for the Projects under either year classification and both objectives would be met. The minimum Net Delta Outflow required from February through June (Collinsville X2 at 7,100 cfs) should be adequate to achieve the Contra Costa objective under either the Dry or Critical classification.

SWRCB recognition of the change in water year type is in the public interest. The change will provide for a water year classification reflective of the extremely dry hydrologic conditions in 2013 and allow the projects to operate in a manner that will provide the maximum benefit to critical beneficial users without unreasonably affecting other designated beneficial uses. As noted above there will be no significant impacts to agricultural or municipal uses, and the change will provide significant benefit to fisheries resources. State and federal agencies have been focused on the protection and improvement of fishery conditions in the Delta watershed, and are in the process of analyzing options for balancing project operations for the numerous different beneficial uses. Approval of the following request would result in water quality conditions in the North Delta that are consistent with the hydrology we are currently experiencing, while preserving cold water storage critical to salmon survival.

Requested Action:
Reclamation and DWR request that the SWRCB recognize the change in year classification need and act immediately. Delaying such recognition to even June 1 will significantly impair Reclamation's ability to meet cold water temperature objectives on the Sacramento River. At present, the controlling D-1641 Delta water quality objectives for the Projects that are linked to the Sacramento Valley Index are Jersey Point in Table 2, Emmaton in Table 2. In addition, Delta Outflow in Table 3, may become a controlling standard and will also impact cold water pool storage starting in the middle of June.

We believe the SWRCB may balance protection of the beneficial uses in light of the critical water year type experienced on the Sacramento River in 2013. Immediate benefits to cold water pool storage can be achieved through the Projects meeting critical water year standards for the Interior and Western Delta salinity standards in Table 2. The compliance points at issue are Sacramento River at Emmaton (Interagency Station Number D-22), San Joaquin River at Jersey

Point (Interagency Station Number D-15), South Fork Mokelumne River at Terminous (Interagency Station Number C-13), and San Joaquin River at San Andreas Landing (Interagency Station Number C-4).

Additional cold water pool benefits can be achieved in July through September with recognition of the critical water year type in Table 3, Water Quality Objectives for Fish and Wildlife Beneficial Uses. As noted above; Delta outflow objectives will likely control project operations in July through September, where agricultural objectives are met under a critical water year designation. A Delta outflow standard reflective of the critical water year type may produce an additional 70,000 af of cold water pool storage.

If you have any questions or would like more information regarding this notification, please contact Mr. Paul Fujitani of Reclamation at 916-979-2197 or Mr. John Leahigh at 916-574-2722.

Sincerely,

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation

for D. Roose

David H. Roose, Chief
SWP Operations Control Office
Department of Water Resources

Attachment -4

cc: Mr. Craig M. Wilson, Delta Watermaster
State Water Resources Control Board
1001 I Street
Sacramento, California 95812

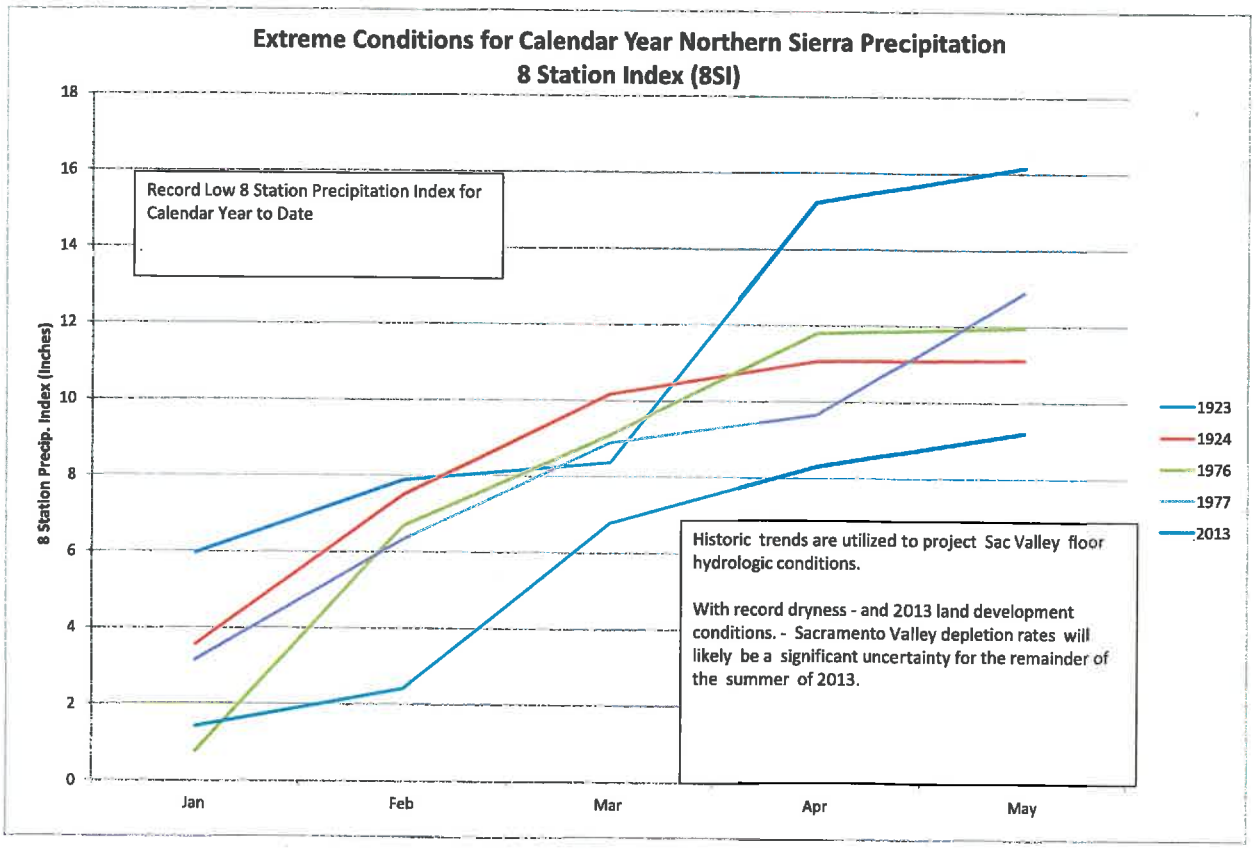
Ms. Maria Rae
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, California 95814

Mr. Les Grober
State Water Resources Control Board
Division of Water Rights
1001 I Street
Sacramento, California 95812
(w/encl to each)

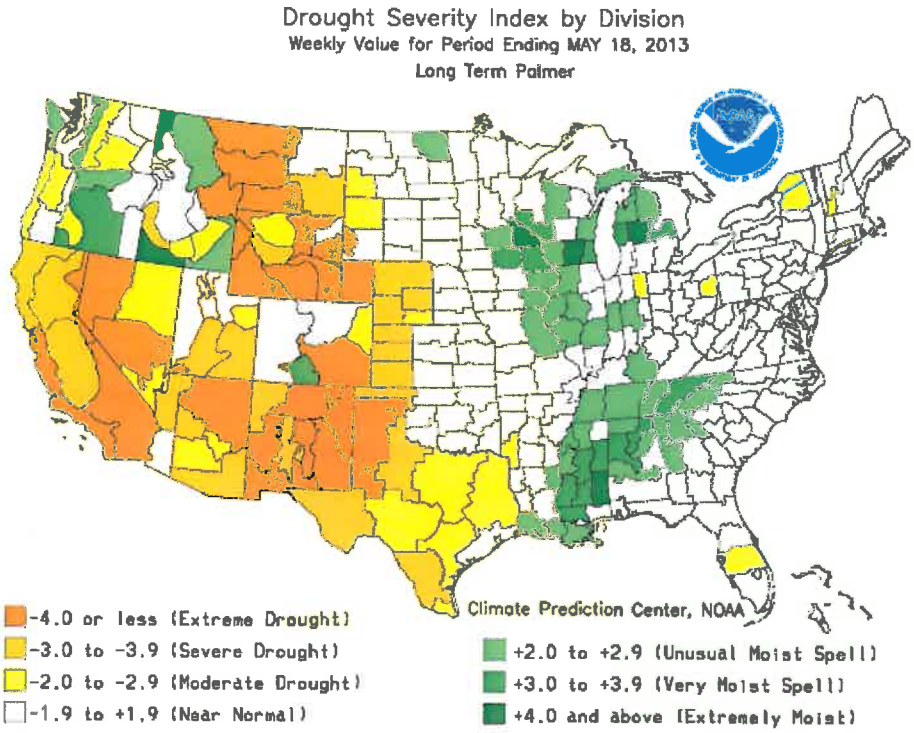
Carl Wilcox
California Department of Fish and Wildlife
1416 9th Street
Sacramento, California 95814

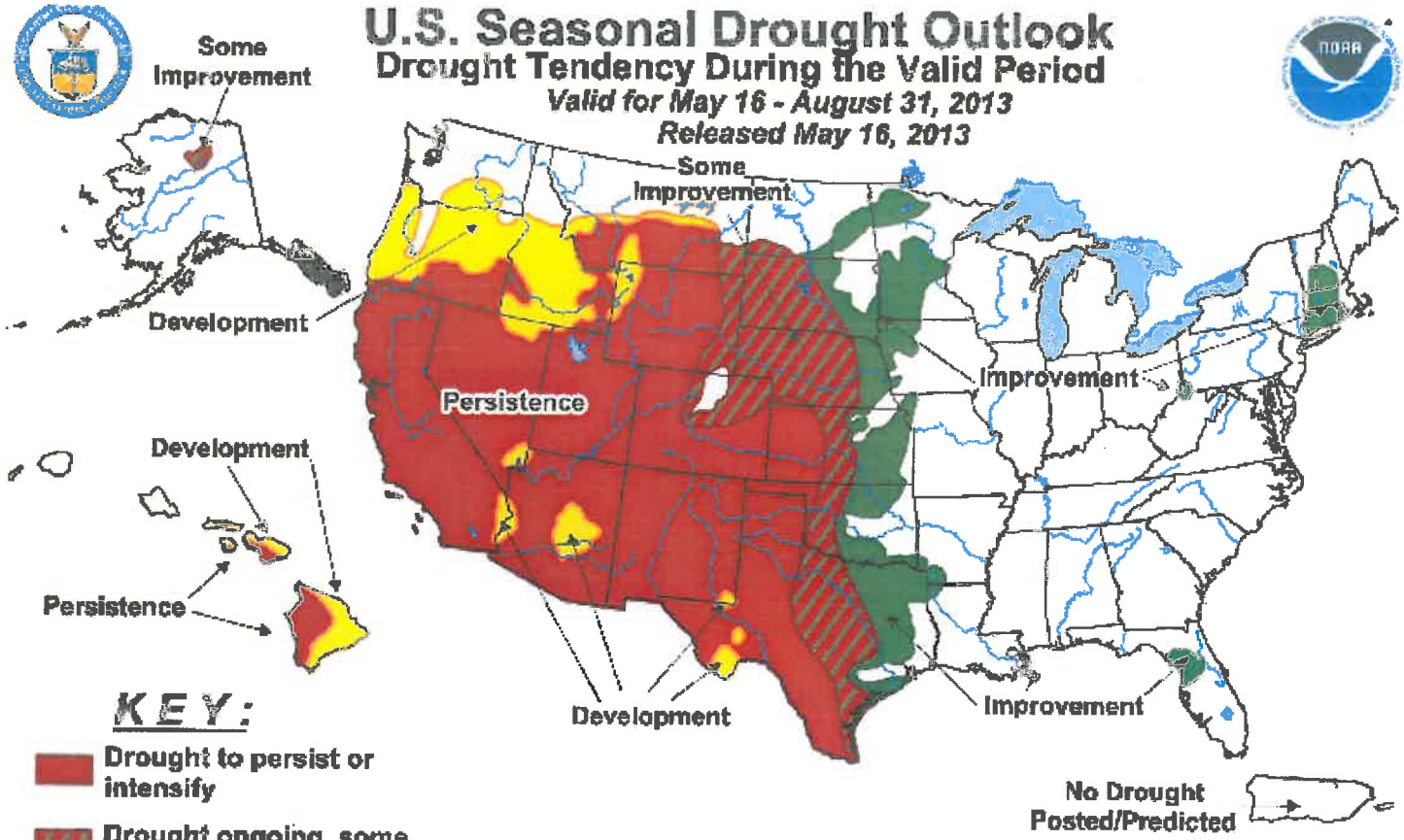
Ms. Kim Turner
Assistant Field Supervisor
Bay-Delta Fish & Wildlife Office
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, California 95814

Attachment 1



Attachment 2





Attachment 3

Attachment 4

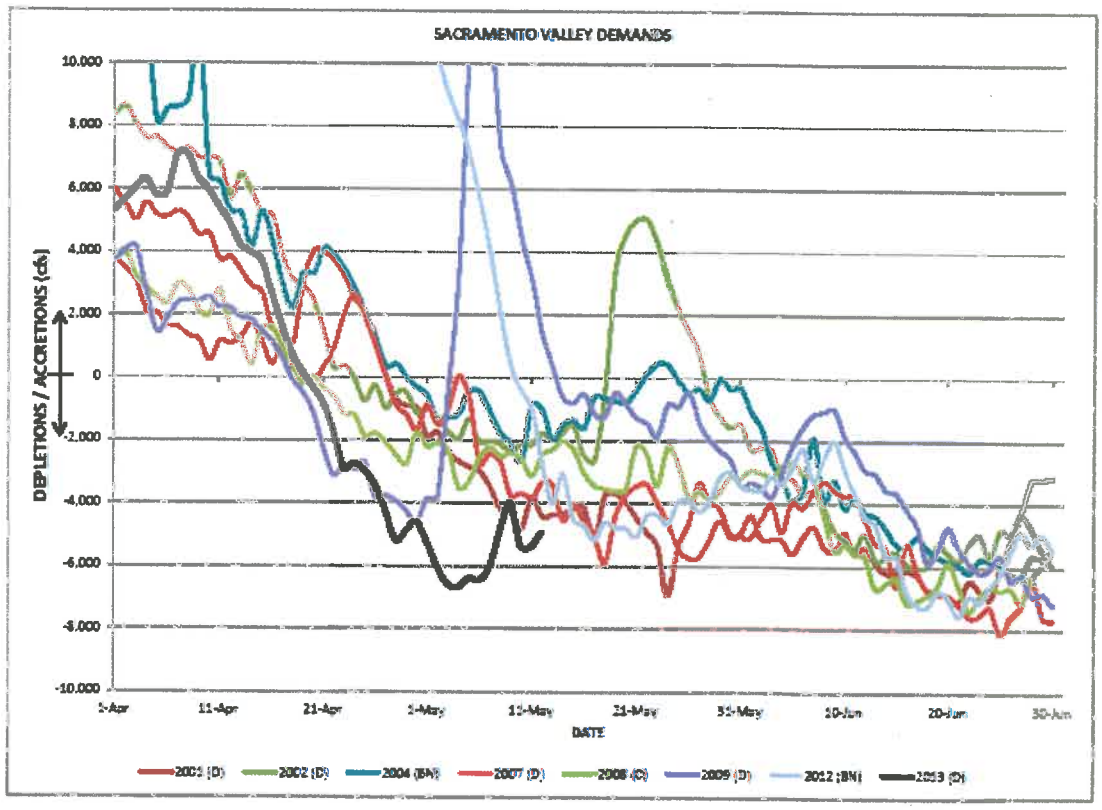


EXHIBIT D

United States Department of the Interior

BUREAU OF RECLAMATION
Central Valley Operations Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY
REFER TO:

CVO-100
WTR-4.00

JUN 0 3 2013

Ms. Barbara Evoy
Deputy Director, Division of Water Rights
State Water Resources Control Board
PO Box 2000
Sacramento, CA 95812

Subject: Report on Proposed Operation of Shasta/Trinity Divisions for 2013

Dear Ms. Evoy:

Enclosed is a copy of the Report on Proposed Operations of Shasta/Trinity Divisions for 2013, including Sacramento and Trinity River Temperatures for Salmon Resources projected for the period April through November 2013. This report identifies the selected temperature operation plan and supporting operational studies.

The selected plan does not meet a daily average water temperature of 56 degrees Fahrenheit (°F) in the Sacramento River at Red Bluff Diversion Dam for all the periods in 2013, when higher temperatures could be detrimental to the fishery. The selected plan was developed by the Sacramento River Temperature Task Group (SRTTG), which consists of representatives of the State Water Resources Control Board (SWRCB), the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, Western Area Power Administration, Department of Water Resources, the Hoopa Valley Tribe, and the Bureau of Reclamation. It provides for the use of available cold water in Shasta Reservoir to provide the best practicable protection for races of Chinook salmon in the Sacramento River. The plan's objective is to meet 56.0 °F at Airport Road Bridge on the Sacramento River by operating to a surrogate temperature target of 56.75 °F at Balls Ferry. The surrogate temperature objective at Balls Ferry may change during the summer as needed to ensure meeting 56 °F at Airport Road Bridge. The plan will be updated as necessary through the summer to account for observed conditions and updated hydrology. Reclamation will notify the SWRCB if there is a need to revise the compliance point due to changes including operations to the critical year objectives in the Delta.

Reclamation prepared this report after consulting with other members of the SRTTG. If you have any questions regarding this report, please call Ms. Elizabeth Kiteck, Chief, Water Operations Division, Central Valley Operations Office, at 916-979-2684.

Sincerely,

Paul Taylor

for Ron Milligan
Operations Manager

UNITED STATES

BUREAU OF RECLAMATION

MID-PACIFIC REGION

ANNUAL REPORT ON PROPOSED OPERATION OF SHASTA/TRINITY DIVISIONS AND SACRAMENTO RIVER TEMPERATURES FOR SALMON RESOURCES PROJECTED FOR THE PERIOD APRIL THROUGH NOVEMBER 2013

TABLE OF CONTENTS

INTRODUCTION

This report is submitted to the State Water Resources Control Board (SWRCB) in compliance with Water Rights Orders WR-90-5, WR-91-01, and WR-92-02.

Shasta Reservoir storage on April 1, 2013 was 3,771,100 acre-feet (ac), and Trinity Reservoir storage was 2,077,400 ac. Based on the April 1 National Weather Service and California Department of Water Resources monthly 90% runoff forecasts, the water year inflow for Shasta Reservoir is forecast to be 3.750 million acre-feet (maf), approximately 63% of average. The 90% runoff to Trinity Reservoir is forecast to be 0.695 maf for water year 2013, or approximately 51% of average.

In order to discuss and evaluate proposed 2013 Sacramento River temperature control operations, several Sacramento River Temperature Task Group (SRTTG) meetings were held (March 19, 2013, May 2, 2013 and May 23, 2013). The SRTTG representatives consists of representatives of the State Water Resources Control Board (SWRCB), the California Department of Fish and Wildlife (DFW), the U. S. Fish and Wildlife Service, the National Marine Fisheries Service (NMFS), Western Area Power Administration, DWR, the Hoopa Valley Tribe, and the Bureau of Reclamation. Some of the SRTTG agency representatives participated in the preparation and review of this report.

FINDINGS

Order 90-5, as amended, requires meeting 56.0 degrees Fahrenheit (°F) at Red Bluff Diversion Dam during times that higher temperatures would be detrimental to the fishery resources. After consultations with NMFS and review of temperature model results from March, April and May and supported by operational experience, it was determined that temperatures of 56.0 °F or less cannot be met at Red Bluff Diversion Dam regardless of the water supply allocation to Central Valley Project contractors. The SRTTG met early this year due to low storage conditions and subsequently selected control points at which current modeling of system resources indicates that 56 °F can be maintained.

Water year 2013 is classified as a dry year for the Sacramento River basin and follows a below normal year (2012). Initial temperature model runs completed in April 2013 showed that Reclamation should be able to meet the Balls Ferry objective point required in the NMFS 2004 Biological Opinion. Based on the April 2013 model runs, the SRTTG agreed to locate the compliance point at Balls Ferry for the months of April and May and to revisit the compliance location at the next meeting. The May modeling runs were done to determine the feasibility of meeting 56 °F at Balls Ferry. These runs suggest that it is likely that temperatures can be maintained at 56 °F at Balls Ferry through August, after which the control point may have to be moved up stream to Clear Creek. In order to be able to provide a consistent temperature regime in the Sacramento River through October, it would be advisable to establish the temperature control point at Airport Road.

A copy of this temperature analysis was given to NMFS on May 15, 2013 and Reclamation received an email from NMFS requesting to operate to a temperature target of 56 °F at Airport Road on May 17, 2013.

On May 23, 2013 at the SRTTG meeting, the group reviewed the May temperature analysis and agrees that an initial temperature target of 56 °F at Airport Road is an appropriate compliance point. The group agrees that starting the control point at Airport Road will help to insure that cold water is available to meet 56 °F at Airport Road for the entire temperature control season.

There is no temperature monitoring station at Airport Road Bridge. Similar to 2008, USBR would then operate to a surrogate target temperature of 56.75 °F at Balls Ferry, with the intention of achieving 56.0 °F at Airport Road Bridge. The surrogate temperature objective at Balls Ferry may change during the summer as needed to ensure meeting 56 °F at Airport Road Bridge. The group will continue to assess the cold water pool condition throughout the summer operations.

The basic objective of WR Order 90-5 is to control temperatures in the upper Sacramento River to 56.0 °F during times when higher temperatures would be harmful to fish. The ability to control daily temperatures to the desired range depends on numerous factors which unfold as the year progresses. Temperature operations may be affected by deviation from average meteorological conditions, actual inflow volumes and temperatures, wind driven mixing, rainfall, cloud cover, spring reservoir storage and initial temperatures, and system or equipment outages. The temperature model studies initially assume average meteorological conditions, although each month is updated with new initial conditions as the season progresses. Experience has shown that April through October represents the primary period when air temperatures and reservoir release temperatures can potentially adversely influence the Sacramento River temperatures. Outside of these months, atmospheric conditions generally keep the river cooler than the required temperature objective.

The SRTTG meets on a regular basis during the temperature control season, typically monthly, but more frequently as conditions warrant. Typical discussions in the regular meetings include an assessment of the temperature control operations, forecast of operations for the remainder of the season, and fishery updates. The temperature control evaluations include a continuing assessment of the capability to meet the temperature objective at the compliance point. The target temperature at Airport Road Bridge will be reevaluated as the season progresses and more measured data regarding the cold water resources becomes available, and the SWRCB will be notified of any proposed changes in either temperature compliance location or temperature operations at Airport Road Bridge. The SRTTG also evaluates survey data to help determine salmon spawning locations and quantity of fish and attempts to balance use of cold water for different runs and life stages.

TABLE 1

TEMPERATURE OPERATING OBJECTIVES FOR 2013

Initial Point of Compliance: 56.0 °F. at Airport Road effective May 17, 2013, until further notice.

Modification to Point of Compliance: As the year progresses, numerous unforeseen factors may indicate that changing the compliance point temperature will be necessary to continue maintaining 56 °F at the desired location. In the event that a compliance point change is required (based upon a combination of experience and modeling), Reclamation will present this information to the SRTTG. If the SRTTG concurs, Reclamation will modify this plan and re-submit it to the SWRCB. In the event that the SRTTG does not concur, Reclamation will forward the SRTTG position to the SWRCB along with Reclamation's recommendations, and the SWRCB may then select the preferred option.

Modeled Forecasted Temperatures for the Sacramento and Trinity Rivers.
Initial Compliance at 56.0 °F at Airport Road Bridge

	Jun	Jul	Aug	Sep	Oct	Nov
Keswick	52.8	54.6	54.6	54.6	55.9	54.0
Airport Rd	53.5	55.7	55.7	55.4	55.7	52.9
Balls Ferry	54.2	56.7	56.6	56.3	56.0	52.7
Jellys Ferry	55.1	57.9	57.8	57.3	56.3	52.4
Bend Br	55.6	58.7	58.6	57.9	56.4	52.2
Red Bluff	56.6	60.2	60.0	59.0	56.8	51.9

	Jul	Aug	Sep	Oct	Nov
Lewiston	48.9	49.5	49.5	48.9	49.0
Douglas City	56.6	56.8	55.6		
Conf. N. Fork				54.2	50.6

Appendix A

BIOLOGICAL ANALYSIS OF 2013 TEMPERATURE CONTROL OPERATIONS

Winter-run Chinook Salmon

The initial plan developed by the Sacramento River Temperature Task Group (SRTTG) for the 2013 season was to set the temperature control point (TCP) at 56 °F at Balls Ferry from April 15 through May 15 consistent with the NMFS 2009 Biological Opinion (RPA Action 1.2.3, for the March to May 14 period) to protect the early segment of the pre-spawning and spawning periods for adult winter-run Chinook salmon. Temperature modeling results using the 90% exceedence forecast in March showed that a Balls Ferry TCP could be maintained all year (May through October). However, January, February, and March were the driest on record (critical water year) which meant Balls Ferry could only be maintained until the end of August. The SRTTG met in May and recommended to set the TCP further upstream at Airport Road (furthest point upstream) in order to conserve cold water for September and October. The peak of winter-run spawning is typically in June with 56 °F water temperatures needed for 90 days (until the end of September) to protect eggs and pre-emergent fry.

Aerial redd surveys showed that 100% of winter-run spawning occurred above Airport Road Bridge in 2012. In the last seven years since 2005, less than 1% of winter run have spawned below Airport Road Bridge. Thus, setting the TCP at Airport Road is expected to protect the vast majority of winter-run eggs until they emerge from the gravel. Given the critically dry year conditions the SRTTG recommended keeping the TCP as far upstream as possible (Airport Rd) for the remainder of the summer. Based on historical winter-run spawning distributions, it is expected that a TCP at Airport Rd is likely to provide the highest level of protection to the early life-stages of winter-run.

Spring-run and Fall-run Chinook Salmon

Reclamation's water temperature model based on the May 90% exceedence forecast predicts that mean daily water temperatures of 56 °F can be maintained at Airport Road until the end of October consistent with the NMFS 2009 Biological Opinion (RPA Action 1.2.4, for the May 15 through October 31 period). Spring-run Chinook typically spawn in the upper Sacramento River mainstem in September and Fall-run Chinook begin spawning in October. The SRTTG considered both in moving the TCP to Airport Rd. Generally, at this early stage, temperature modeling of the fall period is fairly uncertain. Spring-run and fall-run spawning typically occurs further downstream then the TCP in the fall. Therefore, some adverse effects can be expected if temperatures exceed 56 °F between Airport Rd and Balls Ferry. However, by moving the TCP to Airport Rd early in the year (May) it is anticipated that this action will provide the highest level of protection possible for all three runs of Chinook salmon under critically dry conditions.

May 23, 2013

Upper Sacramento River – May 2013 Preliminary Temperature Analysis

Summary of Temperature Compliance Results by Month

Control Point	JUN	JUL	AUG	SEP	OCT
90%-Exceedance Outlook					
Balls Ferry (BSF)	BSF	BSF	BSF	BSF/ClearCr	ClearCr
Airport Road (ArptRd)	ArptRd	ArptRd	ArptRd	ArptRd	ArptRd

Temperature Model Inputs, Assumptions, Limitations and Uncertainty:

1. Operation is based on the May 2013 Operation Outlooks (monthly flows, reservoir release, and end-of-month reservoir storage).
2. The initial profiles used for Shasta, Trinity and Whiskeytown were taken on May 20, May 1, and May 14, respectively.
3. Guidance on forecasted flows from the creeks (e.g., Cow, Cottonwood, Battle, etc.) between Keswick Dam and Bend Bridge is not available beyond 5 days. Model input side flows (Cottonwood Cr & Bend Bridge local flow w/o Cottonwood Cr) were selected from the historical record, and are consistent with the forecast exceedance frequency. During spring, the relatively warm creek flows can be a significant percentage of the flows at Bend Bridge.
4. Although mean daily flows and releases are temperature model inputs, they are based on the mean monthly values from the operation outlooks. Mean daily flow patterns are user defined.
5. Cottonwood Creek flows, Keswick to Bend Bridge local flows, and diversions are mean daily synthesized flows based on the available historical record for a 1922-2002 study period.
6. Meteorological inputs were derived from a database of 86 years of meteorological data (1920-2005). The NOAA-NWS Local Three-Month Temperature Outlook (L3MTO), as a means of estimating air temperature expectation, was used to select each month's meteorology from the database.
7. Meteorology, as well as flow volume and pattern, significantly influences reservoir inflow temperatures and downstream tributary temperatures; and consequently, the development of the cold-water pool during winter and early spring.

Temperature Analysis Results:

90%-Exceedance:
It would be difficult to maintain a Balls Ferry target through fall (Figure 1). Recent increases in Keswick Dam release due to extremely high system depletions since mid-April, and the subsequent need to open 2 middle shutters on the TCD for temperature control, are depleting the cold-water pool earlier than expected. By September, the target would likely need to be moved to Clear Creek.

Airport Road is a target location that can possibly be maintained through fall (Figure 2). Mean daily water temperature at Airport Road are expected to be approximately 0.75-1.0˚F cooler than at Balls Ferry.

The relationship between end-of-September lake volume below 56˚F and a Balls Ferry compliance through fall is based on the figure at the end of this document. Typically, mean daily water temperature at Jellys Ferry tends to be approximately 0.5-1.0˚F warmer than at Balls Ferry after September and into late fall.

Figure 3 shows temperature results for Clear Creek at Igo for the 90%-exceedance.

Figure 4 includes results for the Trinity River at Lewiston Dam for the 90%-exceedance. The dashed lines are the 2011 mean daily temperatures at selected locations.

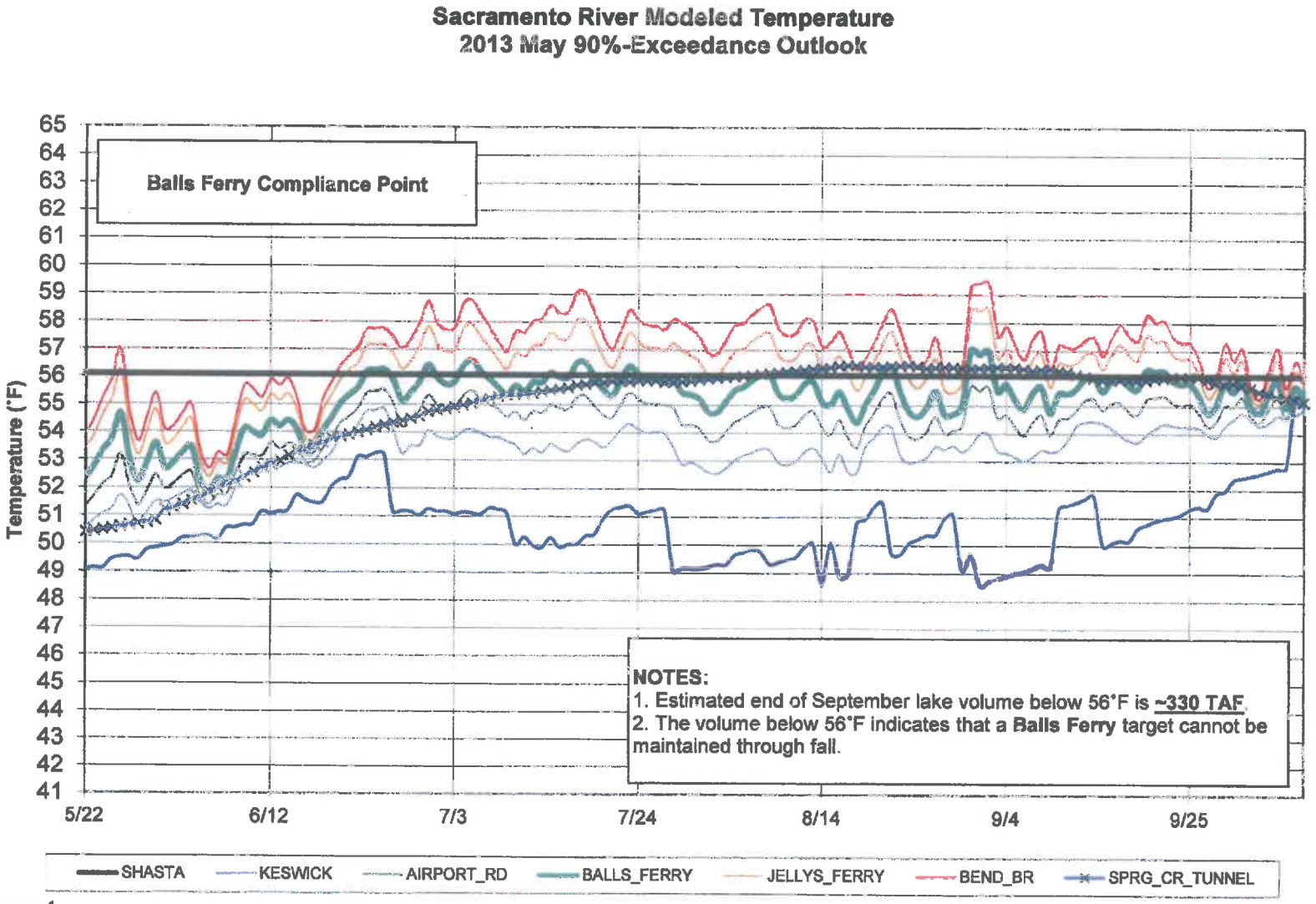

Sacramento River Modeled Temperature
2013 May 90%-Exceedance Outlook
Balls Ferry Compliance Point
Temperature (°F)
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
5/22
6/12
7/3
7/24
8/14
9/4
9/25
NOTES:
1. Estimated end of September lake volume below 56°F is ~330 TAF.
2. The volume below 56°F indicates that a Balls Ferry target cannot be maintained through fall.
SHASTA
KESWICK
AIRPORT_RD
BALLS_FERRY
JELLYS_FERRY
BEND_BR
SPRG_CR_TUNNEL

Figure 1

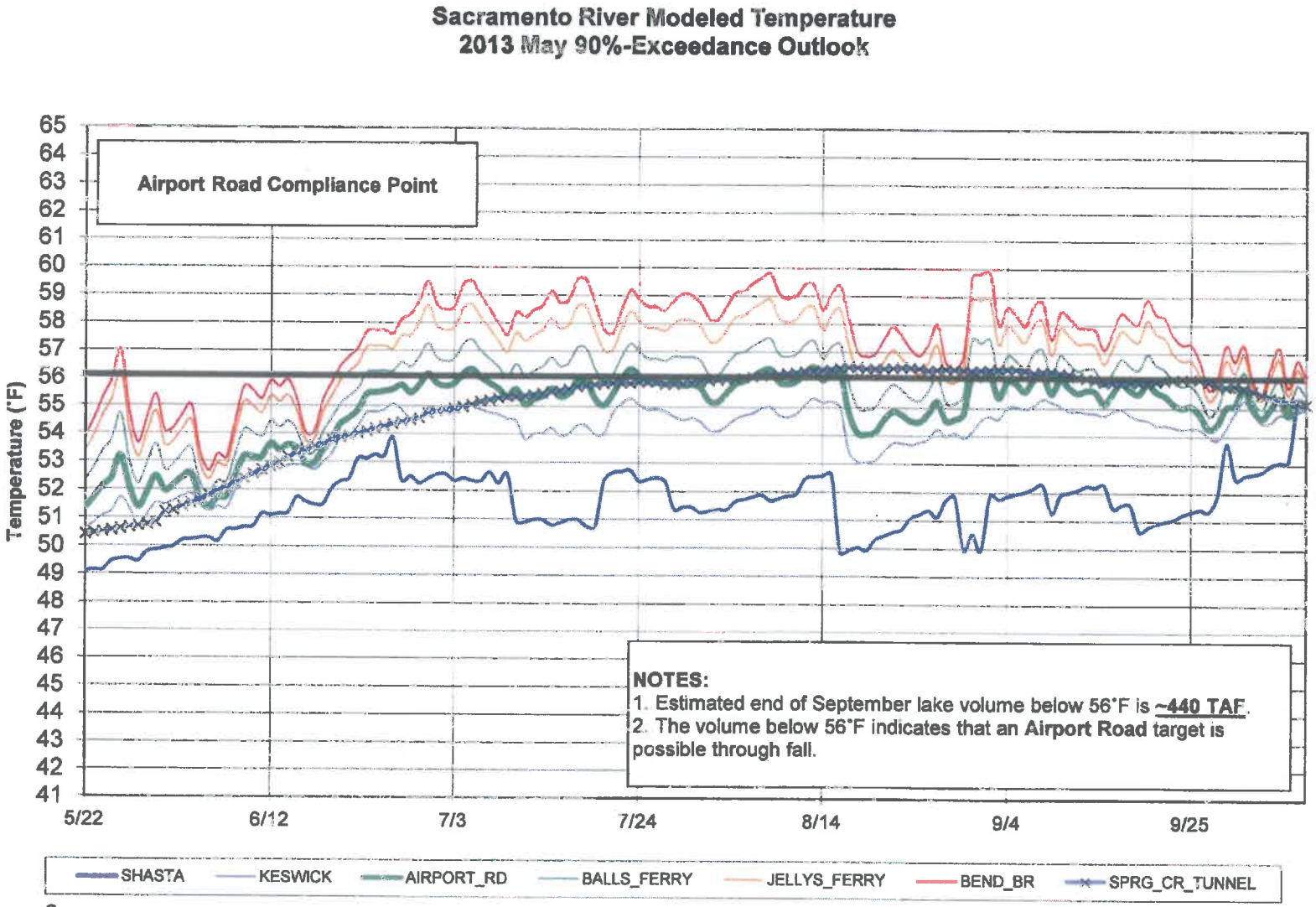

Sacramento River Modeled Temperature
2013 May 90%-Exceedance Outlook
Airport Road Compliance Point
Temperature (°F)
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
5/22
6/12
7/3
7/24
8/14
9/4
9/25
NOTES:
1. Estimated end of September lake volume below 56°F is ~440 TAF.
2. The volume below 56°F indicates that an Airport Road target is possible through fall.
SHASTA
KESWICK
AIRPORT_RD
BALLS_FERRY
JELLYS_FERRY
BEND_BR
SPRG_CR_TUNNEL

Figure 2

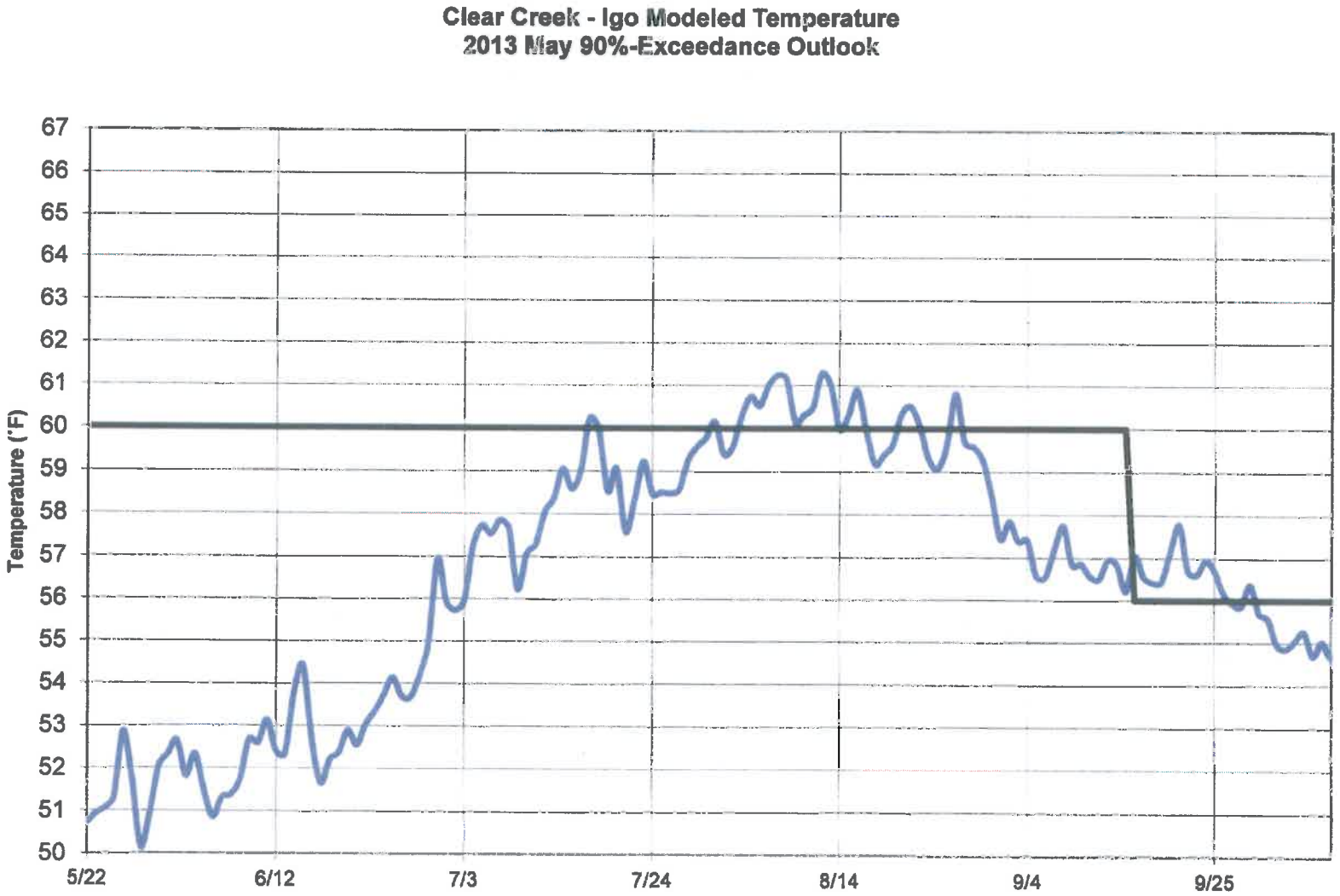

Clear Creek - Igo Modeled Temperature
2013 May 90%-Exceedance Outlook
Temperature (°F)
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
5/22
6/12
7/3
7/24
8/14
9/4
9/25

Figure 3

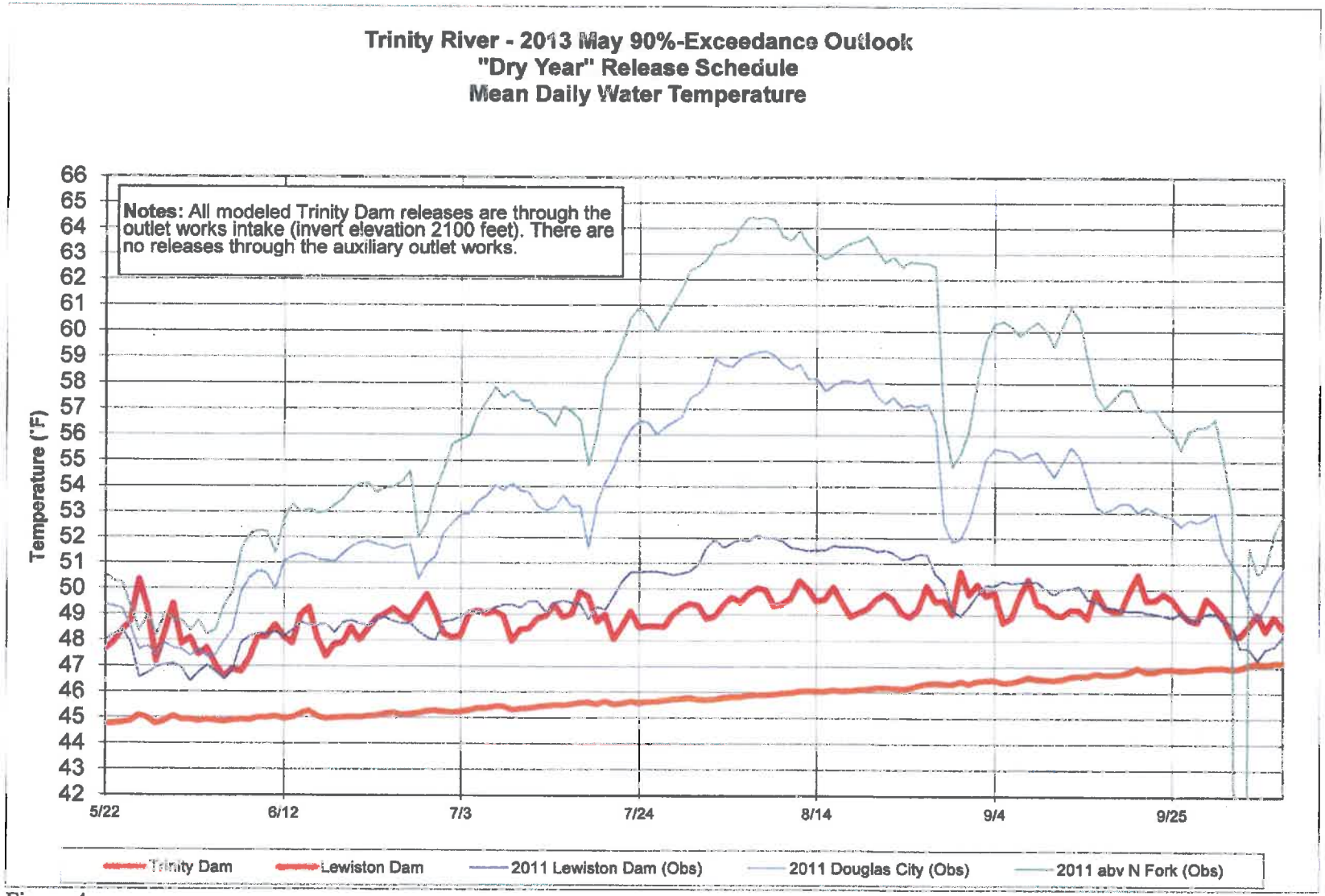

Trinity River - 2013 May 90%-Exceedance Outlook
"Dry Year" Release Schedule
Mean Daily Water Temperature
Notes: All modeled Trinity Dam releases are through the outlet works intake (invert elevation 2100 feet). There are no releases through the auxiliary outlet works.
Temperature (°F)
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
5/22
6/12
7/3
7/24
8/14
9/4
9/25
Trinity Dam
Lewiston Dam
2011 Lewiston Dam (Obs)
2011 Douglas City (Obs)
2011 abv N Fork (Obs)

Figure 4

Model Performance and Fall Temperature Index:

1. Based on past analyses, the temperature model does not perform well from late September through fall. One factor is that the modeled release temperatures are cooler than has historically been achieved when all release is through the side gates (lowest gates), especially when there's a large temperature gradient between the pressure relief gates (PRG) and the side gates.
2. Based on historical records, the end-of-September Lake Shasta volume below 56°F is a reasonable indicator of fall water temperature in the river reach to Balls Ferry.
3. For river temperatures not to exceed 56 °F downstream to Balls Ferry, the end-of-September lake volume less than 56°F should be greater than about 650 TAF, see figure below:

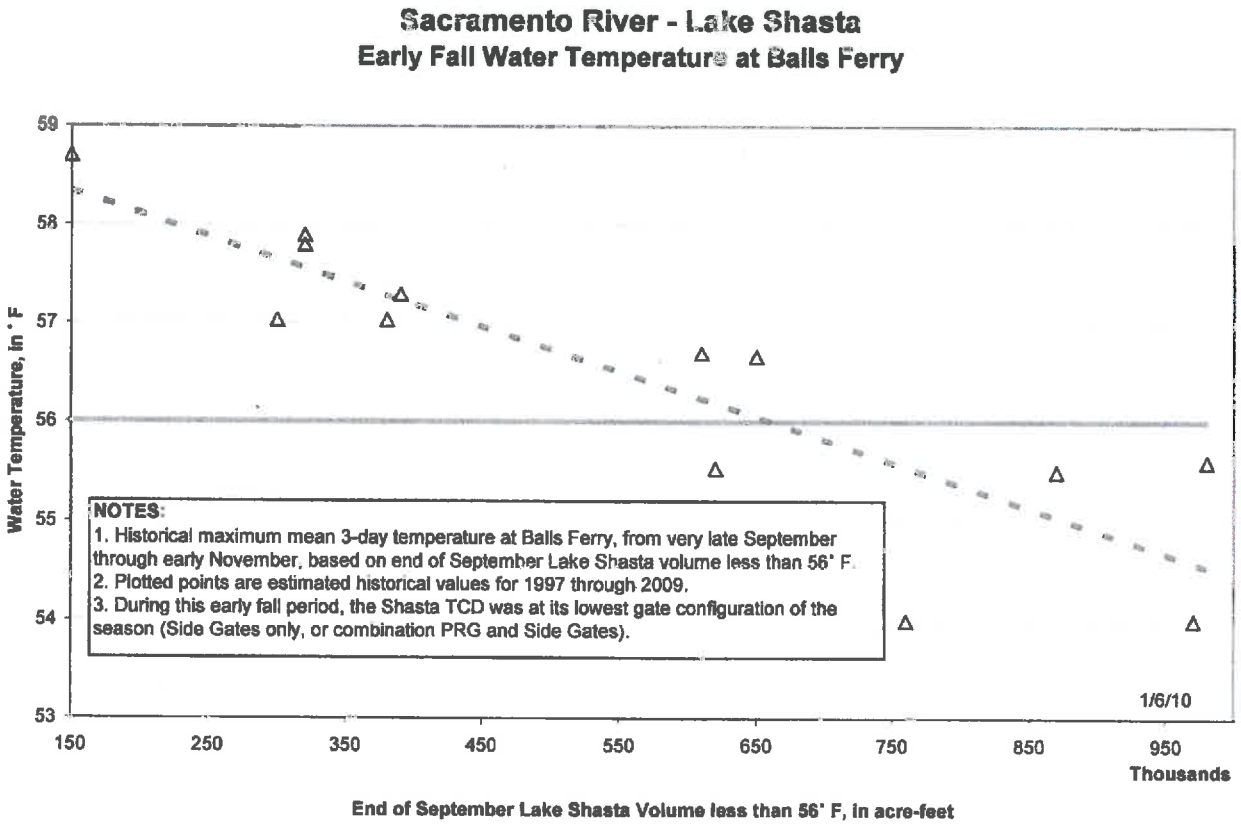
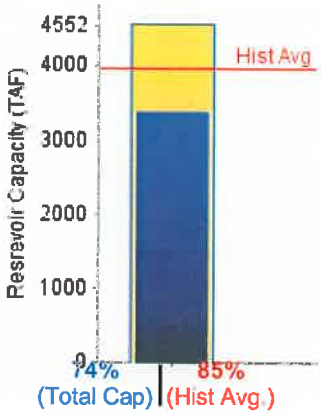


EXHIBIT E

DEPARTMENT OF WATER RESOURCES

California Data Exchange Center

LAKE SHASTA - STORAGE CONDITIONS AS OF MAY 29, 2013



Data as of Midnight: May 29, 2013

Current Storage: 3,386,029 AF
74% of Total Capacity
85% of Historical Avg. For This Date
(Total Capacity: 4,552,100 AF)
(Avg. Storage for May 29: 3,966,535 AF)
Change Date: 29-May-2013

Refresh Data

Major Reservoir Current Conditions Graphs

Printable Version of Current Data

Lake Shasta Storage Level Graph: **Choose water years to plot:**

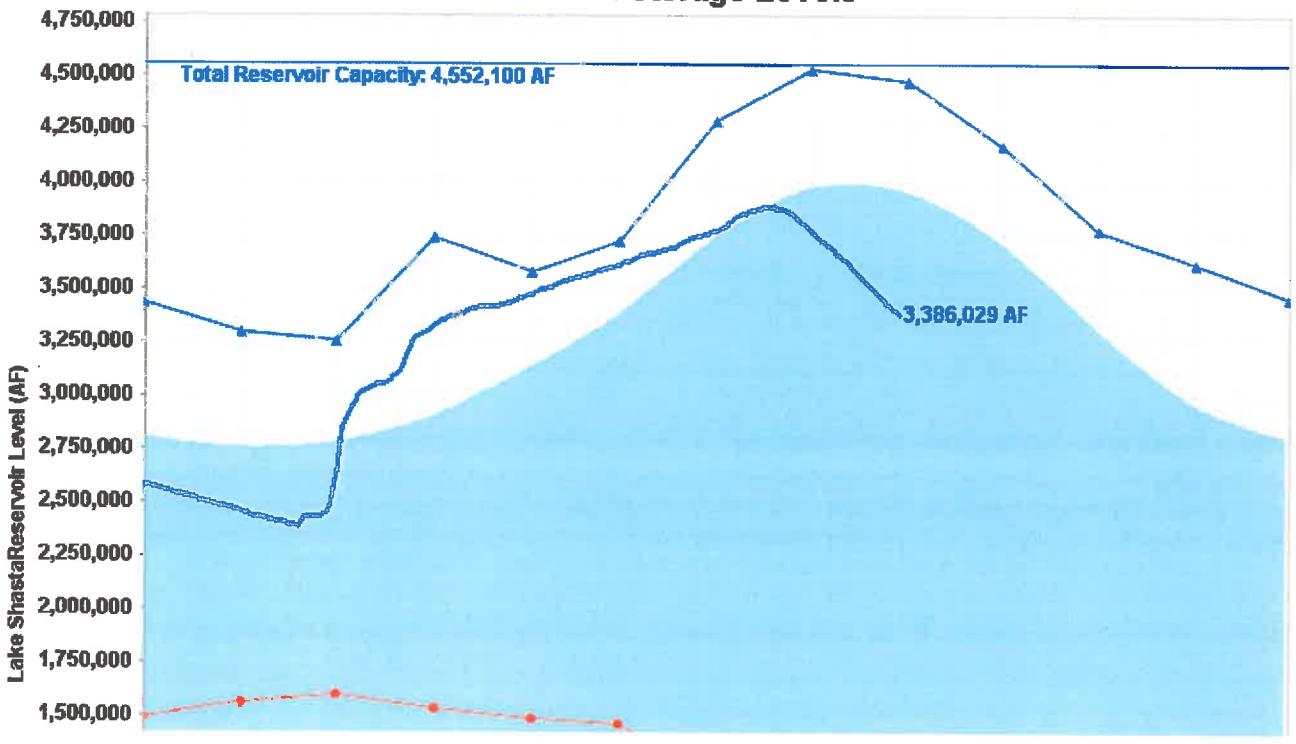
1976-1977 (dry)
1982-1983 (wet)
1988-1989
1989-1990
1990-1991

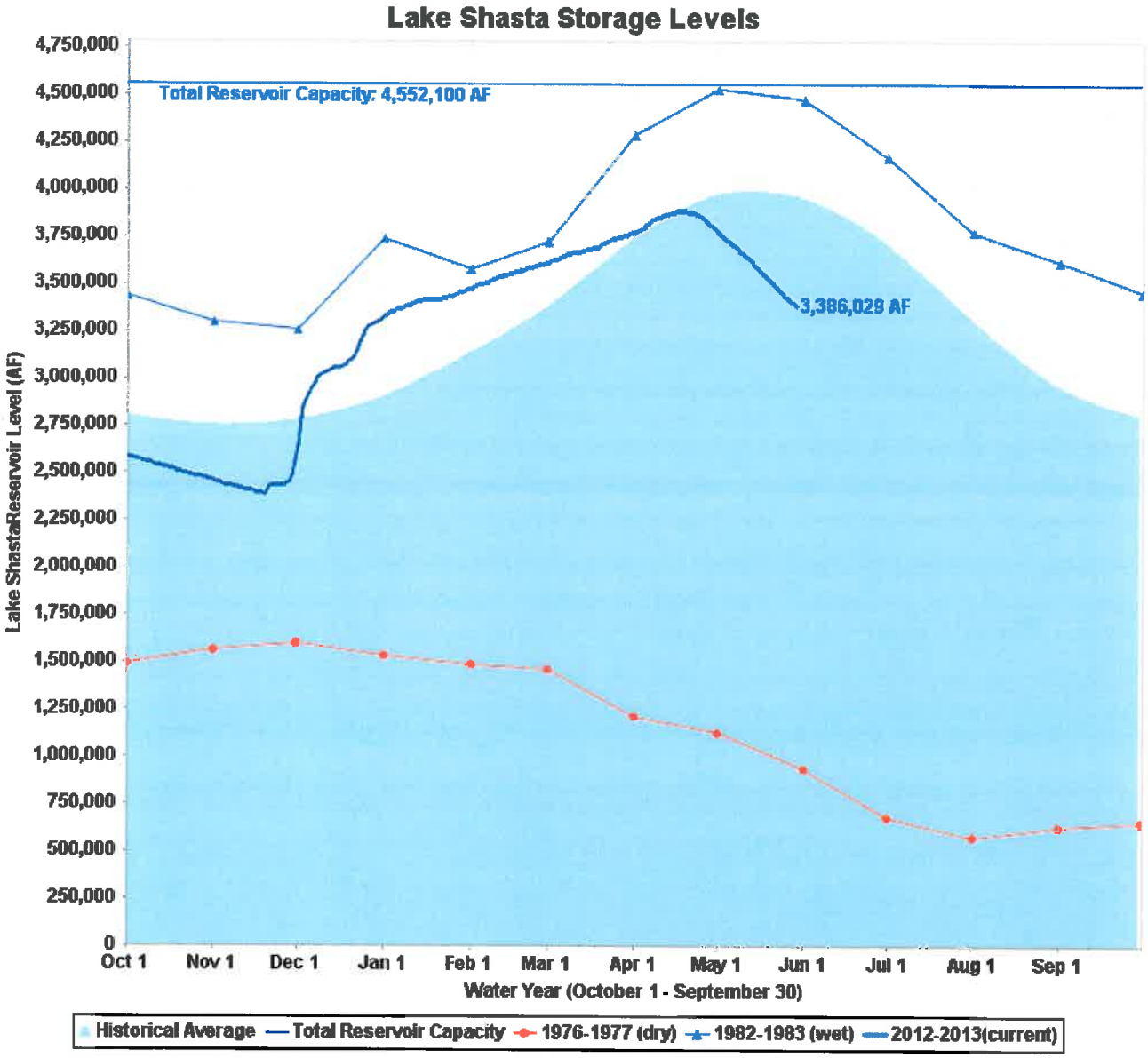
(ctrl+click for multiple selections)

Draw chart

(chart legend appears at bottom)

Lake Shasta Storage Levels

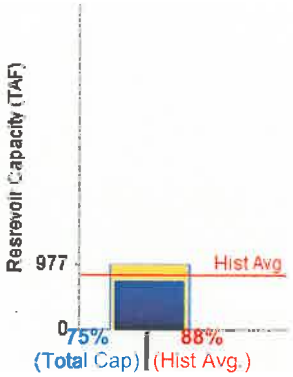



Lake Shasta Storage Levels
Total Reservoir Capacity: 4,552,100 AF
3,386,029 AF
Lake ShastaReservoir Level (AF)
4,750,000
4,500,000
4,250,000
4,000,000
3,750,000
3,500,000
3,250,000
3,000,000
2,750,000
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)
Historical Average
Total Reservoir Capacity
1976-1977 (dry)
1982-1983 (wet)
2012-2013(current)

DEPARTMENT OF WATER RESOURCES

California Data Exchange Center

FOLSOM LAKE - STORAGE CONDITIONS AS OF MAY 29, 2013



Data as of Midnight: May 29, 2013

Current Storage: 730,571 AF
75% of Total Capacity
88% of Historical Avg. For This Date
(Total Capacity: 977,000 AF)
(Avg. Storage for May 29: 829,592 AF)

Change Date: 29-May-2013

Refresh Data

Major Reservoir Current Conditions Graphs

Printable Version of Current Data

Folsom Lake Storage Level Graph: **Choose water years to plot:**

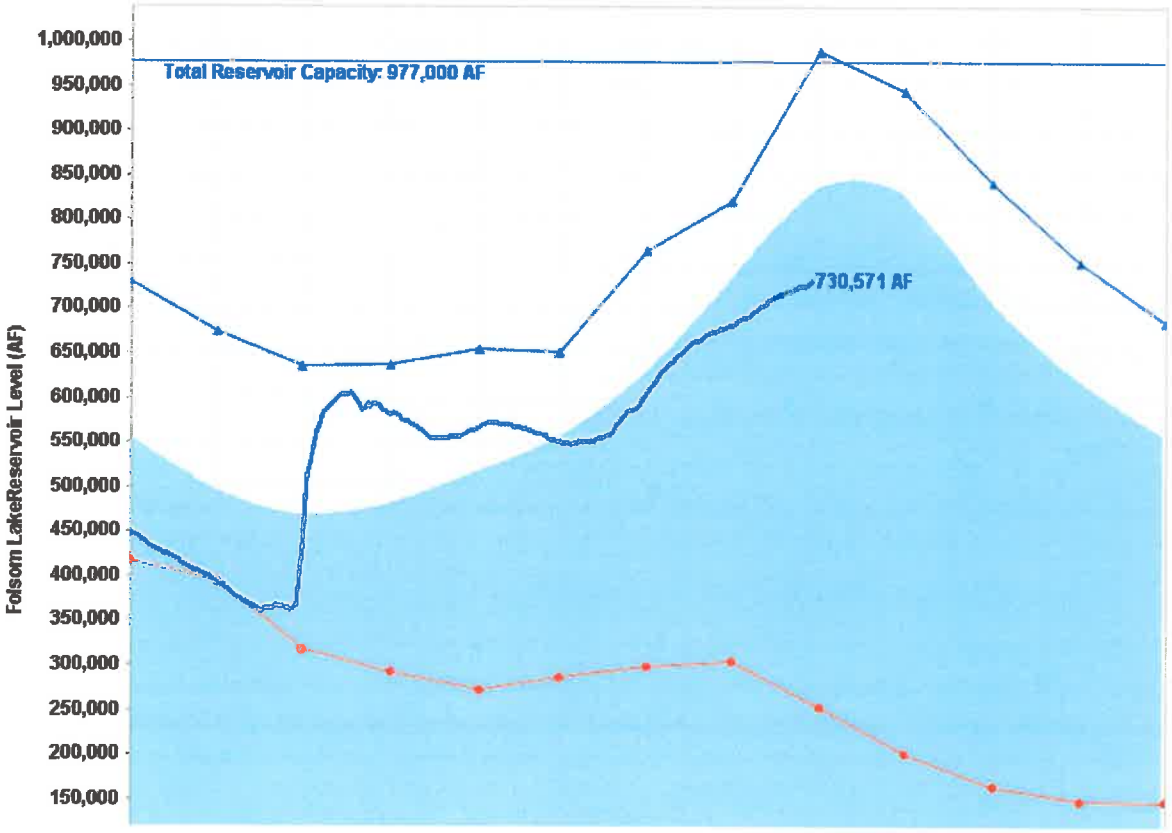
1976-1977 (dry)
1982-1983 (wet)
1988-1989
1989-1990
1990-1991

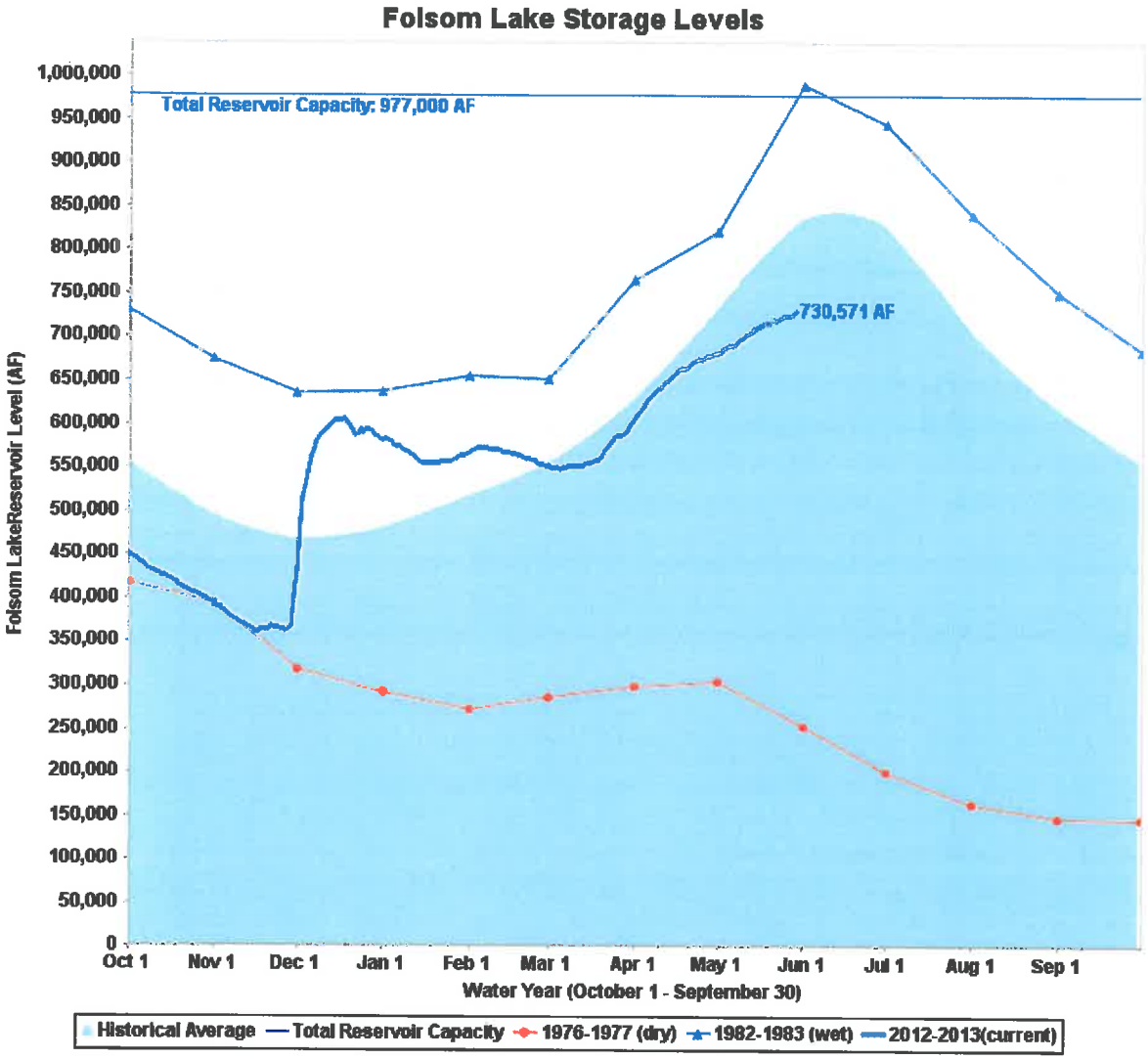
(ctrl+click for multiple selections)

Draw chart

(chart legend appears at bottom)

Folsom Lake Storage Levels

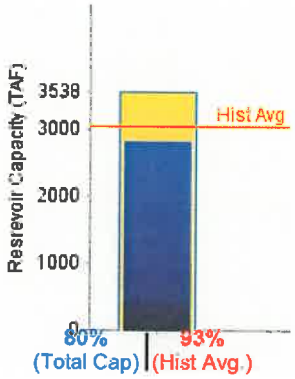



Folsom Lake Storage Levels
Total Reservoir Capacity: 977,000 AF
730,571 AF
Folsom LakeReservoir Level (AF)
1,000,000
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)
Historical Average
Total Reservoir Capacity
1976-1977 (dry)
1982-1983 (wet)
2012-2013(current)

DEPARTMENT OF WATER RESOURCES

California Data Exchange Center

LAKE OROVILLE - STORAGE CONDITIONS AS OF MAY 29, 2013



Data as of Midnight: May 29, 2013

Current Storage: 2,823,536 AF
80% of Total Capacity
93% of Historical Avg. For This Date
(Total Capacity: 3,538,000 AF)
(Avg. Storage for May 29: 3,039,738 AF)
Change Date: 29-May-2013

Refresh Data

Major Reservoir Current Conditions Graphs

Printable Version of Current Data

Lake Oroville Storage Level Graph: **Choose water years to plot:**

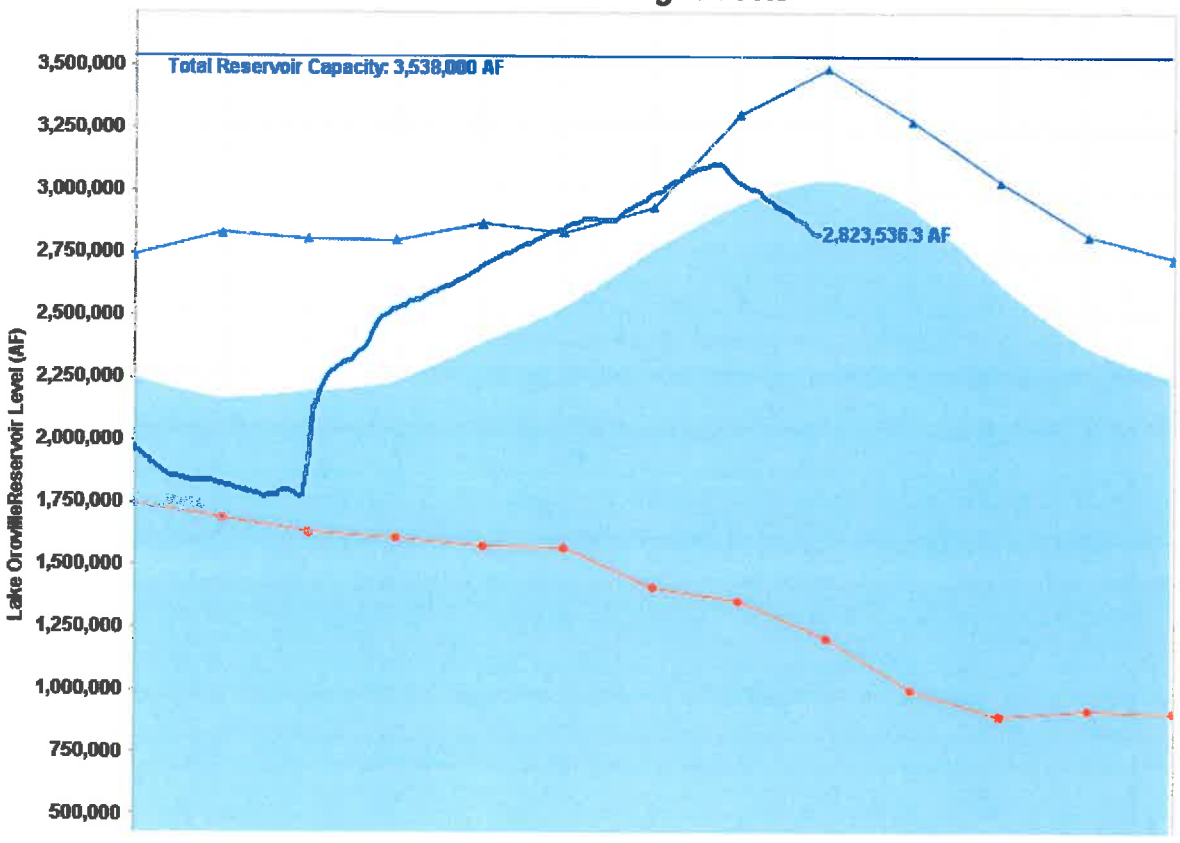
1976-1977 (dry)
1982-1983 (wet)
1988-1989
1989-1990
1990-1991

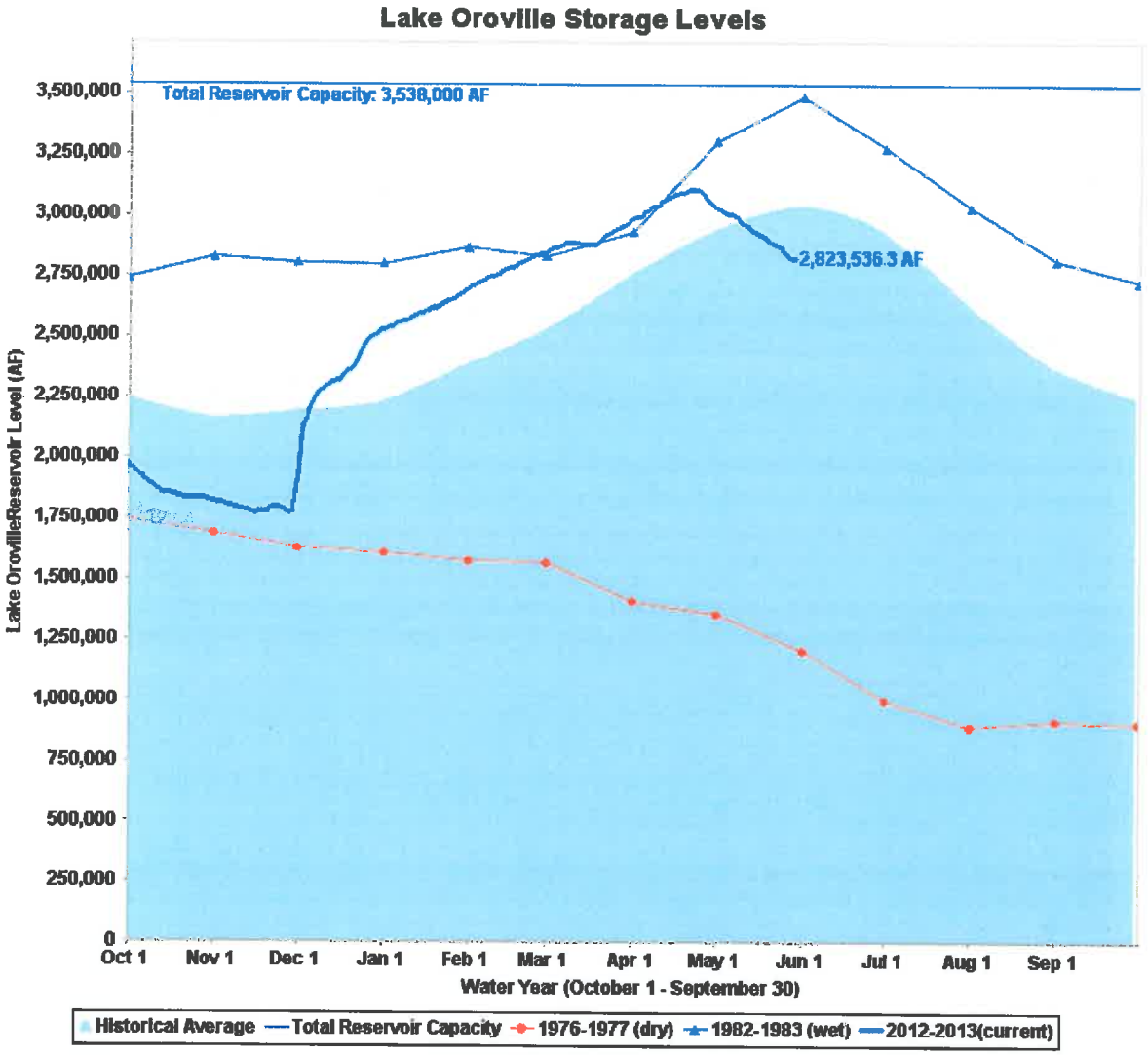
(ctrl+click for multiple selections)

Draw chart

(chart legend appears at bottom)

Lake Oroville Storage Levels




Lake Oroville Storage Levels
Total Reservoir Capacity: 3,538,000 AF
2,823,536.3 AF
Lake OrovilleReservoir Level (AF)
3,500,000
3,250,000
3,000,000
2,750,000
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Water Year (October 1 - September 30)
Historical Average
Total Reservoir Capacity
1976-1977 (dry)
1982-1983 (wet)
2012-2013(current)

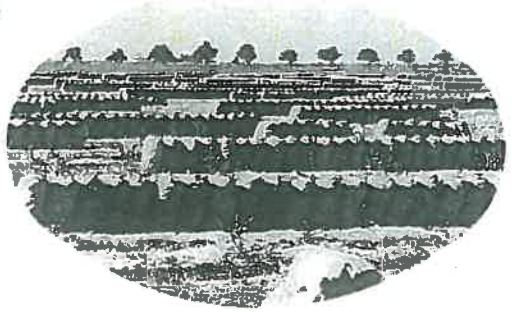
Unimpaired Flow Sacramento and San Joaquin Valley from Department of Water Resources California Data Exchange Center

Water Year	Water Year Sum	Water Year Average
1929	11.24	
1930	16.77	
1931	7.76	
1932	19.75	13.12
1933	12.28	
1934	10.91	
1976	10.17	8.17
1977	6.17	
1987	11.35	
1988	11.71	
1989	18.38	12.71
1990	11.72	
1991	11.64	
1992	11.45	
2007	12.79	13.25
2008	13.71	

EXHIBIT F

John A. Wilson

Preliminary Edition



Bulletin No. 76

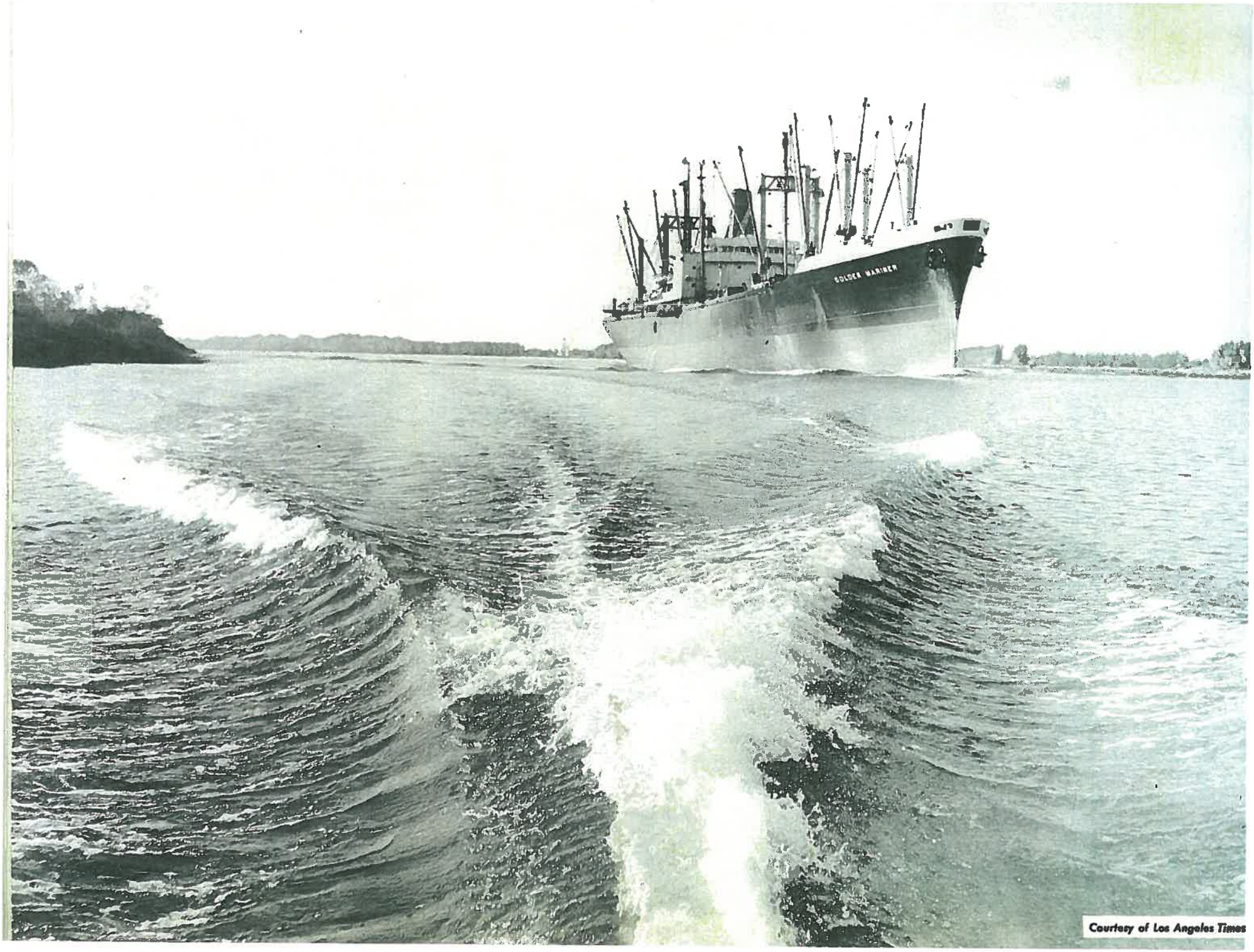
DELTA WATER FACILITIES

EXHIBIT G

EDMUND G. BROWN
Governor
State of California

HARVEY O. BANKS
Director
Department of Water Resources

December, 1960



Courtesy of Los Angeles Times

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

Bulletin No. 76

REPORT TO THE
CALIFORNIA STATE LEGISLATURE

ON THE

DELTA WATER FACILITIES

AS AN INTEGRAL FEATURE OF

THE STATE WATER RESOURCES DEVELOPMENT SYSTEM

EDMUND G. BROWN
Governor

HARVEY O. BANKS
Director

December, 1960

STATEMENT OF CLARIFICATION

This preliminary edition presents a comparison of alternative solutions to the Delta problems. This bulletin shows that the Single Purpose Delta Water Project is the essential minimum project for successful operation of the State Water Facilities. This bulletin also presents, for local consideration, optional modifications of the Single Purpose Delta Water Project which would provide additional local benefits.

The evaluation of project accomplishments, benefit-cost ratios, and costs of project services, are intended only to indicate the relative merits of these solutions and should not be considered in terms of absolute values. Benefits related to recreation are evaluated for comparative purposes. Detailed recreation studies, presently in progress, will indicate specific recreation benefits.

Subsequent to local review and public hearings on this preliminary edition, a final edition will be prepared setting forth an adopted plan. The adopted plan will include, in addition to the essential minimum facilities, those justifiable optional modifications requested by local entities.

Letters . . . .

HARVEY O. BANKS

EDMUND G. BROWN

ADDRESS REPLY TO

STATE OF CALIFORNIA
Department of Water Resources
SACRAMENTO

December 30, 1960

Honorable Edmund G. Brown, Governor
Members of the Legislature of the
State of California

Gentlemen:

I have the honor to transmit herewith a preliminary edition of Bulletin No. 76, "Delta Water Facilities". This bulletin summarizes the results of investigations conducted pursuant to the Abshire-Kelly Salinity Control Barrier Acts of 1955 and 1957, Chapter 1434, Statutes of 1955, and Chapter 2092, Statutes of 1957, as amended by Chapters 1765 and 2038, Statutes of 1959.

Bulletin No. 76 presents findings and conclusions regarding the feasibility of alternative plans for the Delta feature of the State Water Facilities included in the Burns-Porter Act approved by the electorate on November 8, 1960. The Delta water facilities would (1) provide adequate water supplies throughout the Delta, (2) transport water across the Delta without undue loss or deterioration in quality, (3) provide flood and seepage control to Delta islands, (4) provide improved vehicular transportation access, and (5) minimize effects on existing recreation development and enhance recreation growth. All of the alternative plans would accomplish the first two objectives, and two alternative plans would also accomplish the other objectives.

Further planning for Delta water facilities should include consideration of joint financing and construction by federal, state and local interests. Facilities for flood and seepage control, vehicular transportation and recreation would not have to be constructed unless local governmental agencies desire these works and are willing to share in certain costs thereof. There would be some conflicts of interest in operation of these facilities which must be resolved prior to a decision by local interests regarding the extent of local participation. To this end, it is recommended that a period of a few months be allowed for local review and resolution of differences, after which public hearings should be held by the California Water Commission and the department. Following the public hearings, a final edition of Bulletin No. 76, incorporating any necessary modifications, should be published.

Very truly yours,

HARVEY O. BANKS
Director

BOARD OF CONSULTING ENGINEERS

November 16, 1960

Mr. Harvey O. Banks, Director
Department of Water Resources
Sacramento, California

Dear Mr. Banks:

This Board of Consulting Engineers which was active in 1958 was reconvened in April, 1960 and has met from time to time with your staff. Thus we have followed the preparation of this report and have commented to you following each meeting.

The Delta Water Facilities constitute needed works vital to the transfer of northern water into and across the Delta to provide water for use in the Delta and for export to water deficient areas along the Coast, in the San Joaquin Valley and to Southern California, to be financed under the California Water Resources Development Bond Act. The Board is of the opinion that the gross future water requirements for municipal and industrial purposes in the Delta have been very liberally estimated.

The Board is of the opinion that the engineering studies, designs and estimates are adequate for the purpose of this planning report and we support the conclusions and recommendations embodied therein.

We believe that the Chipps Island Barrier Project should not be authorized or constructed owing to its high cost of nearly $800 million which substantially exceeds project benefits.

The Delta Water Project, including such economically desirable flood control, seepage control, transportation and recreational features as may be agreed upon by local Delta beneficiaries willing to share in costs, would meet all water requirements with maximum net project benefits, and should be constructed under the Bond Act.

Respectfully submitted,

H. A. Einstein — O. J. Porter

Ray K. Linsley — Samuel B. Morris, Chairman

Preface

This bulletin summarizes the engineering and economic conclusions and recommendations concerning the feasibility of providing salinity control, water supply, flood and seepage control, transportation facilities, and recreation development for the Sacramento-San Joaquin Delta, and conserving and making the most beneficial use of a major portion of the water resources of the State. Alternative plans for accomplishing some or all of these objectives are presented and compared to indicate their relative merits and to guide the selection of facilities to be constructed.

Findings presented herein are the result of intensive studies conducted during a five-year period. Previous studies and cooperative investigations by various public and private agencies and individuals were utilized in development of the plans. The cooperation of these individuals and agencies is gratefully acknowledged.

Study procedures and analyses are summarized in six supporting office reports, which are available to interested agencies and individuals. The subjects and titles of these reports are:

Salinity Incursion and Water Resources
Delta Water Requirements
Channel Hydraulics and Flood Channel Design
Recreation
Plans, Designs, and Cost Estimates
Economic Aspects

TABLE OF CONTENTS

Salinity Control Studies

1879-1880, WM. HAM. HALL

Salinity incursion into the Delta, which was recorded in 1841 and 1871, was recognized by the early settlers as a potential problem to water supplies, and a salt water barrier was proposed in the 1860's. State Engineer Wm. Ham. Hall subsequently studied a barrier in conjunction with flood control and concluded that, while a physical barrier could be constructed, the costs would exceed the benefits.

1924-1928, WALKER YOUNG INVESTIGATION

A series of subnormal water supply years began in 1917 and various proposals for barriers were advanced during the early 1920's. In cooperation with the State of California and the Sacramento Valley Development Association, the U. S. Bureau of Reclamation, under the direction of Walker Young, extensively investigated four alternative barrier sites and concluded that it was ". . . physically feasible to construct a Salt Water Barrier at any one of the sites investigated . . ." It was recognized that without a barrier, ". . . salinity conditions will become more acute unless mountain storage is provided to be released during periods of low river discharge . . ." Economic analyses of barriers were not made by Mr. Young.

1929-1931, BULLETINS NOS. 27 AND 28

Following investigation of the physical feasibility of barriers, the State Division of Water Resources studied the phenomena of salinity incursion and the economics of barriers. In Bulletin No. 27, "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay," it was concluded that ". . . invasion of salinity . . . as far as the lower end of the . . . Delta is a natural phenomenon which, in varying degree, has occurred each year as far back as historical records reveal." It was also concluded that the Delta could be protected from saline invasion and be assured of ample and dependable water supplies if mountain storage were utilized to provide a controlled rate of outflow from the Delta.

In Bulletin No. 28, "Economic Aspects of a Salt Water Barrier," it was concluded that it was not economically justifiable to construct a barrier. With conditions of upstream water use at that time, it was concluded that the most economical solution to salinity incursion and provision of adequate water supplies in the Delta could be achieved by constructing upstream storage and controlling rates of outflow during periods of insufficient natural outflow.

1953, ABSHIRE-KELLY SALINITY CONTROL BARRIER ACT

Shasta Reservoir on the Sacramento River was constructed and began operation in 1944 for salinity control and other purposes. Expanding water requirements in the Central Valley and San Francisco Bay area stimulated reconsideration of barrier plans for water conservation and related purposes. Seven alternative plans for barriers in the Bay and Delta system were investigated by a Board of Consultants and the State Division of Water Resources for the California Water Project Authority. The Board of Consultants concluded that barriers in the San Francisco Bay system would not be functionally feasible due to the uncertainty of the quality of water in a barrier pool. It was recommended by the Division of Water Resources that "Further consideration be given only to . . . barriers . . . at or upstream from the Chipps Island site" at the outlet of the Delta.

1955, ABSHIRE-KELLY SALINITY CONTROL BARRIER ACT

Additional legislation specified study of a system of works in the Delta, referred to as the Junction Point Barrier Plan, and the Chipps Island Barrier Plan. The principal purposes of these studies were to develop complete plans for water supply in the San Francisco Bay area and to provide salinity control and urgently needed flood protection in the Delta.

CHAPTER 1434

An act to provide for a study of the junction point barrier and appurtenant facilities, the Abshire-Kelly Salinity Control Barrier Act of 1955, relating to barriers for salinity and flood control purposes, declaring the urgency thereof, to take effect immediately.

[Approved by Governor June 27, 1955. Filed with Secretary of State June 28, 1955.]

The people of the State of California do enact as follows:

SECTION 1. There is hereby appropriated to the Water Project Authority the sum of one hundred thousand dollars ($100,000), payable from the Flood Control Fund of 1946, to initiate the further investigation and study of the Junction Point Barrier and Chipps Island Barrier and appurtenant facilities, as such barriers and facilities are described in the report of the Water Project Authority to the Legislature entitled "Feasibility of Construction by the State of Barriers in the San Francisco Bay System," dated March, 1955, for the purposes of developing complete plans of the means of accomplishing delivery of fresh water to the San Francisco Bay area, including the Counties of Solano, Sonoma, Napa, Marin, Contra Costa, Alameda, Santa Clara, San Benito, and San Mateo, and the City and County of San Francisco, providing urgently needed flood protection to agricultural lands in the Sacramento-San Joaquin Delta, conducting subsurface exploration work in the delta and designing facilities appurtenant to the cross-delta aqueduct, obtaining more complete information on the hydrology of the delta, and studying integration of the proposed project in the California Water Plan.

SEC. 2. The Water Project Authority may contract with such other public agencies, federal, state, or local, as it deems necessary for the rendition and affording of such services, facilities, studies, and reports to the Water Project Authority as will best assist it to carry out this act. The Water Project Authority may also employ, by contract or otherwise, such private consulting engineering and other technical services as it deems necessary for the rendition and affording of such services, facilities, studies, and reports as will best assist it to carry out this act.

SEC. 3. It is the intent of the Legislature that in conducting the study and investigation the Water Project Authority shall confer and exchange information with and shall seek the participation of the United States Navy, the United States Bureau of Reclamation, the United States Corps of Engineers and the local port districts to the extent possible.

SEC. 4. The Water Project Authority shall report to the Legislature the result of its study and investigation not later than March 30, 1957.

SEC. 5. This act shall be known and may be cited as the Abshire-Kelly Salinity Control Barrier Act of 1955.

SEC. 6. This act is an urgency measure necessary for the immediate preservation of the public peace, health or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting such necessity are:

The areas adjacent to the San Francisco Bay urgently need an adequate supply of fresh water for domestic and industrial uses. It is essential to the public health, safety and welfare that a study of salinity control barriers as a means of securing such a supply of fresh water, be undertaken without delay.

A four-year investigation was contemplated, and an interim report, Bulletin No. 60, "Salinity Control Barrier Investigation", was published in March 1957, by the Department of Water Resources. This report outlined a water plan for the San Francisco Bay area, and recommended that the North Bay Aqueduct be authorized for construction. The North Bay Aqueduct was authorized by the Legislature in 1957. The report also compared the Biemond Plan, a system of works in the Delta, with the Chipps Island Barrier Plan, and recommended that further study be limited to the Biemond Plan.

1957, ABSHIRE-KELLY SALINITY CONTROL BARRIER ACT

The Legislature concurred in limiting further study to the Biemond Plan and stressed the need for improving the quality of water in the Delta and making the most beneficial use of the water resources of the State. A report on the further studies was scheduled for release by March 30, 1959.

CHAPTER 2092

An act relating to barriers for salinity and flood control purposes.

[Approved by Governor July 8, 1957. Filed with Secretary of State July 10, 1957.]

The people of the State of California do enact as follows:

SECTION 1. The Department of Water Resources may limit its studies of salinity control barriers to the Biemond Plan as described in Bulletin No. 60 of the Department of Water Resources entitled "Salinity Control Barrier Investigation," dated March, 1957, subject to such modifications thereof as the department may adopt, said studies being for the purposes of developing complete plans of the means of accomplishing delivery of fresh water to the Counties of Solano, Sonoma, Napa and Marin, providing urgently needed flood protection to agricultural lands in the Sacramento-San Joaquin Delta, accomplishing salinity control, improving the quality of water exported from the delta to the San Francisco Bay area, San Joaquin Valley, and southern portions of California, making the most beneficial use of the water resources of the State, and studying integration of the proposed project in The California Water Plan.

SEC. 2. The department may contract with such other public agencies, federal, state or local, as it deems necessary for the rendition and affording of such services, facilities, studies, and reports to the department as will best assist it to carry out this act.

SEC. 3. It is the intent of the Legislature that in conducting the study and investigation the department shall confer and exchange information with and shall seek the participation of the United States Navy, the United States Bureau of Reclamation, the United States Corps of Engineers, and the local port districts to the extent possible.

SEC. 4. The department shall submit a report to the Legislature stating the result of its study and investigation not later than March 30, 1959.

SEC. 5. This act shall be known and may be cited as the "Abshire-Kelly Salinity Control Barrier Act of 1957."

1959, ADDITIONAL LEGISLATION

The potential expansion of water requirements of the urban and industrial complex in the western Delta area, and greater upstream water use with resultant depletion of inflow to and outflow from the Delta, indicated need for more concentrated study of the water requirements and supplies of the Delta. Legislation was enacted in 1959 to undertake studies of the type and extent of future water requirements of lands which can be served from present channels in the western Delta, effects of upstream water uses on Delta supplies, plans for water service and costs thereof, and economic and financial feasibility of the plans. Additional legislation authorized studies of the most economical and efficient procedures of constructing levees for flood control.

CHAPTER 1765

An act providing for the investigation of water supplies and flood control levees for the Sacramento-San Joaquin Delta and making an appropriation therefor.

[Approved by Governor July 16, 1959. Filed with Secretary of State July 16, 1959.]

The people of the State of California do enact as follows:

SECTION 1. The Department of Water Resources shall investigate the water supplies for the Sacramento-San Joaquin Delta. The investigation shall include, among other things: (1) the type and extent of the future water requirements of lands which can be served from present channels in the western Delta; (2) the extent and nature of effects of upstream water developments on water supply available to such lands; (3) the development of plans for water service to such lands and estimates of costs thereof; and (4) economic and financial analyses of such plans. In carrying out the investigation, the department shall seek the co-operation and assistance of the counties and other local agencies and entities in the Sacramento-San Joaquin Delta and of the United States; may enter into contracts with such entities to assist it in carrying out the purposes of such investigation, and shall consult with and keep appropriate legislative committees informed of the progress of this work.

SEC. 2. There is appropriated from the California Water Fund to the Department of Water Resources the sum of two hundred thousand dollars ($200,000) to be expended for the purposes of this act.

SEC. 3. Section 4.5 is added to the Abshire-Kelly Salinity Control Barrier Act of 1957 (Chapter 2092, Statutes of 1957), to read:

Sec. 4.5. As a part of the studies being performed hereunder and to obtain such information as may be required to implement the plan included in the report referred to in Section 4, the department may conduct studies and investigations to determine the most economical and efficient type and methods and procedures of construction to provide an adequate levee system in the Delta.

SEC. 4. There is hereby appropriated to the Department of Water Resources from the California Water Fund the sum of two hundred thirty thousand dollars ($230,000), of which one hundred eighty thousand dollars ($180,000), may be expended for the studies and investigations authorized by Section 3 hereof, and fifty thousand dollars ($50,000) may be expended for such remedial work as may be necessary in connection with levee tests being performed as a part of the studies and investigations authorized by Section 3 hereof.

Intensive studies were made of the future economic growth of lands which can be served from channels in the western Delta. Particular attention was given to the future municipal and industrial water needs in the area and the future water supplies available in the Delta. Due to the expanded scope of the studies, the report was delayed.

CHAPTER 2038

An act to amend Section 4 of Chapter 2092, Statutes of 1957, relating to barriers for salinity and flood control purposes.

[Approved by Governor July 17, 1959. Filed with Secretary of State July 20, 1959.]

The people of the State of California do enact as follows:

SECTION 1. Section 4 of Chapter 2092, Statutes of 1957, is amended to read:

Sec. 4. The department shall submit a report to the Legislature stating the result of its study and investigation not later than January 2, 1961.

The unique character of the water supply problems of the Delta was recognized by the State Legislature when it amended the California Water Code in 1959 to include general policy regarding the Delta. This legislation calls for provision of salinity control and adequate water supplies in the Delta and states that water to which the users within the Delta are entitled should not be exported. The policy in this act is basic to the planning and operation of all works in the Delta or diversions therefrom.

CHAPTER 1766

An act to add Part 4.5 (commencing at Section 12200) to Division 6 of the Water Code, relating to delivery of surplus water into, and extractions thereof for exportation from, the Sacramento-San Joaquin Delta.

[Approved by Governor July 16, 1959. Filed with Secretary of State July 16, 1959.]

The people of the State of California do enact as follows:

SECTION 1. Part 4.5 (commencing at Section 12200) is added to Division 6 of the Water Code, to read:

PART 4.5. SACRAMENTO-SAN JOAQUIN DELTA

CHAPTER 1. GENERAL POLICY

12200. The Legislature hereby finds that the water problems of the Sacramento-San Joaquin Delta are unique within the State; the Sacramento and San Joaquin Rivers join at the Sacramento-San Joaquin Delta to discharge their fresh water flows into Suisun, San Pablo and San Francisco Bays and thence into the Pacific Ocean; the merging of fresh water with saline bay waters and drainage waters and the withdrawal of fresh water for beneficial uses creates an acute problem of salinity intrusion into the vast network of channels and sloughs of the Delta; the State Water Resources Development System has as one of its objectives the transfer of waters from water-surplus areas in the Sacramento Valley and the north coastal area to water-deficient areas to the south and west of the Sacramento-San Joaquin Delta via the Delta; water surplus to the needs of the areas in which it originates is gathered in the Delta and thereby provides a common source of fresh water supply for water-deficient areas. It is, therefore, hereby declared that a general law cannot be made applicable to said Delta and that the enactment of this law is necessary for the protection, conservation, development, control and use of the waters in the Delta for the public good.

12201. The Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export to areas of water deficiency is necessary to the peace, health, saftey and welfare of the people of the State, except that delivery of such water shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code.

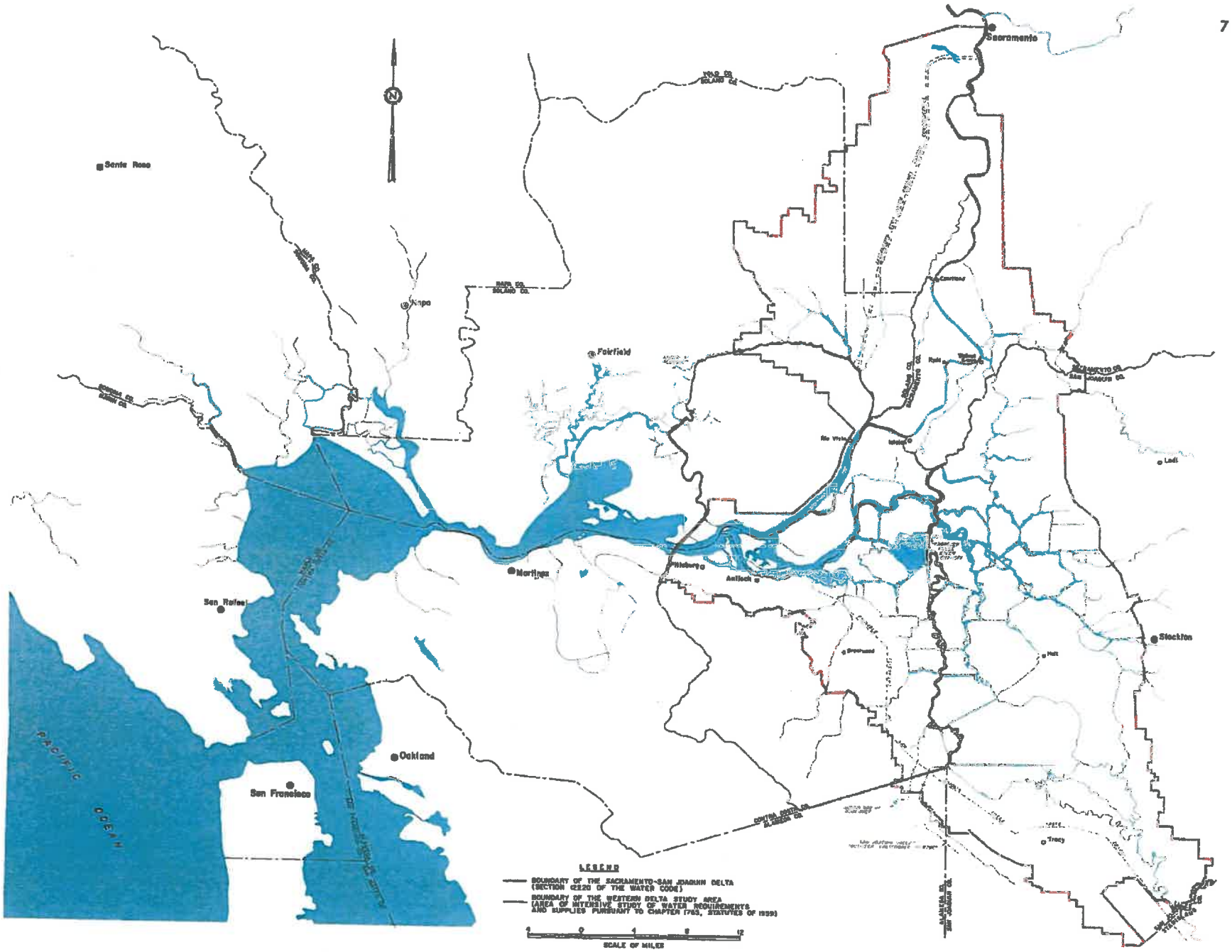
12202. Among the functions to be provided by the State Water Resources Development System, in coordination with the activities of the United States in providing salinity control for the Delta through operation of the Federal Central Valley Project, shall be the provision of salinity control and an adequate water supply for the users of water in the Sacramento-San Joaquin Delta. If it is determined to be in the public interest to provide a substitute water supply to the users in said Delta in lieu of that which would be provided as a result of salinity control no added financial burden shall be placed upon said Delta water users solely by virtue of such substitution. Delivery of said substitute water supply shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code.

12203. It is hereby declared to be the policy of the State that no person, corporation or public or private agency of the State or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within said Delta are entitled.

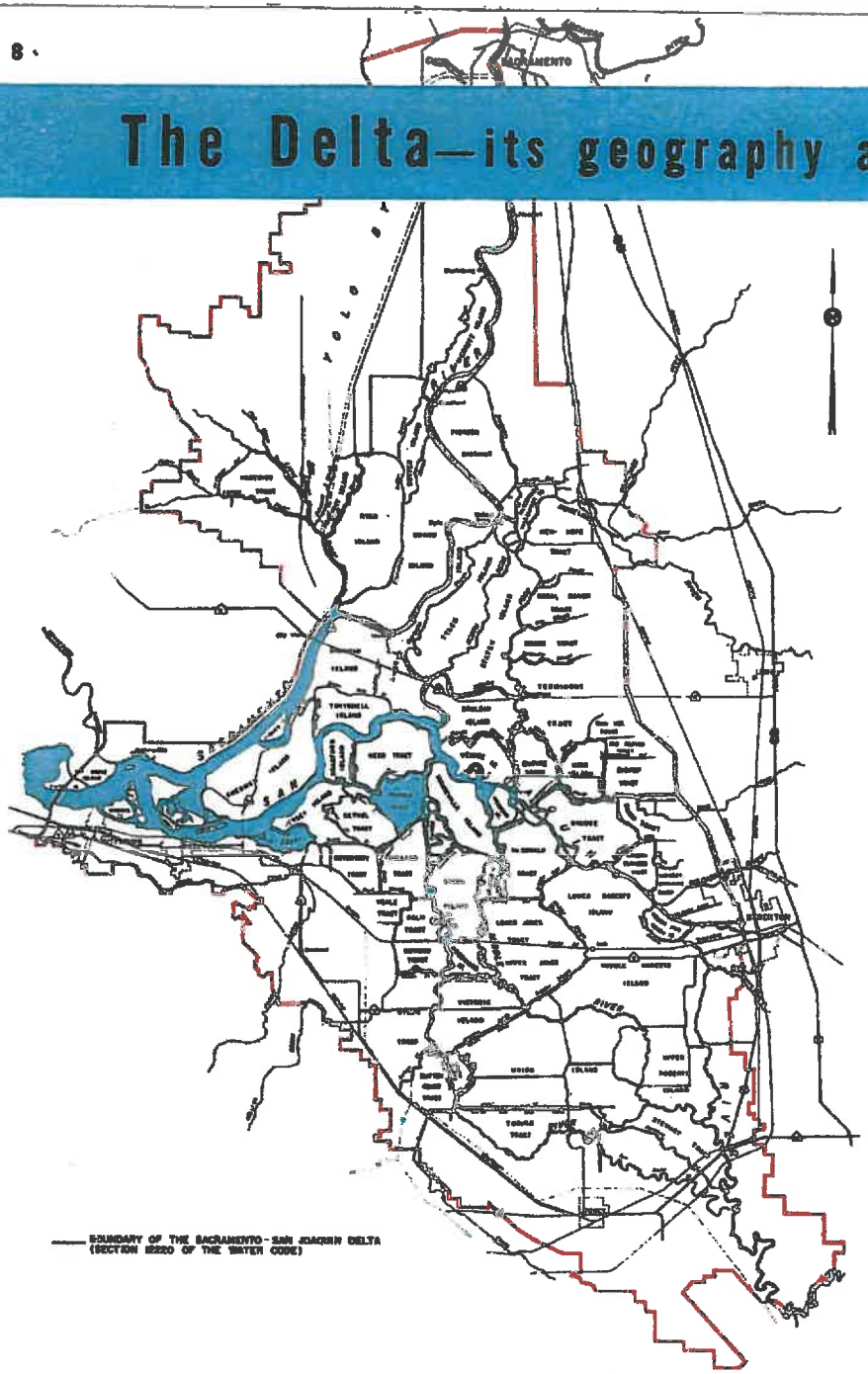
12204. In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter.

12205. It is the policy of the State that the operation and management of releases from storage into the Sacramento-San Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible in order to permit the fulfillment of the objectives of this part.

This legislation also described the area of the Delta to which the general policy applies. The boundary of the Delta, as described in Section 12220 of the Water Code, is indicated on the facing map. The area considered in the intensive studies of water requirements and supplies is described as the Western Delta Study Area.


Sacramento
Santa Rosa
Napa
Fairfield
Martinez
Antioch
Pittsburg
San Rafael
Oakland
San Francisco
Stockton
Lodi
Tracy
PACIFIC OCEAN
LEGEND
BOUNDARY OF THE SACRAMENTO-SAN JOAQUIN DELTA (SECTION 12220 OF THE WATER CODE)
BOUNDARY OF THE WESTERN DELTA STUDY AREA (AREA OF INTENSIVE STUDY OF WATER REQUIREMENTS AND SUPPLIES PURSUANT TO CHAPTER 1745, STATUTES OF 1959)
SCALE OF MILES

The Delta—its geography and economy

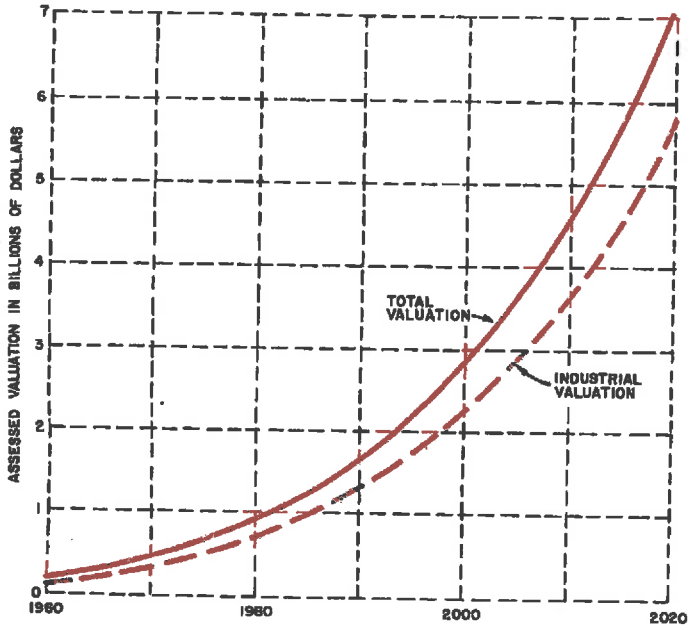


The Delta, located at the confluence of the Sacramento and San Joaquin Rivers system, is a unique feature of the California landscape. The Delta encompasses some 738,000 acres, interlaced with 700 miles of meandering waterways covering 50,000 acres. About 415,000 acres of land, referred to as Delta Lowlands, lie between elevations of 5 feet above and 20 feet below sea level. This area is composed of peat, organic sediments, and alluvium, and is protected from flood water and high tides by man-made levees. The extensive waterways afford opportunity for shipping and provide a wonderland for boating and water sports. These same waterways must safely discharge flood waters of the Central Valley.

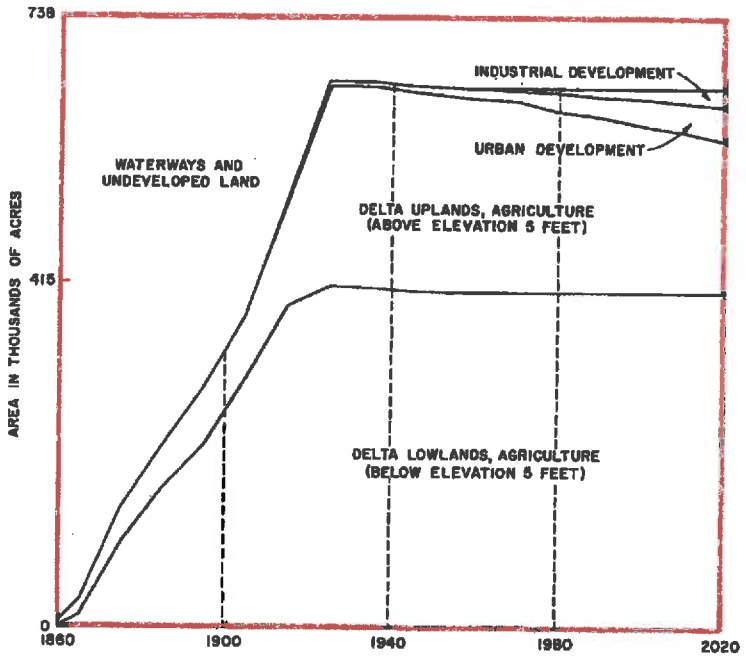
The fortunate combination of fertile soils, convenient water supplies, and shallow-draft shipping to central California markets led to development of an intensified agricultural economy in the Delta. Initial reclamation of the marshlands began slowly in the 1850's, but rapidly expanded after state assistance was provided by a swampland act in 1861. By 1930, all but minor areas of the swamplands had been leveed and were in production.

The Delta has historically been noted for its asparagus, potatoes, celery, and varied truck crops. Recently, greater emphasis has been placed on field corn, milo, grain, and hay, although the Delta still produces most of the nation's canned asparagus. The Delta's agricultural economy for many years was dependent upon repulsion of ocean salinity by fresh water outflow, which fluctuated widely, but during the past sixteen years has been protected largely by releases from upstream reservoirs of the Federal Central Valley Project during summer months.

Several towns and cities are located in the upland areas and an industrial complex is expanding in the western part of the Delta. Early industrial development centered around food and kindred products, steel production, fibreboard, lumber, and shipbuilding activity. Large water-using industries, such as steel, paper products, and chemicals, have developed in the western area where water, rail, and highway transportation, coupled with water supplies, has stimulated growth. The manufacturing employment in this area was about 10,000 people in 1960.



PROJECTED ASSESSED VALUATIONS WITHIN THE WESTERN DELTA STUDY AREA



TRENDS IN LAND USE

A deep-draft ship channel serving commercial and military installations terminates at Stockton, and another is being constructed to Sacramento. Water-borne shipments in the Delta amounted to about 6,000,000 tons annually in recent years.

The Delta encompasses one of California's most important high quality natural gas fields. Since 1941 the field has produced about 300,000,000 cubic feet of methane gas for use in the San Francisco Bay area.

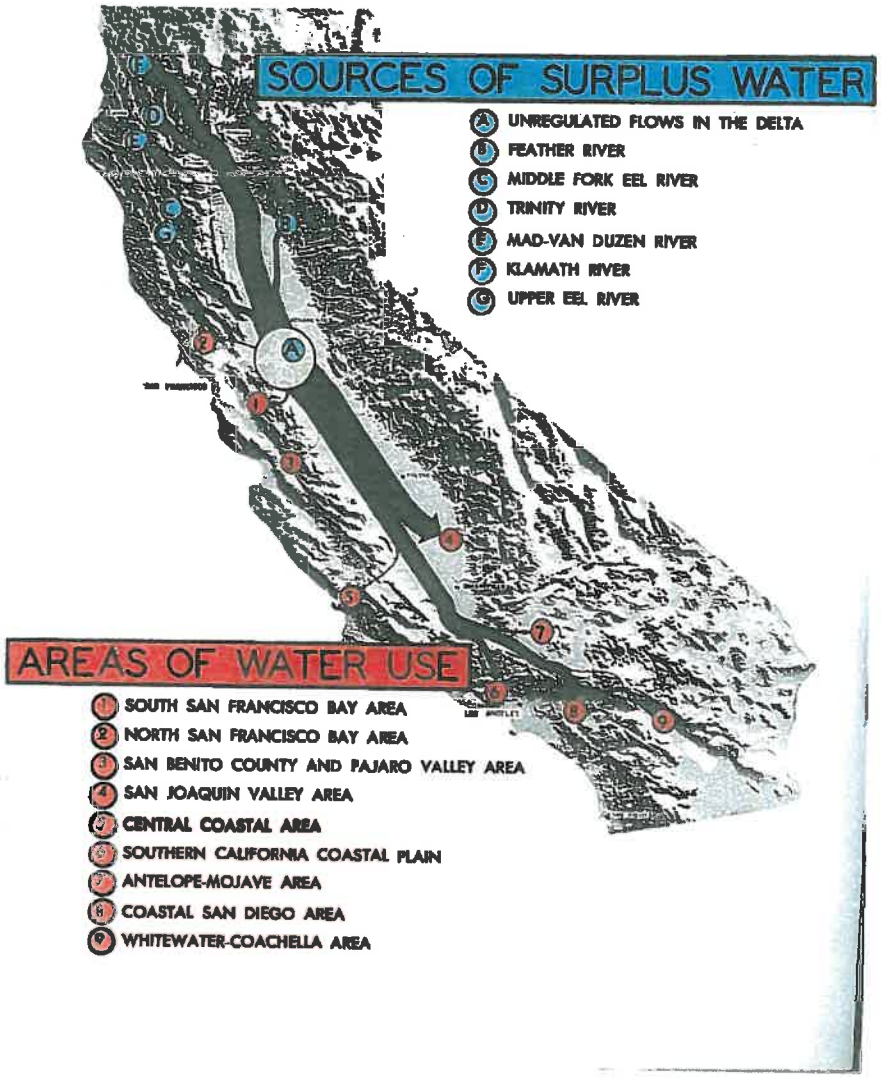
With the growing significance of recreation, the Delta has blossomed into a major recreation area at the doorsteps of metropolitan development in the San Francisco Bay area, Sacramento, and Stockton. In 1960, nearly 2,800,000 recreation-days were enjoyed in this boating wonderland.

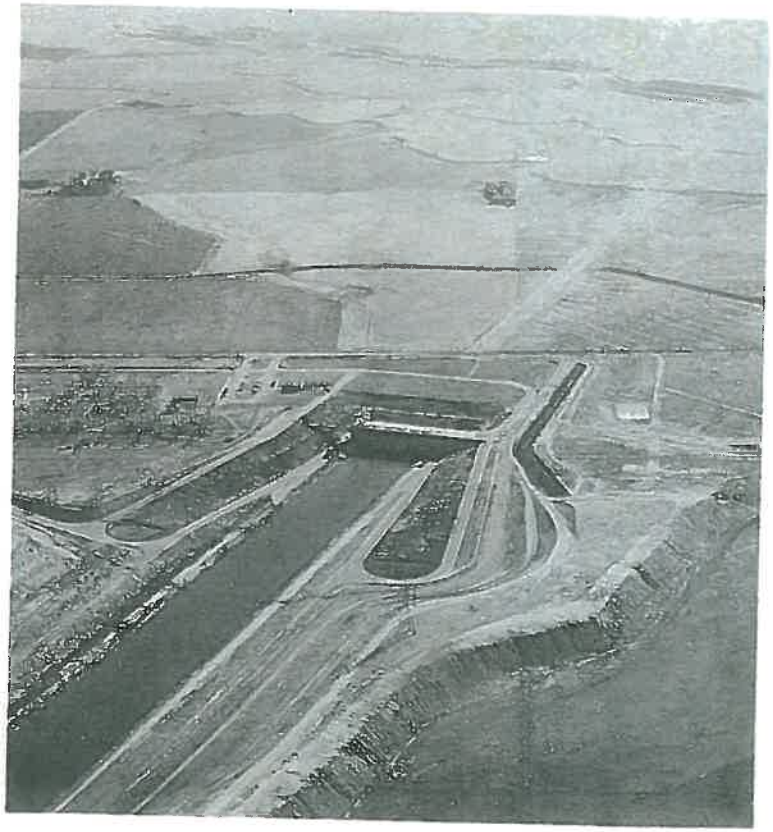
The Delta — its role in California's water development

In 1959, the State Legislature enacted the California Water Resources Development Bond Act to finance construction of the State Water Resources Development System. The bond act was approved by the California electorate in November 1960. The State Water Facilities, the initial features of this system, will complement continuing local and federal water development programs and include the very necessary works in the Delta.

One of the principal objectives of the State Water Resources Development System is to conserve water in areas of surplus in the north and to transport water to areas of deficiency to the south and west. The Delta is important in achieving this objective, since it receives all of the surplus flows of Central Valley rivers draining to the ocean during winter and spring months and is the last location where water not needed in the Delta or upstream therefrom can conveniently be controlled and diverted to beneficial use. Surplus water from the northern portion of the Central Valley and north coastal rivers will be conveyed by the natural river system to the Delta, where it must be transferred through Delta channels to export pumping plants without undue loss or deterioration in quality. Aqueducts will convey the water from the Delta to off-stream storage and use in areas of deficiency to the south and west.

In addition to being an important link in the interbasin transfer of water, the Delta is a significant segment of California's economy, and its agricultural, municipal, and industrial water supply problems, and flood control and related problems, must be remedied. A multipurpose system of Delta water facilities, which will comprise one portion of the State Water Resources Development System, is the most economical means of transferring water and solving Delta problems.

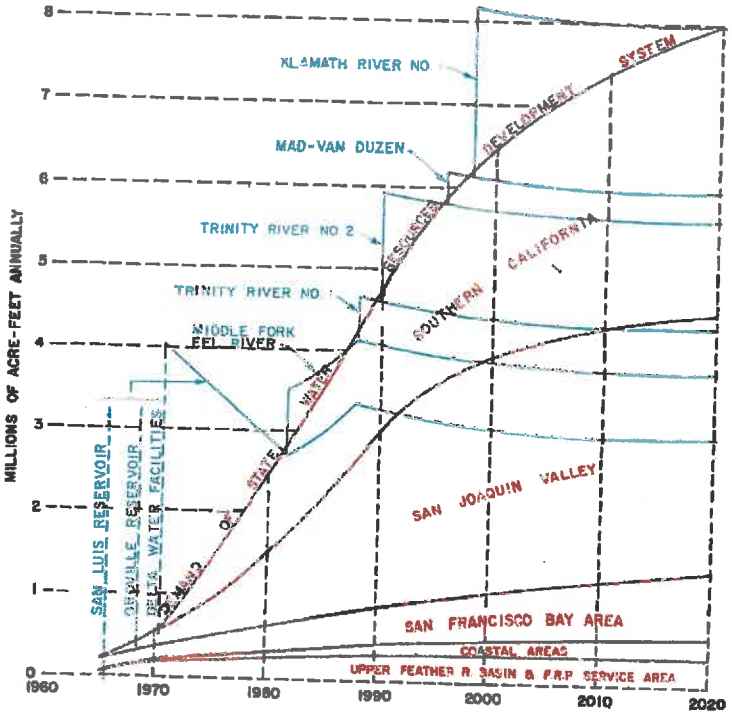




Tracy Pumping Plant

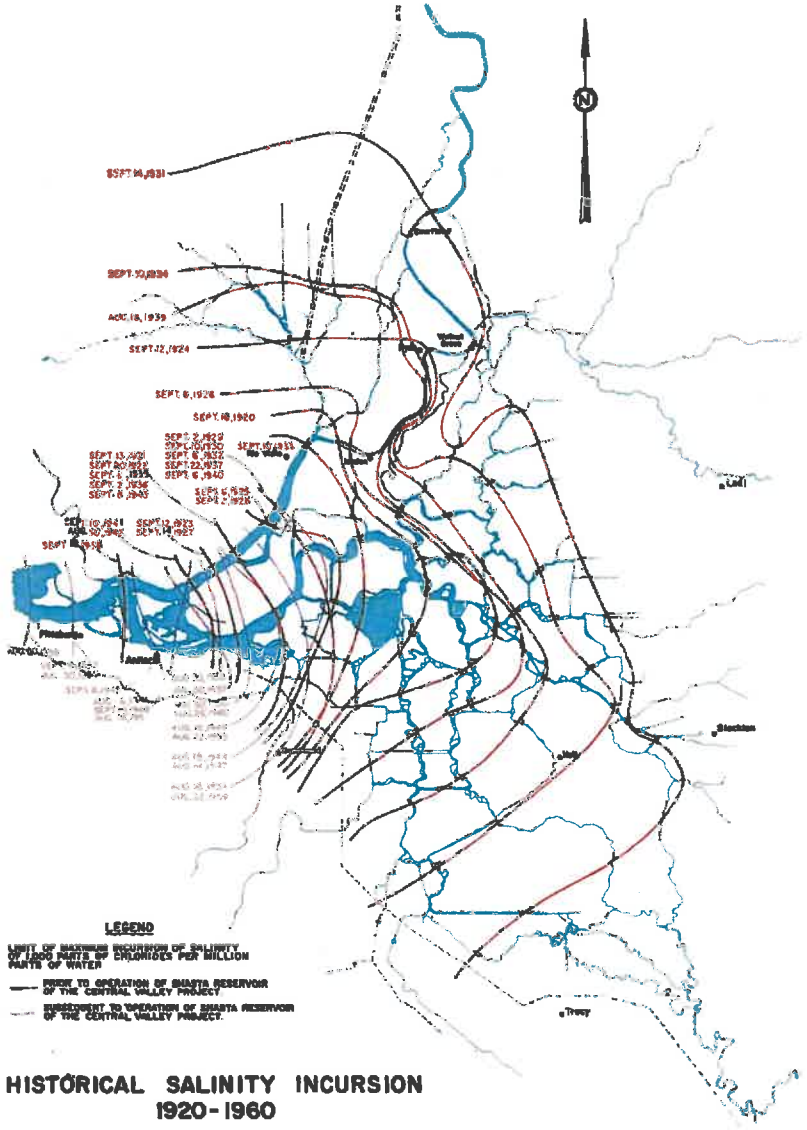
Full demands on the State Water Resources Development system can be met until about 1981 from surplus water in and tributary to the Delta with regulation by the proposed Oroville and San Luis Reservoirs. However, upstream depletions will reduce the available surplus supplies and water will have to be imported from north coastal sources after that year. It is anticipated that coordinated operation of the State Water Resources Development System and the Federal Central Valley Project will afford a limited increase in usable surplus Delta supplies beginning in 1981. As indicated in the chart, upstream depletions will continue to decrease the available surplus supplies.

The coordinated use of surplus water in and tributary to the Delta and of regulated or imported supplements to this supply, as required, is referred to as the Delta Pooling Concept. Under this concept of operation the State will ensure a continued supply of water adequate in quantity and quality to meet the needs of export water users. Advantage will be taken of surplus water available in the Delta, and as the demand for water increases and the available surplus supply is reduced by further upstream uses, the State will assume the responsibility of guaranteeing a firm supply of water, which will be accomplished by construction of additional storage facilities and import works. At the same time, the water needs of the Delta will be fully met.



WATER SOURCES AND USES

Delta Problems — salinity incursion and water supplies

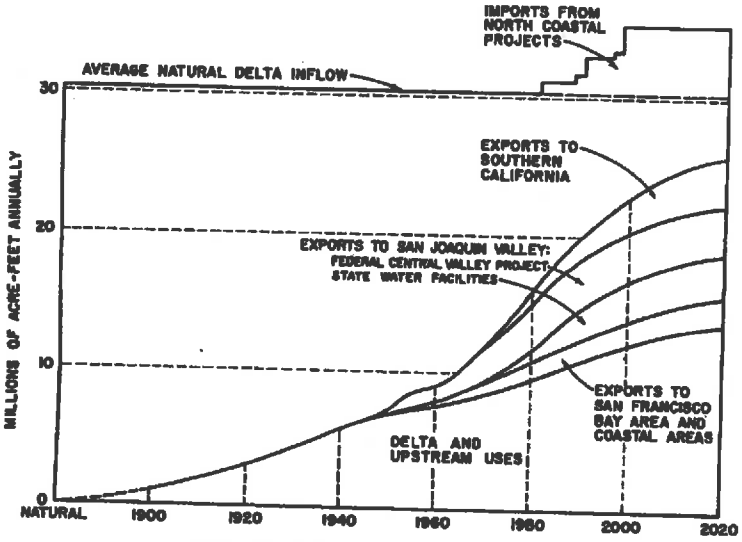


HISTORICAL SALINITY INCURSION
1920-1960

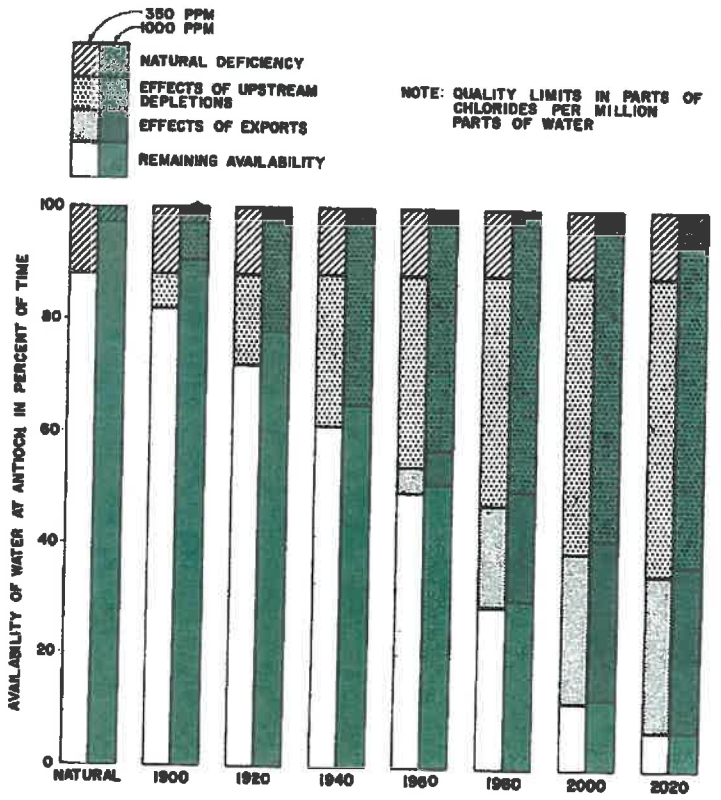
Salinity incursion into the Delta results from the flooding and ebbing of ocean tides through the San Francisco Bay and Delta system during periods when the fresh water outflow from the Delta is insufficient to repel the saline water. The natural fresh water outflow from the Central Valley was historically inadequate to repel salinity during summer months of some years. The first known record of salinity encroachment into the Delta was reported by Cmdr. Ringgold, U. S. Navy, in August 1841, whose party found the water at the site of the present city of Antioch very brackish and unfit for drinking. Since that time, and particularly after the turn of the century, with expanding upstream water use salinity incursion has become an increasingly greater problem in Delta water supplies. The maximum recorded extent of salinity incursion happened in 1931, when ocean salts reached Stockton. Since 1944 extensive incursion has been repulsed much of the time by fresh water releases from Central Valley Project storage in Shasta and Folsom Reservoirs. Without such releases, saline water would have spread through about 90 percent of the Delta channels in 1955 and 1959. Although upstream uses might not have reached present levels in the absence of the Central Valley Project, salinity problems would still have been very serious during most years.

Further increase in water use in areas tributary to the Delta will worsen the salinity incursion problem and complicate the already complex water rights situation. To maintain and expand the economy of the Delta, it will be necessary to provide an adequate supply of good quality water and protect the lands from the effects of salinity incursion. In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.

The natural availability of good quality water in the Delta is directly related to the amount of surplus water which flows to the ocean. The graph to the right indicates the historic and projected availability of water in the San Joaquin River at Antioch containing less than 350 and 1,000 parts chlorides per million parts water, under long-term average runoff and *without* specific releases for salinity control. It may be noted that even under natural conditions, before any significant upstream water developments, there was a deficiency of water supplies within the specified quality limits. It is anticipated that, without salinity control releases, upstream depletions by the year 2020 will have reduced the availability of water containing less than 1,000 ppm chlorides by about 60 percent, and that exports will have caused an additional 30 percent reduction.



USE OF DELTA WATER SUPPLIES



DELTA WATER QUALITY WITHOUT SALINITY CONTROL

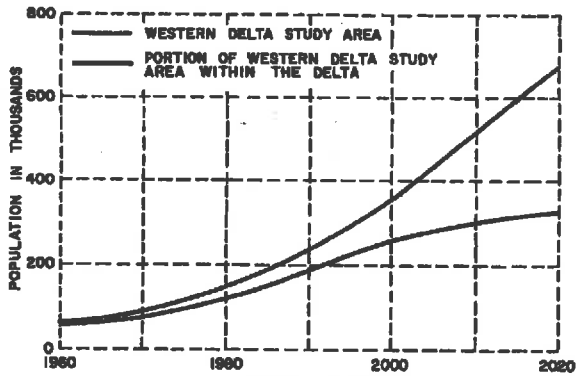
The magnitude of the past and anticipated future uses of water in areas tributary to the Delta, except the Tulare Lake Basin, is indicated in the diagram to the left. It may be noted that, while the present upstream use accounts for reduction of natural inflow to the Delta by almost 25 percent, upstream development during the next 60 years will deplete the inflow by an additional 20 percent. By that date about 22 percent of the natural water supply reaching the Delta will be exported to areas of deficiency by local, state, and federal projects. In addition, economical development of water supplies will necessitate importation of about 5,000,000 acre-feet of water seasonally to the Delta from north coastal streams for transfer to areas of deficiency.

Delta Problems—municipal water

Municipalities in the surrounding upland areas of the Delta, except in the western portion, obtain their water supplies from surface or underground sources which are, or will be with further development, adequate to meet their needs. In the western Delta, the principal municipalities rely on supplies from the Contra Costa Canal which are diverted from Delta channels. The main problem relates to quality of the water. At the present time, the mineral quality of the supplies deteriorates during some summer and fall months below standards established by the U. S. Public Health Service. This results from incursion of ocean salts, combined with industrial wastes and poor quality return water from the Central Valley. Assurance of good quality supplies in adequate quantities to meet present requirements and anticipated future growth is one of the most pressing problems in the Delta.

Estimates of future municipal water requirements in the western Delta area were based on projected population and per capita use. Population projections were founded on national, state, and regional forecasts for moderately high economical conditions. Although these conditions result in forecasts which may exceed an anticipated "most probable" projection by about ten percent, it is believed that this approach will assure adequate consideration of Delta water requirements in plans for diversion of surplus water from the Delta.

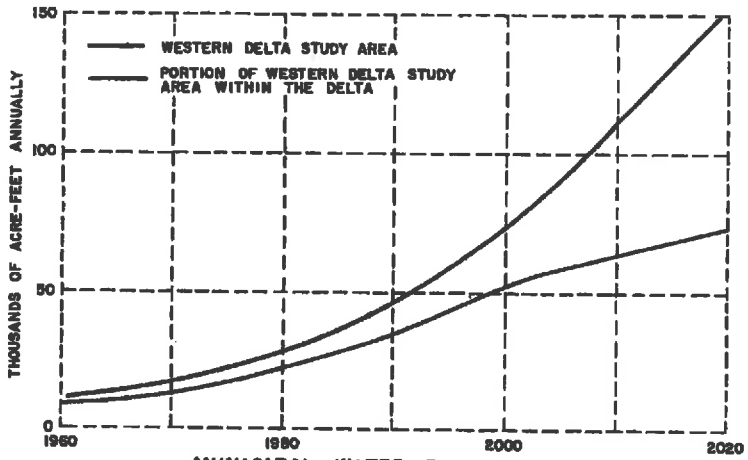
Projected estimates of per capita water uses reflect anticipated increases due to greater emphasis on water-using appliances in homes, additional lawns and landscaping, and the general trend toward higher standards of living. An average municipal water use of about 140 gallons per capita per day at this time reflects the climatic and economic conditions of the area. It is anticipated that the average use in low density residential areas will increase to about 200 gallons per capita per day by 2020. The estimated total annual municipal water requirement in the western Delta area indicates about a fifteenfold increase by 2020.



POPULATION
WESTERN DELTA STUDY AREA

ESTIMATED MUNICIPAL WATER REQUIREMENTS
WESTERN DELTA STUDY AREA
(In thousands of acre-feet annually)

Area	1960	1980	2000	2020
Western Delta Study Area				
Contra Costa Co.	9.6	26.8	62.7	116.4
Solano Co.	0.7	1.4	10.0	35.4
Portion of Western Delta Study Area Within the Delta				
Contra Costa Co.	8.6	22.6	52.0	71.4
Solano Co.	0.0	0.0	0.4	2.5



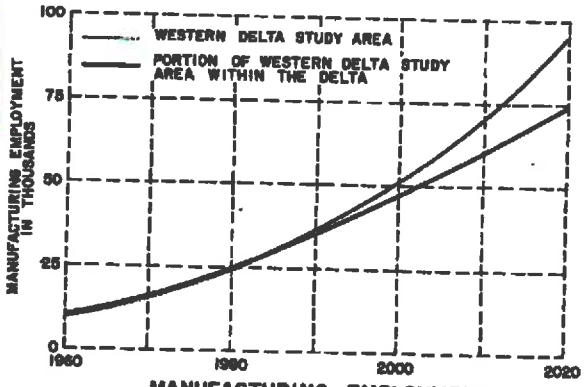
MUNICIPAL WATER REQUIREMENTS
WESTERN DELTA STUDY AREA

Delta Problems—industrial water

The problems of industrial water supply are similar to municipal supply problems in that they are concentrated in the western Delta area and center around quality aspects. Deterioration of water supplies by salinity incursion in 1959 caused curtailment of production in several plants and a production halt in one major industry. As additional upstream development and beneficial use of water takes place, the duration and degree of salinity incursion each year will become more extended. It will become increasingly necessary to provide adequate industrial water supplies in the western Delta area for maintenance and expansion of the present economy.

Estimates of future industrial growth were based on correlation of state and regional manufacturing employment with national projections. Projections to 1980 were based on detailed analyses of the several components of the industrial complex, while projections beyond that date reflect total manufacturing employment. A sevenfold increase in manufacturing employment in the western Delta area is anticipated by 2020. Increasing productivity per employee, due to automation and technical advancements, coupled with projected employment, indicates a thirtyfold increase in production by that date.

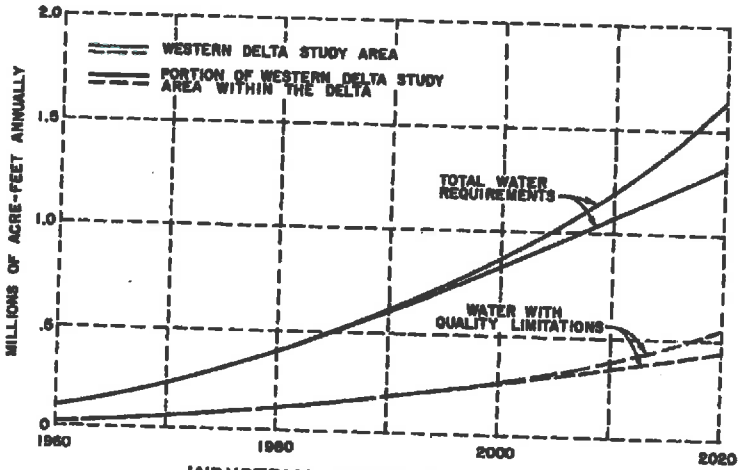
Estimates of future water supplies to enable the production increases were based on six manufacturing categories, and reflect a continuation of the trend of decreasing water use per unit of production. A fifteenfold increase in total industrial water requirements is indicated by 2020. The total requirement includes two types of industrial water. One type is for processing and recirculated cooling with quality limitations, and the second type is for general cooling where good quality water is not required because materials of construction in cooling equipment can satisfactorily withstand a wide range of quality conditions.



MANUFACTURING EMPLOYMENT
WESTERN DELTA STUDY AREA

ESTIMATED INDUSTRIAL WATER REQUIREMENTS
WESTERN DELTA STUDY AREA
(In thousands of acre-feet annually)

Area	1960	1980	2000	2020
Western Delta Study Area				
Total water requirements, Contra Costa Co.	105	396	790	1,270
Total water requirements, Solano Co.	1	7	67	387
Water with quality limitations, Contra Costa Co.	30	120	251	423
Water with quality limitations, Solano Co.	–	2	21	129
Portion of Western Delta Study Area Within the Delta				
Total water requirements, Contra Costa Co.	105	396	790	1,270
Total water requirements, Solano Co.	–	–	9	56
Water with quality limitations, Contra Costa Co.	30	120	251	423
Water with quality limitations, Solano Co.	–	–	3	19



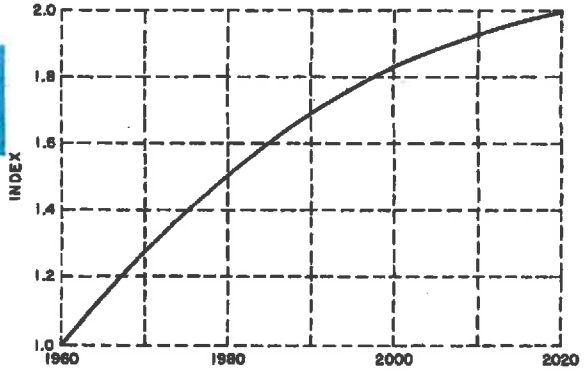
INDUSTRIAL WATER REQUIREMENTS
WESTERN DELTA STUDY AREA

Delta Problems—agricultural water

For many years farmers in the Delta have been confronted with salinity incursion in Delta channels. Since 1944 they have enjoyed partial salinity protection and supplemental water due to releases from Shasta and Folsom Reservoirs. As additional water is utilized in areas tributary to the Delta, there will be further reductions in unregulated late spring runoff to the Delta, which will result in diminishing supplies in the western Delta and greater Delta-wide reliance on regulated fresh water outflow. About 40,000 acres in the western Delta are faced with water supplies of poor quality even if future export projects are not constructed. In the southern portion of the Delta the present water supplies during summer months consist mainly of very poor quality drainage water in the San Joaquin River. Operation of the proposed San Joaquin Valley waste conduit may reduce the amount of return drainage water available in the San Joaquin River. If this occurs, substitute water supplies would have to be provided.

Although most of the suitable land in the Delta is now irrigated, limited additional development in the uplands is anticipated, and more intense use by double-cropping will be made of Delta lowlands. Estimates of expanding water requirements reflect correlations with statewide projections of the economic demand for farm produce. It is anticipated that about 10,000 acres of "new" land will be irrigated in the upland areas, but about 40,000 acres will be converted to urban uses by 2020.

Future water requirements were based on projected crop patterns and unit water requirements of the various crops. Some additional water may be required for leaching of lands surrounded by brackish water. Separate allowance for this purpose was provided in operation studies of plans which result in brackish water in western Delta channels.

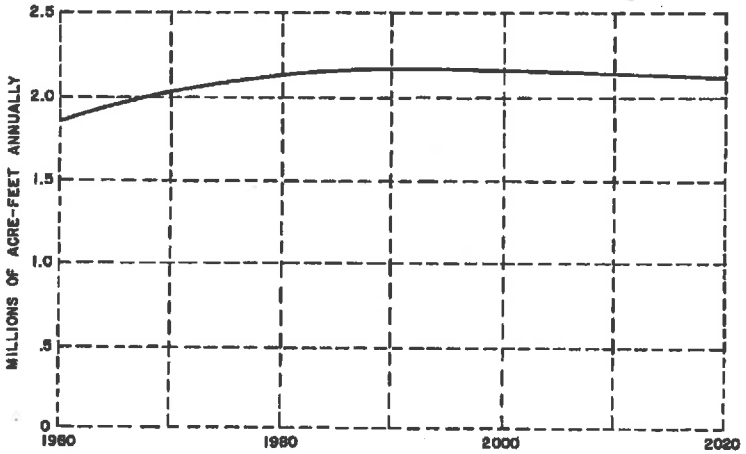


INDEX OF AGRICULTURAL PRODUCTIVITY

ESTIMATED AGRICULTURAL WATER REQUIREMENTS WITHIN THE DELTA [1]
(In thousands of acre-feet annually)

Area	1960	1980	2000	2020
Alameda County	13	15	15	15
Contra Costa County	236	272	275	270
Sacramento County	294	339	342	336
San Joaquin County	838	967	977	958
Solano County	238	264	267	261
Yolo County	244	282	285	279
TOTAL	1,863	2,139	2,161	2,119

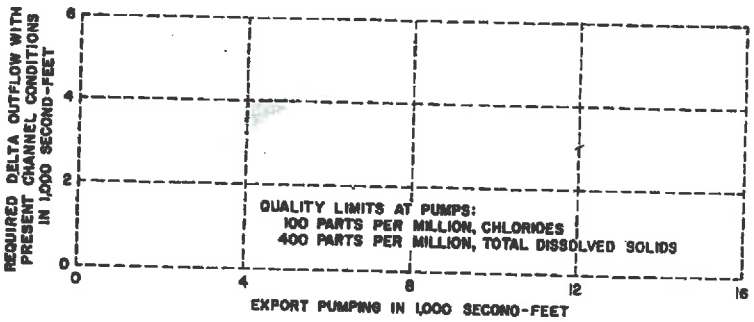
[1] Including effective precipitation.



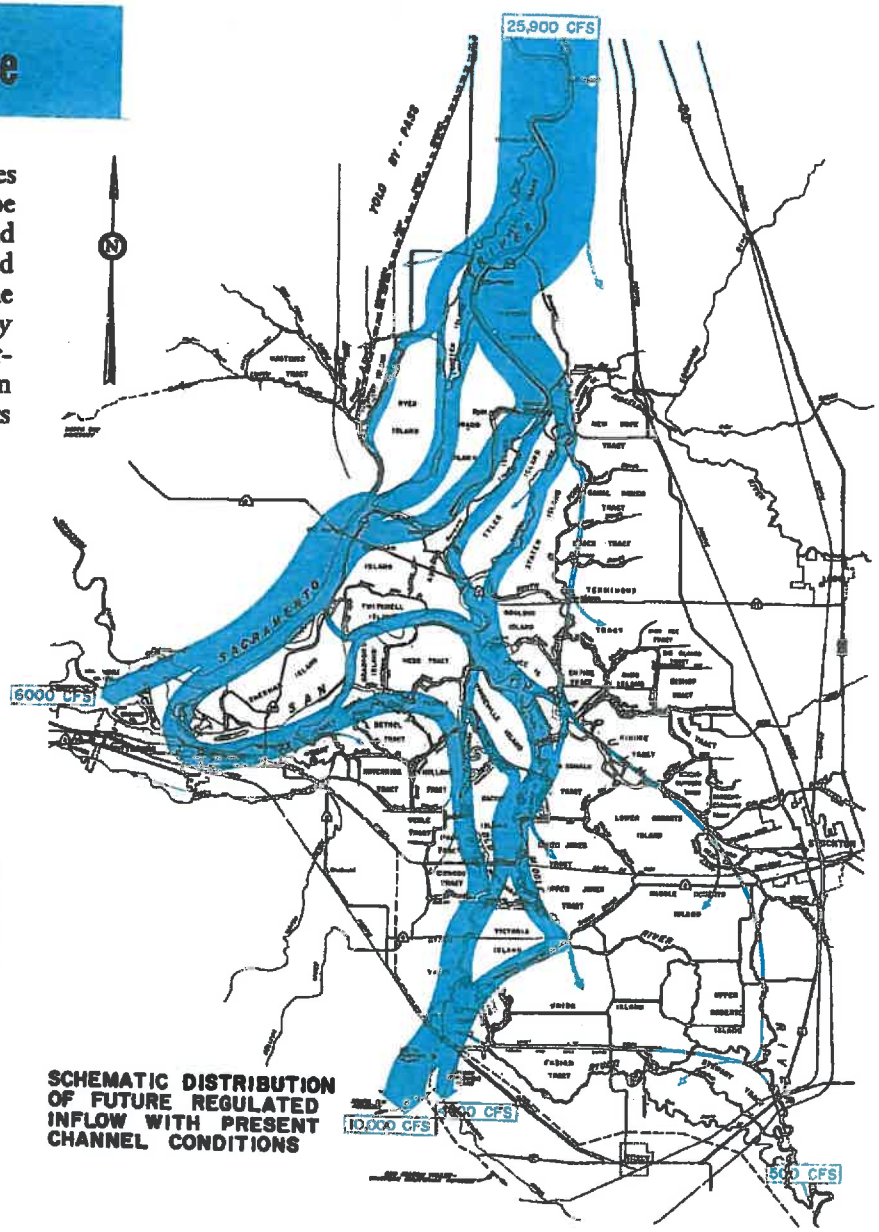
AGRICULTURAL WATER REQUIREMENTS

Delta Problems—water salvage

During winter months of most years, flood flows exceed Delta uses and flush ocean salts from the channel system. Surplus water can be diverted from the Delta under these conditions. During summer and early fall months, the inflow to the Delta is generally limited to regulated flow in the Sacramento River. This supply must meet all uses in the Delta and export therefrom, and prevent salinity incursion from unduly degrading the quality of water in the Delta. Due to the hydraulic characteristics of the complex channel system, the amount of outflow from the Delta necessary for quality control at the export pumping plants increases as the rates of export increase.

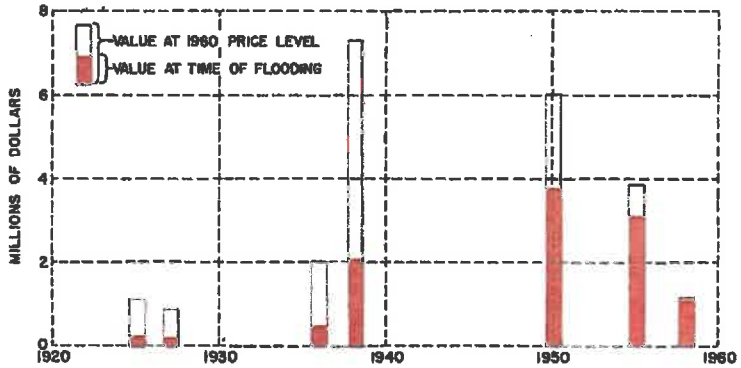


Water in the Sacramento River follows two basic routes to the export pumping plants. It flows from the vicinity of Walnut Grove through several generally parallel channels in a southerly direction across the central portion of the Delta, and also through channels in the western portion around Sherman Island and then upstream into the central area. The quantities transferred by the first route are *not sufficient* to supply the pumps and enroute Delta users during summer months, and water transferred around Sherman Island by the second route is mixed with and carries ocean salts into the Delta. Therefore, greater quantities of water will be necessary to reduce the salinity concentrations in the western Delta, unless a physical barrier is constructed or water is diverted directly southward across the Delta.

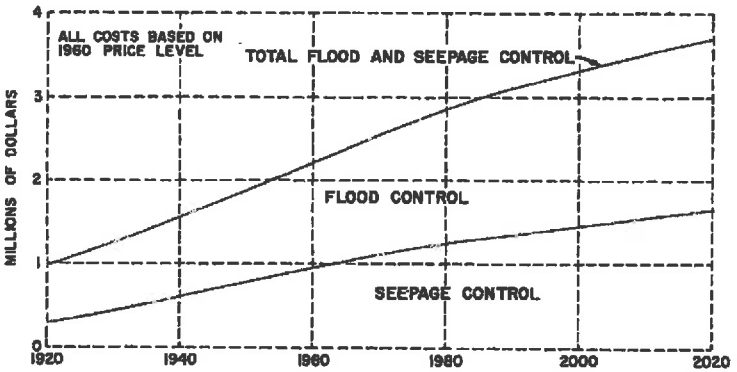


SCHEMATIC DISTRIBUTION OF FUTURE REGULATED INFLOW WITH PRESENT CHANNEL CONDITIONS

Delta Problems—flood and seepage control



HISTORICAL FLOOD DAMAGE IN THE DELTA

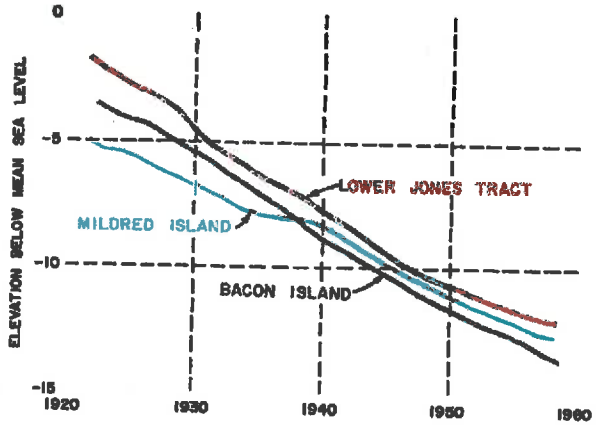


ANNUAL COSTS - FLOOD AND SEEPAGE CONTROL

While the peat soils of the Delta are excellent for growing crops, they cause several difficult levee maintenance and farming problems. Levees along the channels have been constructed on the peat and periodically must be raised and widened as the organic foundation soils are consolidated. During the early stages of land reclamation, islands were frequently flooded by overtopping of the levees. However, under present conditions floods due to overtopping are infrequent in the central portion of the Delta, but numerous islands have been flooded when sections of the levees have suddenly failed. This apparent trend toward decreasing levee stability results from subsidence of the land surface and resultant greater forces on the levees. Despite increasing maintenance work on many existing levees, no significant improvement in protection is achieved.

The land surface in areas of peat soils is subsiding at an average rate of about three inches per year. This is generally attributed to oxidation of the peat fibers, wind erosion, compaction by farm equipment, and loss of water in the upper few feet. As a result of land subsidence, future levees in many areas will be 30 to 35 feet high. Work must be initiated soon to gradually increase the stability of the levees for these future conditions. In this connection, it must be recognized that flood protection for the Delta must include works in the Delta. Flood stages in the Delta result from inflow and high tides, frequently amplified by heavy winds on the ocean and Bay system. Although upstream flood control reservoirs will afford some relief, more stable levees are needed to safely resist the high tide and flood stages.

As the peat soils are lost by oxidation and erosion, the seepage problems are compounded. Differences in elevation between water levels in the channels and in the islands will increase, and the resistance by the peat to upward movement of water from

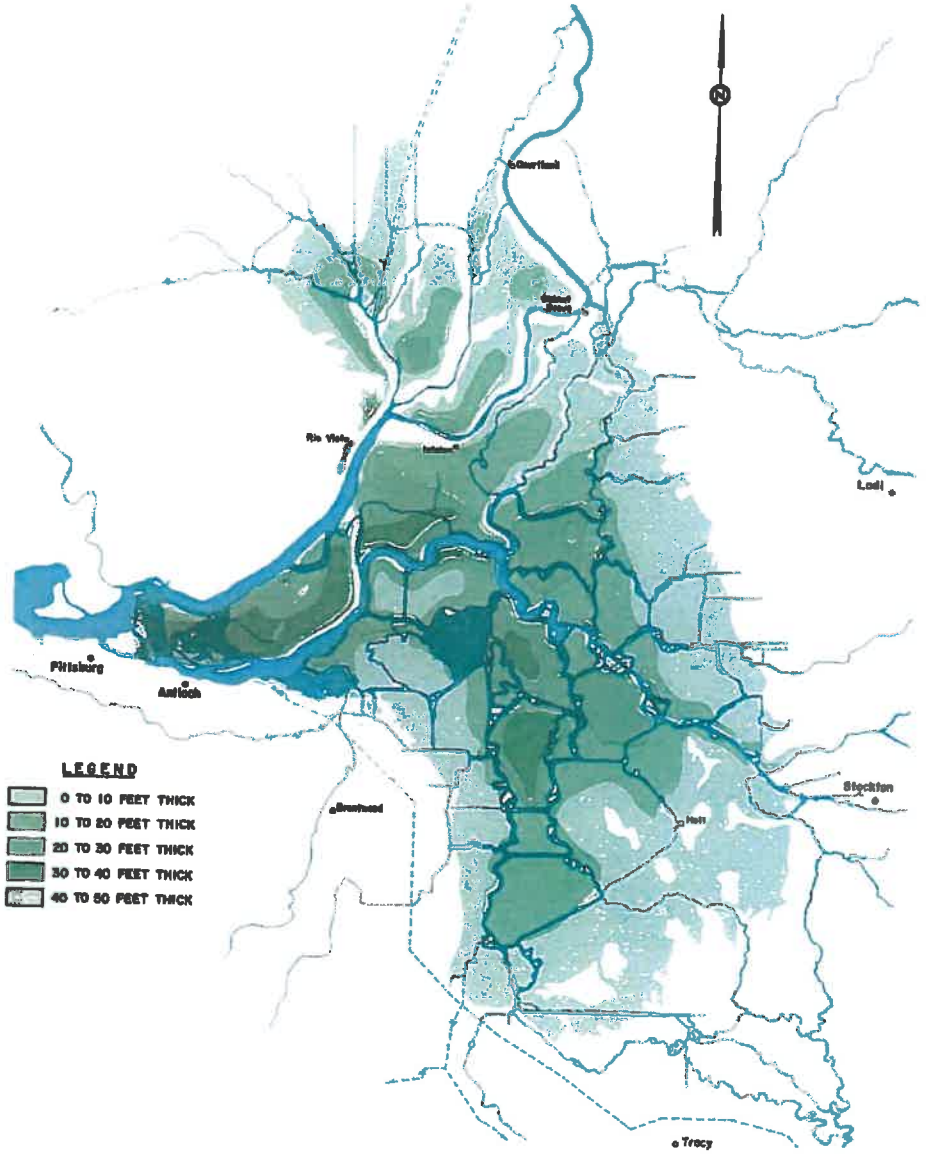


LAND SUBSIDENCE

underlying sand aquifers will be reduced. Unless suitable methods of arresting the loss of peat are developed, farming in the Delta will cause continued subsidence. Experience has shown that this subsidence will continue to within about two to three feet above the bottom of the peat. Significant tracts of Delta land will become impractical to farm unless seepage is controlled and the danger of inundation is reduced.

The largest natural gas field in areal extent in the State of California is located in the Delta. The geological structure of this field is strikingly similar to the structure of the oil fields of Wilmington, California, but the gas pressures are dissimilar. Because of the similarity of geologic conditions, studies are being conducted to determine if deep-seated subsidence might occur as the gas is extracted. Estimates based on preliminary data indicate a maximum subsidence of two feet in the Rio Vista area, if all the gas is extracted from the field.

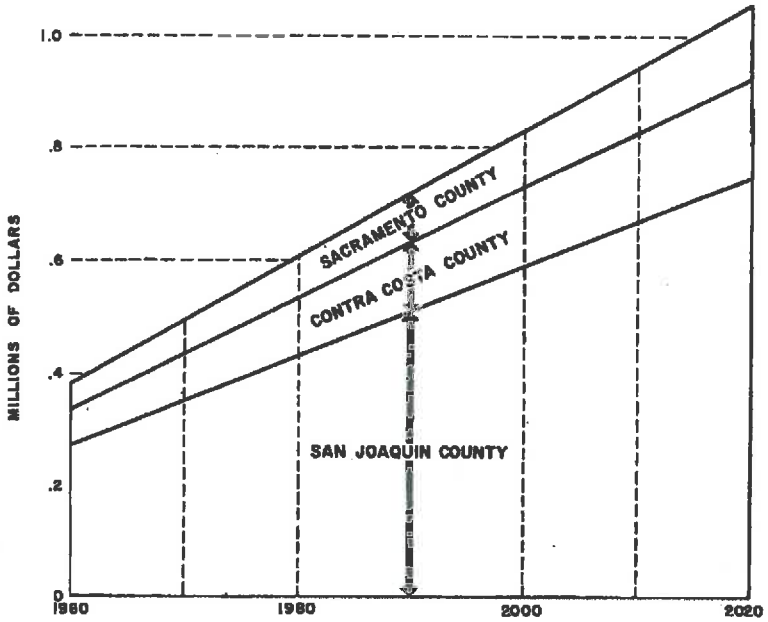
AREAS OF PEAT AND RELATED ORGANIC SEDIMENTS



Delta Problems—vehicular transportation

The wooden barges and stern paddle wheelers long ago disappeared from the Delta scene, to be replaced by fast trucks, ocean-going freighters, and tugs towing steel barges. However, despite tremendous technological advances in transportation, the Delta, with its poor foundation soils and miles of open waterways, has hindered the development of a satisfactory highway system.

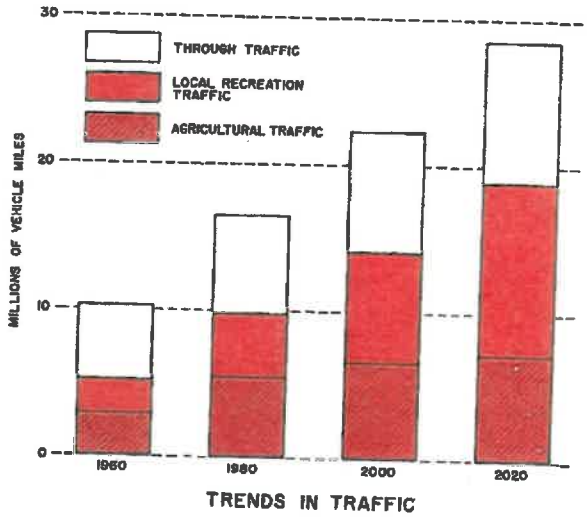
Vehicular transportation, even today, is confined mainly to the crowns of the levees which encircle the farmlands, and inter-island traffic is dependent to a large extent on ferries. Periodic levee reconstruction to compensate for consolidation and land subsidence results in delays and detours for the traveling public and farm-to-market commerce. In winter months much of the area is inaccessible because of muddy roads. There are 950 miles of paved roads in the area, but because of the unstable peat foundation, the costs of maintenance and operation are disproportionately high. For example, in San Joaquin County only 12 percent of the county's 1,780 miles of roads is in the Delta, but almost 30 percent of the county's annual costs of $1,000,000 for highway facilities is expended in the Delta. Future costs will increase due to greater use of the road system.



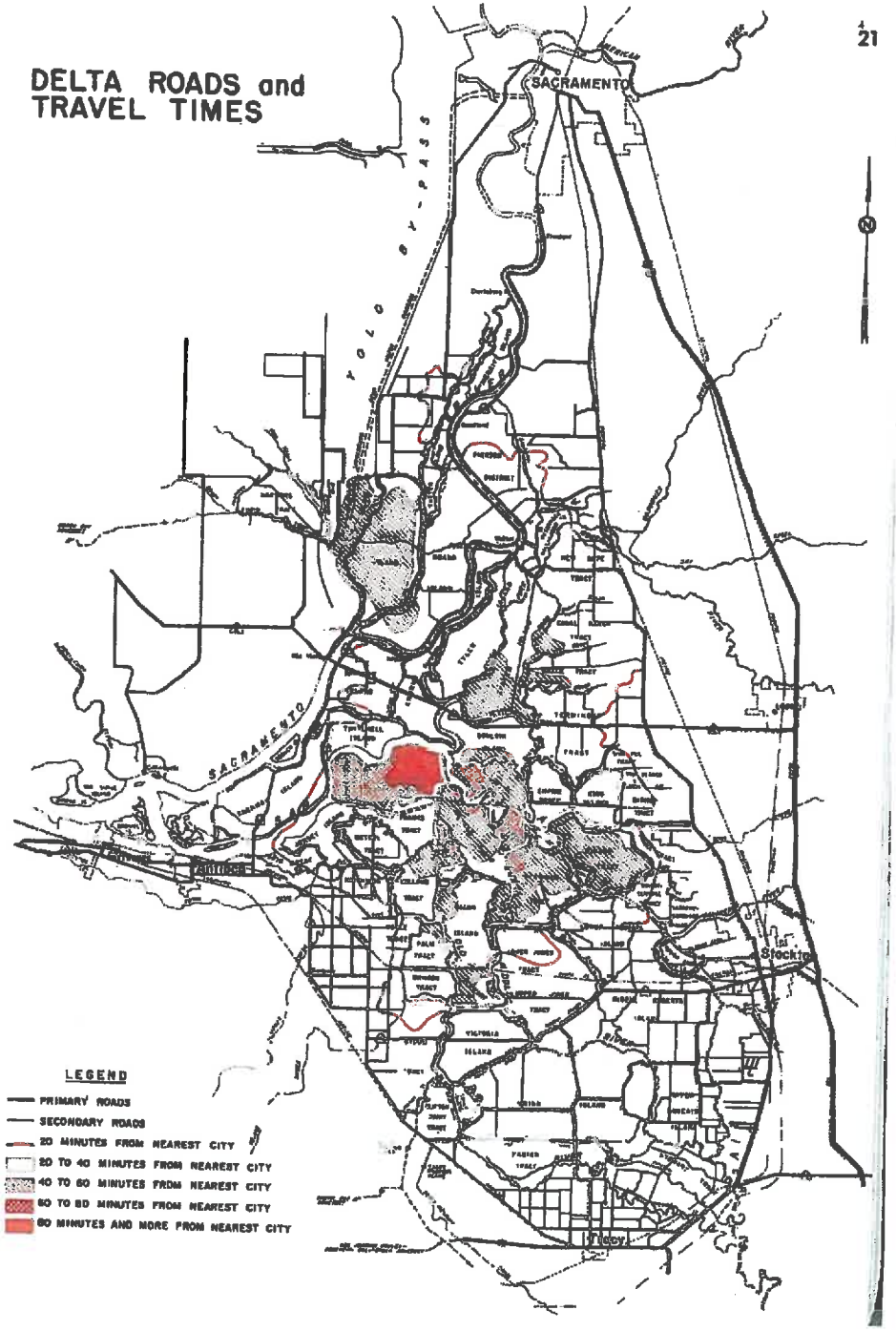
ANNUAL COST OF MAINTAINING
COUNTY ROADS WITHIN THE DELTA

While it is true that today's Delta roads are greatly improved over those of the past, there still remains a serious lack of access to many remote locations of the Delta. Improvements are also needed in roads linked with the state and county highway networks. Travel times to principal cities of Stockton, Tracy, Sacramento, and Antioch are depicted on the map.

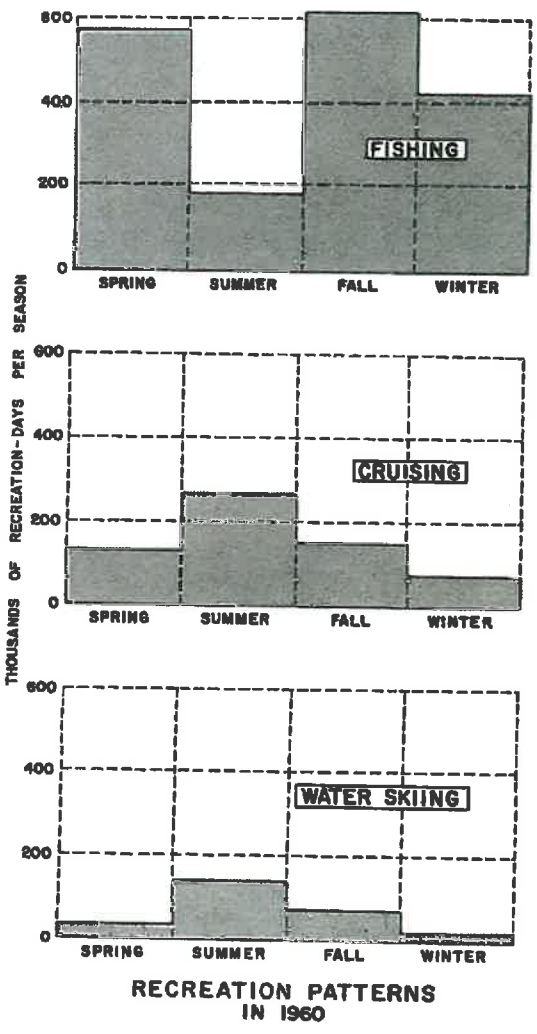
An expanded and improved system of roads would unquestionably make the Delta more attractive to the recreation industry. The new roadways also would benefit many local landowners who are presently at an economic disadvantage in shipment of their crops to markets. Increasing production in the Delta, due to anticipated double-cropping and improvements in farming practices, will increase the amount of agricultural road traffic.



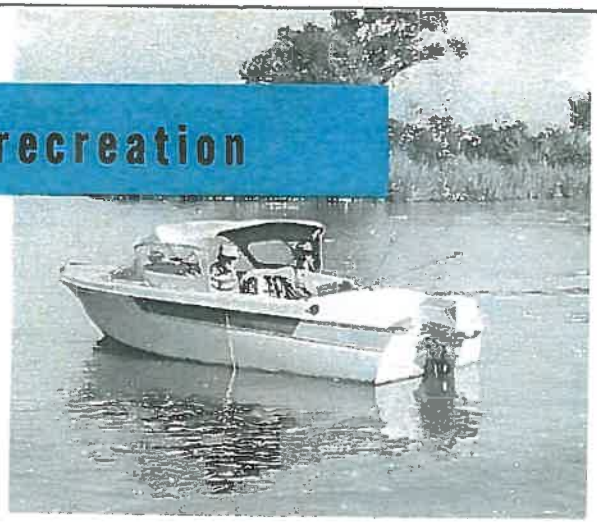
TRENDS IN TRAFFIC



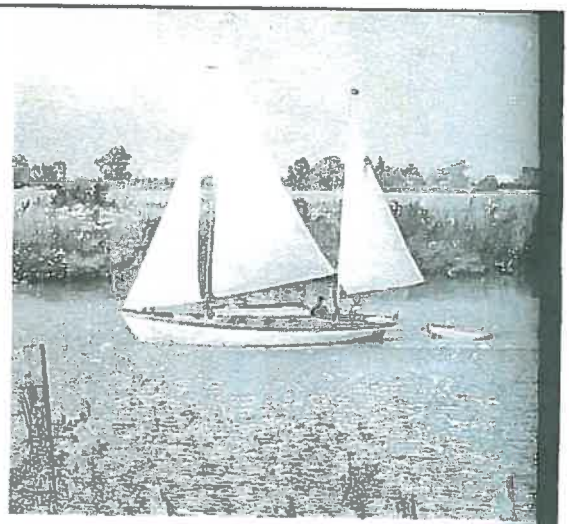
Delta Problems—recreation



RECREATION PATTERNS
IN 1960



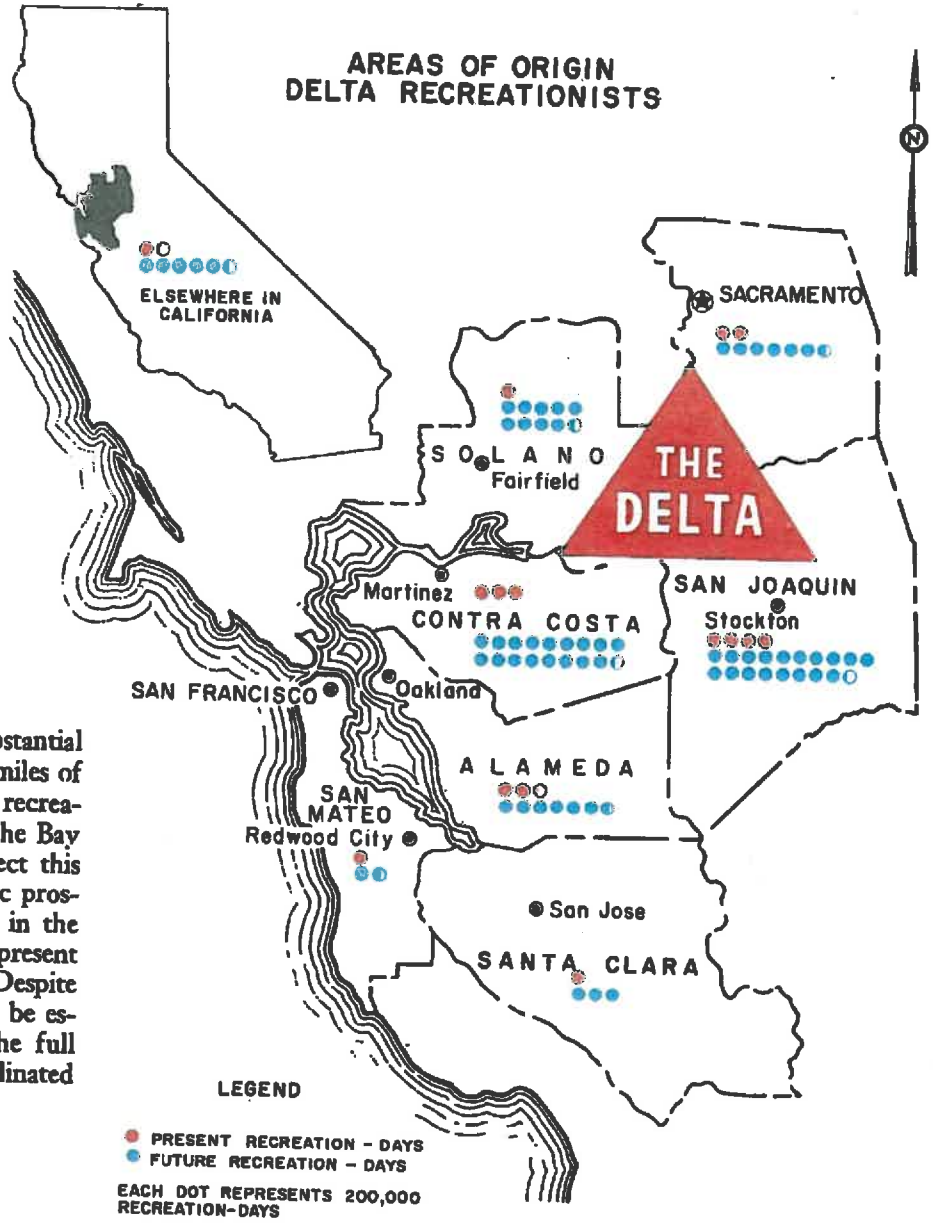
Courtesy of Los Angeles Times



Courtesy of Los Angeles Tim

The 50,000 acres of water surface and almost 1,000 miles of shore line in the Delta offer a vast and fascinating area with a great diversity of recreational opportunities. Fishing is the favorite pursuit and striped bass is the leading catch. Salmon, shad, black bass, catfish, and sturgeon are also important in the sportsman's bag. The maze of Delta channels is appealing to boatmen for cruising, and the many miles of calm water are ideal for water skiing and high-speed boating. While many of the channels are not extensively used, due mainly to difficulty of access and lack of service facilities, other areas have become congested and competition is developing between fishermen, boatmen, and skiers. Safety of the recreationists is becoming a significant problem and local law enforcement agencies are increasing their patrols. Levee erosion problems due to speeding boats also have developed in some localities. Picnicking and swimming are becoming more attractive as facilities are developed, and duck and pheasant hunting is very popular. There are now 123 private and public resorts which cater primarily to fishermen and boatmen in the Delta. In addition, many of these resorts are also developing facilities for picnicking and camping.

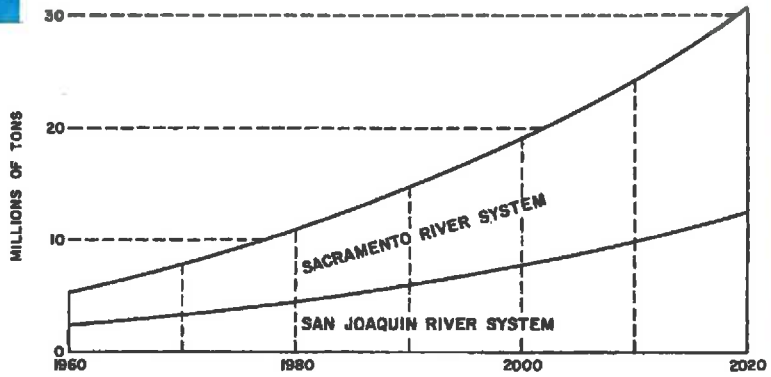
Courtesy of Hubert Miller



Although the Delta at the present time is a scene of substantial recreation use, there is ample room for expansion. Many miles of shore line and large areas of water are still available for recreational development. As the rapid population growth of the Bay area continues, recreation activity in the Delta will reflect this increase. Based on a future of continued general economic prosperity and population growth, the amount of recreation in the Delta will increase from 2,800,000 recreation-days at the present time to as many as 14,000,000 recreation-days by 2020. Despite the size of the Delta, proper local zoning and control will be essential for public safety and continued enjoyment. If the full recreation potential of the region is to be realized, coordinated planning by state and local agencies will be required.

Delta Problems—navigation

The Delta channels are extensively utilized by vessels ranging in size from rowboats to deep-draft commercial freighters and warships. The significance of navigation in the Delta has risen and fallen in the past, but in the last few decades it has been steadily increasing. The Corps of Engineers maintains many miles of channels in authorized navigation projects, the principal one in recent years being the Stockton Deep Water Channel. Construction is now underway on the Sacramento Deep Water Channel. Petroleum products carried by tugs and barges account for the majority of commercial shipping, but large amounts of farm produce are shipped by barges and deep-draft freighters.

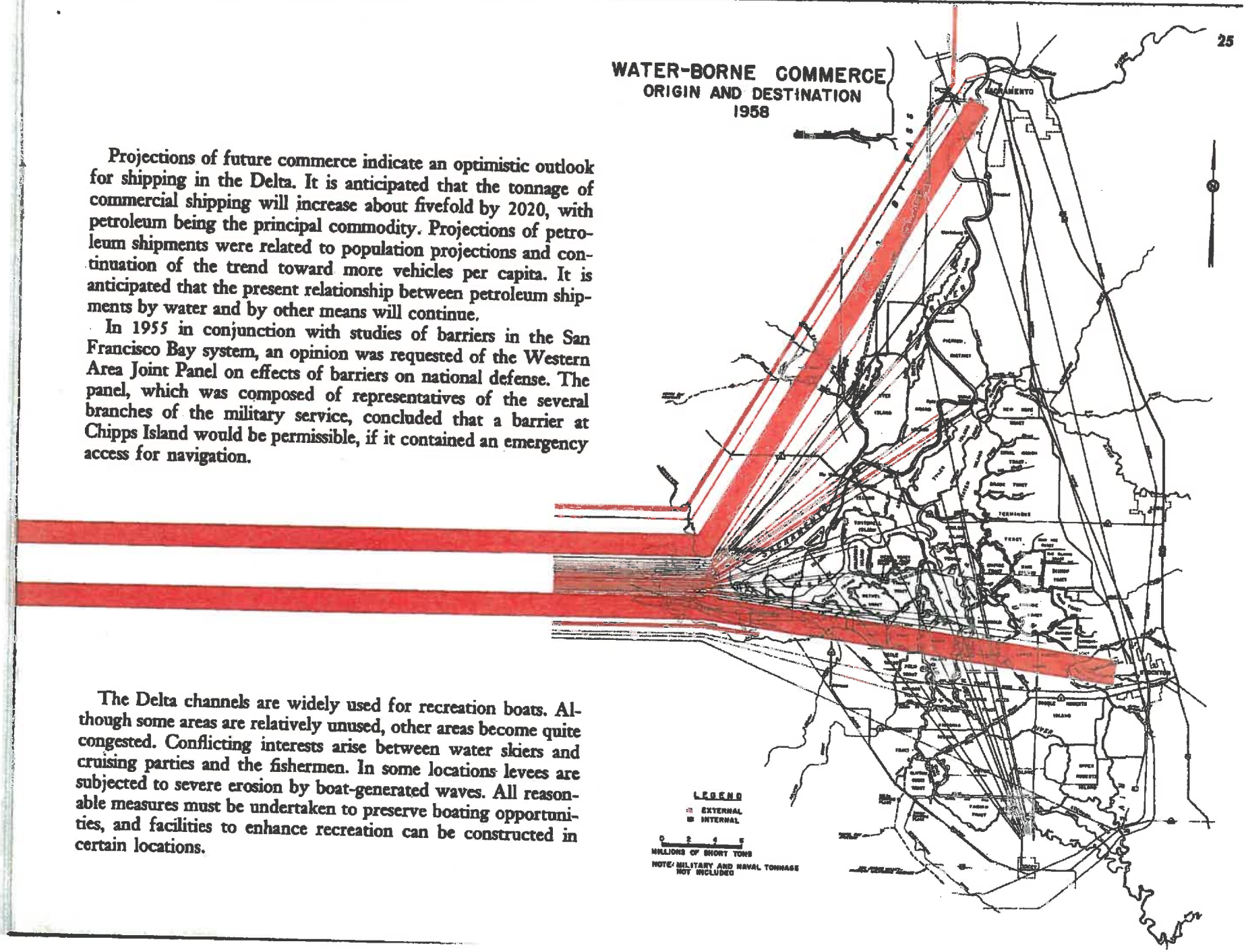


WATER-BORNE COMMERCE

Courtesy of Robert Yelland

Projections of future commerce indicate an optimistic outlook for shipping in the Delta. It is anticipated that the tonnage of commercial shipping will increase about fivefold by 2020, with petroleum being the principal commodity. Projections of petroleum shipments were related to population projections and continuation of the trend toward more vehicles per capita. It is anticipated that the present relationship between petroleum shipments by water and by other means will continue.

In 1955 in conjunction with studies of barriers in the San Francisco Bay system, an opinion was requested of the Western Area Joint Panel on effects of barriers on national defense. The panel, which was composed of representatives of the several branches of the military service, concluded that a barrier at Chipps Island would be permissible, if it contained an emergency access for navigation.



The Delta channels are widely used for recreation boats. Although some areas are relatively unused, other areas become quite congested. Conflicting interests arise between water skiers and cruising parties and the fishermen. In some locations levees are subjected to severe erosion by boat-generated waves. All reasonable measures must be undertaken to preserve boating opportunities, and facilities to enhance recreation can be constructed in certain locations.

Planning and Design Concepts

Planning for solutions to the complex Delta problems necessitates full recognition of the interrelated effects on all phases of the Delta's economy. The best solution should reflect the greatest overall benefits and least detriments, realizing that both objectives cannot be completely achieved when basic interests differ. Economies of construction and operation generally may be effected by multi-use of facilities. Therefore, consideration must be given to multipurpose development.

DELTA WATER SUPPLY

Water users in the Delta enjoy a naturally convenient source of supply in the numerous channels from which water is diverted by siphon or low-lift pumps. The supply problem in portions of the Delta stems from the poor quality of water, due to salinity incursion from the Bay and degradation by agricultural and industrial wastes. Adequate water supplies could be provided either by regulated releases of stored fresh water to repel salinity incursion and flush other wastes, or by constructing a physical barrier against salinity incursion and conveying unusable wastes beyond the barrier. A third alternative would involve a reduction of present salinity control in the western Delta channels and provision of substitute fresh water supplies to users who could not then divert from the channels containing brackish water. All three alternatives were evaluated, with particular attention to minimizing modifications to existing water supply systems.

The California Water Code specifies that one of the functions of the State Water Resources Development System is to provide salinity control and an adequate water supply in the Delta. If it is in the public interest to provide substitute supplies in lieu of salinity control, no added financial burden shall be placed on the local water users as a result of such substitution. The code also declares that water to which the Delta is entitled shall not be diverted. It is clearly established that supplying water for the Delta must be a primary and integral function of the State Water Facilities.

WATER SALVAGE

Unless physical works are constructed in the Delta, increasingly greater quantities of outflow will be required for quality control as more and more water is transferred across the Delta. However, most of the required outflow could be salvaged by constructing a physical barrier against salinity incursion, or by transferring the water more directly across the Delta to prevent commingling with brackish water near the outlet of the Delta.

The quality of water available for export, as well as for use in the Delta, must be suitable for various purposes. Standards for mineral quality, adopted by the Department of Water Resources and incorporated in water service contracts, permit not more than 400 parts of total dissolved solids and 100 parts of chlorides per million parts of water.

FLOOD AND SEEPAGE CONTROL

Flood stages in the Delta result from a combination of high tides, amplified by heavy winds on the ocean and Bay system, and inflow to the Delta. Historic inundations have generally resulted from levee failures, rather than overtopping. As the land behind the levees continues to subside, the stability of the levees decreases.

Physical and economic factors dictate an extended construction period for improvement of levees on organic soils. To reduce the extent and cost of levee improvements, it is prudent to limit flood waters to principal improved flood channels. Additional flood control reservoirs on rivers entering the Delta are contemplated for construction in the near future. Therefore, it is economical to design Delta flood channels for rates of flow anticipated after construction of upstream storage. Design of improved flood channels was predicated on additional

regulation of the Cosumnes, Mokelumne, Calaveras, Stanislaus, and Tuolumne Rivers. Although the "design" floods reaching the Delta after completion of these works may generally be expected to occur on an average of once every fifty years, the degree of frequency is not particularly meaningful in the tidal channels of the Delta, since protection is largely dependent on levee stability. It should be recognized that complete flood protection generally cannot be assured by construction of control works. Continued emphasis should be placed on flood plain zoning in the Delta for low value improvement uses as generally associated with farming.

Construction of principal flood channels and creation of interior channels would afford an opportunity to regulate water stages in the interior channels. Since the rate of seepage inflow to the islands is directly related to the level of water in the surrounding channels, seepage could be reduced by lowering the water levels.

However, project operation might cause increased seepage problems in certain locations. Where these problems are evidenced by future operation, remedial measures would be necessary. Allowances for cost of such works were included in planning for areas of anticipated damage.

VEHICULAR TRANSPORTATION

Improvements in the road network of the Delta to enhance recreational opportunities and reduce costs of farm-to-market travel, could conveniently and economically be incorporated in master levee construction for flood and seepage control. Construction of the master levees would involve a wide berm on the landward side of existing levees in most locations. This berm would provide a suitable base for a road. Parking areas off the roadway could also be constructed at many locations. Channel closures in the master levee system would eliminate the need for ferries in certain locations.

Where existing roads would be rendered unusable by construction and operation of the Delta water facilities, equivalent service would be provided. Road improvements which would enhance the existing system, such as better road surfacing or extensions to connect with nearby routes, could be incorporated, if local agencies desire these improvements and participate in the costs.

RECREATION

The Delta is extensively used for recreation at this time, yet its potential use is several times greater. Planning for any facilities in the Delta should seek to minimize adverse effects on recreation, consistent with sound economics, and to enhance the attractiveness and advantages of the Delta for further recreational development. It is recognized that flood and seepage control measures, or other works which restrict free movement of boats, tend to limit recreation activity. While such effects could be reduced by providing small craft locks and portage facilities, some inconvenience would remain. Where such conflicts occur, local choice will be necessary between flood and seepage control works or open channels for recreation. Additional recreation facilities and joint use of certain lands for recreation and other purposes should be planned to enhance the potential recreational development. Local desires, as evidenced by questionnaires and discussions with county recreation agencies, guided planning for recreation facilities.

NAVIGATION

Principal ship channels in the Delta serve deep-draft commercial and military shipping. Shallow-draft tug and barge traffic utilizes the ship channels and many other channels in the Delta. The effects of alternative plans on commercial navigation can be readily evaluated, and the nature and extent of compensating measures or benefits can be determined. Unfortunately, it is not possible to evaluate in comparable terms the effects of war-damaged facilities on national defense. However, comparisons of alternative plans must include recognition of national defense aspects.

FISH

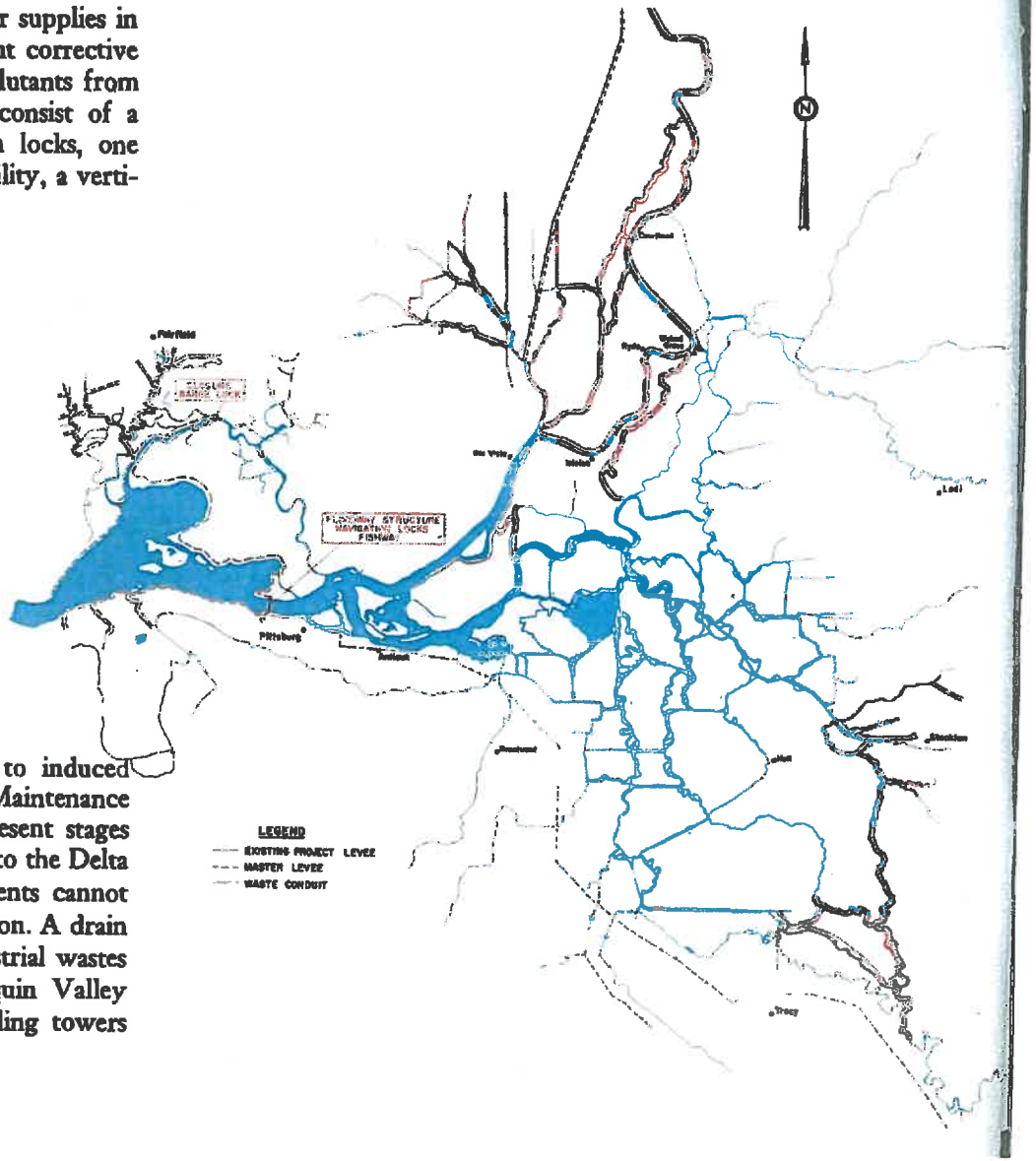
The Delta is a dominant factor in the habitat of several anadromous species of fish and the residence of several additional sport fish. All reasonable measures must be taken to minimize the adverse effects of planned facilities on the fisheries in the Delta and, when possible, to provide for their enhancement.

Courtesy of Los Angeles Times

Chipps Island Barrier Project—physical works

A barrier at Chipps Island would insure the water supplies in the Delta against salinity incursion from the Bay, but corrective features would be necessary to dispose of other pollutants from sources upstream. The principal structure would consist of a gated floodway section, two deep-draft navigation locks, one barge lock, one small craft lock, a tug assistance facility, a vertical baffle fishway, emergency navigation access, and appurtenant operating facilities. The floodway section would have a net area of openings equivalent to the existing channel in order to preclude interference with flood flows. The conventional navigation locks would allow a limited amount of denser saline water to enter the upstream pool, but this water would be removed from a sump by a salt-scavenging system of pipes and pumps. A barge lock would be located on Montezuma Slough near the new Grizzly Island bridge, about ten miles north of Chipps Island.

A barrier at the Chipps Island site would require a master levee system along principal channels in Suisun Bay to contain the high tidal stages, which would be higher than the present high stages. Additional dredging of navigation channels also would be necessary, due to induced lower low tidal stages downstream from the barrier. Maintenance of water levels in Delta channels at lower than present stages during summer months would require improvements to the Delta levees, but the nature and extent of the improvements cannot be accurately evaluated without the project in operation. A drain would be constructed to convey municipal and industrial wastes and agricultural drainage water from the San Joaquin Valley into tidal water downstream from the barrier. Cooling towers

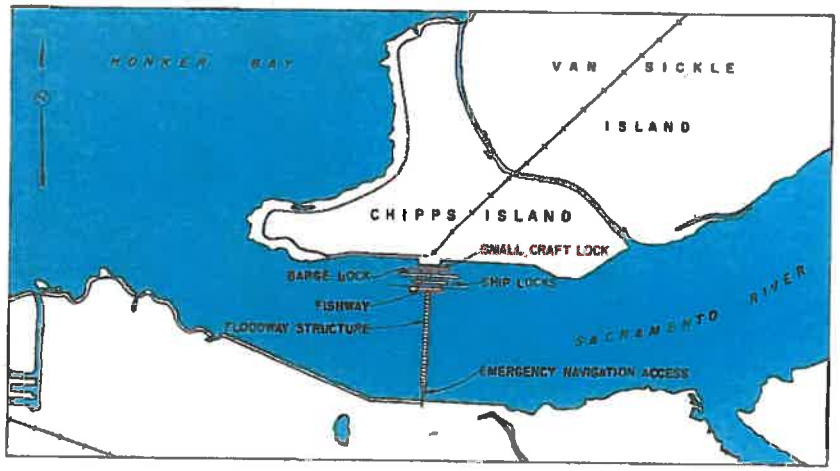


would be required for the two principal power plants which would discharge warm water into the barrier pool.

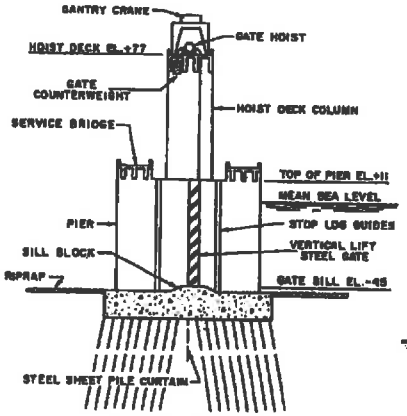
The type and design of the facilities described in this report incorporate results of preliminary designs and quantity estimates of the Corps of Engineers in current work on barriers in the San Francisco Bay system. Estimates of the capital cost of the facilities were based on construction costs prevailing in 1960, plus 15 percent for contingencies and 15 percent for engineering and overhead. The anticipated schedule of construction of the facilities is indicated in the tabulation of estimated capital costs.

SUMMARY OF ESTIMATED CAPITAL COSTS
CHIPPS ISLAND BARRIER PROJECT

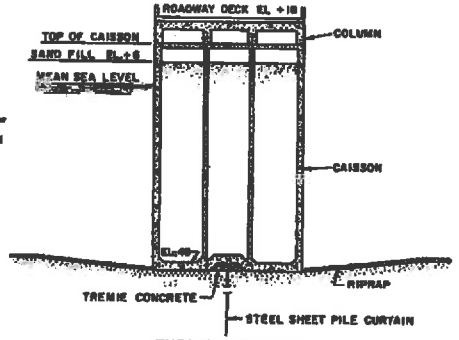
Feature and date of construction	Capital cost
On Site Features	
Floodway structure (1964-70)	$44,119,000
Locks (1964-70)	74,278,000
Salt-scavenging system (1968-70)	3,768,000
Emergency navigation access (1964-66)	6,092,000
South abutment and access facilities (1964-65)	723,000
Fishway (1969)	79,000
Buildings and miscellaneous (1966)	2,062,000
Montezuma Slough closure and barge lock (1968-70)	3,492,000
Subtotal, On Site Features	$134,613,000
Off Site Features	
Waste disposal facilities (1967-70)	$26,914,000
Extension San Joaquin Valley drain (1967-70)	17,356,000
Suisun Bay levee system (1964-73)	21,608,000
Shoreline facilities and dredging (1968-70)	1,481,000
Subtotal, Off Site Features	$67,359,000
TOTAL CAPITAL COST, CHIPPS ISLAND BARRIER PROJECT	$201,972,000



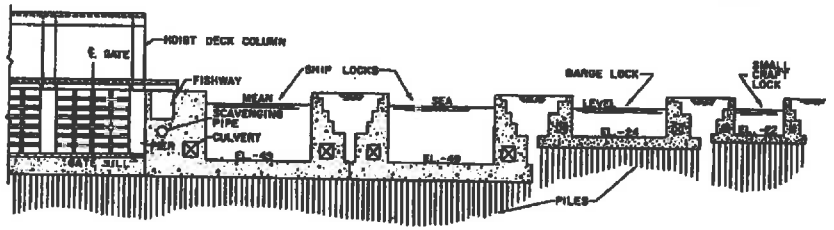
CHIPPS ISLAND BARRIER SITE



TYPICAL SECTION
FLOODWAY STRUCTURE



TYPICAL SECTION
EMERGENCY NAVIGATION ACCESS



TYPICAL SECTION OF FISHWAY AND LOCKS

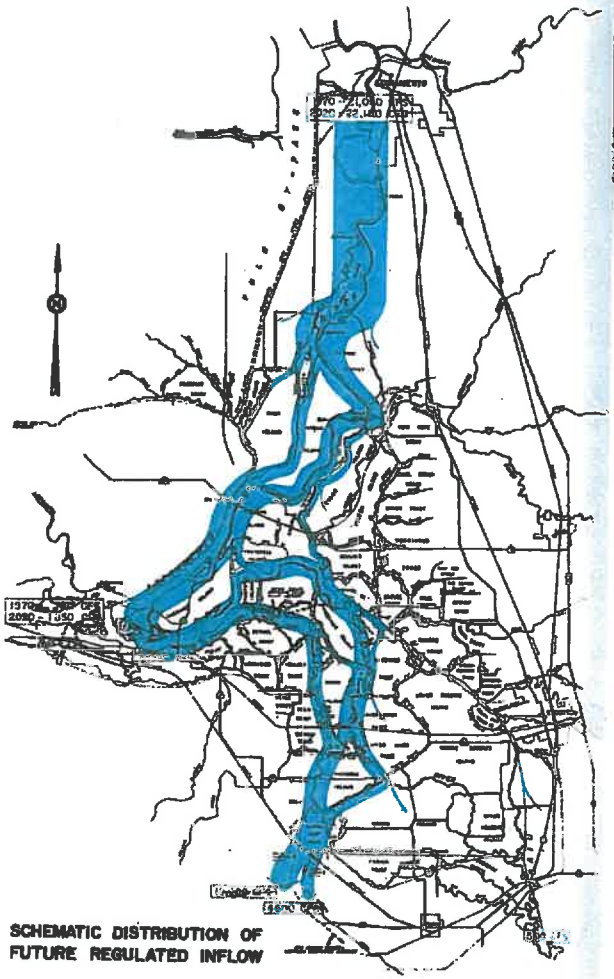
Chipps Island Barrier Project — operation

A barrier at Chipps Island would provide a definite separation between saline water in the Bay system and fresh water in the Delta channels, thereby preventing salinity incursion and assuring adequate water supplies in the Delta. However, there would be attendant operating problems, and the barrier and appurtenances would not provide flood control and related benefits to the Delta.

With the floodway gates closed, the inflow to the Delta to supply local uses and export pumping plants would be distributed in the channels as shown in the schematic diagram. Large quantities of water would be directed through channels in the western Delta to remove heat wastes and maintain satisfactory water quality conditions. Storage in the channels could be utilized to achieve a limited amount of regulation. However, navigation requirements would prevent controlling the water level lower than one foot below mean sea level, without additional dredging. Seepage and levee stability problems would limit the maximum level for sustained storage to about two feet above mean sea level. Economic analyses of various operating ranges indicate that a three-foot range in water levels for conservation of flood water would be most economical.

Electric analog model studies reveal that the barrier would increase the tidal amplitudes downstream from the structure. An unusually large amplitude of 6.3 feet at Chipps Island under present conditions would be increased to about 12 feet by a barrier. Changes indicated on the electric analog model were generally confirmed by preliminary tests by the U. S. Corps of Engineers on a hydraulic model which indicated slightly smaller increases in tidal amplitudes and a slight decrease in the mean tide level. The lower low water would seriously affect navigation depths, and the higher high water would seriously affect levees along the downstream bays and municipal, industrial, and military installations along the shore lines. Remedial measures would be necessary.

Disposal of cooling water from power plants and other industries would cause an increase in temperature in the nearly quiescent barrier pool. This increase in temperature would reduce the efficiency of cooling equipment and adversely affect fish, and could cause significantly increased corrosion in equipment exposed to the warmer water. The monetary magnitude of these effects would be dependent upon the amount of heat energy dissipated in the pool by existing and future industries, and many other factors which cannot be fully evaluated at this time. Satisfactory conditions could probably be achieved by passing cool-



SCHEMATIC DISTRIBUTION OF FUTURE REGULATED INFLOW

ing water from the principal power plants over cooling towers.

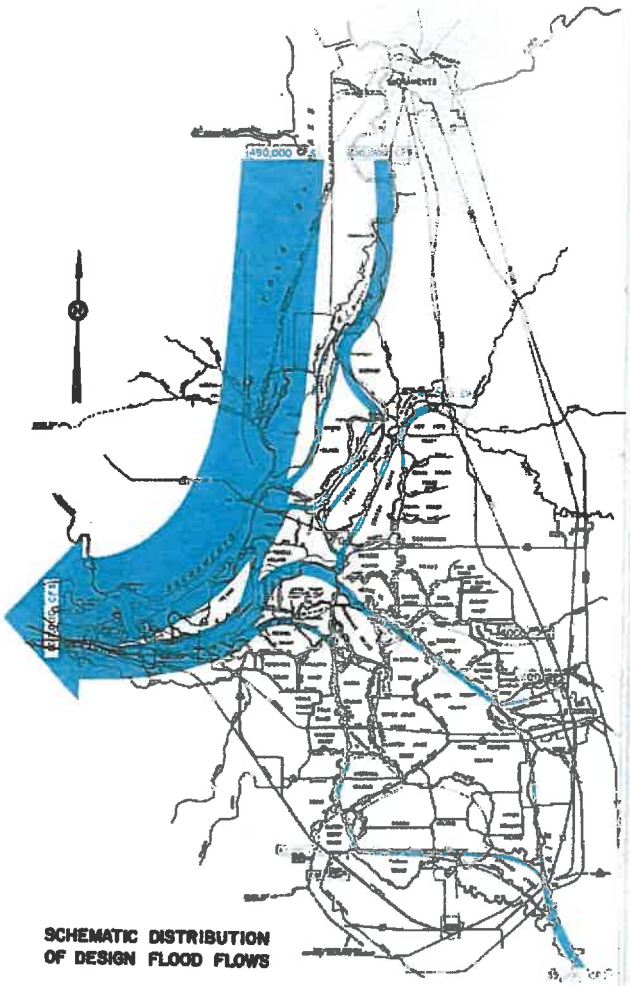
To maintain satisfactory water quality conditions in the barrier pool, it would be necessary to convey industrial and municipal wastes to tidal water. Drainage water from the San Joaquin Valley would also have to be discharged into tidal water.

Saline water entering the pool through the locks would be allowed to settle in a sump from which it would be pumped by a salt-scavenging system. Operation of locks would cause delays of about 35 minutes per transit for deep-draft vessels and 20 minutes for tugs and smaller vessels. Assistance would have to be provided to maneuver deep-draft ships through the locks. A tug and operating crew for this purpose would be necessary at all times.

National defense aspects dictate that an emergency navigation access be incorporated in the barrier. This access would consist of concrete bins filled with sand in a section of the barrier. In an emergency, the sand would be pumped out and the bins towed out of the channel.

Anadromous fish would be passed through a vertical baffle fishway, comprising a series of baffles with vertical slots extending to the bottom to provide passages for water and fish. The baffles would dissipate the energy of the water and create a series of bays with a slightly lower water level in each adjacent downstream bay. The bays would provide resting areas for the fish after passing through short distances of high velocity water in the slots. During high tides downstream from the barrier, the fishway would be closed by a gate to prevent saline water from entering the pool.

During flood conditions the gates in the barrier floodway would be opened. Flood stages in the Delta would be essentially the same as under present conditions for comparable flood flows. Since master levees in the Delta are not incorporated in this plan, high flood water would occur in all the channels. Although the flood stages would not be changed, levee stability problems would increase. Tidal fluctuations presently keep the levees saturated a few feet above the mean tide elevation, but under barrier conditions the peat levees would dry out and crack when water levels would be drawn down to about one foot below sea level. Should a sudden flood occur the open barrier gates would permit tidal fluctuations throughout the Delta and sections of some dried-out levees might become unstable and fail as the water levels rapidly rise and fall. Remedial work would be required as problems develop. Allowances for cost of this as yet undefined work are not included in the cost estimate.



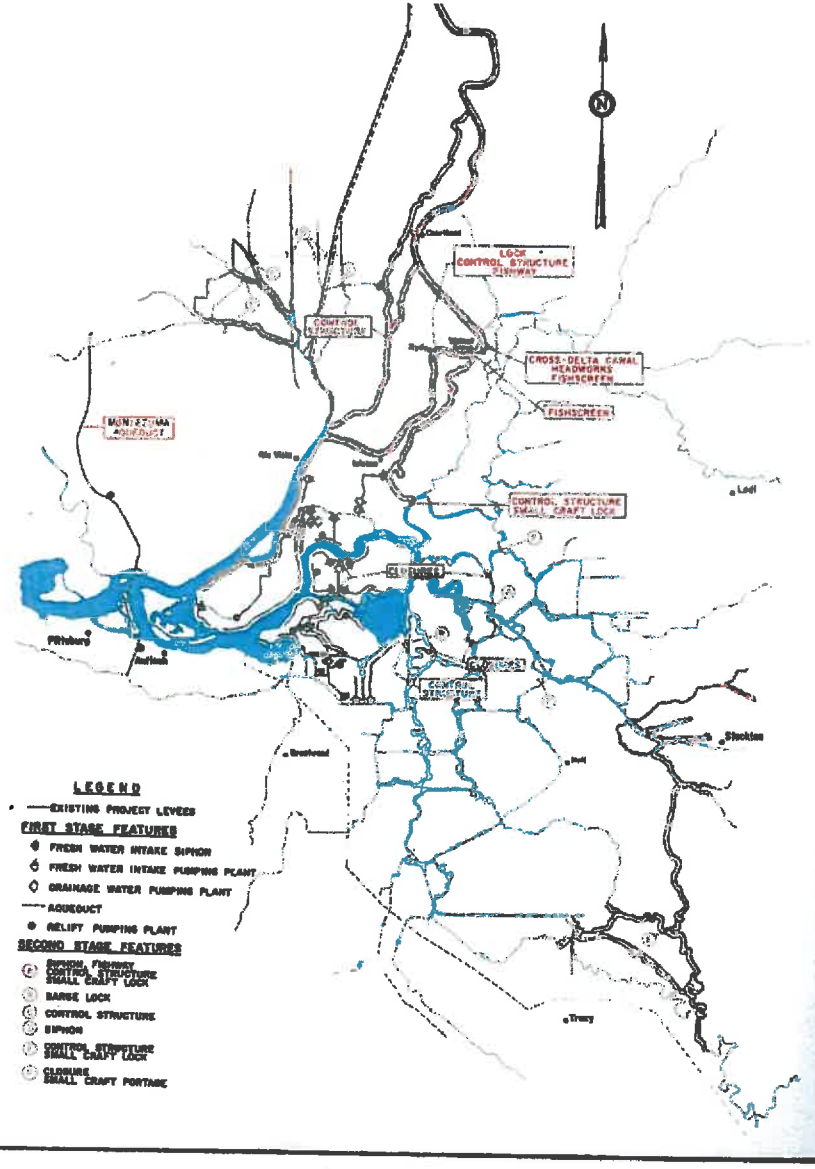
SCHEMATIC DISTRIBUTION OF DESIGN FLOOD FLOWS

Single Purpose Delta Water Project—physical works

This system of works would accomplish essentially the same results as a barrier at Chipps Island, that is, adequate water supplies for the Delta and for export therefrom, but would not necessitate costly remedial works. Good quality water supplies for the Delta and export pumps would be separated from saline water by control structures operated with a relatively small rate of fresh water outflow. Water would be supplied in the western Delta area through new supply facilities, and in the rest of the Delta existing irrigation and drainage works would continue in operation. There are no flood control features in this plan.

Control structures with gated openings for discharging flood flows would be located on channels of the Sacramento, Mokelumne, and San Joaquin Rivers. A barge lock and fishway would be incorporated in the Sacramento River control structure. Earth fill channel closures would be constructed at four locations. In 1980-82, additional gates would be constructed at the existing headworks of the Delta Cross Channel of the Central Valley Project. Small craft locks and portage facilities would be incorporated in certain control structures and channel closures. Vertical louver fish screens would be constructed at the head of Georgiana Slough and at the Delta Cross Channel near Walnut Grove, and rotary drum fish screens would be constructed at other diversions.

Water supply facilities would serve areas in the western Delta. The Montezuma Aqueduct would be constructed in about 1968-71 and in subsequent stages to serve water to potential industrial land and some agriculture in central southern Solano County, and to supplement supplies in Contra Costa County. Works would also be included to remedy detrimental effects of project operation, such as seepage alleviation along the Sacramento River channels and modifications to existing irrigation and drainage works made necessary by the project.



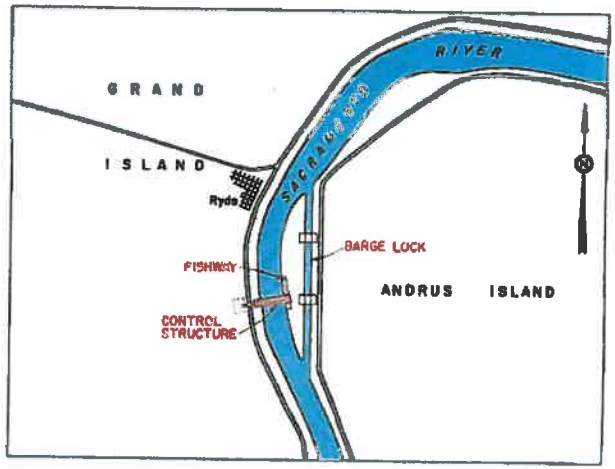
About 1,900 acres of land in the Delta, mostly small unreclaimed islands, would be used for disposal of excess dredged material. Many of these areas would be available and desirable for development as recreation areas.

Additional water could be salvaged by completely separating good quality cross-Delta flows from tidal water, and thereby reducing the amount of fresh water outflow needed for salinity repulsion. These second stage features would include a siphon under the San Joaquin River, additional channel closures, control structures and appurtenances, and water supply facilities. These works may be indefinitely deferred, depending on their need.

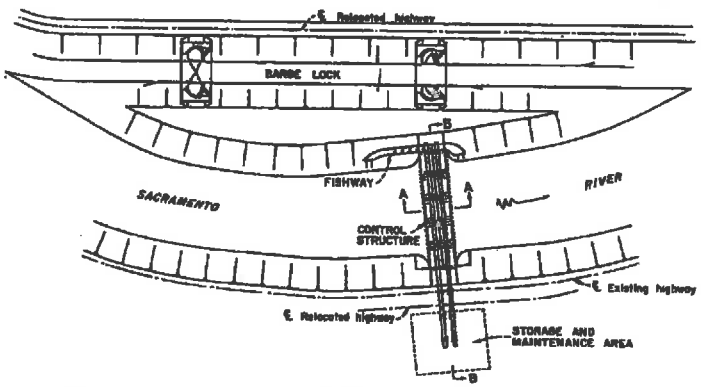
Estimates of the capital costs reflect 1960 construction costs, plus 15 percent for contingencies and 15 percent for engineering and overhead. The anticipated construction schedule is indicated in the following tabulation:

SUMMARY OF ESTIMATED CAPITAL COSTS
SINGLE PURPOSE DELTA WATER PROJECT

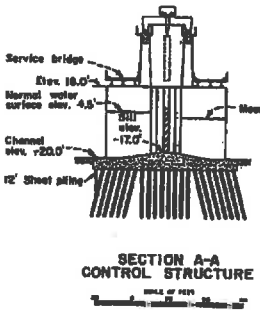
Feature and date of construction	Capital cost
Steamboat Slough control structure (1968-70)	$2,943,000
Miner Slough closure (1970)	108,000
Ryde control structure, barge lock, and fishway (1968-71)	5,653,000
Holland Cut control structure (1973-75)	2,761,000
Mokelumne River control structure and small craft lock (1973-75)	1,951,000
Cross-Delta Canal headworks (1980-82)	1,223,000
Fish screens: Cross-Delta Canal and Georgiana Slough (1968-70)	3,500,000
Closures: Potato Slough, Old River, and Middle River (1974-76)	404,000
Fishermans Cut closures (2) (1964)	133,000
Agricultural water facilities (1963-65)	4,300,000
Municipal and industrial water facilities (1968-71, 1980, 1995, 2010)	13,952,000
Channel dredging (1974-78)	7,154,000
Bank protection (1976-78)	1,880,000
Seepage alleviation facilities (1971)	593,000
TOTAL CAPITAL COST, FIRST STAGE FEATURES	$46,555,000
TOTAL CAPITAL COST, SECOND STAGE FEATURES	$23,765,000



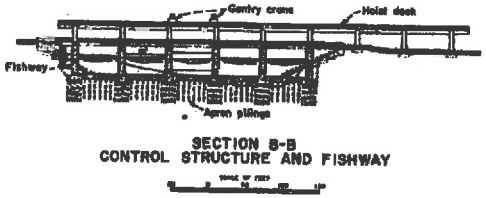
RYDE STRUCTURE SITE



PLAN
CONTROL STRUCTURE, FISHWAY AND LOCK



SECTION A-A
CONTROL STRUCTURE



SECTION B-B
CONTROL STRUCTURE AND FISHWAY

Single Purpose Delta Water Project—operation

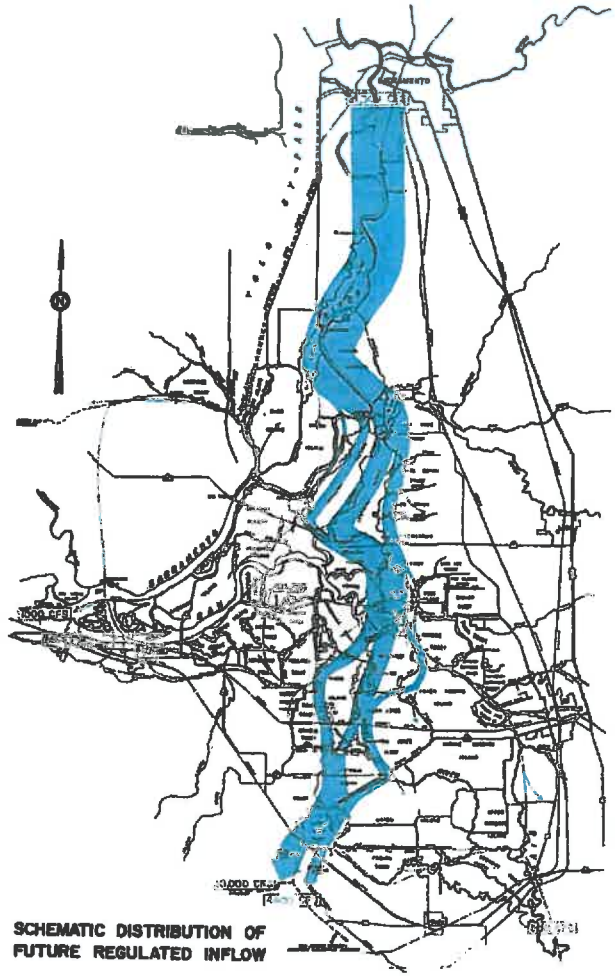
A Single Purpose Delta Water Project would salvage water otherwise wasted to Suisun Bay for salinity control, and would provide water supplies for the Delta and for export and use in areas of deficiency. The project would allow salinity to encroach somewhat farther into the Delta than under present operations; however, the area affected by this controlled incursion would be supplied water by new facilities. Certain aspects of operation described in the following paragraphs would also apply to other variations of the Delta Water Project.

Control structures on the Sacramento River system would divert water southward toward the center of the Delta. Control structures and closures on channels east of Franks Tract would cause the water to flow toward the export pumping plants in channels in the center of the Delta. With this type of operation, it would be necessary to prevent brackish saline water from mixing with fresh water in the center of the Delta. This control could be accomplished by providing fresh water outflow in the Sacramento and San Joaquin Rivers.

The salinity control line, with control to a mean concentration of 1,000 parts of chlorides per million parts of water (1,000 ppm), would be maintained in the San Joaquin River near the mouth of False River, about 7 miles upstream from Antioch and in the Sacramento River at Decker Island, about 1½ miles below Threemile Slough. Salinity control at these locations could be accomplished by maintaining an outflow from the Delta of 1,000 second-feet, of which about 60 percent would be released through the San Joaquin River and the remainder through the Sacramento River.

Good quality water from the cross-Delta flows would be available in existing channels throughout 90 percent of the Delta lowlands. Water would be provided to all agricultural lands downstream of the line of *maximum* salinity encroachment of 500 ppm of chlorides. The mean concentration of chlorides would be about 250 ppm at locations on this line. Research studies by the University of California indicate that seepage of any brackish water from the channels into the Delta islands can be controlled below the plant root zone by application of good quality water on the surface. The supplies diverted from the cross-Delta flows would normally contain between 20 and 80 ppm of chlorides.

Water would also be provided to municipalities and for certain industrial uses in the western Delta area. Most of the required industrial cooling water could be supplied from the adjacent channels. The Contra



SCHEMATIC DISTRIBUTION OF FUTURE REGULATED INFLOW

Costa Canal could serve the projected industrial requirements in its service area until about 1970, and significant industrial development in southeastern Solano County is not anticipated before 1980. The Montezuma Aqueduct would be constructed to convey supplemental water from the proposed North Bay Aqueduct and would be linked to the Contra Costa Canal near Pittsburg in 1980. The capacity of the Contra Costa Canal would then be utilized primarily between the Delta and the connection with the Montezuma Aqueduct. The estimated quality of the water would be very good, with a chloride content generally ranging between 15 and 80 ppm, total dissolved solids ranging between 125 and 300 ppm, and with total hardness of between 40 and 160 ppm.

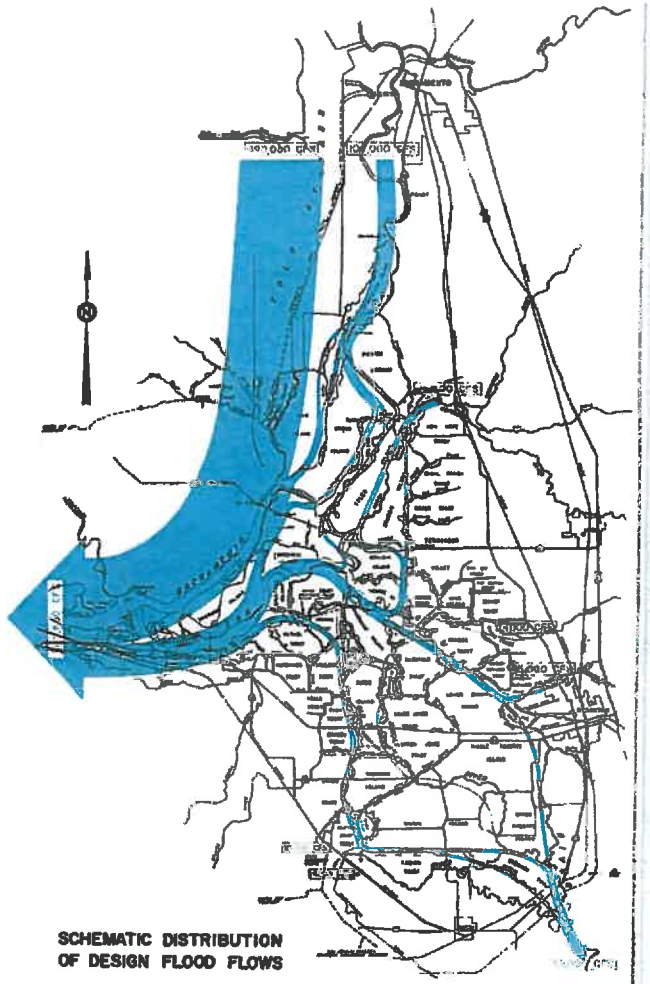
Existing irrigation water supply facilities throughout most of the Delta would not be affected by operation of the export pumps, but the average water level in the southern portion of the Delta would be lowered slightly. Irrigation facilities affected thereby would be modified under the project.

Small increases in tidal amplitudes of about 1.5 feet would occur at the Sacramento River and Steamboat Slough control structure sites, but the mean water level would not significantly change. The effects would be very minor at Rio Vista.

The average water level upstream from the control structures would be gradually raised to a maximum of about 2.5 feet under full project operation in about 30 years. The increase would occur during summer months, and any resultant increased seepage from the channels would be fully consumed by crops on adjoining lands without damage.

During flood periods, the control structures would be opened and flood stages throughout the Delta would be similar to those under present conditions. Flood stages on the Sacramento River would be slightly higher for longer periods due to closing of Miner Slough. This effect would tend to increase seepage conditions during a critical crop planting time, and might necessitate installation of seepage alleviation works. Such works would also alleviate existing seepage problems.

The future value of water and quality considerations might justify construction of the second stage features to permit further reduction in the fresh water outflow from the Delta. The outflow could be reduced to the amount of unavoidable losses, or about 750 second-feet. The value of the additionally salvaged water would probably not justify construction of these works before 1990.



SCHEMATIC DISTRIBUTION
OF DESIGN FLOOD FLOWS

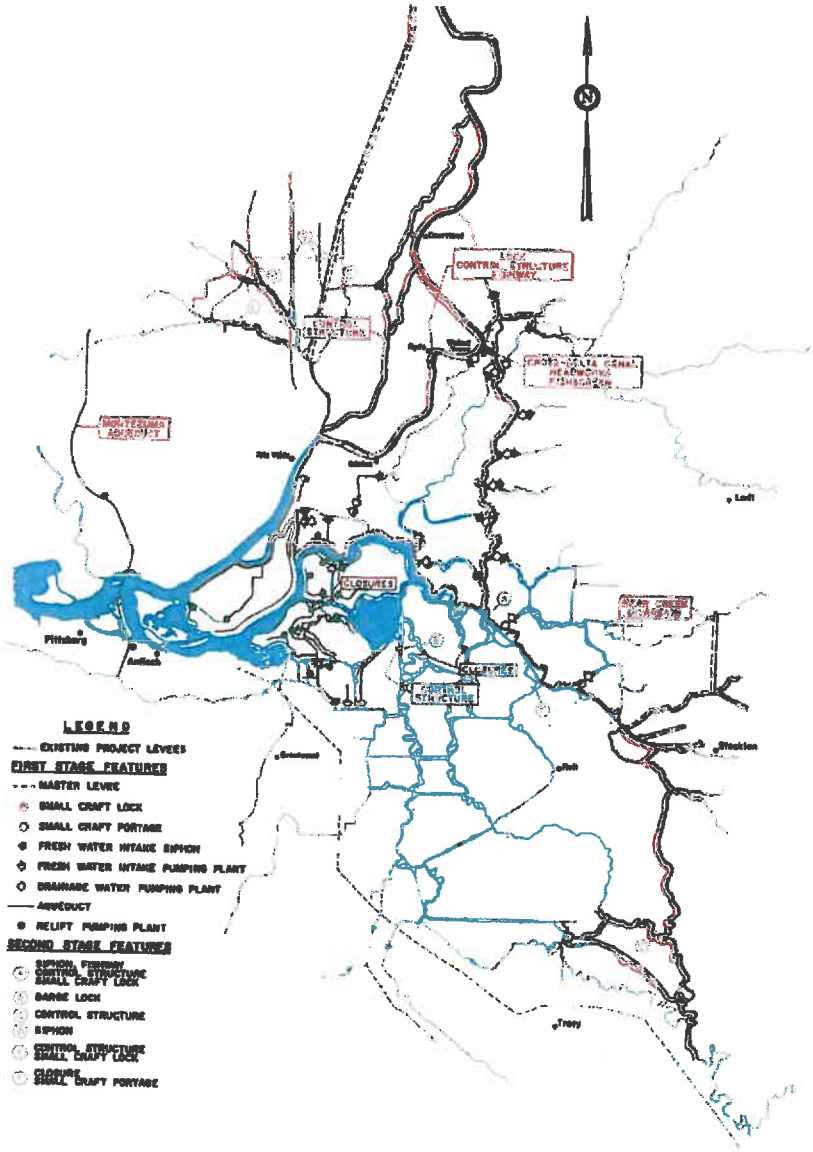
Typical Alternative Delta Water Project — physical works

Several additional features can be added to the basic Single Purpose Delta Water Project to provide varying degrees of local benefits, in addition to adequate water supplies. These additional features would be for flood and seepage control, transportation, and recreation. While the economics of construction and operation factors would dictate grouping certain islands within encircling master levee systems, flood protection for any one or more of several groups of islands could be undertaken.

The Typical Alternative Delta Water Project, one of several alternative plans, would include flood protection for the islands in the north central portion of the Delta around Isleton, and for the northeastern islands in the vicinity of Lodi. Fourteen channel closures would be required in addition to those incorporated in the Single Purpose Delta Water Project. Minor modifications and additions would be made in the irrigation water supply and drainage facilities. Rotary drum fish screens would be incorporated where required in all water supply works, and a vertical louver screen would be constructed at the headworks of the Cross-Delta Canal at Walnut Grove. Bear Creek would be diverted into the Calaveras River.

The master levee system would include existing levees of the Sacramento River Flood Control Project. Other existing levees would be improved by constructing a berm on the landward side, and by raising the levee crown where necessary to increase the freeboard. Public roads would be relocated from levee crowns to the berms. A service and maintenance road would be placed on the crown of the levees.

Small craft locks would be constructed at certain channel closures. At locations where rapid transits of boats under 25 feet long would be necessary, a tank elevator boat portage would be installed.



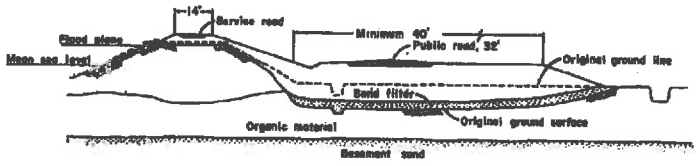
About 1,900 acres of Delta land would be filled with excess dredged material, and most of this land would be available for recreational development. The additional gates on the Cross-Delta Canal headworks and the extensions of the adjacent highway and railroad bridges would be constructed with about 16 feet of clearance above the present average water level to improve small craft access between the Sacramento River and channels of the Mokelumne River system.

The second stage features of this project would be similar to those contemplated for the Single Purpose Delta Water Project.

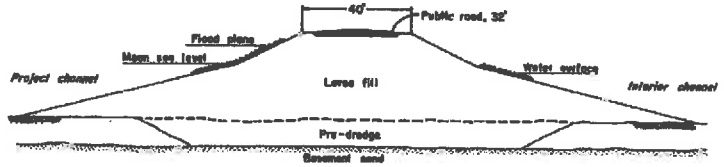
Estimates of capital cost were based on 1960 construction costs plus 15 percent for contingencies and 15 percent for engineering and overhead.

SUMMARY OF ESTIMATED CAPITAL COSTS
TYPICAL ALTERNATIVE DELTA WATER PROJECT

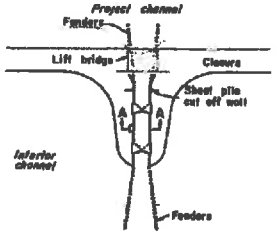
Feature and date of construction	Capital cost
Steamboat Slough control structure (1968-70)	$2,943,000
Miner Slough closure (1970)	108,000
Ryde control structure, barge lock, and fishway (1967-70)	5,653,000
Holland Cut control structure (1973-75)	2,761,000
Cross-Delta Canal headworks (1975-77)	1,998,000
Cross-Delta Canal fish screen (1968-70)	3,500,000
Old River and Middle River closures (1975)	258,000
Fishermans Cut closures (2) (1964)	133,000
Agricultural water facilities (1963-65)	4,282,000
Municipal and industrial water facilities (1968-71, 1980, 1995, 2010)	13,952,000
Channel dredging (1974-78)	7,224,000
Master levee system (small craft locks and portages, irrigation and drainage works)	
Isleton island-group (1964-80)	12,610,000
Lodi island-group (1964-81)	11,439,000
Bear Creek diversion (1967-70)	670,000
TOTAL CAPITAL COST, FIRST STAGE FEATURES	$67,531,000
TOTAL CAPITAL COST, SECOND STAGE FEATURES	$23,635,000



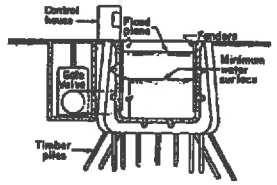
TYPICAL SECTION OF MASTER LEVEE



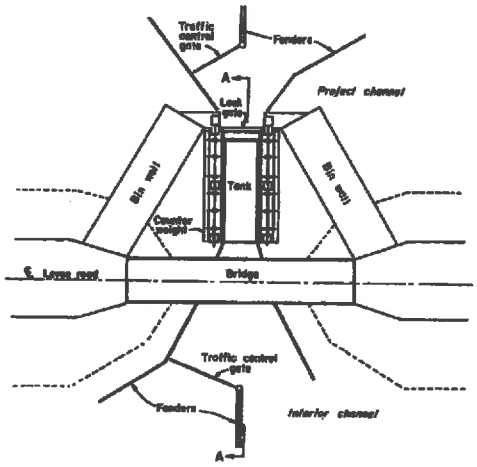
TYPICAL SECTION OF CHANNEL CLOSURE



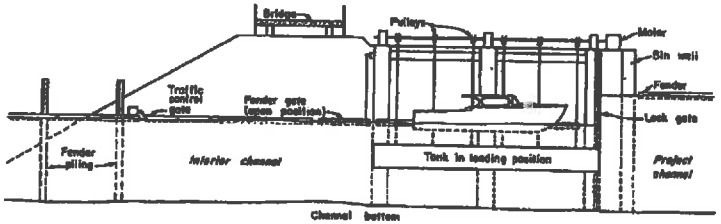
SMALL CRAFT LOCK SITE



SECTION A-A
SMALL CRAFT LOCK



PLAN OF SMALL CRAFT PORTAGE



SECTION A-A OF SMALL CRAFT PORTAGE

Typical Alternative Delta Water Project — operation

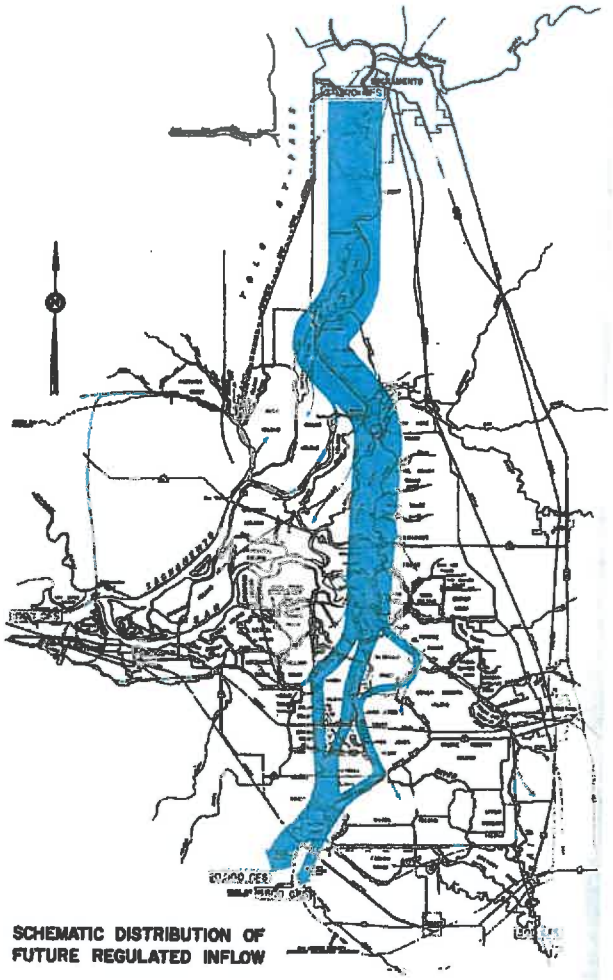
Operation of the Typical Alternative Delta Water Project would be basically the same as with the Single Purpose Delta Water Project. Good quality water would be transferred directly across the Delta and degradation in water quality from salinity incursion would be prevented by limited releases of fresh water with the same degree of control as under the Single Purpose Delta Water Project. Water supplies for the Delta would be distributed from the cross-Delta flows.

Irrigation water for the Isleton island-group and the Lodi island-group would be diverted through siphons from the Cross-Delta Canal into interior channels. Existing diversion works out of the Cross-Delta Canal, which would be rebuilt during construction of the master levees, and diversion works out of the interior channels would continue in operation. Drainage pumping plants at channel closures would have capacity to remove all water pumped from the islands into the interior channels. Under all alternative plans for the Delta Water Project, the irrigation and drainage works would be managed by local districts. Adjustments in costs of operation and maintenance would be made with the districts to reflect costs allocated to interests other than the local districts. Water supply facilities serving several districts or agencies would be operated by the State or by an appropriate master district or agency.

Flood flows would be contained in principal project channels in those portions of the Delta protected by the master levee system, and levees along interior channels would no longer be subject to high flood stages. Levees on interior channels would not need to be as high as for present conditions, and could be allowed to settle. Experience has shown that Delta levees reach a state of equilibrium if they are allowed to settle a limited amount. Thus much of the periodic reconstruction of the interior levees would no longer be necessary. Bank erosion problems due to flood flows also would be eliminated on interior levees.

Storm runoff from upland areas surrounding the Delta would be pumped into flood channels, except in the case of Bear Creek which would be diverted into flood channels.

Water levels in the interior channels could be lowered to achieve reductions in the amount of seepage into the islands. In



SCHEMATIC DISTRIBUTION OF FUTURE REGULATED INFLOW

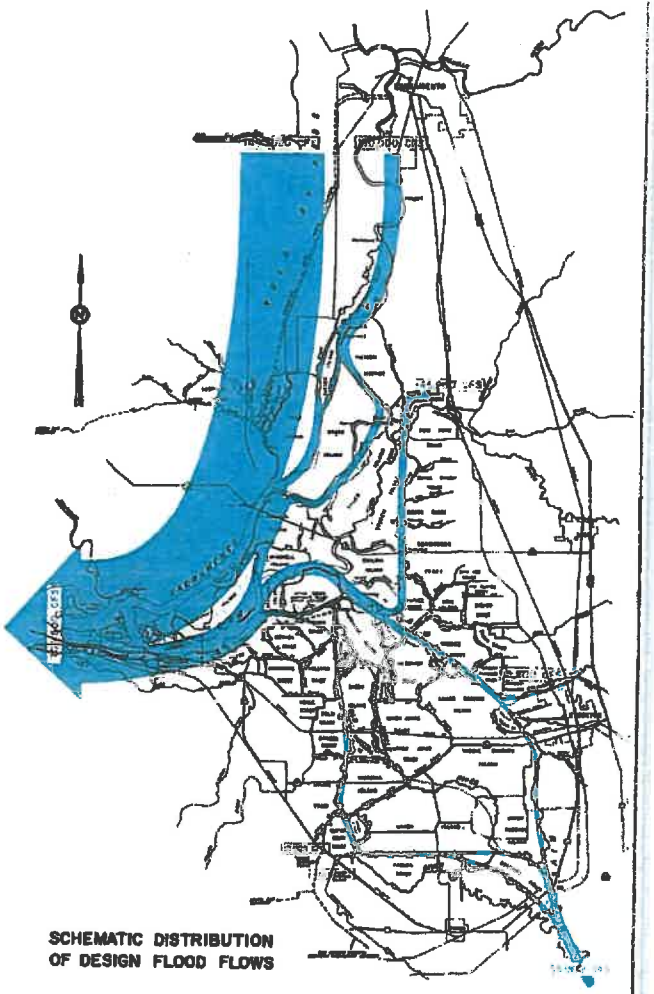
practically all channels the level could be five feet lower than the present average level, or about three feet below sea level, without causing maneuvering problems for small craft. Any resultant shallow depths in specific locations could be increased by dredging.

Small craft locks and portage facilities would be operated without cost to the boating public as the costs would be allocated to beneficiaries of the master levee system. The locks would be operated in a standard manner with pumps for filling and draining. The boat portages would be tank elevators with a gate at one end. The tank would be lowered below the hull of the boat, and the boat would then move between guides over the tank. The counterweighted tank would then be raised to the higher water level and the gate opened to permit the boat to move out under its own power. The time for operation after positioning of the boat over the tank would be less than one minute. The boat would be in the water at all times and there would be no contact with the bottom of the hull.

The operation and maintenance of public roads located on the berm of the master levees would be less costly than for existing roads, which must be periodically reconstructed due to levee settlement and levee rebuilding. Maintenance of the public roads would be by local agencies. Closures in the master levee system of this plan would eliminate the need for continued operation of four ferries.

Reduction of the water surface area under tidal influence would cause limited increases in tidal amplitudes in the Delta, but no significant changes in the average water levels. Such changes on the Sacramento River and Steamboat Slough would be similar to those under the Single Purpose Delta Water Project, and amplitude changes in the San Joaquin River in the heart of the Delta would be less than one foot. However, dredging would be necessary in some navigable channels.

Small islands in bends and side channels, which would be reclaimed and raised by filling, would be available for recreational development after the areas are no longer needed for disposal areas. It is contemplated that arrangements would be made with local governmental agencies for recreational development of the lands, either by direct means or by leasing to concessionaires.



SCHEMATIC DISTRIBUTION
OF DESIGN FLOOD FLOWS

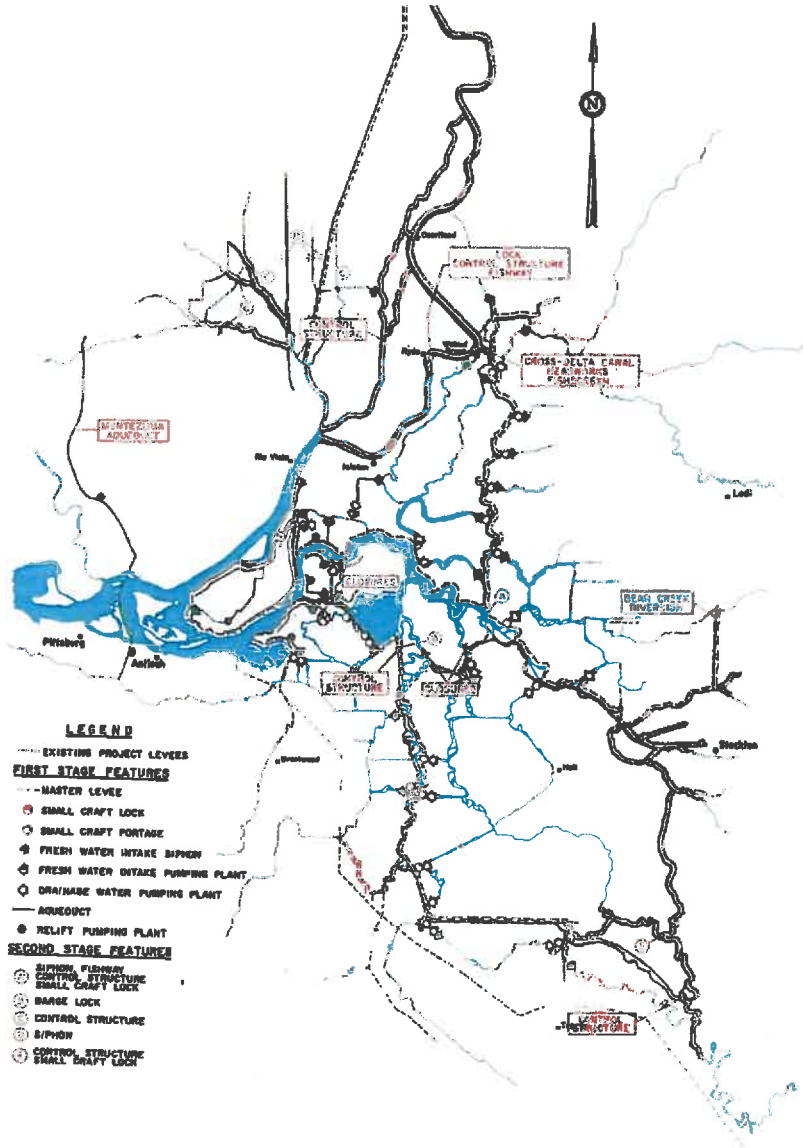
Comprehensive Delta Water Project—physical works

The Comprehensive Delta Water Project would salvage water otherwise needed for salinity control and provide water for the Delta. In addition, the project would provide flood and seepage control, transportation, and recreation benefits for most of the Delta. New master levees would encompass five principal groups of islands and Sherman Island. Works for water supply and drainage in the Delta would include those of the Typical Alternative Delta Water Project, with some modifications, plus other works to serve the newly formed island-groups. Additional small craft facilities would also be constructed.

Flood waters of the San Joaquin River would be divided between the main channel and an improved chain of distributary channels to the west, the two branches coming together in the western Delta. Improved channels of the Lower San Joaquin River Tributaries Flood Control Project would be incorporated.

The master levee along Piper Slough east of Bethel Island would be constructed on old levees on Franks Tract to minimize interference with existing developments on the Bethel Island levee.

The additional interior channels created by the project in northeastern Contra Costa County would contain good quality water, and would serve as a fresh water distribution system for the adjacent islands. Intensive small craft traffic in the vicinity of Bethel Island would necessitate the construction of four small craft portage facilities in adjacent channels and one small craft lock at Sand Mound Slough.

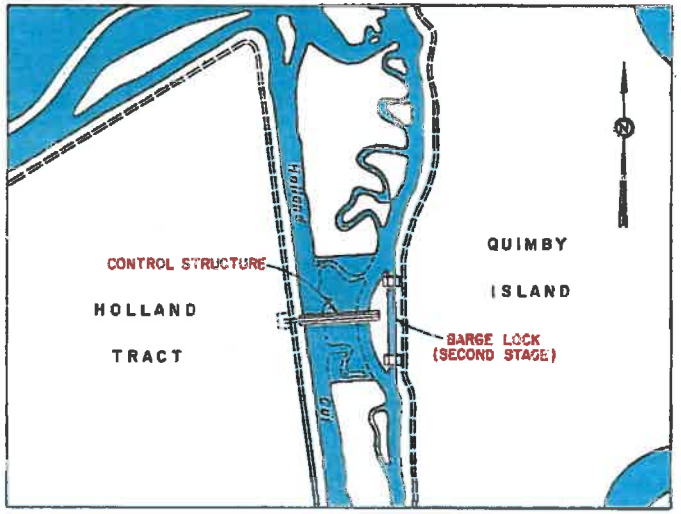


The second stage features of the Comprehensive Delta Water Project would be similar to those in other variations of the Delta Water Project.

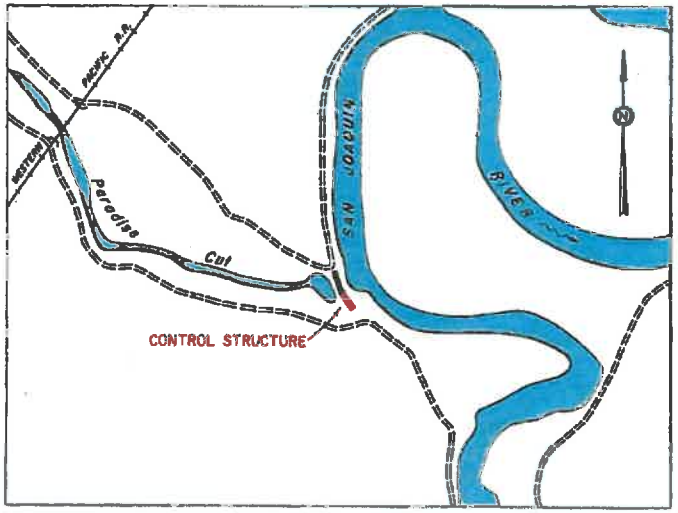
Estimates of the capital costs reflect 1960 construction costs, plus 15 percent for contingencies and 15 percent for engineering and overhead.

SUMMARY OF ESTIMATED CAPITAL COSTS
COMPREHENSIVE DELTA WATER PROJECT

Feature and date of construction	Capital cost
Steamboat Slough control structure (1968-70)	$2,943,000
Miner Slough closure (1970)	108,000
Ryde control structure, barge lock and fishway (1967-70)	5,653,000
Holland Cut control structure (1973-75)	2,761,000
Cross-Delta Canal headworks (1975-77)	1,998,000
Cross-Delta Canal fish screen (1968-70)	3,500,000
Old River and Middle River closures (1975)	258,000
Fishermans Cut closures (2) (1964)	133,000
Agricultural water facilities (1963-65)	2,520,000
Municipal and industrial water facilities (1968-71, 1980, 1995, 2010)	13,952,000
Channel dredging (1968-78)	8,950,000
Master levee system (small craft locks and portages, irrigation and drainage works)	
Isleton island-group (1964-80)	12,610,000
Lodi island-group (1964-81)	11,439,000
Holt island-group (1964-80)	13,810,000
Tracy island-group (1968-74)	4,722,000
Brentwood island-group (1964-79)	9,802,000
Sherman Island (1964-79)	2,030,000
Paradise Cut control structure (1969-71)	121,000
Bear Creek diversion (1967-70)	670,000
Kellogg Creek diversion (1971)	79,000
TOTAL CAPITAL COST, FIRST STAGE FEATURES	$98,059,000
TOTAL CAPITAL COST, SECOND STAGE FEATURES	$21,560,000



HOLLAND CUT STRUCTURE SITE



PARADISE CUT STRUCTURE SITE

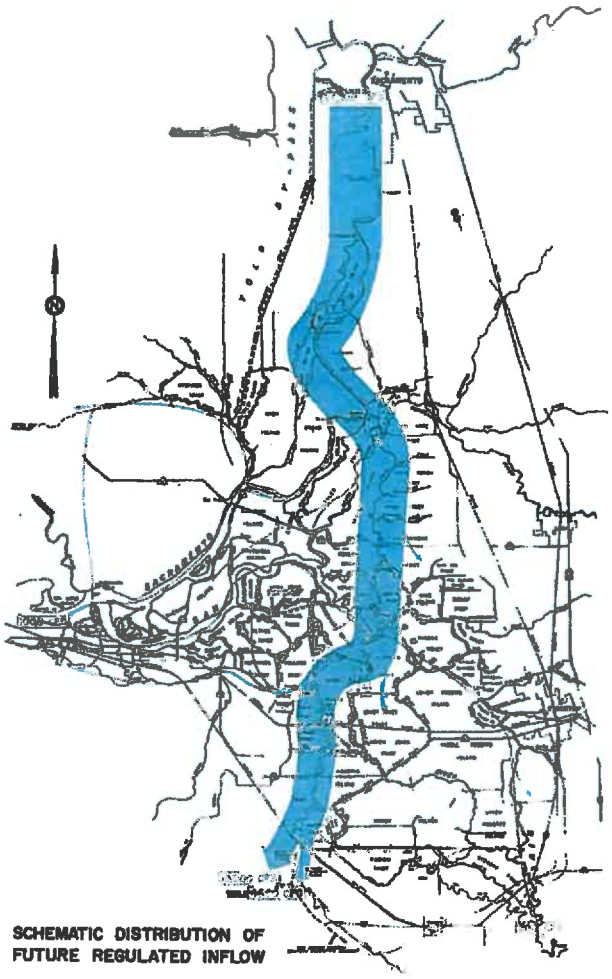
Comprehensive Delta Water Project—operation

Integrated operation of the multipurpose facilities of the Comprehensive Delta Water Project would enhance all principal phases of the Delta's economy, salvage water otherwise needed for salinity control, and provide very good quality water throughout the Delta. Although the project would have some adverse effects on certain segments of the Delta's economy, such as recreation and navigation, the multipurpose works would afford opportunity for enhancement of these same segments in other ways.

Operation of the water supply and transfer facilities during summer months would be similar to that described for the Single Purpose and Typical Alternative plans. Where representative districts or agencies are organized, the facilities could be locally operated and maintained, and appropriate adjustments in costs thereof could be made to achieve equitable distribution of costs to all beneficiaries.

Creation of interior and project channels in the southern portion of the Delta would separate irrigation water supplies from drainage water originating on lands east of the San Joaquin River. Good quality water from cross-Delta flows would be available throughout most of the southern Delta. Lands adjacent to the San Joaquin River upstream from Stockton would continue to divert from the river, but the quality of the water in this area could be improved by upstream flow in the San Joaquin River past Stockton induced by the pumping plants. A small net upstream flow occurs during summer months under present conditions. The quality of water in Paradise Cut could also be improved with circulation induced by pumping from the upper end into the San Joaquin River. Diversions from the river in this vicinity might be affected by operation of a San Joaquin Valley waste conduit. If current studies indicate that substitute supplies would then be necessary, or if further improvement of the quality of the supplies is desired even in the absence of adverse effects of a waste conduit, such supplies could be readily diverted from Delta channels without affecting works described herein.

Lands in the Holt island-group in the south central portion of the Delta range in elevation from several feet below sea level to a few feet above sea level. Irrigation water for the higher islands is pumped from the channels, while siphons are utilized for the lower islands. To achieve seepage control benefits for the lower islands, water



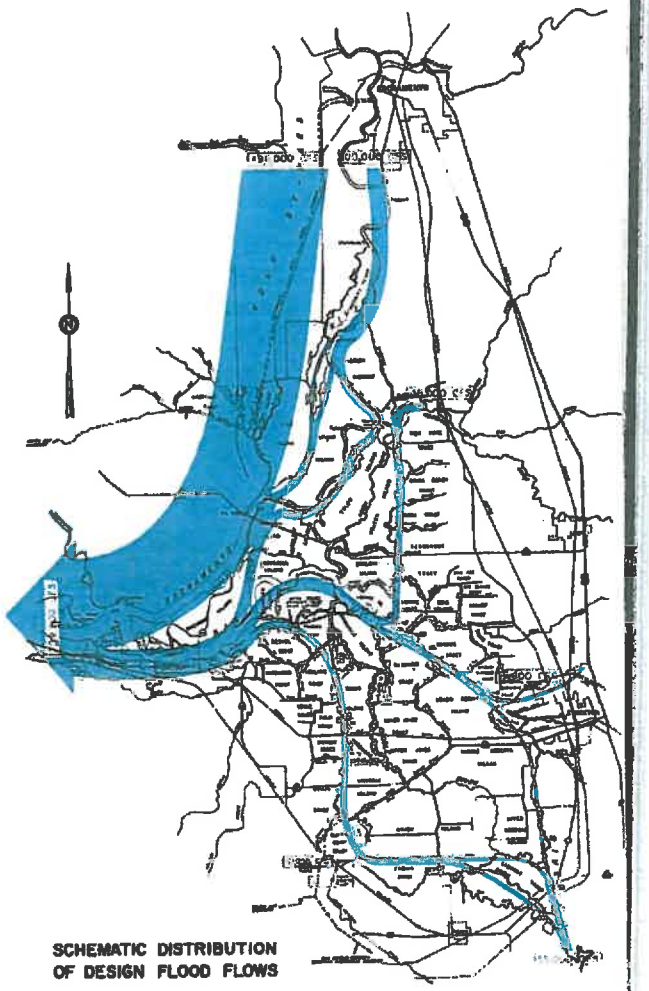
SCHEMATIC DISTRIBUTION OF FUTURE REGULATED INFLOW

levels in the channels could be lowered. This could be accomplished locally without detriment to the higher lands by constructing low dams with pumping plants in the channels and maintaining different water levels in the interior channel system.

Large volumes of small craft and fishing boats move between marinas and resorts in the Bethel Island area and Franks Tract or more distant points in the Delta and San Francisco Bay system. Peak small boat traffic would be served by three small craft portages on Piper Slough, and by one small craft lock on Sand Mound Slough. Lock or portage service for small craft would be provided at various other locations in the Delta when dictated by construction of channel closures. It should be recognized that subsequent developments and changes in patterns of use may necessitate revisions in the planned local service. While the lock and portages would cause some inconvenience to recreationists, creation of interior channels not subject to flood and tidal stages would benefit shore line installations. An expected great increase in boating in the future would intensify problems of patrolling and safety enforcement. Opportunities would be available to local public agencies to designate certain waterways for specific uses, and problems of regulation would be reduced under controlled access.

Master levees of the project in the southern half of the Delta would cause increased tidal amplitudes in the project channels. The maximum increase in the San Joaquin River system would be about one foot at Stockton. There would be no significant change in the mean water level. Some dredging in navigation channels would be necessary.

Tug and barge shipments into the southern Delta would be limited to the Cross-Delta Canal. Most of the present traffic involves beet shipments to a sugar refinery near Tracy, and the Holland Cut channel east of Franks Tract is generally used. The Cross-Delta Canal would be open to the San Joaquin River, and a barge lock at the Holland Cut control structure would not be economically justified. Although a slightly greater travel distance from northern and western Delta points would be involved under the project, the channel to the vicinity of the sugar refinery would be dredged. This would permit use of larger barges, which are presently precluded by shallow channel depths.



SCHEMATIC DISTRIBUTION OF DESIGN FLOOD FLOWS

Project Accomplishments—Delta water supply

Over 90 percent of the Delta lowlands now has adequate water supplies during summer months due in part to operation of the Central Valley Project. However, ten percent of the Delta in the western portion, including lands occupied by large water-using industries and municipalities, does not have adequate good quality water supplies at all times. Moreover, additional regulation and use of water in areas tributary to the Delta, exclusive of Delta exports, will lengthen the average period each year when salinity incursion from the Bay causes increased operating costs, plant shutdowns, and decreased farm production. The concentrations of dissolved minerals in water from the Contra Costa Canal now approach upper limits of acceptable quality during several months of most years, and significant sums of money are expended by industries for demineralization and water softening.

Under any of the foregoing projects, water of very good quality would continue to be supplied to about 90 percent of the Delta lowlands through existing facilities. It is estimated that the mineral quality of the supplies would generally range between about 15 to 80 parts of chlorides and between 100 and 350 parts of total dissolved solids per million parts water. The quality of water in the southern portion of the Delta would be improved.

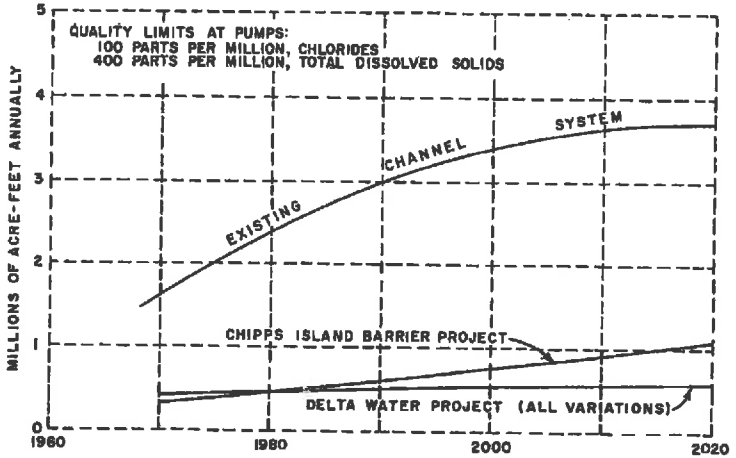
The quality of water in the Pittsburg-Antioch area with the Chipps Island Barrier Project in operation would be uncertain. Although downstream disposal of local municipal and industrial wastes and drainage from the San Joaquin Valley would eliminate the majority of the mineral pollutants, the effects of cooling water and mineral and organic wastes of the Delta might result in water supplies of questionable quality, particularly during critical dry periods. Elimination of the tidal effects in this area by construction of the barrier would also reduce the supply of dissolved oxygen in the water, which is now partly replenished from Suisun Bay.

All of the alternative plans for the Delta Water Project would involve dual water supplies with different water quality characteristics. While the concentrations of minerals in water in certain western channels would increase due to greater ocean salinity incursion, the quality of water from the Contra Costa Canal and from proposed water supply facilities would be excellent. It is estimated that substitute industrial water supplies would generally contain between 15 and 80 parts of chlorides per million parts of water. Similarly, the total dissolved solids would generally range between 125 and 300 parts per million. Irrigation water supplies would be of similar quality. The Contra Costa Canal would annually supply about 195,000 acre-feet of water, including some substitute water in northeastern Contra Costa County. All additionally required supplemental and substitute water would be supplied from the Montezuma Aqueduct. This annual quantity would amount to about 120,000 acre-feet in 1990 and 330,000 acre-feet in 2020. Brackish water supplies in the western Delta channels would vary in quality with location. The mean quality would be about 3,000 parts of chlorides per million parts water at Antioch during summer months. Water containing this much salinity is not necessarily damaging to cooling equipment involving alloy metals. A composite of several factors, most of which would not be modified by alternative plans for the Delta Water Project, controls the rate of corrosion of cooling equipment.

Project Accomplishments — water salvage

Unless physical works are constructed in the Delta to prevent salinity incursion from the Bay system, or to channelize fresh water directly across the Delta channels, it will be necessary to release increasingly greater amounts of fresh water from upstream storage to maintain satisfactory quality conditions. Greater rates of fresh water outflow will be necessary as the rate of export pumping from the Delta increases, and greater quantities of stored water will have to be released as the amount of surplus water for outflow is reduced by upstream depletions and export from the Delta. If Delta works are not constructed, the yield of other features of the State Water Facilities would be reduced and subsequent features for importation of water from north coastal sources would be needed at an earlier date. Any such modifications in the program would increase the cost of water in the Delta.

With any of the plans for the Delta water facilities, the amount of outflow from the Delta otherwise necessary for salinity control would be greatly reduced. It would still be necessary to dispose of municipal and industrial wastes from the western Delta, and drainage from the San Joaquin Valley, into channels downstream from points of usable good quality water. All of the plans are comparable in this respect, except that these wastes would aid in repulsion of ocean salinity incursion with any of the alternatives of the Delta Water Project. Fresh water required for operation of locks and the fishway would be lost with a barrier at Chipps Island, but would be available for use downstream of the control structures with any of the alternatives of the Delta Water Project. A small amount of conservation yield could be obtained from limited storage in Delta channels with a barrier at Chipps Island, but alternatives of the Delta Water Project would not provide conservation storage.



UPSTREAM STORAGE RELEASES FOR PROJECT OPERATION

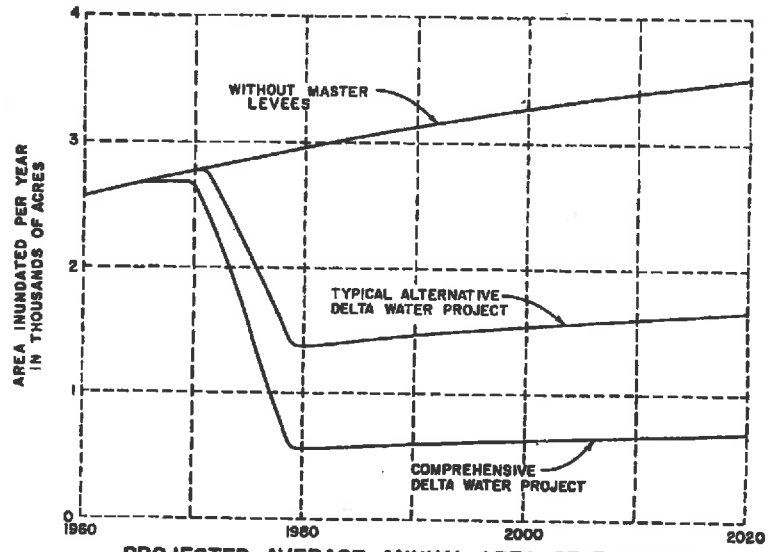
The amount of water otherwise necessary for salinity control which could be salvaged by Delta water facilities would vary with time, as indicated by the above graph. The amount of salvaged water would be the difference between demands on upstream storage for outflow without any works in the Delta, and demands with such works in operation. The estimated average annual salvage during the next 60 years would be 1,900,000 acre-feet with the Chipps Island Barrier Project, and 2,050,000 acre-feet with any of the alternative plans for the Delta Water Project.

Project Accomplishments — flood and seepage control

Only the Typical Alternative Delta Water Project and the Comprehensive Delta Water Project would provide flood and seepage control benefits to the Delta. However, all plans would include remedial works made necessary by adverse effects of flood or tidal water stages changed by project operation. These would be particularly necessary with the Chipps Island Barrier Project.

Project flood control benefits would result from reduction in the frequency of flooding, and from reductions in costs of maintaining Delta levees. It is emphasized that complete flood protection could not be assured, as the inflow to the Delta could exceed the designed capacity of the channels. Furthermore, although the stability of the master levees would be significantly greater than the stability of existing levees, the character of organic foundation soils is such that unforeseen stability problems might develop in some areas. For these reasons, emphasis should be given to zoning Delta lands lying below flood levels for uses involving low-value improvements such as farming, and precluding residential development. While complete flood protection for the Delta lands could not be assured under project conditions, there would be a marked improvement in protection over existing conditions which will worsen as land elevations in the Delta continue to subside.

About 103,000 acres would be benefited by master levees included in the Typical Alternative Delta Water Project, and about 143 miles of levees along interior channels would no longer require costly maintenance for high flood stages. The estimated average annual benefit of reduced flooding and operation and maintenance costs would be about $4.65 per acre. Master levees of the Comprehensive Delta Water Project would benefit about 252,000 acres and would reduce expensive maintenance on 295 miles of interior channel levees. The estimate of average annual flood control benefits is about $3.60 per acre.



PROJECTED AVERAGE ANNUAL AREA OF FLOODING

Seepage control benefits would be made available by lowering water levels in interior channels created by the Typical Alternative Delta Water Project or by the Comprehensive Delta Water Project. In addition, lower water levels would prolong the economic life of certain islands. These benefits and the extent of increased economic life would depend upon lowering average water levels in the interior channels. A general lowering of five feet could be made without adversely affecting depths for small craft, except in isolated locations, or the majority of water supply siphons. Based upon a five-foot lowering of water levels, seepage control benefits, averaging an estimated $0.50 per acre for 103,000 acres, would be available with the Typical Alternative Delta Water Project. The Comprehensive Delta Water Project would afford seepage benefits to 252,000 acres, and the estimated average annual benefit would be $0.45 per acre.

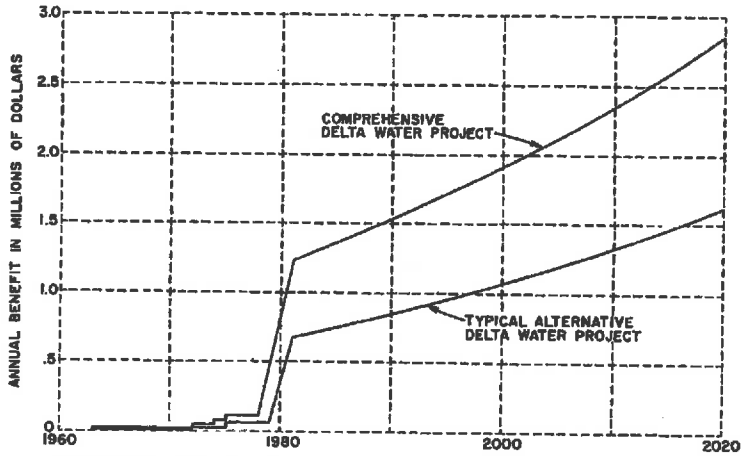
Project Accomplishments — vehicular transportation

The two basic problems of the existing road system in the Delta are (1) inadequate channel crossings and circuitous routes, with resultant excessive travel times, and (2) disproportionately high costs of maintenance. Projects involving master levees for flood control in the Delta would afford means for reducing both of these problems. However, the Chipps Island Barrier Project would provide no benefits to vehicular transportation, and the Single Purpose Delta Water Project would provide only incidental benefits of this kind.

The master levee system of the Typical Alternative Delta Water Project would include twenty-two channel closures upon which roads could be placed, and operation of four existing ferries could be terminated. The Comprehensive Delta Water Project would include thirty-nine channel closures providing new access and would eliminate the need for six ferries.

Roads on the landward berms of the master levees would be more stable and less difficult to maintain than existing roads on levee crowns. Driving on present levee roads is hazardous, as evidenced by frequent drownings when vehicles run off levees into adjacent channels. Passing clearance is often limited by parked vehicles. In addition to improved safety with roads on the levee berms, there would be ample width for parking off the roadways.

To realize the anticipated and needed development of recreation in the Delta, it will be necessary to greatly improve vehicular access. Realization of about 7,000,000 recreation-days each year by 1990, and almost 14,000,000 by 2020 will, in large degree, be dependent upon the improved vehicular access that could be provided by multipurpose use of the master flood control levees.



BENEFITS OF VEHICULAR TRANSPORTATION IMPROVEMENTS

The project benefits from enhancement of the road system would be a combination of savings in maintenance costs and savings in costs to Delta traffic associated with farming and to the recreationists. Savings to Delta interests reflect reduced costs of general travel and produce shipments through decreased travel times and distances. Savings to the recreationists were based upon projected recreation use and decreased travel times and distances.

Project Accomplishments — recreation

While some detriments to recreation are inherent in construction of any facilities in the Delta, substantial benefits would also be achieved. As has been stated, improvements in the road network would make more of the Delta accessible to recreationists. Land areas reclaimed by spoiling material from dredging of channels onto small islands would afford space for development of recreation service facilities and picnic areas. Project works at the head of the Cross-Delta Canal would be constructed to provide clearance for the majority of pleasure craft, thereby connecting the Sacramento and Mokelumne River systems. Elimination of flood and tidal effects from interior channels would make it possible to control water levels in those channels, reducing costs of maintaining waterfront recreation facilities. Furthermore, costs of new facilities would be less than for present conditions. The safety of the boating public is becoming a significant problem, and the incompatibility of high-speed boating, cruising, and skiing with fishing and swimming creates related safety problems. Local authorities will find it desirable and even necessary to designate certain Delta channels for specified types of recreation use. The interior project channels would lend themselves to this type of zoning and also to simplified enforcement.

Planning and construction of recreational developments in the Delta should involve local governmental agencies. Most project channel closures would not be constructed for eight or more years, and changing recreation patterns should be considered in future selection of remedial and enhancement facilities. Needs for small craft locks and boat portages should be re-evaluated at the time closures are constructed.

The most important form of recreation in the Delta is fishing. In terms of recreation-days, fishing is three times as important as the next most popular sport—cruising. A project which would cause a major reduction in fish populations might also cause very adverse effects on the recreation. In this connection the Chipps Island Barrier Project would result in losses of striped bass several times as great as those anticipated with any of the alternative plans for the Delta Water Project.

It is recognized that cruising, sailing, and water skiing are rapidly gaining in popularity in the Delta, and that construction of master flood control levees and channel closures would interfere with unrestricted boating access to certain channels. However, access would be provided through small craft locks or portage facilities at many of the channel closures, thus reducing the detriment primarily to short delays. Studies in other areas indicate that lockage delays are not too important to the majority of pleasure boatmen.

The following tabulation summarizes physical features of the several alternative projects which would affect recreational activity and growth in the Delta.

Item	Chipps Island Barrier Project	Single Purpose Delta Water Project	Typical Alternative Delta Water Project	Comprehensive Delta Water Project
Control structures	1	4	3	4
Channel closures	1	10	23	41
New master levees (miles)	0	0	90	185
Fishways	1	1	1	1
Principal fish screens	0	2	1	1
Barge locks	1	1	1	1
Small craft locks	0	0	2	5
Small craft portage facilities	0	0	5	17
Open navigable area (acres)	49,500	49,400	45,800	42,600
Navigable interior area (acres)	0	100	3,700	6,900
Open navigable channels (miles)	700	695	590	450
Navigable interior channels (miles)	0	5	110	250
Project roads (miles)				
Paved	0	0	33	70
Graveled	0	1	47	109
State and county levee roads (miles)	295	295	279	265
New inter-island accesses (closures)	0	6	22	39
New public waterfront land (acres)				
From master levees	0	0	1,900	3,600
From dredge spoils	0	1,900	1,900	2,300
Normal overhead clearance through Delta Cross Channel (feet)	6	16	16	16

Project Accomplishments—fish and wildlife

Any Delta water facilities would affect the habitat of fish in the Delta, but would have little effect, if any, on Delta wildlife. While it is known that the Delta plays an important role in the life cycle of migratory fish, and also supports resident sport fish, insufficient biological information is available with which to clearly define the potential effects of Delta water facilities. Nevertheless, relative comparisons of the alternative projects can be made.

Studies of effects of the Delta water facilities and export pumping plants were made by the California Department of Fish and Game in co-operation with the Department of Water Resources. Cooperative experiments with a full-scale vertical baffle fishway indicate that all migratory species would use this type of fishway. The conclusions of the Department of Fish and Game regarding the alternative projects are as follows:

"Chipps Island Barrier

"This project would be the most damaging of the four studied. It would probably cause a disastrous reduction of almost all species of fish found in the Delta. These losses would be brought about by the rapid salinity and temperature change across the barrier, loss of current in the fresh-water pool for migration direction, striped bass spawning eliminated due to lack of current behind the barrier, loss of important food items, and a threefold increase in pumping of water at Tracy. The amount of Sacramento River water being drawn around the tip of Sherman Island to the pumping plant would be greatly increased. Downstream migrants of the Sacramento River would be diverted to the pumps in large numbers. These fish would have to be screened at the pumps and returned to the river channel below the influence of this current. This condition would be a serious detriment to all fish using the Delta.

"Single Purpose Delta Water Project

"This project would be the least detrimental of the four projects studied. The reversal of flow around Sherman Island would be eliminated. Major fish screens would be installed at the Cross-Delta Canal headworks and at the head of Georgiana Slough. Therefore, downstream migrants in the Sacramento River would be guided down the western side of the Delta out of the influence of the pumps. In general, fish and eggs in the western portion of the Delta would no longer be affected by the pumps. The replacement of the hundreds of existing small irrigation siphons in the western Delta by screened irrigation supply systems would further reduce losses of small fish. In these respects conditions for fish in the Delta would be improved.

"Fish habitat would not be reduced in the Delta. The one channel that would be isolated under this project would be insignificant. An important effect of the project would be the increased reversal of flow in the San Joaquin River above the Cross-Delta Canal crossing. This reversal of flow would occur during an average of seven months of the year under full project operation. We were unable to evaluate the effect of the reversal. However, it could result in serious losses to salmon that now spawn in San Joaquin River tributaries south of the Mokelumne River. Most seriously affected would be upstream migrating salmon. The amount of water pumped from the Delta would be increased threefold. This increased withdrawal of water would divert proportionately more fish than is presently being diverted.

"Typical Alternative Delta Water Project

"This project would be the second least detrimental. Losses would be expected to be greater than the Single Purpose Project because of the reduction of 8 percent of the fish habitat through channel closures, and partial channelization of the Cross-Delta Canal. The channelization would cause a detriment by channeling the fish toward the pumps by a more direct route. Water diversions into isolated channels would be screened and loss of fish would be reduced. However, loss of eggs and fry would be unavoidable. Other project conditions would be the same as the Single Purpose Project.

"Comprehensive Delta Water Project

"This project would be the third least detrimental. It would cause greater loss than the Typical Alternative Project because of the reduction of 14 percent of the fish habitat, and the complete channelization of the Cross-Delta Canal. This would channel the fish directly to the pumps. Other project conditions would be the same as in the Single Purpose Project.

"From the foregoing, if one of the above-named projects is to be built in the Delta, the Department of Fish and Game would favor the Single Purpose Delta Water Project. However, all projects will cause serious fisheries problems and an intensive study would be required to solve these problems."

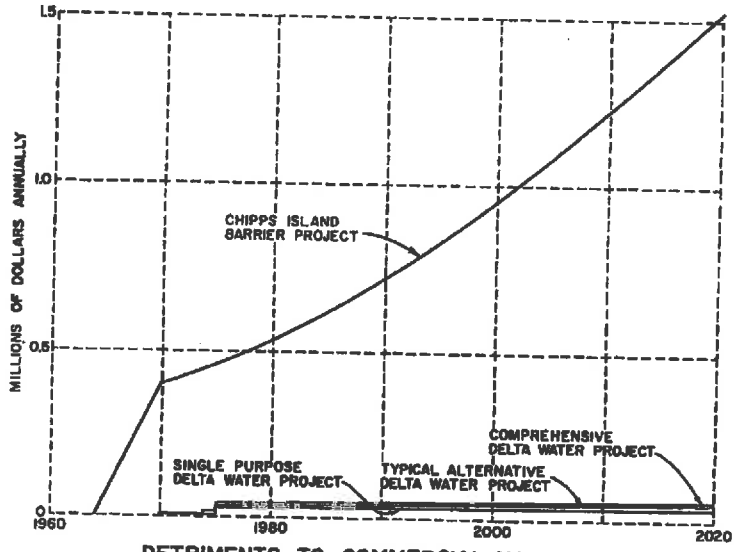
Formulation of project plans reflects comments and recommendations of the Department of Fish and Game. Fish screens would be installed at the heads of channels diverting water southward from the Sacramento River. Such screens would reduce the present rates of fish losses at the Tracy Pumping Plant and in numerous other diversions in the Delta. Project pumping plants would also be screened. Hundreds of diversion siphons and pumping plants in the Delta are not screened at this time. However, project diversions into interior channels would be screened, and the fish populations enhanced thereby.

Project Accomplishments—navigation

Commercial and military navigation in the Delta would be adversely affected in varying degrees by any Delta water facilities, but some potential benefits would also be realized through increases in channel depths and widths.

The Chipps Island Barrier Project would cause the greatest detrimental effect to navigation, since all traffic between the San Francisco Bay system and Delta points would have to pass through locks. At present, an average of about 570 deep-draft commercial vessels, and 10,300 tug and barge tows and small vessels pass Chipps Island each year. It is estimated the annual transits would increase to 2,800 and 40,000, respectively, by 2020. The volume of future military traffic cannot be realistically estimated, nor is it possible to place a reasonable value on its lost time. The increased tidal amplitude downstream from a barrier at Chipps Island would necessitate additional dredging in some areas to provide the required minimum navigation depth. This increased depth might cause additional maintenance dredging which frequently results from deepening navigation channels.

Completion of the Sacramento Deep Water Channel will divert most of the tug and barge traffic away from the Sacramento River between the vicinities of Rio Vista and Sacramento. The traffic which would pass the site of the Sacramento River control structure would generally be limited to that originating from or destined to points of call downstream from the vicinity of Freeport. It is anticipated that the volume of this traffic would increase from 600 transits per year after completion of the Sacramento Deep Water Channel to about 900 transits per year by 2020.



DETRIMENTS TO COMMERCIAL NAVIGATION

Construction of control structures and closures on channels south of the San Joaquin River in the heart of the Delta would increase time and distance for tug and barge travel to a sugar refinery near Tracy. However, channel improvements would permit use of larger barges, if shipping concerns should elect to do so. As this advantage would be subject to many factors in an operator's business which cannot be readily predicted, benefits were not claimed for possible use of larger barges.

Construction of a master levee system would necessitate relocation of some sugar beet loading docks in the Delta. However, improved roads would tend to compensate for increased hauls to relocated docks.

Economic Aspects—benefits, detriments, and costs

Only direct, tangible benefits and detriments to the initial recipient were evaluated for comparison with direct costs. However, it must be recognized that direct, intangible benefits and detriments would also result from project operation. The ratios of benefits to costs provide a guide to project selection, but consideration should also be given to the net benefits in making the final project selection. Although variations in benefit-cost ratios can result from different basic economic premises, the relative comparison of alternative projects would not change.

Certain significant benefits and detriments were not evaluated. All alternative plans would improve the quality of water exported to the San Joaquin Valley and reduce the drainage problems there. Only direct benefits of flood protection to agriculture were evaluated, but this protection would also benefit principal highways and urban developments. The estimated recreation benefits from land made available for development were considered to be equivalent to the value of the land. Intangible benefits would also accrue to recreation, and intangible detriments would result from reduced convenience of access into some channels. Only detriments to commercial fishing are shown, but intangible detriments to sport fishing would also accrue.

All estimates of benefits, detriments, and costs, including amortization, operation, and maintenance, reflect annual equivalent values for the period 1960-2020. An interest rate of four percent per annum was used in the analysis.

Attention is invited to the net benefits of the Comprehensive Delta Water Project which are less than the net benefits of the Typical Alternative Delta Water Project. This condition results from inclusion of economically unjustified flood control for large areas south of the San Joaquin River wherein the direct benefits would be less than the costs. However, flood control for some of the critical areas south of the San Joaquin River warrants further study.

ESTIMATED ANNUAL BENEFITS, DETRIMENTS, AND COSTS
(In thousands of dollars)

Item	Chipps Island Barrier Project	Single Purpose Delta Water Project	Typical Alternative Delta Water Project	Comprehensive Delta Water Project
Benefits				
Water salvage (for export)	8,337	8,963	8,963	8,963
Improved water quality—municipal, industrial, and irrigation	880	880	880	880
Supplemental municipal and industrial water supply	503	1,343	1,343	1,343
Flood and seepage control	---	---	530	1,022
Vehicular transportation	---	---	410	734
Recreation	---	19	37	58
Total Benefits	9,720	11,205	12,163	13,000
Detriments				
Commercial navigation	617	18	24	27
Commercial fisheries	844	203	254	287
Total Detriments	1,461	221	278	314
BENEFITS MINUS DETRIMENTS	8,259	10,984	11,885	12,686
Costs				
Capital amortization	6,825	1,358	1,965	2,846
Annual operation and maintenance	2,077	691	884	1,136
Total Costs	8,902	2,049	2,849	3,982
NET BENEFITS	–643	8,935	9,036	8,704
BENEFIT–COST RATIO	0.93:1	5.36:1	4.17:1	3.19:1

Economic Aspects—allocation of costs

The capital and operational costs of each of the alternative projects were allocated among the project functions by the Separable Costs-Remaining Benefits method. In this method, all costs assignable to single functions are identified, and the remaining multipurpose costs are distributed among the functions in proportion to the benefits provided by the project, or in proportion to the lowest cost alternative means of providing equivalent benefits. The lowest value of either the benefits or alternative means is used as a limit.

The basic allocations were made in terms of present worth values (1960) of all costs and benefits. This procedure properly accounts for the time-value of money (interest) and the wide variation in dates of expenditure of money and realization of benefits. Allocations of the capital and operational costs in terms of actual expenditures, rather than present worth, are indicated in the accompanying tabulations to permit convenient comparisons with total amounts of these costs.

Attention is invited to the allocated costs of the Chipps Island Barrier Project. The costs which would be allocated to water salvage and western Delta water supply were limited by the lowest cost alternative means of providing equivalent benefits, which would be the Single Purpose Delta Water Project. The values

ALLOCATION OF ESTIMATED CAPITAL COSTS
(In thousands)

Item	Chipps Island Barrier Project	Single Purpose Delta Water Project	Typical Alternative Delta Water Project	Comprehensive Delta Water Project
Water salvage (for export)	$38,384	$38,444	$38,662	$41,655
Western Delta water supply [1]	8,098	8,111	8,156	8,788
Flood and seepage control	none	none	11,900	25,159
Vehicular transportation	none	none	8,132	18,083
Recreation land	none	none	681	1,429
Unassigned local costs	155,490	none	none	2,945
TOTALS	$201,972	$46,555	$67,531	$98,059

[1] For improvement in quality and supplemental water supplies. Allocated costs include portions properly attributable to upstream water users for future effects on the western Delta area due to increased water use in areas tributary to the Delta. Definite values attributable to upstream water users would be dependent upon resolution, negotiated or otherwise, of water rights problems.

shown for the Chipps Island Barrier Project are slightly less than those for the lowest cost alternative, since the funds for the former would be expended at an earlier date. The allocations to both projects in present worth values would be the same. As the costs which may be properly allocated to water salvage and western Delta water supply are less than the total cost, a portion of the costs of the Chipps Island Barrier Project are shown as unassigned local costs. If these costs are not repaid from sources other than water users, the Chipps Island Barrier Project would be financially infeasible.

Attention is also invited to the allocated costs of the Comprehensive Delta Water Project which indicate certain unassigned local costs. In this case the costs of flood and seepage control in areas south of the San Joaquin River exceed the direct benefits of flood and seepage control in these areas. Therefore, the allocation to flood and seepage control for these areas was limited to the benefits. These flood and seepage control features of the Comprehensive Delta Water Project are not economically justified.

After the costs were allocated to principal project functions, it was necessary to make suballocations among particular groups of beneficiaries. These suballocations, which are indicated on the following pages, were also made by the Separable Costs-Remaining Benefits method and were the basis for computing the average annual costs to beneficiaries throughout a 60-year period. In the adjoining tabulations the amounts allocated to vehicular transportation include some costs which would be suballocated to recreation access to reflect the benefits to the public for improved access to recreation areas of the Delta. It is estimated that about $7,075,000 of the capital costs and $92,000 of the annual operational costs for vehicular transportation under the Typical Alternative Delta Water Project would be suballocated to recreation access. Under the Comprehensive Delta Water Project these respective amounts would be $15,123,000 and $176,000. These foregoing amounts would be in addition to the basic allocation to recreation land, which reflects the value of lands made available for recreational development.

ALLOCATION OF ESTIMATED AVERAGE ANNUAL OPERATIONAL COSTS
(In thousands)

Item	Chipps Island Barrier Project	Single Purpose Delta Water Project	Typical Alternative Delta Water Project	Comprehensive Delta Water Project
Water salvage (for export)	$395	$571	$506	$483
Western Delta water supply [1]	83	120	107	102
Flood and seepage control	none	none	156	292
Vehicular transportation	none	none	106	210
Recreation land	none	none	9	16
Unassigned local costs	1,599	none	none	34
TOTALS	$2,077	$691	$884	$1,137

[1] For improvement in quality and supplemental water supplies. Allocated costs include portions properly attributable to upstream water users for future effects on the western Delta area due to increased water use in areas tributary to the Delta. Definite values attributable to upstream water users would be dependent upon resolution, negotiated or otherwise, of water rights problems.

Economic Aspects—costs of project services

It was assumed that all project costs not specifically declared nonreimbursable would be repaid by all beneficiaries of project functions. In accordance with the contracting principles established for water service under the State Water Resources Development System, the conservation features of the Delta water facilities will be financially integrated with other conservation features of the system. The cost of supplemental water required by Delta water users will include the Delta Water Charge and an allocated transportation charge.

Estimates of present and future costs of water supply in the western Delta area were predicated on continuation of current federal salinity control policy, which limits the minimum regulated outflow from the Delta to 1,500 second-feet, considered necessary to afford satisfactory quality control at the Central Valley Project pumping plants. Estimates of increased future costs without the State Water Facilities reflect continued upstream depletion of surplus water in the Delta, and represent average costs during the next 60 years. Estimates of costs shown for project conditions also reflect average costs during the next 60 years. It is emphasized that the estimates are comparative average annual *costs* during a 60-year period and do not reflect estimates of year by year *prices* which may be established.

The amounts allocated for repayment were limited by the lowest cost alternative means of accomplishing equivalent benefits. It may be noted that the costs of water supply in the western Delta area would be the same for the Chipps Island Barrier Project, Single Purpose Delta Water Project, and Comprehensive Delta Water Project. The Single Purpose Delta Water Project would be the lowest cost alternative means of providing water supplies and it limits the amount which may be allocated under the other two projects.

The costs of the Typical Alternative Delta Water Project allocated to water salvage would amount to an average of $0.64

COMPARATIVE SUMMARY OF ESTIMATED AVERAGE ANNUAL COSTS OF WATER SUPPLY IN WESTERN DELTA AREA WITH AND WITHOUT STATE WATER FACILITIES DURING 1960-2020 [1]

Item	Future cost without State Water Facilities	Chipps Island Barrier Project	Single Purpose Delta Water Project	Typical Alternative Delta Water Project	Comprehensive Delta Water Project
Contra Costa Canal service, $/acre-foot [2]	14.52 [3]	11.66	11.66	11.64	11.66
Substitute municipal and industrial water supply, $/acre-foot	[4]	[4]	3.45	3.33	3.45
Supplemental water supply [5]					
Contra Costa County, $/acre-foot	15.20	9.06	9.06	8.92	9.06
Solano County, $/acre-foot	17.00	8.82	8.82	8.68	8.82
Agricultural water supply, $/acre [6]	7.91 [7]	1.50	1.50	1.45	1.50

[1] Average of estimated costs during a 60-year period. Values do not necessarily reflect *prices* for project services.
[2] For all municipal and industrial water served from the Contra Costa Canal. All costs include $11 per acre-foot for water from the canal. Allocated costs reflect benefits from improved quality.
[3] Includes estimated excess water treatment due to salinity degradation.
[4] Estimated future cost of high quality water from Delta channels will vary between $2.00 and $5.00 per acre-foot, depending upon plant locations and operations.
[5] All supplemental project water available through operation of the Montezuma Aqueduct.
[6] Costs reflect average for about 34,000 acres in the western Delta lowlands.
[7] Cost expressed as loss per acre due to salinity incursion.

per acre-foot for all water exported from the Delta by the State Water Facilities. Similar costs with the other projects would be about $0.66 per acre-foot.

It is anticipated that a federal contribution would be provided for flood and seepage control. This contribution, tentatively estimated at $10,123,000 for the Typical Alternative Delta Water Project and $16,020,000 for the Comprehensive Delta Water Project, would probably reflect current federal policy for allocation of costs of levee improvements, and would be based on reduced flood damages and net savings from reduced levee maintenance costs. Local costs of maintaining existing levees incorporated in the master levee system probably would not be directly met by local districts. Maintenance would be included in the total project costs, and a portion of these costs would be allocated to local beneficiaries.

The total project costs allocated to vehicular transportation were suballocated to the benefited counties and to the general public. The allocation to the general public reflects enhancement of recreation, and was considered nonreimbursable.

COMPARATIVE SUMMARY OF ESTIMATED ANNUAL COSTS OF FLOOD AND SEEPAGE CONTROL WITH AND WITHOUT DELTA WATER FACILITIES DURING 1960-2020 [1]

(Per acre)

Item	Island-group					
	Isleton	Lodi	Holt	Tracy	Brentwood	Sherman
Present control cost	$8.00	$8.00	$7.50	$6.50	$7.50	$9.00
Future control cost without a project	10.85	10.29	9.16	7.50	8.83	13.10
Annual damage savings with a project	2.80	1.65	0.35	0.20	1.32	3.12
Typical Alternative Delta Water Project						
Allocated project cost	2.04	2.17				
Interior levees and pumping cost	7.96	7.34				
Total control cost	$10.00	$9.51				
Net savings	3.65	2.43				
Comprehensive Delta Water Project						
Allocated project cost	2.15	2.29	2.09	2.29	2.38	2.53
Interior levees and pumping cost	7.96	7.34	6.66	4.97	6.04	10.57
Total control cost	$10.11	$9.63	$8.75	$7.26	$8.42	$13.10
Net savings	3.54	2.31	0.76	0.44	1.73	3.12

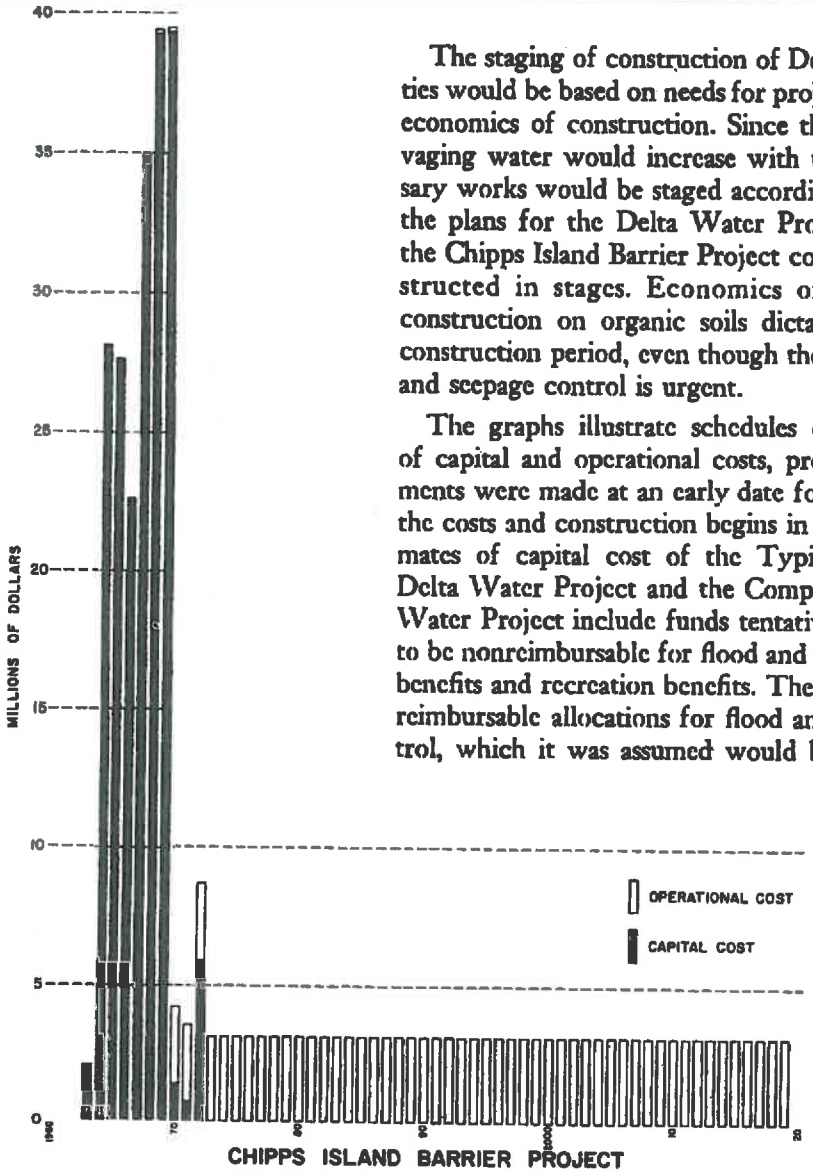
[1] Average of estimated costs during a 60-year period. Values do not necessarily reflect prices for project services.

COMPARATIVE SUMMARY OF ESTIMATED ANNUAL COSTS AND SAVINGS WITH VEHICULAR TRANSPORTATION IMPROVEMENTS DURING 1960-2020 [1]

Item	Contra Costa County	San Joaquin County	Sacramento County
Typical Alternative Delta Water Project			
Allocated project cost	$—	$41,400	$4,500
Operational savings to present road system	—	38,500	1,100
Savings to road users	—	265,700	105,200
Net savings	—	268,800	101,800
Comprehensive Delta Water Project			
Allocated project cost	13,300	95,700	11,200
Operational savings to present road system	2,900	59,300	5,000
Savings to road users	82,000	465,600	119,700
Net savings	71,600	429,200	113,500

[1] Average of estimated costs during a 60-year period. Values do not necessarily reflect prices for project services.
NOTE: There would not be any vehicular transportation improvements in portions of other counties within the Delta.

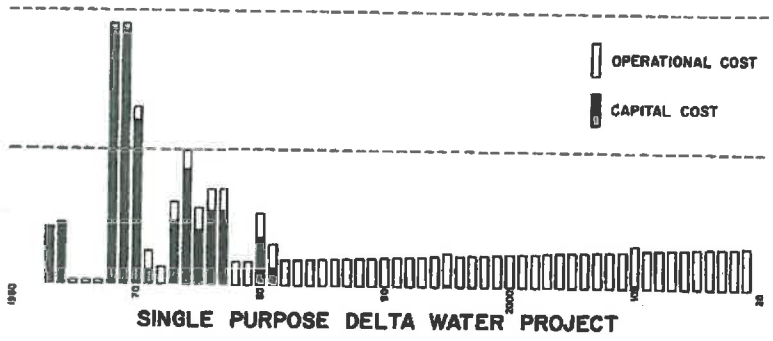
Economic Aspects—repayment



The staging of construction of Delta water facilities would be based on needs for project services and economics of construction. Since the need for salvaging water would increase with time, the necessary works would be staged accordingly for any of the plans for the Delta Water Project. However, the Chipps Island Barrier Project could not be constructed in stages. Economics of master levee construction on organic soils dictate an extended construction period, even though the need for flood and seepage control is urgent.

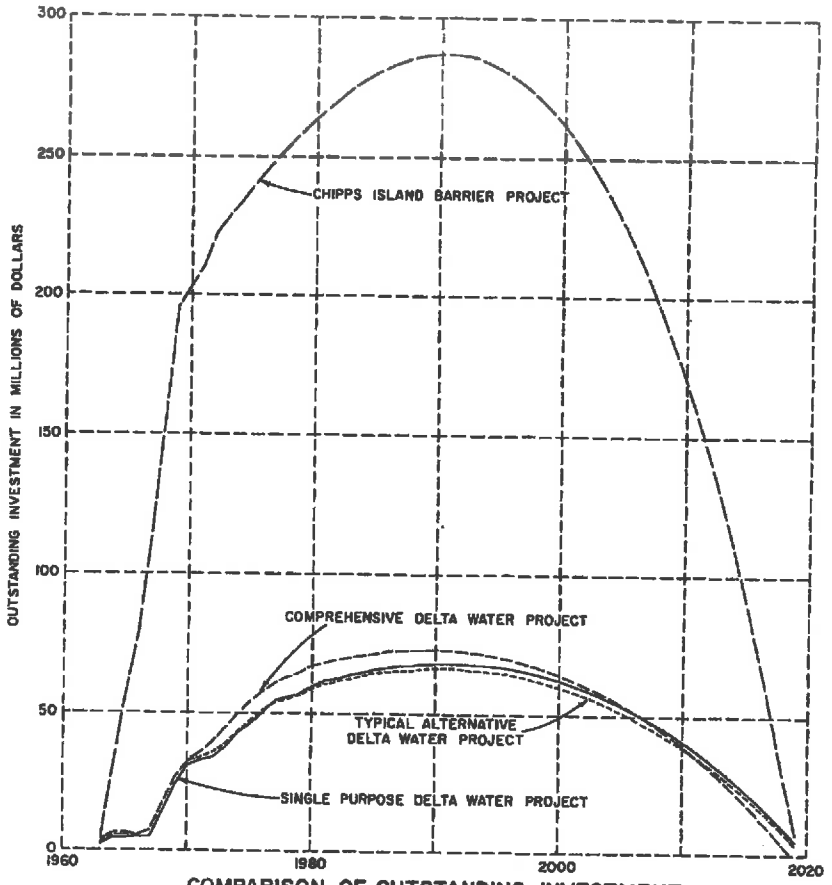
The graphs illustrate schedules of expenditures of capital and operational costs, provided arrangements were made at an early date for repayment of the costs and construction begins in 1963. The estimates of capital cost of the Typical Alternative Delta Water Project and the Comprehensive Delta Water Project include funds tentatively considered to be nonreimbursable for flood and seepage control benefits and recreation benefits. The estimated nonreimbursable allocations for flood and seepage control, which it was assumed would be provided by the Federal Government, amount to about $10,123,000 for the Typical Alternative Delta Water Project and $16,020,000 for the Comprehensive Delta Water Project. The estimated allocation of capital costs to recreation land and access would be $7,756,000 with the Typical Alternative Delta Water Project and $16,552,000 with the Comprehensive Delta Water Project. The corresponding allocations of annual operational costs would be $101,000 and $192,000, respectively. It was assumed that the allocated capital costs for recreation land and access would be nonreimbursable and be borne by the State of California. It was also assumed that the annual operational costs would be reimbursable from gas tax funds and nominal rental charges on land made available for recreation development.

The allocated reimbursable costs for water salvage and western Delta water supply would be repaid by water charges. The charges would be based on integrated repayment of other necessary State Water Facilities. The reimbursable costs of flood

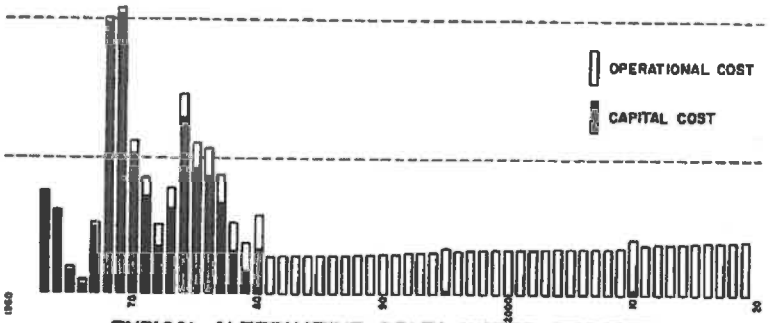


and seepage control and vehicular transportation improvements would be repaid by annual payments from the beneficiaries of flood and seepage control and from the counties, respectively. It was assumed that unassigned local costs of the Chipps Island Barrier Project would be recovered in annual payments in proportion to the projected industrial tax base. This assumed method of repayment would necessitate a rate of about $1.19 per $100 of assessed valuation throughout a 60-year period. It was also assumed that unassigned local costs of the Comprehensive Delta Water Project would be recovered in annual payments based upon the total acreage of land south of the San Joaquin River which would benefit from flood and seepage control. An annual payment of $0.86 per acre would be required.

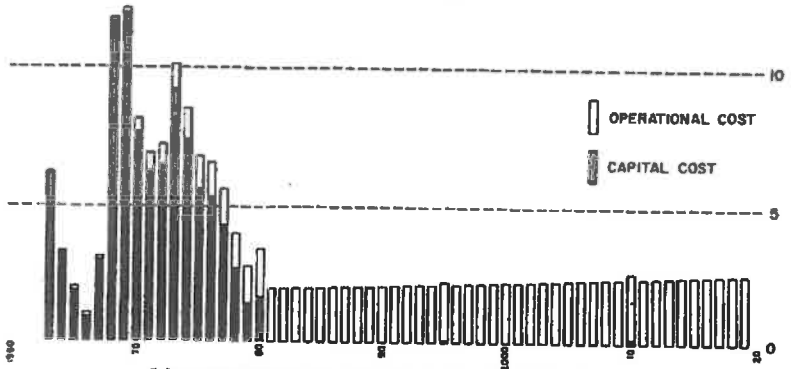
The comparative investment requirements for allocated reimbursable costs, including interest and operational costs, of the several projects are shown in the accompanying graph.



COMPARISON OF OUTSTANDING INVESTMENT REIMBURSABLE PROJECT COSTS



TYPICAL ALTERNATIVE DELTA WATER PROJECT



COMPREHENSIVE DELTA WATER PROJECT

Conclusions and Recommendations

CONCLUSIONS

GENERAL

The plans for Delta water facilities described in this report are consistent with and would accomplish the water development purposes embraced in the California Water Resources Development Bond Act approved on November 8, 1960. Additional features could be incorporated to provide flood and seepage control, transportation, and recreation benefits.

WATER SUPPLY

Problems of water quality in the western portion of the Delta necessitate early construction of facilities to provide suitable water supplies for present and future uses.

WATER SALVAGE

Without physical control works in the Delta, increasingly greater quantities of fresh water from upstream storage will be required to repel ocean salinity and maintain good quality water for use within and export from the Delta. Water salvage will be dependent upon coordinated operation of regulatory storage, export works, and Delta water facilities.

FLOOD AND SEEPAGE CONTROL

The magnitude of flood damage and the costs of flood and seepage control will become increasingly greater as the land surface of many Delta islands continues to subside. A master levee system would reduce these costs. Early initiation of construction is necessary to economically provide stable levees.

VEHICULAR TRANSPORTATION AND RECREATION

Improvements to the road system in the Delta are needed to reduce costs of vehicular shipment and to develop the recreation potential to accommodate an estimated 7,000,000 recreation-days in 1990, and 14,000,000 recreation-days in 2020.

DELTA WATER FACILITIES

1. The Chipps Island Barrier Project would be functionally feasible, would provide adequate water supplies of acceptable quality for the Delta, and would salvage water otherwise needed for salinity control amounting to an estimated annual average of 1,900,000 acre-feet based on a 60-year period. However, the net benefits would be less than the project costs in a ratio of 0.93:1. Therefore, the project would not be economically justified. The project would not be financially feasible, unless revenues could be obtained from local taxes in addition to revenues derived from water sales.

2. The alternative plans of the Delta Water Project would be functionally feasible, would permit export of full water demands on the State Water Facilities, and would provide adequate water supplies, both in quality and quantity, for the Delta. The project would salvage water otherwise needed for salinity control amounting to an estimated annual average of 2,050,000 acre-feet based on a 60-year period.

3. The Chipps Island Barrier Project would probably cause disastrous reductions in the fisheries resource of the Delta. The Single Purpose Delta Water Project would be the least detrimental of all projects and would reduce some losses of fish and

Advanced Planning, Design, and Operation Studies

It is anticipated that the results of the planning studies summarized in this bulletin and described in detail in the supporting office reports will be the basis for selection of a general plan for the Delta Water Project. However, it is recognized that definite plans, designs, and operation programs will be dependent upon further studies and negotiations on certain aspects of the project plans.

LOCAL ACTION

Early consideration should be given by local agencies to the extent of their interest in facilities which could be constructed to provide local benefits. Acute water supply problems in the western Delta, particularly in the agricultural lowlands, warrant early resolution of interest in plans for water supply facilities. Consideration should be given to creation of master districts to represent related areas of interest in flood and seepage control benefits.

UNITED STATES CORPS OF ENGINEERS

Studies for flood and seepage control benefits and estimates of the federal contribution were based on methods and preliminary studies of the Corps of Engineers. Conditions in the Delta do not precisely fit standard procedures, and it will be necessary for the Corps of Engineers to make a detailed review of these studies to determine the extent of federal interest.

UNITED STATES BUREAU OF RECLAMATION

The Delta Water Project would enhance the operation of the Federal Central Valley Project by improving and insuring the quality of water exported from the Delta and by providing good quality water in the western Delta area in lieu of salinity control. The extent of federal interest in these benefits should be jointly analyzed by the Bureau of Reclamation and the Department of Water Resources.

HIGHWAYS

The channel closures and wide landward berms of the master levee system offer excellent opportunities for enhancing the road network in the Delta. Studies should be made by the State Division of Highways and county highway departments of transportation enhancement features, such as better road surfacing and connecting roads, which might be incorporated in the project plans.

FISHERY RESOURCES

To more definitely predict the anticipated project effects on fisheries and to design the fish screens and other remedial measures, it will be necessary to study certain biological aspects of the Delta fisheries. Joint studies of the anticipated project effects should be undertaken by the Department of Fish and Game and the Department of Water Resources.

OTHER STUDIES

Advance planning studies of flow distribution, salinity incursion, water quality, and sedimentation should continue throughout the design and early operation phases of project construction.

Test levee construction now being conducted pursuant to legislative directives will be continued to determine the most economical and efficient means of construction to provide an adequate levee system.

A general plan for remedial recreation facilities and recreation enhancement has been developed. Specific plans for facilities and development of land which can be made available for recreation uses should be prepared by county agencies, the Department of Water Resources, and other appropriate state agencies.

Acknowledgments

BOARD OF CONSULTING ENGINEERS

Samuel B. Morris, Chairman
Consulting Engineer, Los Angeles, California

Dr. Hans A. Einstein
Professor of Hydraulic Engineering
University of California, Berkeley, California

Professor Ray K. Linsley
Professor of Civil Engineering
Stanford University, Stanford, California

O. J. Porter
Porter and O'Brien, Consulting Engineers, Newark, New Jersey

CONSULTANTS ON SPECIAL ASPECTS

Ir. C. Blemond, Consulting Engineer
Amsterdam, The Netherlands
Sheppard T. Powell, Consulting Engineer, Baltimore, Maryland
Van Beuren Stanbery, Area Economics Consultant, San Francisco, California
Thomas Means, Consulting Engineer
San Francisco, California
Harry Barnes, Consulting Engineer
Madera, California
Dr. Hugo Benioff, California Institute of Technology, Los Angeles, California
Dr. U. S. Grant, University of California
Los Angeles, California
Dr. Gerard de Josselin de Jong, Delft Laboratories, The Netherlands
Dr. James A. Harder, University of California, Berkeley, California
Dr. David K. Todd, University of California, Berkeley, California
Dr. Donald Pritchard, Johns Hopkins University, Baltimore, Maryland
Dr. H. Bolton Seed, University of California, Berkeley, California
Ronald Pizer, Consultant, Sacramento, California
Don J. Cretzler, Hytech Corporation
Inglewood, California

COOPERATIVE STUDIES

U. S. Corps of Engineers
Sacramento District—flood control and navigation aspects
San Francisco District—preliminary designs, Chipps Island Barrier Project

U. S. Coast and Geodetic Survey—subsidence surveying

California Department of Fish and Game—fish and game studies

Contra Costa County Water Agency—industrial water use studies

University of California
Berkeley—electric analog model of Delta channels
Davis—organic soil salination research

Stanford University—salinity incursion analyses

Parsons, Brinckerhoff, Hall and Macdonald—recreation studies

WESTERN DELTA ADVISORY COMMITTEE

A special Western Delta Advisory Committee was established at the suggestion of the Director of Water Resources to advise the department, primarily on studies of water requirements and plans in the western Delta. Committee membership, which has not endorsed all aspects of this report, included:

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Thomas M. Carlson
William J. O'Connell

Sacramento County

Arthur L. Kiefer
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Richard J. Shukle

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William A. Doyle

STAFF

Harvey O. Banks, Director
Department of Water Resources
James F. Wright, Deputy Director
Department of Water Resources
William L. Berry, Chief Engineer
Division of Resources Planning
John M. Haley, Chief
Project Development Branch
Albert J. Delcini, Chief
California Aqueduct Section

Investigations by Delta Studies Unit

Herbert W. Greydanus, Engineer in Charge
Don H. Nance, Hydrology
Langdon W. Owen, Planning and Design
Irene E. Bailey, Executive Assistant
Marlene R. Schumaker, Stenographer

Hydrology

Joseph N. Soderstrand
Gerald C. Cox
Glenn R. Peterson
William A. Toomey
John O. Nelson
Roy F. Nelson
Gordon J. McGregor
David K. Marty
Philip W. Nahhas

Planning and Design

Robert J. Rooney
Neil M. Cline
Maurice D. Roos
James R. Cofer
Frank Davenport
Edward A. Cecil
Franklin A. Preuss
Robert G. Potter
Sam I. Ito
Gene E. Linley
Lee H. Woodward
Edward F. Huntley
Philip T. Zwanck
Virgil D. Buechler
Howard W. Walker

DIRECTORS
George Biagi, Jr.
Rudy Mussi
Edward Zuckerman

COUNSEL
Dante John Nomellini
Dante John Nomellini, Jr.

CENTRAL DELTA WATER AGENCY

235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone 209/465-5883 • Fax 209/465-3956

September 9, 2013

Felicia Marcus
Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Re: 2013 SWP and CVP Violations of D-1641

Dear Madam Chair:

I am in receipt of the August 21, 2013, joint USBR and DWR "accounting of the volume of water conserved by changing the water year type from 'Dry' to 'Critical' as it pertained to the Water Quality Objectives for Agricultural Beneficial Uses under Water Rights Decision 1641 (D-1641) at the Western Delta and Interior Delta monitoring stations." I appreciate the copy provided by Craig Wilson and appreciate being copied on the letter itself.

The accounting in substance provides that the Project operators "estimate that approximately 55,000 acre feet (af) of water was conserved in upstream reservoir storage due to conservation actions taken during early June to June 15, 2013." The conservation actions are not specified and no distinction is made between the actions violating the water quality standards or the action moving the 56°F temperature requirement for salmon on the Sacramento River, upstream from the Red Bluff Diversion Dam to Andersen. Whether or not there were other conservation actions is not clear. The accounting should be specific as to the separate savings, if any, due to the water quality standard violations, the water temperature requirement change and any other related actions.

Table One sets forth the monthly exports in acre feet for the Jones Pumping Plant (USBR) and the Banks Pumping Plant (DWR) taken from the USBR CVO website. The data shows that in each of the months of violation of the standards, the Project exports were in excess of 55,000 af.

Table One
CVP and SWP Delta Exports From Jones and Banks Pumping Plants
(Acre Feet)
2013

	January	February	March	April	May	June	July	August
Jones	101220	144430	151202	27053	63782	46504	224925	233905
Banks	162445	96508	157850	77331	54793	112894	315670	355870
	263675	240938	309052	104384	118575	159398	540595	589775

January through August	2326392
May through August	1408343

It appears that a reduction of exports could have avoided the violation of the standards and achieved the 55,000 acre feet of conservation in storage.

The accounting only addresses the period of June 1st to June 15th. The violations started in the later part of April and occurred intermittently to about June 15th. The first contact with the SWRCB was reportedly not until May 17, 2013, and was based on the urgent need to violate the agricultural standards to conserve cold water for fish. No mention was made regarding the need to reduce exports to conserve cold water for fish and it would appear that the water gained by violation of the standards was exported.

Total exports for the period from January 1, 2013, through August 30, 2013, were 2,326,392 acre feet. For the period of May 17, 2013, through August 30, 2013, the exports were 1,408,343 acre feet. The export levels seem quite high given the alleged urgency for saving cold water in Shasta both as to the prior and future needs for temperature control in the Sacramento River.

This matter should be given additional review. A more complete accounting should be required to show: 1) the conservation of cold water in upstream storage resulting from the violation of the water quality standards; 2) the conservation of cold water in upstream storage resulting from changing the temperature standards and 3) the conservation of cold water in upstream storage that could have been achieved by curtailing exports without any change to or violation of the standards or temperature requirements. The justification for violating the water quality standards rather than reducing exports to conserve cold water in storage should also be provided.

It is apparent that the Projects are being operated in a manner which does not result in sufficient carryover storage to meet senior water rights, water quality standards and fish requirements in the event of a series of dry years such as 1929-34 or 1987-92 or even a shorter

drought. The SWP and CVP should be required to provide a plan of operation to achieve compliance with the water quality standards and fish requirements in the event of future droughts. Such a plan should show when and how much surplus water is available for export.

We look forward to a more detailed accounting and explanation.

Thank you for your attention to this matter.

Yours very truly,

DANTE JOHN NOMELLINI
Manager and Co-Counsel

DJN:ju
cc: See attached list.

Felicia Marcus
Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Frances Spivy-Weber, Vice Chair SWRCB
1001 I Street
Sacramento, CA 95812

Tam M. Doduc, SWRCB
1001 I Street
Sacramento, CA 95812

Steven Moore, SWRCB
1001 I Street
Sacramento, CA 95812

Dorene D'Adamo, SWRCB
1001 I Street
Sacramento, CA 95812

Thomas Howard, Executive Director
SWRCB
1001 I Street
Sacramento, CA 95812

Craig Wilson
Office of Delta Watermaster
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
CA DWR
3310 El Camino Avenue, Suite 300
Sacramento, CA 95814

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Kim Turner
Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski
Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Ste. 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Erin Foresman
USEPA Region 9
Water Division
75 Hawthorne Street
San Francisco, CA 94105

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino avenue, Suite 300
Sacramento, CA 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Michael Jackson
P. O. Box 207
Quincy, CA 95971

CENTRAL DELTA WATER AGENCY
235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone 209/465-5883 • Fax 209/465-3956

October 24, 2013

Craig Wilson
Delta Watermaster
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Re: 2013 SWP and CVP Violations of D-1641

Dear Mr. Wilson:

Thank you for your September 20, 2013, response to mine of August 13, 2013.

Our concern continues to be that actions of the operators of the SWP and CVP reflect a plan and practice of violating the Water Quality Standards to facilitate greater exports from the Delta. It is also our view that the SWRCB should enforce the Standards as against the SWP and CVP as they would as against any diverter not affiliated with the State or Federal government.

D-1641 which includes the water year classifications was adopted after CEQA review and more than eighty (80) days of quasi-adjudicatory proceedings. The water quality standards and other provisions are basically those put forth by the Department of Water Resources and the Bureau of Reclamation and their contractors. Balancing of the ability of the SWP and CVP to meet the water quality standards was a part of the SWRCB decision process. Meeting D-1641 is a condition to the SWP and CVP right to export water from the Delta and there should be no further balancing and changes to the standards except through an appropriate SWRCB proceeding with CEQA compliance. The water quality criteria are geared to water year classifications based on unimpaired runoff for the current year and the index for the prior year. A final determination is made in May by and published by the Department of Water Resources in Bulletin 120. The determination is based on hydrologic conditions to date plus forecasts of future runoff assuming normal precipitation for the remainder of the water year. As of May 1st, the actual forecast is limited to the months of May through July and is required to be based on runoff assuming normal precipitation. The variations due to depletions and droughts were well understood by the Water Year Hydrologic Classifications designers. The weighting of the Index Formula coupled with the inclusion of the previous year's index more than adequately accounted for variables in hydrology and the ability of the projects to meet the criteria. The flexibility is in

the amount of surplus water available for export not balancing the degree of violation of the standards.

THIS MATTER MERITS FURTHER INVESTIGATION.

The absence in the correspondence of the project operators, the fish agencies and the SWRCB of any consideration or even mention of the possibility of reduction of exports to save cold water in Shasta for fish is disturbing and raises the possibility of a concerted plan to violate the water quality standards to favor exports from the Delta.

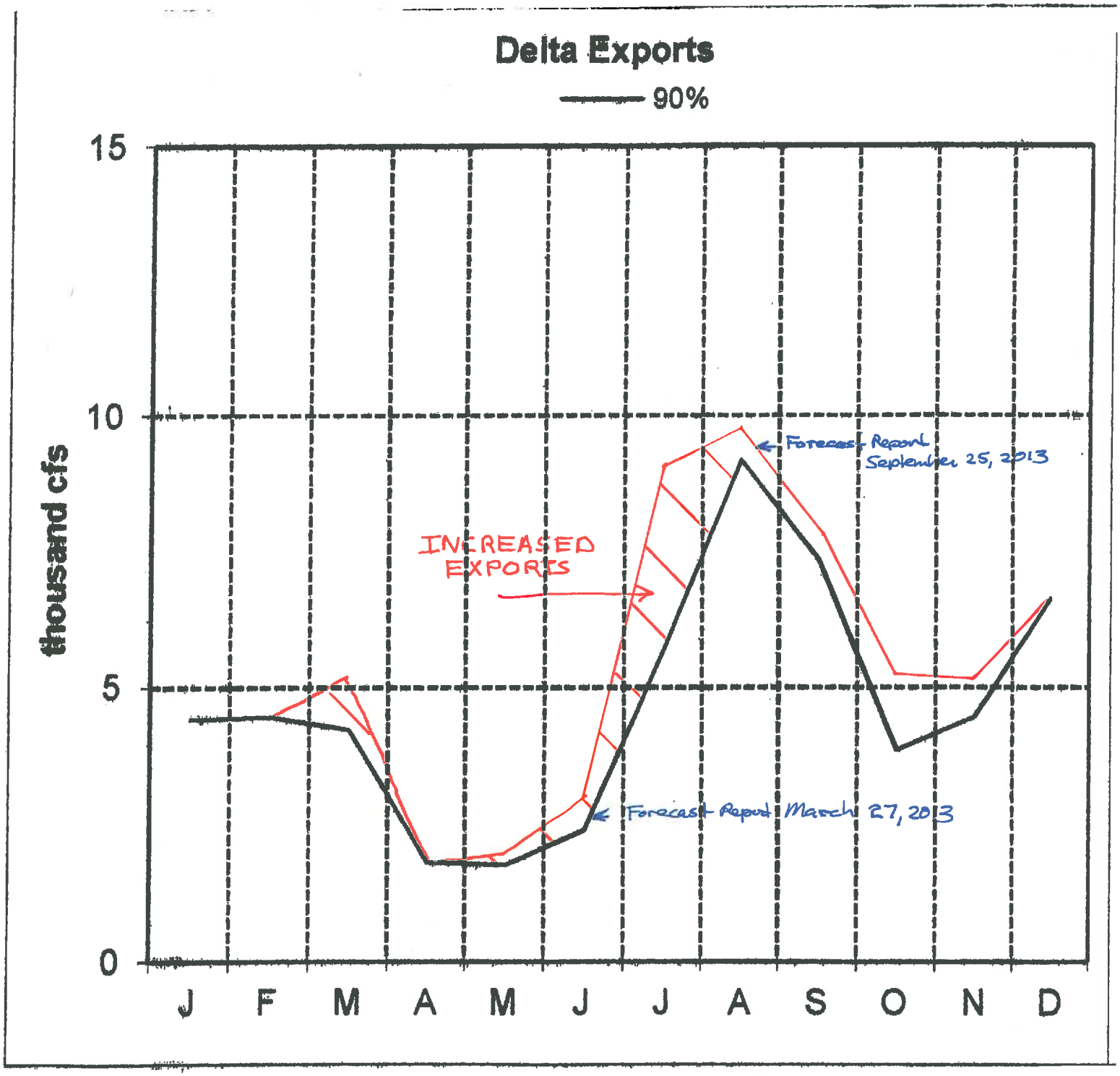
Your letter cites "the ability of the Projects to curtail contract water deliveries during the middle of the irrigation system is also problematic." By May 17, 2013, water contractors were on notice that water deliveries would be curtailed. On March 22, 2013, the DWR gave notice to its contractors that the projections for meeting the State Water Project (SWP) contractors' 2013 Table A requests were being reduced from 1,668,958 acre feet to 1,460,342 acre feet (see Attachment A). Of the 1,460,342 acre feet, 1,359,674 acre feet were to be exported from the Delta by way of the Bank's Pumping Plant.

During the period of January through September of 2013, the State diverted 1,540,496 acre feet through the Bank's Pumping Plant. This is 180,822 acre feet more than was projected. For the Water Year, the Bank's State pumping totaled 2,186,452 acre feet which is 826,778 acre feet more than was projected. It would appear that not only did the State not curtail exports to save cold water for fish but it appears that they increased exports.

On the CVP side, it appears that they met their allocations without any curtailment to preserve additional cold water for fish. Attachment B shows the CVP March 22, 2013, Water Supply Allocation Update and Attachment C with a revised date of 7-17-13 shows the allocations were as projected on March 22, 2013, with the "South of Delta" total of 1,639,639 acre feet. The CVO Delta Operations Reports show the Jones Pumping Plant totals for the water year to be 1,647,981 acre feet.

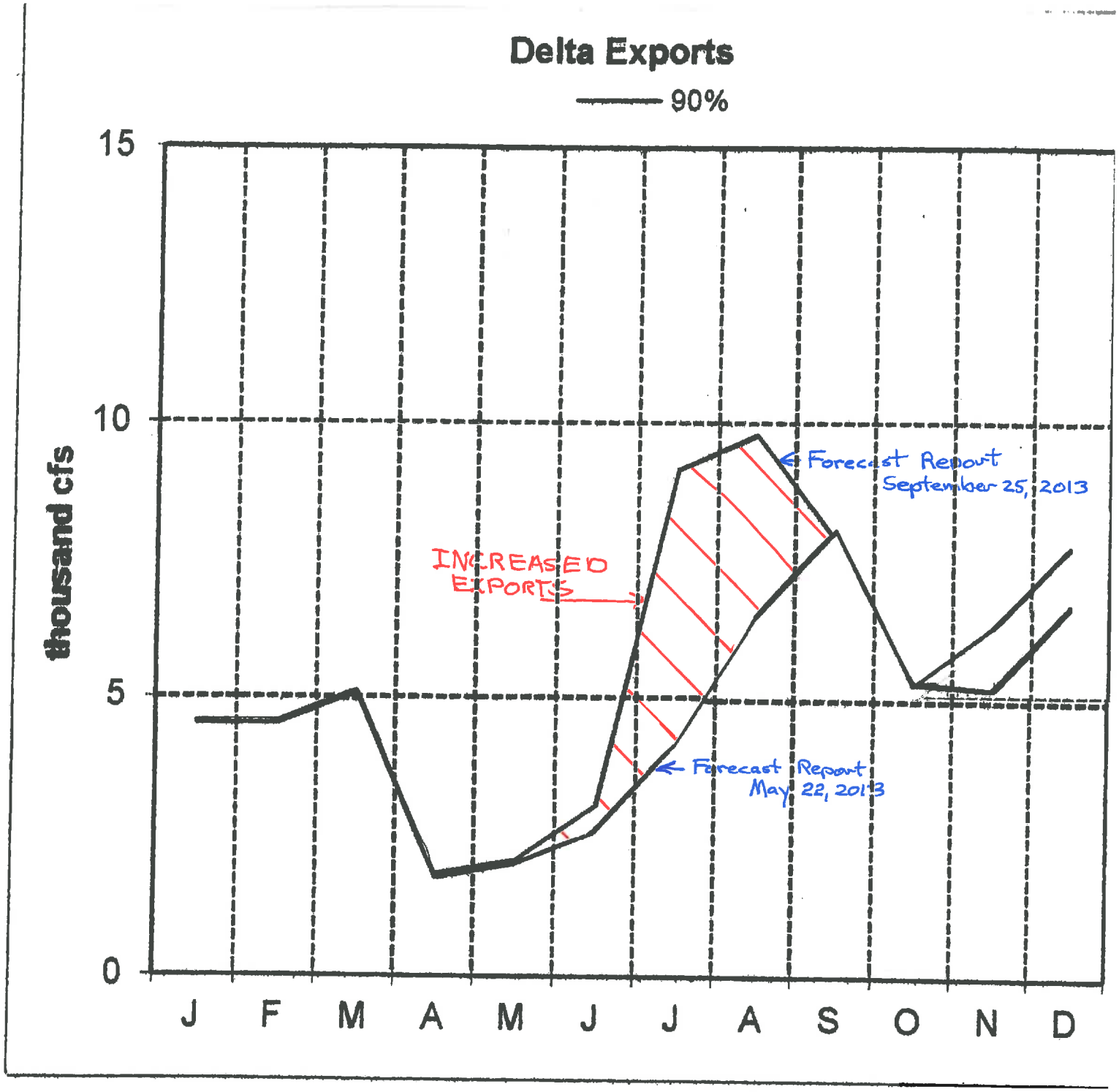
The CALFED Operations Group website contains some agendas, reports and notes for their meetings. The reports include forecasts of Delta exports.

Figure One is an overlay of the Delta Exports forecast chart included in the report for the March 27, 2013, meeting (Attachment D based on March Water Supply Forecast) with the Delta Exports chart in the report for the September 25, 2013, meeting (Attachment E based on Historical Water Supply Forecast). The red crosshatching reflects the increase in exports as compared to the March Forecast. This shows an increase in exports during the April to June 15 period of violation of the D-1641 standards as well as an overall increase. Figure Two is an overlay of the Delta Export forecast chart included in the report for the May 22, 2013, meeting (Attachment F based on May Water Supply Forecast) with the Delta Exports chart in the report



Flows are monthly averages.

FIGURE ONE



Flows are monthly averages.

FIGURE TWO

for the September 25, 2013, meeting (Attachment E based on Historical Water Supply Forecast). The red crosshatching reflects the increase in exports as compared to the May Forecast. This again reflects an increase in exports during the period of violation and an overall increase in exports.

The Agenda for the CALFED Operations Coordination Group May 22, 2013, meeting (Attachment G) contained the following:

"6. Potential Adjustment of D-1641 Standards for 2013 (P. Fujitani)."

The CALFED Operations Meeting Notes for May 22, 2013, reflects that the SWRCB staff member, R. Satkowski, was present (Attachment H). Perhaps he can shed some light on the discussion if any regarding increasing exports or the reasoning for not reducing exports to save cold water for fish. The CALFED Operations Group was apparently headed towards adjustment of the Standards. It would be interesting to know if they were planning to bring the matter to a SWRCB hearing similar to 2009 and at what point and pursuant to who's suggestion was it planned to allow violation of the Standards with an assurance of no enforcement.

COLD WATER FOR FISH

The correspondence from the project operators and fish agencies on or about May 17, 2013, seeking to violate the western Delta agricultural standards was based on the purported urgency to save cold water for fish.

Figure Three is a graph showing Shasta storage as compared to the historical average storage, and the storage for the years 1976-1977, 1991-1992, 2008-2009 and 2012-2013. This graph was produced from the CDEC Reservoir Reports.

On May 17, 2013, Shasta storage was 89% of the historic average and at 3,554,510 acre feet. A cold water urgency at this level is surprising and suggests the need for consideration of a new May minimum storage requirement in addition to the end of the water year (September) storage requirement for preservation of cold water for fish. This new urgency level for protection for fish can be compared to the February 2009 level of about 1,416,000 acre feet when the SWP and CVP claimed an urgency to preserve cold water in Shasta for fish. At that time the project operators claimed that violation of the D-1641 February outflow requirement to protect fish was needed to preserve cold water in Shasta for salmon. The SWRCB noticed a hearing and the evidence was clear that the projects were at the time exporting unregulated flow which if not exported would have caused the February fish outflow requirement to be met. The SWRCB took no action and did not even admonish the operators to refrain from such conduct in the future. The huge difference in the storage levels at which cold water preservation becomes an urgency needs further examination. The unfortunate result of the May 17, 2013, urgency has been a violation of the western Delta Water Quality Standards for agriculture, a relaxation of the cold

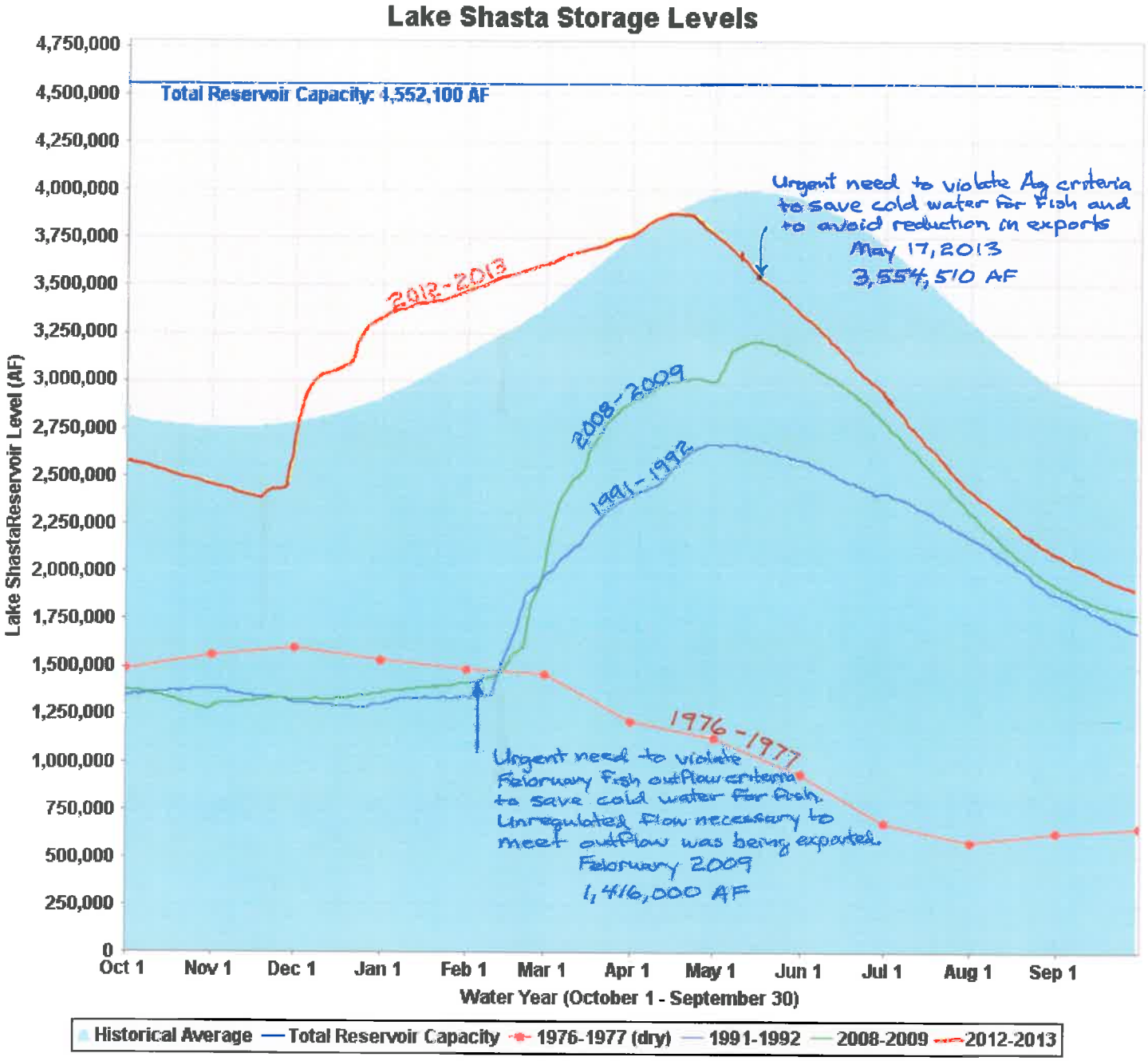


FIGURE THREE

water requirements for fish and an increase in exports from the Delta. If the May urgency for cold water preservation is real, then there is a need for additional carryover storage with a May minimum Shasta storage level. The project operators should be required to set forth a plan for future operation that will meet water quality standards and fish requirements and limit project exports accordingly.

We request that you further investigate the circumstances related to project operations this year and determine the following:

1) Was there an increase in project exports from the Delta over the forecasted quantities?

2) If there was an increase, did any part of this increase occur during the period when the western Delta agriculture water quality standards were being violated?

3) What amount of export curtailment would have been required to avoid the violation of the western Delta agricultural water quality standards and achieve 55,000 acre feet of cold water preservation?

4) What amount of cold water was preserved in Shasta, if any, by reason of the change in the location of the cold water requirement for salmon on the Sacramento River?

5) What amount of export curtailment would have been required to achieve the same quantity of cold water preservation as that achieved by the change in location of the cold water requirement for salmon on the Sacramento River?

6) What discussion, if any, took place at the CALFED Operations Meetings or otherwise with SWRCB staff during the months of April and May of 2013 regarding not curtailing and/or increasing exports from the Delta?

7) What examination, if any, was made as to the impacts of reducing Delta outflow to preserve the cold water for fish as compared to a reduction or avoiding an increase in exports?

Hopefully, you will further investigate this matter and the results of your investigation will help avoid a future re-occurrence.

Yours very truly,

DANTE JOHN NOMELLINI
Manager and Co-Counsel

DJN:ju
Enclosures
cc:

Felicia Marcus
Chair
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Frances Spivy-Weber, Vice Chair SWRCB
1001 I Street
Sacramento, CA 95812

Tam M. Doduc, SWRCB
1001 I Street
Sacramento, CA 95812

Steven Moore, SWRCB
1001 I Street
Sacramento, CA 95812

Dorene D'Adamo, SWRCB
1001 I Street
Sacramento, CA 95812

Thomas Howard, Executive Director
SWRCB
1001 I Street
Sacramento, CA 95812

Ronald Milligan, Operations Manager
Central Valley Operations Office
U.S. Bureau of Reclamation
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

David H. Roose, Chief
SWP Operations Control Office
California Department of Water Resources
Division of Operations and Maintenance
3310 El Camino Avenue, Suite 300
Sacramento, Ca 95821

Mark Cowin, Director
Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

David Murillo, Regional Director
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

Charlton H. Bonham
1416 Ninth Street
Sacramento, CA 95814

Maria Rea
Central Valley Office Supervisor
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Carl Wilcox
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Kim Turner
Assistant Field Supervisor
U.S. Fish & Wildlife Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mike Chotkowski
Field Supervisor
Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

South Delta Water Agency
4255 Pacific Avenue, Ste. 2
Stockton, CA 95207

North Delta Water Agency
910 K Street, Suite 310
Sacramento, CA 95814

Erin Foresman
USEPA Region 9
c/o NMFS
650 Capitol Mall
Sacramento, CA 95814

Paul Fujitani
U.S. Bureau of Reclamation
3310 El Camino avenue, Suite 300
Sacramento, CA 95821

John Leahigh
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Bill Jennings
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Michael Jackson
P. O. Box 207
Quincy, CA 95971

NOTICE TO STATE WATER PROJECT CONTRACTORS

Date: March 22, 2013

Number: 13-09

Subject: 2013 Table A Allocation Decrease

From: Carl A. Torgersen
Deputy Director
Department of Water Resources

The Department of Water Resources (DWR) is adjusting its projection for meeting the State Water Project (SWP) contractors' 2013 Table A requests.

DWR is reducing its projected delivery capability from 1,668,958 acre-feet to 1,460,342 acre-feet. This reduction equates to a drop in allocations from 40 percent to 35 percent for long-term SWP contractors. Enclosed is the revised 2013 SWP Allocation Table.

This decrease is primarily due to the well below average statewide snowpack and precipitation. DWR will continue to monitor the situation and may revise the allocations if warranted by the year's developing hydrologic and water supply conditions.

Based on this updated allocation, DWR will use the contractors' current 40 percent delivery schedules in developing new schedules, unless revised schedules are submitted. DWR will send an approved monthly water delivery schedule to each long-term contractor in April.

If you have any questions or need additional information, please contact Robert Cooke, Chief of DWR's State Water Project Analysis Office, at (916) 653-4313.

Enclosure

2013 STATE WATER PROJECT ALLOCATION
(ACRE-FEET)

SWP CONTRACTORS	TABLE A (1)	INITIAL REQUEST (2)	APPROVED ALLOCATION (3)	PERCENT INITIAL REQUEST APPROVED (3)/(2) (4)
FEATHER RIVER				
County of Butte	27,500	27,500	9,625	35%
Plumas County FC&WCD	2,410	2,410	844	35%
City of Yuba City	9,600	9,600	3,360	35%
Subtotal	39,510	39,510	13,829	
NORTH BAY				
Napa County FC&WCD	29,025	29,025	10,159	35%
Solano County WA	47,656	47,656	16,680	35%
Subtotal	76,681	76,681	26,839	
SOUTH BAY				
Alameda County FC&WCD, Zone 7	80,619	80,619	28,217	35%
Alameda County WD	42,000	42,000	14,700	35%
Santa Clara Valley WD	100,000	100,000	35,000	35%
Subtotal	222,619	222,619	77,917	
SAN JOAQUIN VALLEY				
Oak Flat WD	5,700	5,700	1,995	35%
County of Kings	9,305	9,305	3,257	35%
Dudley Ridge WD	50,343	50,343	17,620	35%
Empire West Side ID	3,000	3,000	1,050	35%
Kern County WA	982,730	982,730	343,956	35%
Tulare Lake Basin WSD	88,922	88,922	31,123	35%
Subtotal	1,140,000	1,140,000	399,001	
CENTRAL COASTAL				
San Luis Obispo County FC&WCD	25,000	25,000	8,750	35%
Santa Barbara County FC&WCD	45,486	45,486	15,920	35%
Subtotal	70,486	70,486	24,670	
SOUTHERN CALIFORNIA				
Antelope Valley-East Kern WA	141,400	141,400	49,490	35%
Castaic Lake WA	95,200	95,200	33,320	35%
Coachella Valley WD	138,350	138,350	48,423	35%
Crestline-Lake Arrowhead WA	5,800	5,800	2,030	35%
Desert WA	55,750	55,750	19,513	35%
Littlerock Creek ID	2,300	2,300	805	35%
Metropolitan WDSC	1,911,500	1,911,500	669,025	35%
Mojave WA	82,800	82,800	28,980	35%
Palmdale WD	21,300	21,300	7,455	35%
San Bernardino Valley MWD	102,600	102,600	35,910	35%
San Gabriel Valley MWD	28,800	28,800	10,080	35%
San Gorgonio Pass WA	17,300	17,300	6,055	35%
Ventura County WPD	20,000	20,000	7,000	35%
Subtotal	2,623,100	2,623,100	918,086	
TOTAL	4,172,396	4,172,396	1,460,342	

SWPAO
3/21/2013

Central Valley Project Water Supply

~ Interpreting Water Supply Forecasts ~

Download Map PDF JPG

Up-To-Date

- Reservoir Conditions Map
- CVP Operations
- Daily CVP Reports
- Monthly Delta Operations
- Hydro Cond Exec Summ
- Water Delivery Fact Sheet
- Water Contracts Fact Sheet
- Water Transfer Fact Sheet

Statistical Information

- CVP Contractors
- CVP Historical Water Allocations
- CVP Quantities/2013 Allocation
- Central Valley Water Contractors
- Water Delivered 2008 - 2011
- Water Transfers 2005-2011
- Annual Federal-State Operations Info 2012 (pdf - 58 KB)
- Water Year Carry Over Announcement 2013

NOAA Precipitation Predictions
1 Month 3 Months

Central Valley Project
Water Plan 2013 - March Update

Annual Federal-State Operations:

2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |

- 2013 Rescheduling Guidelines San Luis Reservoir (pdf - 59 KB)
- July 15, 2013 - Friant Division Allocation increased - *New*

Mid Pacific Region - CVP Water Year 2013 Water Supply Allocation Update: March 22, 2013									
	Sacramento Valley Water Year Type and Percentage of Average Runoff	North of Delta (percentages of contracted water supply)				South of Delta (percentages of contracted water supply)			
		AG	M&I	R	WR	AG	M&I	R	WR
Conservative Forecast (90%)	Critical 65% of Average	75	100*	100**	100***	20	70	100**	100***
Median Forecast (50%)	Dry 78% of Average	100	100	100	100	30	75	100	100
5 Yr Average Allocation		76	90	100	100	43	77	100	100

ATTACHMENT B

Ag = Agriculture M&I = Municipal and Industrial R = Refuges WR = Water Rights

* North-of-Delta M&I water service contractors who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.
* North-of-Delta M&I water service contractors who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.
* Contra Costa Water District, which receives water directly from the Delta, is allocated 75 percent of its historic use amount of 170,000 acre-feet.
**The allocation shown in the table for wildlife refuges applies to Level 2 water supplies. A full refuge water supply (including Level 2 and incremental Level 4 water) is 555,515 acre-feet. Level 2 is 422,251 acre-feet which accounts for approximately three-fourths of annual refuge needs.
*** The allocation for water rights contractors are based upon pre-CVP held water rights and wildlife refuge contractors are based upon pre-established Shasta inflow criteria.

News Release
(click to go to press release)

July 15, 2013

Reclamation Announces Update to the 2013 Central Valley Project Water Supply Allocation

Allocations Increased for Friant Division Contractors

The full CVP allocation follows, including the increased allocation for Friant Division Contractors.

North of the Delta Contractors

Sacramento River

- Agricultural water service contractors North-of-Delta are allocated 75 percent of their contract supply of 443,000 acre-feet.
- M&I water service contractors North-of-Delta who are serviced by Shasta Reservoir on the Sacramento River are allocated 100 percent of their contract supply.
- Sacramento River Settlement Contractors, whose water supply is based upon senior water rights and is subject to pre-established Shasta Reservoir inflow criteria, are allocated 100 percent of their contract supply of 2.2 million acre-feet.

American River

- M&I water service contractors North-of-Delta who are serviced by Folsom Reservoir on the American River are allocated 75 percent of their historic use.

In-Delta

- The Contra Costa Water District, which receives water directly from the Delta, is allocated 75 percent of its historic use amount of 170,000 acre-feet.

South of the Delta Contractors

- The allocation for agricultural water service contractors South-of-Delta is decreased from 25 to 20 percent of their contract supply of 1.965 million acre-feet.
- The allocation for M&I water service contractors is decreased from 75 to 70 percent of their historic use.
- San Joaquin River Exchange and Settlement Contractors, whose CVP water supply allocation is subject to pre-established Shasta Reservoir inflow criteria, are allocated 100 percent of their contract supply of 875,000 acre-feet.

Wildlife Refuges

- Wildlife refuges (Level 2) North- and South-of-Delta, which also have allocations subject to pre-established Shasta inflow criteria, are allocated 100 percent of their contract supply of 422,000 acre-feet.

Friant Division Contractors

- ***CHANGED July 15, 2013***: Friant Division contractors' water supply is delivered from Millerton Reservoir on the upper San Joaquin River. The first 800,000 acre-feet of water supply is considered Class 1 and the next 1.4 million acre-feet is considered Class 2. The Friant Division water supply allocation is increased from 55 percent to 62 percent of Class 1. Class 2 water remains at 0 percent.

Eastside Water Service Contractors

- Eastside water service contractors (Central San Joaquin Water Conservation District and Stockton East Water District), whose water supplies are delivered from New Melones Reservoir on the Stanislaus River, are allocated their full contract supply of 155,000 acre-feet.

Reclamation determines the water allocation for agricultural, environmental and municipal and industrial purposes based upon many factors, including water quality requirements, flow objectives, relative priority of water rights, and Endangered Species Act protection measures, including operational adjustments in accordance with biological opinions to protect threatened and endangered fish species.

Water supply updates will be made as appropriate and will be posted on http://www.usbr.gov/mp/pa/water. For additional information, please contact the Public Affairs Office at 916-978-5100 (TTY 916-978-5608) or email mppublicaffairs@usbr.gov.

###

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 western states. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at http://www.usbr.gov.

Top

Learn more about the Central Valley Project

Related websites include...

FWS NOAA CalWDWR

For assistance or additional information about this website, please contact Public Affairs
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, Sacramento CA 95825-1898
Main (916) 978-5100 | FAX (916) 978-5114 | TTY (916) 978-5608
Reclamation Officials' Telephone Numbers

July 31, 2013

Central Valley Project (CVP) Water Quantities
w/2013 Allocation

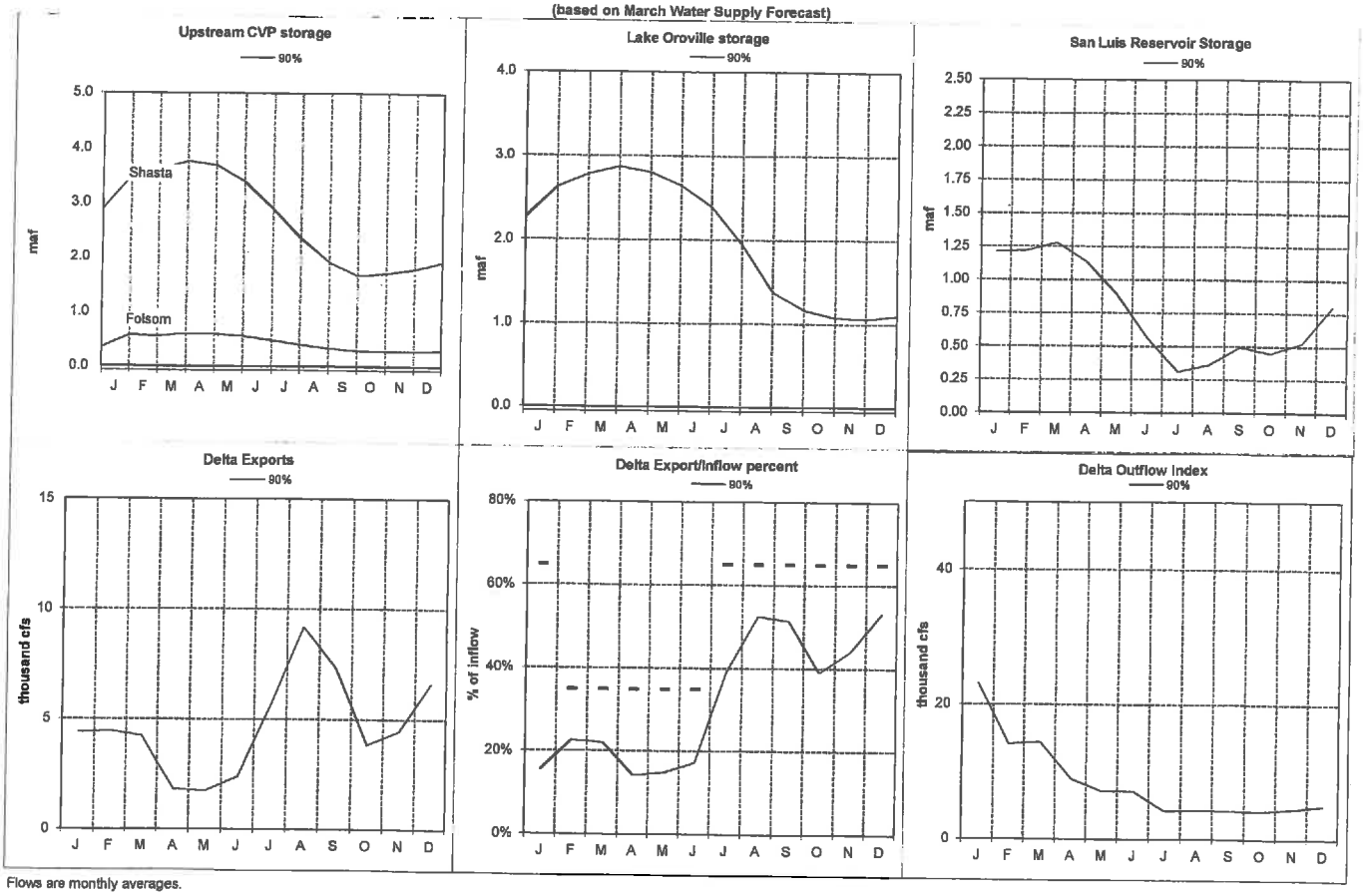
Contractors	Maximum per Contract or Agreement (acre-feet)	M&I Historical Use (1) (acre-feet)	Agricultural Use (2) (acre-feet)	2013 Allocation by %	2013 Allocation by acre-feet
North of the Delta					
American River M&I	313,750	178,077		75%	133,558
Sacramento River					
Water Service	468,990				
Agriculture			423,538	75%	317,654
M&I		45,452		100%	45,452
Water Rights (3)	2,115,620			100%	2,115,620
Refuge - Level 2 (4)	151,250			100%	151,250
South of the Delta					
Water Service	2,110,648				
Agriculture			1,967,677	20%	393,535
M&I		142,971		70%	100,080
Water Rights	875,023			100%	875,023
Refuge - Level 2 (4)	271,001			100%	271,001
Contra Costa In Delta	195,000	170,000		75%	127,500
New Melones East Side (5)	155,000			100%	155,000
East-Side Water Rights (6)	600,000				600,000
Friant					
Class 1	800,000			62%	496,000
Class 2	1,401,475			0%	0
Buchanan Unit	24,000				24,000
Hidden Unit	24,000				24,000
Total Contracted Water (7) (8)	9,505,757				5,829,672

Notes:

1. M&I historical use is computed when the M&I allocation is less than 100% and is based upon the average of actual deliveries made the last 3 years of unconstrained CVP delivery. The historical use for Contra Costa Water District is 170,000 acre-feet as agreed upon in contract renewal negotiations.
2. Agricultural use computed as maximum contract amount less M&I historical use, if any.
3. Sacramento River Water Rights includes: base supply (1,775,509 a.f.) & Project supply (340,111 a.f.)
4. Project also acquires up to 133,264 a.f. incremental Level 4 from willing sellers subject to availability and funding.
5. New Melones East Side allocation is computed as a quantity, rather than a percent, since only one group receives the water allocation.
6. Oakdale I.D. and South San Joaquin I.D. receive up to 600,000 a.f. of water annually based upon a 1988 Agreement and Stipulation in recognition of the Districts Melones water rights. The Districts are not allocated water, but rather receive water based upon in-flows into New Melones and application of a formula in the 1988 Agreement.
7. Water supplied to City of Sacramento under operations agreement not included: Amer. R. (245,000 a.f.) & Sacramento R. (90,000 a.f.)
8. Total does not include 800,000 CVPIA b(2) water provided out of Project yield for mitigation purposes.

SWP & CVP CY 2013 Forecasted Operations

(based on March Water Supply Forecast)



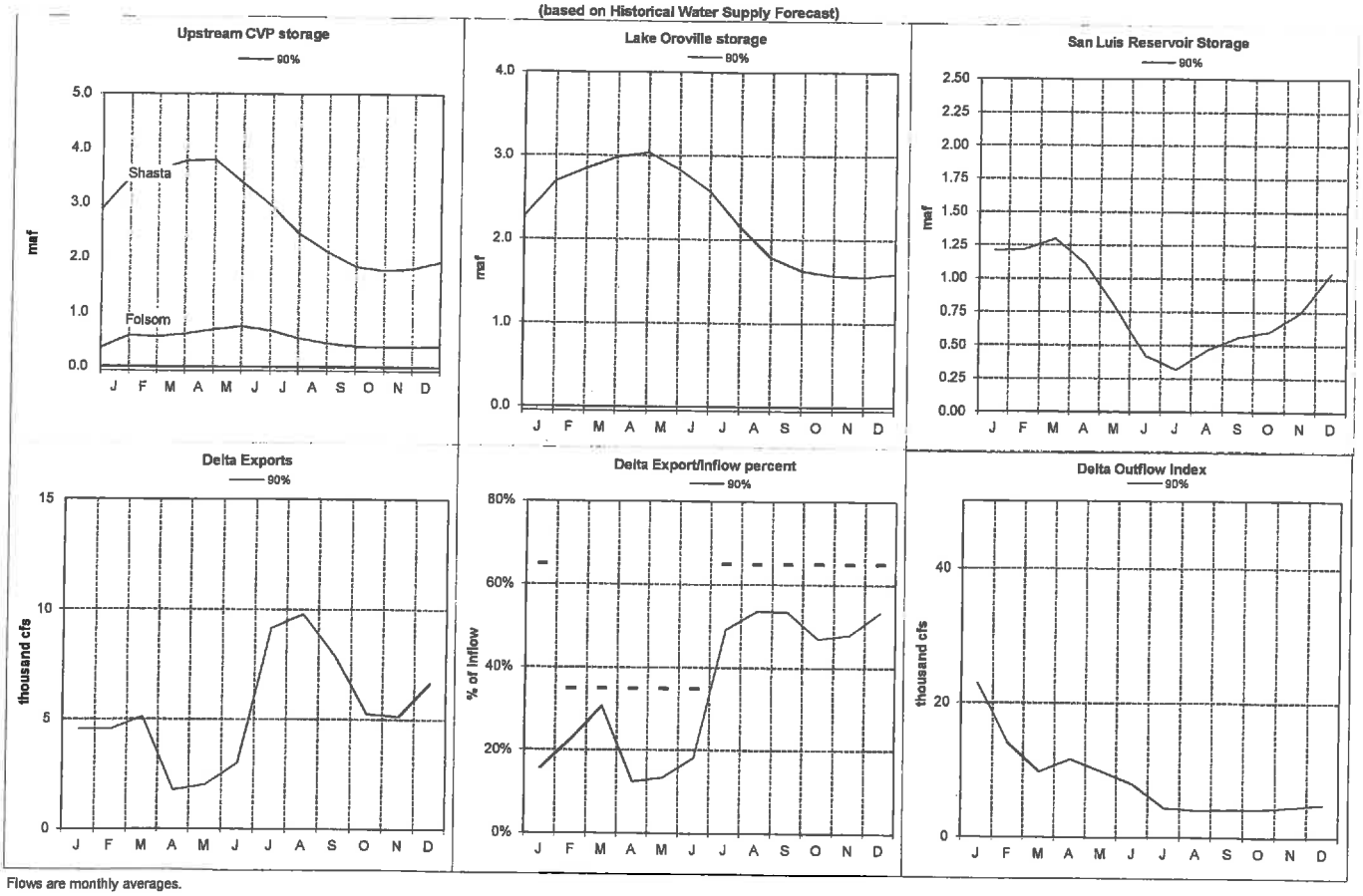
Flows are monthly averages.

PRELIMINARY DATA - SUBJECT TO REVISION

ATTACHMENT D

SWP & CVP CY 2013 Forecasted Operations

(based on Historical Water Supply Forecast)



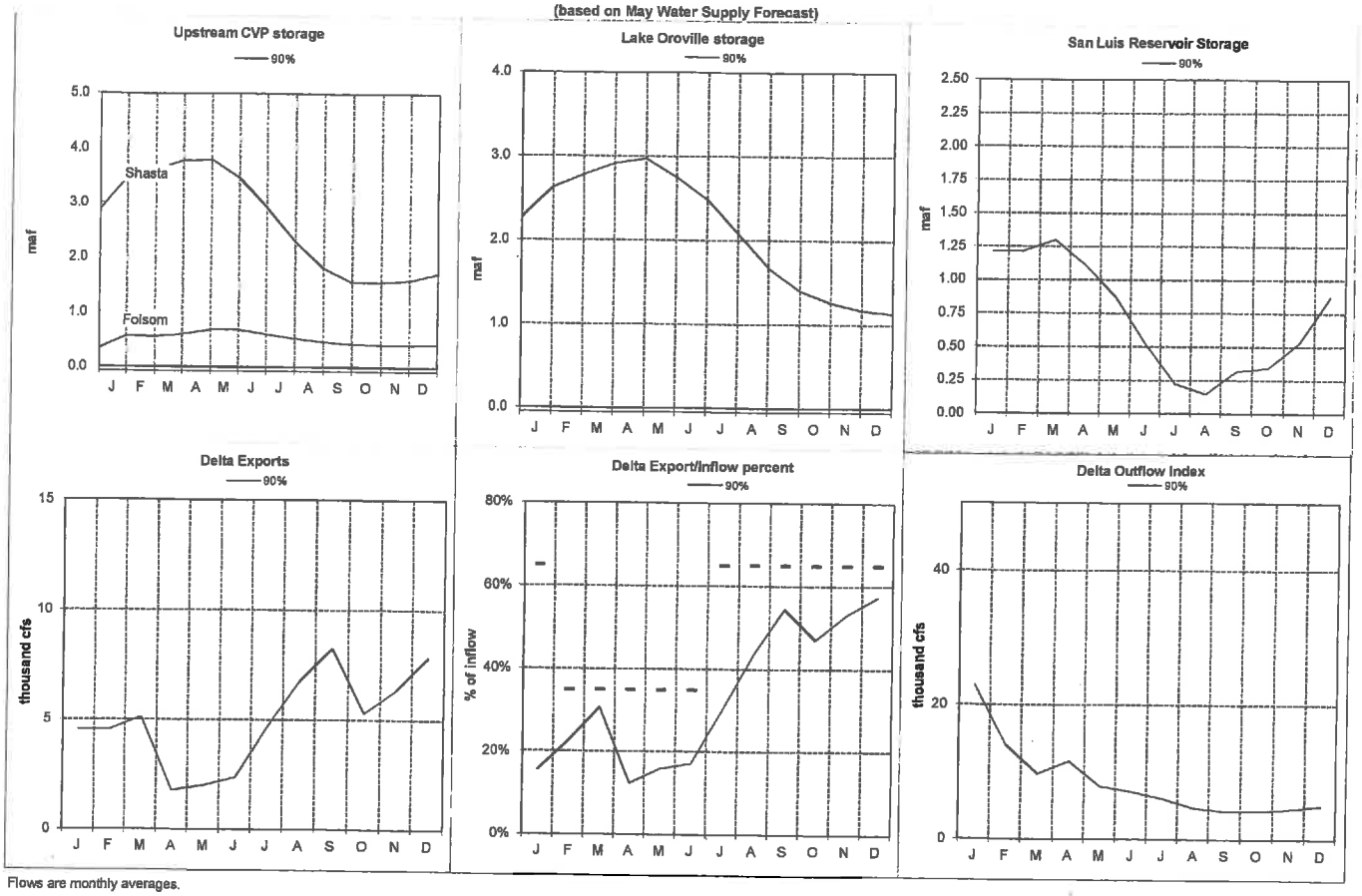
Flows are monthly averages.

PRELIMINARY DATA - SUBJECT TO REVISION

ATTACHMENT E

SWP & CVP CY 2013 Forecasted Operations

(based on May Water Supply Forecast)



Flows are monthly averages.

PRELIMINARY DATA - SUBJECT TO REVISION

ATTACHMENT F

CALFED OPERATIONS COORDINATION GROUP
AGENDA
Wednesday, May 22, 2013
1:00 – 2:00 p.m.
Conference Call Number (916) 574-2008

1. Announcements

2. SWRCB Activities Update (P. Fernandez)

3. Fishery Status
   Chinook (B. Oppenheim)
   Steelhead (B. Oppenheim)
   Green Sturgeon (B. Oppenheim)
   Delta Smelt (E. Gleason)
   Longfin Smelt (DFG)

4. Work Groups
   DOSS (B. Oppenheim)
   SWG (E. Gleason)
   SOG (B. Byrne)
   WOMT (M. Ford/P. Fujitani)

5. CVP/SWP Operations
   CVP (R. Yaworsky)
   SWP (A. Chu)
   Delta Criteria (A. Chu)

6. Potential Adjustment of D-1641 Standards for 2013 (P. Fujitani)

ATTACHMENT G

CALFED OPERATIONS MEETING NOTES
Wednesday, May 22, 2013
1:00 – 2:00 p.m.

SWRCB Update (R. Satkowski)

The Final Report prepared by Brock Bernstein on the Workshops held to support Phase 2 of the SWRCB Process has been finished.

The next steps after the Phase 2 workshops are to request input into the SWRCB process from the Delta Stewardship Council and the Delta Science Program. Information received from them will be distributed to stakeholders in the Phase 2 process.

The SED for Phase 1 will be finalized by summer/fall of 2013 in response to comments received so far.

Water transfers in 2013 will be expedited per Governor Brown's most recent Executive Order

Fisheries Update

Chinook Salmon, Steelhead and Green Sturgeon (B. Byrne) – A good indicator of salmon populations in the San Joaquin River is provided through the Mossdale trawls. 4500 juvenile Chinook salmon have been caught in the trawls since April of this year.

Chinook salmon and steelhead have been released at Durham Ferry in the last several weeks; survival estimates will be made later. Other studies are being done to provided data which will support VAMP data from previous studies.

Sacramento River: Winter-run and late fall run migrate past Chipps Island in April and May. Chipps Island catch showed an increase in April.

Salvage at Project Export Facilities for 2013 to date: Steelhead ITL = 3000, Actual Take = 1742. Winter Run ITL = 10,656, Actual Take = 731. No green sturgeon taken during 2013.

Delta smelt (E. Gleason) – Juvenile smelt take for 2013 is greater than 30% of the 2013 ITL so far; SWG expects to see a drop in salvage in the next week or two.

Longfin smelt (C. Dibble) – OMR no more negative than -5000 cfs is adequately protective of longfin smelt; conditions appear favorable given the current distribution of longfin.

DOSS – The Inflow/Export ratio for April and May of 2013 is 1:1 per the Biological Opinion. The OMR flow limit has been tripped occasionally during April and May by the

salvage density triggers at the export facilities but is has never limited project operations with the I/E ratio in place

SOG – The water year type has been classified as Dry on the Stanislaus River requiring a base flow of 200 cfs at Goodwin Dam from now on; the April-May pulse flow per the BiOp was modified in response to the OID/SSJID sale of 80TAF for environmental purposes.

Water Project Operations

CVP – Keswick @ 13000 cfs; Nimbus @ 1000 cfs; Goodwin @ 300 cfs , Jones PP @ 800 cfs

SWP – Oroville @3000 cfs, Clifton Court @ 700 cfs, and Delta Outflow approx. 7,100 cfs

CENTRAL DELTA WATER AGENCY

235 East Weber Avenue • P.O. Box 1461 • Stockton, CA 95201
Phone (209) 465-5883 • Fax (209) 465-3956

DIRECTORS
George Biagi, Jr.
Rudy Mussi
Edward Zuckerman

COUNSEL
Dante John Nomellini
Dante John Nomellini, Jr.

June 30, 2014

Clerk
State Water Resources Control Board
commentletters@waterboards.ca.gov

Re: 7/1-2/14 Proposed Regulation regarding drought related emergency regulations for curtailment of diversions to protect senior water rights - Part Two of Comments

Dear Ladies and Gentlemen:

This is Part Two of comments submitted on behalf of the Central Delta Water Agency and the diverters of water within the boundaries within the agency including RC Farms, Inc., a holder of riparian and other water rights within the Sacramento-San Joaquin Delta.

ENTITLEMENT OF DELTA DIVERTERS TO STORED WATER

The entitlement of Delta Diverters to stored water is not only based on water rights but is as to the SWP and CVP based on statutory mandates.

Water storage projects typically store natural flow in the winter and spring. The winter and spring natural flows, except in wetter years, would provide flushing of salts from the rivers flowing into the Delta and from the Delta into the Bay such that salt balance in the soil can be maintained and adequate protection can be provided to fish and wildlife and other Delta water use. This flushing action drives saline water farther out into the Bay thereby prolonging the availability of good water quality in the Delta pool. When the stored water is used within the watershed, the return flow is basically delayed return of natural flow. The improved summer flow is an offset or mitigation for reduced winter and spring flows. The balance is in effect a physical solution that advances the beneficial use of water.

The equity of such a physical solution is reflected in the statutory obligations of the SWP and CVP to the Delta and in the conditions imposed on the water rights for such projects. Such

statutory obligations require both mitigation and improvement.

The adverse impacts to Delta water supply and quality from State and Federal actions were clearly recognized. The near complete re-diversion of the Upper San Joaquin River to the south by way of the Friant Dam and Friant Kern canal deprived the Delta of the late spring and summer natural flow from the high Sierra snowmelt; the reverse flows and induced Bay salinity intrusion caused by export diversions; the increased salinity entering the San Joaquin River by reason of delivery of water to the west side of the San Joaquin River without a valley drain with an outlet to the ocean; the induced salinity intrusion from the Bay caused by channel enlargement for the Stockton and Sacramento ship channels, the reduced late spring and summer natural flows resulting from the State and Federal flood control projects; inducement of salinity intrusion by reason of planned permanent flooding of areas such as Lower Liberty island which increases the tidal prism and the project inducement of upstream development are examples. All of the above have the result of degradation of water quality.

In addition to the mitigation or physical solution aspects driving the statutory commitments of the SWP and CVP to provide stored water to the Delta was the purpose of providing such salinity control to benefit a broad range of purposes. Such purposes include protection of water quality at the CVP Tracy export pumps, the SWP export pumping facilities at Clifton Court, the Contra Costa Water District intakes, the Montezuma Slough gates to serve the Suisun Marsh, and the North Bay Aqueduct. Protection of fish and wildlife, water quality in the bays and meeting project contractual commitments are also served.

There should be no dispute that the Delta Protection Act (Water Code Section 12200 et seq.) prohibits project exports from the Delta unless the Delta is first provided an adequate supply.

DWR Bulletin 76, December 1960, report to the Legislature provided:

> "In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided." (See Exhibit 1)

The DWR and NDWA Contract provides:

> "(f) The general welfare, as well as the rights and requirements of the water users in the Delta, require that there be maintained in the Delta an adequate supply of good quality water for agricultural, municipal and industrial uses."
>
> "(g) The law of the State of California requires protection of the areas within which water originates and the watersheds in which water is developed. The Delta is such an area and within such a

> watershed. Part 4.5 of Division 6 of the California Water Code affords a first priority to provision of salinity control and maintenance of an adequate water supply in the Delta for reasonable and beneficial uses of water and relegates to lesser priority all exports of water from the Delta to other areas for any purpose."

United States vs State Water Resources Control Board 182 Cal.App.3d 82 (1986) at page 139 provides:

> "In 1959, when the SWP was authorized, the Legislature enacted the Delta Protection Act. (§§ 12200-12220.) The Legislature recognized the unique water problems in the Delta, particularly 'salinity intrusion,' which mandates the need for such special legislation 'for the protection, conservation, development, control and use of the waters in the Delta for the public good.' (§ 12200.) The act prohibits project exports from the Delta of water necessary to provide water to which the Delta users are 'entitled' and water which is needed for salinity control and an adequate supply for Delta users. (§§ 12202, 12203, 12204.)
>
> But the crucial question left unanswered by the protective legislation is exactly *what* level of salinity control the projects must provide . . ."

SWRCB D-1485 at page 9 provides:

> "The Delta Protection Act accords first priority to satisfaction of vested rights and public interest needs for water in the Delta and relegates to lesser priority all exports of water from the Delta to other areas for any purpose."

The level of salinity control the projects must provide is now set by federal statute, SWRCB water quality standards and contracts such as those for export and the contract with the North Delta Water Agency.

PL-99-546 (HR 3113) October 27, 1986, put to rest as to the CVP the question of the level of salinity control and the question as to any related payment. For meeting water quality standards in D-1485 the cost is to be allocated among the project purposes in accordance with existing reclamation law and policy - water and power contractors. The costs for complying with State water quality standards above those standards is to be non-reimbursable. (See Exhibit 21)

To the extent there is an issue of compensation with the State, it would appear to be a matter of coordination between the SWP and CVP or a matter of voluntary agreement with parties seeking improvement over and above the level already provided.

THE PROPOSED REGULATION FAILS TO ACCOUNT FOR THE INTER-RELATIONSHIP OF GROUNDWATER FLOW AND NATURAL FLOW IN THE DELTA WATERSHED

For much if not all of the Delta watershed the water in the upper groundwater aquifers is directly interconnected with the water in the surface channels. Extraction from wells depletes natural channel flow and in some cases reduces natural accretions to downstream portions of the tributaries and to the Delta. The inter-relationship is complex and requires a fact specific analysis requiring inclusion of the affected groundwater and surface water diverters.

The proposed regulation does not include a process for a proper adjudication of such issues prior to imposition of penalties.

The SWRCB has been approving surface water transfers which allow for the substitution of groundwater. Such a practice makes the SWRCB a party to the depletion of natural flow adversely impacting senior water right holders. This further necessitates that a proper adjudication before a court be held prior to the imposition of curtailment penalties.

The proposed resolution which is to protect senior water rights totally ignores the illegal diversions by the SWP and CVP and the possible use of water stored in San Luis Reservoir rather than curtailments to address Delta outflow needs.

Similarly, physical measures such as temporary operable barriers should be given further consideration. The relatively inflexible approach previously set forth is not the path for progress.

HEALTH AND SAFETY NEEDS

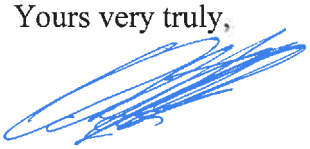
Health and safety needs should be addressed through financial assistance for water facility improvements or water purchases at the local community level. Trying to address health and safety needs with general water right curtailments requires specific control and analysis which is extremely difficult if not impossible to achieve even in a proper adjudication setting.

THE FAILURE OF THE SWP AND CVP TO DEVELOP SUFFICIENT WATER TO MEET THE WISHES OF THEIR EXPORT CONTRACTORS AND THEIR FAILURE TO PRESERVE FISH AND WILDLIFE AND OTHERWISE MEET THEIR OBLIGATIONS TO RESTORE THE NATURAL PRODUCTION OF ANADROMOUS FISH AS REQUIRED BY THE CVPIA (PL 102-575) IS DRIVING THE SWRCB STAFF RECOMMENDATIONS FOR THE PROPOSED REGULATIONS.

Proceeding with the proposed regulations as intended by staff will result in broad scale instability of water rights and severe economic consequences. Such consequences will be the result of SWRCB action which we respectfully submit is contrary to law.

A better alternative is to reject the proposed regulation and focus on particular issues as they arise. Helping parties work together to achieve real gains and only in extreme cases using existing authority to compel resolution.

Yours very truly,



DANTE JOHN NOMELLINI, SR.
Manager and Co-Counsel