

# ATTACHMENT D

UNITED STATES BUREAU OF RECLAMATION  
NEW MELONES RESERVOIR – WATER RIGHT PERMITS 16597, 16600, 20245  
(APPLICATIONS 14858, 19304, 14858B)

PETITION TO CHANGE STANISLAUS RIVER DISSOLVED OXYGEN (DO)  
COMPLIANCE POINT

- OID/SSJID and SEWD prepared this petition for Reclamation to request the State Water Board change the compliance point for dissolved oxygen on the Stanislaus River in Reclamation water right permits for New Melones Reservoir.
- Petition contains a summary of the water right process leading up to issuance of the permits, including testimony regarding the fishery needs on the Stanislaus River.
- Monitoring of fishery resources in the Stanislaus River, as well as a review of the temperature data, indicates that fish are not rearing at Ripon as temperatures exceed what is needed for the fish.
- Petition requests the State Water Board exercise its reserved jurisdiction to move the Stanislaus River DO compliance point from Ripon (River Mile 16) to Orange Blossom Bridge (River Mile 46.9) from June 1 through August 31.

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I. INTRODUCTION.

Pursuant to the requirements of State Water Resources Control Board (“SWRCB”) Decision 1422 (“D-1422”), Decision 1616 (“D-1616”), Decision 1641 (“D-1641”) and the Water Quality Control Plan, Central Valley Region, Fourth Edition, for the Sacramento River Basin (5A) and San Joaquin River Basin (5B) (“2004 CRWQCB Basin Plan”), the United States Bureau of Reclamation (“USBR”) is required to release stored water from New Melones Reservoir to maintain a dissolved oxygen (“DO”) concentration of 7.0 mg/L in the Stanislaus River as measured at Ripon.

The establishment of the 7.0 mg/L DO concentration is intended to preserve or enhance aquatic habitats, and spawning and rearing of salmon and steelhead. While the Stanislaus River contains fish and aquatic habitat that benefit from a minimum DO concentration of 7.0 mg/L, such fish and aquatic habitat are located far upstream of the Ripon compliance point during the summer months. As such, the USBR contends that the SWRCB should exercise its reserved jurisdiction to move the Stanislaus River DO compliance point from Ripon (River Mile 16) to Orange Blossom Bridge (River Mile 46.9) from June 1 through August 31.

II. BACKGROUND.

A. D-1422

In D-1422, the SWRCB required the USBR to release conserved water from New Melones Reservoir for water quality control purposes, including DO in the Stanislaus River. (D-1422, Condition 8). The SWRCB did not identify the DO concentration that the USBR would need to achieve in D-1422, but rather required the USBR to meet whatever DO concentration was required by any current and applicable Water Quality Control Plan. (*Id.*). Although no DO concentration requirement was established, D-1422 did establish that any Stanislaus River DO concentration requirement was to be met at Ripon, unless an alternative compliance location was approved by the SWRCB. (*Id.*).

The express purpose of the original request that a DO concentration in the Stanislaus River be met was “to protect the salmon fishery.” (D-1422, p. 12, citing RT 526). However, it is unclear from the hearing transcripts and written testimony considered at the hearings which culminated in D-1422 how the DO requirement would

protect the salmon fishery generally, or why the compliance point was established at Ripon.

Mr. Maurice Fjelstad authored a large portion of Chapter 2 of the California Department of Fish and Game's ("CDFG") "Report to the California State Water Resources Control Board On Effects of the New Melones Project on Fish and Wildlife Resources of the Stanislaus River and Sacramento-San Joaquin Delta ("1972 CDFG Report") which dealt with the predicted impact of the New Melones Project on the existing fishery resources of the Stanislaus River. (RT 520). His testimony is cited by the SWRCB in D-1422 in that the DO concentration is necessary to protect the salmon fishery of the Stanislaus River. (D-1422, p. 12). However, the citation relied upon by the SWRCB is of little specific assistance as to the importance of the DO concentration to salmon as it was just one part of a general answer given by Mr. Fjelstad in response to the question "Could you tell the board the specifics of – well, what the salmon need to survive?" Mr. Fjelstad responded to this question as follows:

"Well,..., the salmon's primary requirement is water at the right time and at the right place. They require suitable water temperature. Fifty to fifty-two degrees is ideal for spawning. The temperature during spawning should be below 58 degrees. After spawning, after incubation, the temperatures should remain below 70 degrees. They require suitable dissolved oxygen which should be no less than seven parts per million. And, as I said before, they require adequate flows for upstream migration, spawning, incubation of the eggs, and downstream migration." (RT 526).

While Mr. Fjelstad further testified in detail about the specific needs of the various life-stages of salmon, as was also provided in Chapter 2 of the 1972 CDFG Report, neither Mr. Fjelstad nor the 1972 CDFG Report provide any further detail as to the what particular life stages of salmon require a minimum DO concentration.

This lack of a discussion about how DO affects any or all of the salmon life stages is critical, as virtually all of the other proposed requirements are associated with a specific life stage. For example, CDFG recommended a minimum flow of 200 cfs from Goodwin Dam to the confluence with the San Joaquin River between October and December for purposes of allowing upstream migration and spawning and incubation of eggs. (1972 CDFG Report, p. 2-11, 2-12 and Errata Sheet). CDFG recommended a minimum flow of 150 cfs from January 1 through February 28 between Goodwin Dam and the confluence with the San Joaquin River for incubation and a variety of flows between Goodwin Dam and Ripon during the January through June migration period. (1972 CDFG Report, p. 2-12 – 2-17 and Errata Sheet). CDFG further recommended a flow of 100 cfs between Goodwin Dam and the confluence with the San Joaquin River during July, August and September to control vegetative encroachment on spawning

gravels, maintain suitable temperature and maintain suitable DO. (1972 CDFG Report, p. 2-17).

While there is a specific reference to DO during the summer months, this reference is particularly vague when compared to the other recommendations. In fact, it is not at all clear whether or not the reference to DO in the summer months has anything to do with fall run salmon at all. CDFG specifically stated

“Summer flows are essential...in maintaining suitable dissolved oxygen and temperature levels for resident fishes and any steelhead and spring-run salmon populations which might develop in the Stanislaus River and will sustain juvenile salmon that stay in fresh water for one year.” (1972 CDFG Report, p. 2-17).

From the construction of the sentence, CDFG is certainly stating that DO will assist resident fish and any steelhead or spring-run salmon, but it is not clear if CDFG is stating that DO is needed by juvenile salmon, or if the recommended summer *flows* will “sustain” such fish. Indeed, given that Mr. Paul Jensen, testifying on behalf of CDFG, stated that “juvenile fall run king salmon would not normally be expected to be in the river much beyond June,” (RT 620) and that therefore summer temperatures were not a concern or limiting factor for salmon, it seems that the statement on page 2-17 of the 1972 CDFG Report must be read to state that DO in the summer is only important for steelhead and spring-run salmon if such populations might develop. This conclusion is bolstered further by Mr. Jensen’s testimony that “[i]n July, August and September the salmon are gone.” (RT 635).

A complete review of the evidence and testimony submitted to the SWRCB does not resolve the ambiguity. Clearly, at least as a general matter, the CDFG is recommending that a DO requirement is needed to protect the salmon fishery in the Stanislaus River. However, since there is no specific discussion as to the specific life stage or stages that the DO requirement is to protect or promote, there is no geographic area at which such DO requirement must be met. As noted above, the specific purpose that the other recommended conditions – such as flow or temperature – was to promote or protect determined where, in a geographic sense, such condition would be applicable. Thus, flows recommended for upstream migration were applicable throughout the Stanislaus River, whereas other flow recommendations were applicable primarily between Goodwin Dam and Ripon.

Despite the lack of specificity as to the purpose of the DO requirement requested by CDFG (beyond the general “for the protection of the salmon fishery”) and therefore the lack of geographic location(s) at which such requirement must be met, the SWRCB nonetheless agreed to condition the USBR’s permits on, among other things, the requirement that the USBR make releases of conserved water from New Melones for the purpose of meeting DO. (D-1422, p. 31, Condition 5). Additionally, although there is apparently no discussion as to the purpose of the DO requirement, and therefore no

geographic area of compliance, the SWRCB nonetheless established the DO compliance point at Ripon. (Id.).<sup>1</sup>

## B. D-1616

D-1422 dealt with the USBR's request for permits to divert water into New Melones for storage. In D-1616, the SWRCB considered the USBR's request for permits for direct diversion at New Melones.

While granting the permits requested by the USBR, the SWRCB prohibited any direct diversion for consumptive use if the DO concentration, as measured at Ripon, is less than that specified in the April 1975 version of the SWRCB's Water Quality Control Plan, San Joaquin River Basin 5C. (D-1616, Condition 12 and 13). As in D-1422, the SWRCB left open the possibility that it would consider and approve an alternate location for measuring compliance with the Stanislaus River DO concentration requirement. (D-1616, Condition 13).

CDFG did initially protest the USBR's permit application, but the protest was resolved before the conclusion of D-1616 through an agreement between the USBR and CDFG. As such, the SWRCB made no specific statements or findings regarding either the purpose of the continued DO concentration requirement or the continued use of Ripon as the compliance point of such requirement.

## C. Current Permit Conditions

The USBR's permits for the New Melones Project were modified by the SWRCB in D-1641. These modifications were minor and still require the USBR to release stored water and/or refrain from directly diverting water unless and until the DO concentration at Ripon is met. (D-1641, p. 160 and 162).

The DO concentration requirement itself has changed over time since it was first required in D-1422. Now, the DO concentration requirement at Ripon is that specified in the 2004 CRWQCB Basin Plan. According to this plan, DO objectives are established based upon general needs of the fishery resource specific to a particular river or stream in the basin. That is, as a general matter, streams are designated as "WARM," meaning the fishery resources of that water body are rely primarily on warm water habitat (such as sunfish or catfish), "COLD," meaning the fishery resources of that water body rely primarily on cold water habitat (such as rainbow trout or sculpins) and "SPWN," meaning the fishery resources of that water body utilize the water body for reproduction and early development (such as salmon or steelhead trout), and a general DO

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<sup>1</sup> In a personal communication with Mr. John Renning of the USBR in 2004, he suggested that Ripon was chosen as the compliance point not because of salmon, but rather due to the existence of numerous canneries in Ripon. These canneries had discharges of effluent that were high in biological or chemical oxygen demand. Mr. Renning's suggestion makes sense, as the SWRCB noted in D-1422 that the then-applicable water quality control plan included a requirement in the Stanislaus River for DO "as a result of waste discharges..." (D-1422, p. 12).

concentration is established for each of these fishery purposes. Unless an exception is made that requires either less or more stringent concentrations, water bodies designated as WARM shall not have DO concentrations that fall below 5.0 mg/L and water bodies designated as COLD or SPWN shall not have DO concentrations fall below 7.0 mg/L. (2004 CRWQCB Basin Plan, page III-5.00).

Since the Stanislaus River is designated COLD and SPWN, the DO concentration requirement is 7.0 mg/L. (2004 CRWQCB Basin Plan, p. II-8.00). Although the 2004 CRWQCB Basin Plan does not establish compliance points, the DO concentration of 7.0 mg/L must be met at Ripon as required by the USBR's permits for the New Melones Project.

### III. DO CONCENTRATION COMPLAINT POINT AT RIPON IS NOT NEEDED YEAR ROUND TO PROTECT THE SALMON OR STEELHEAD FISHERY.

The CDFG originally recommended a DO concentration requirement in the Stanislaus River "to protect the salmon fishery." (D-1422, p. 12, citing RT 526). Similarly, the current DO concentration requirement established by the CWRQCB is designed to protect the cold-water fishery and spawning fishes, which in the Stanislaus are primarily salmon and steelhead. While it is undisputed that salmon and steelhead exist in the Stanislaus River and that a DO concentration in the Stanislaus River for the protection of such fishery is appropriate, the compliance point of Ripon is not always appropriate for the protection of such fishery.

Geographically, the Stanislaus River extends approximately 60 miles from Goodwin Dam to the confluence with the San Joaquin River. Ripon is located approximately 44 miles downstream of Goodwin Dam, and approximately 16 miles upstream from the confluence of the Stanislaus and San Joaquin Rivers. As noted earlier, many requirements regarding flow, temperature, water quality, gravel size and other items are designed and intended to support, enhance or protect certain specific salmonid life stages. Salmon and steelhead in the Stanislaus River have five basic life stages: adult migration, spawning, egg incubation, juvenile rearing, and juvenile migration. By examining the timing and locations of these five life stages of salmon utilizing the Stanislaus River, it can be seen that the DO concentration requirement is not needed at Ripon on a year-round basis.

#### A. Fishery Resources

##### 1. Fall-Run Chinook Salmon

###### a. Adult Fall-Run Chinook Migration

In 1972, the CDFG reported that adult salmon migrated up the Stanislaus River between early October and late December, with migration reaching a peak in Late October and early November. (1972 CDFG Report, p. 2-4). Although this description of migration timing is over 30 years old, it remains fairly accurate. Since 1972, data

collected by private fishery consultants, non-profit organizations, and the CDFG demonstrate the majority of adults migrate upstream from late September through December with peak migration occurring from late October through early November (Table 1, Cramer Fish Sciences [CFS] unpublished data; Fishery Foundation of California [FFC] unpublished data; CDFG annual spawning survey reports). Yet, some adult migration has been observed as early as September and as late as January (Table 1).

In terms of location, adult migration in the Stanislaus River extends upstream from the river’s confluence with the San Joaquin River to the spawning grounds located between Riverbank (River Mile 33) and Goodwin Dam (River Mile 58.4).

**Table 1. Generalized upstream migration timing pattern observed at the Stanislaus River Weir near Riverbank (River Mile 31.2) during 2003-2005.**

<i>Date</i>	<i>% Adult Chinook</i>
Sep 1-15	0.02%
Sep 16-30	2.72%
Oct 1-15	18.35%
Oct 16-31	26.60%
Nov 1-15	32.69%
Nov 16-30	12.68%
Dec 1-15	5.60%
Dec 16-31	1.16%
Jan 1-15	0.15%
Jan 16-31	0.02%

b. Fall-Run Chinook Spawning

Adult fall-run Chinook salmon spawn soon after they complete their upstream migration and arrive at the spawning grounds. For Stanislaus River salmon, spawning generally takes place between October and December based on spawning surveys (Table 2). However, there is evidence from spawning surveys (Table 2) that indicates a small amount (i.e., 1.2%) of spawning activity may occur as early as September or as late as January. In addition, juvenile outmigration studies (CFS unpublished data) indicate that spawning activity can occur as late as February based on estimated incubation requirements (i.e., 40 to 60 days) and the presence of newly emerged fry observed in late April.

According to the Stanislaus River Fish Group’s (SRFG) “A summary of fisheries research in the lower Stanislaus River” (“SRFG 2004”), the spawning reach is about 25 miles long and extends from Goodwin Dam (River Mile 58.4) downstream to Riverbank (River Mile 33).

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**Table 2. Generalized timing pattern of spawning in the Stanislaus River based on redd counts from CDFG spawning surveys conducted 1998 to 2005. (CDFG annual reports).**

<i><u>Date</u></i>	<i><u>% redds observed</u></i>
Before Oct 1	0.1%
Oct 1-15	1.5%
Oct 16-31	10.5%
Nov 1-15	29.4%
Nov 16-30	29.4%
Dec 1-15	19.0%
Dec 16-31	9.0%
Jan 1-15	1.1%

c. Fall-Run Chinook Egg Incubation

The duration of salmon egg incubation varies significantly with water temperature, and Chinook salmon eggs require the accumulation of 888 Fahrenheit degree days (e.g., 1°F above freezing for one day) from the time that they are deposited by spawning adults until juveniles hatch and emerge from the gravel. (Piper and others 1982). Temperatures vary between years, within years, and by location, but based on typical fall/winter temperatures in the Stanislaus this translates to an incubation period of approximately 40 to 60 days. Based on documented spawn timing (CDFG annual reports) and the estimated number of days until hatching and emergence based on degree days, egg incubation generally extends from October through March.

Incubation occurs within the 25 mile spawning reach that extends from Goodwin Dam (River Mile 58.4) downstream to Riverbank (River Mile 33).(SRFG 2004).

d. Fall-Run Chinook Juvenile Rearing

Juvenile Chinook rearing in the Stanislaus River primarily occurs from mid December through May between Goodwin and Riverbank. However, some rearing may occur at different times and locations. For instance, some rearing may occur throughout the lower river below Riverbank from mid December through May when temperatures in the lower river are within tolerable ranges. However, the number of juveniles rearing in this lower reach is anticipated to be small based on abundance trends, migration timing, and fish size observed between Oakdale and Caswell; and any rearing that occurs below Orange Blossom Bridge is generally believed to be associated with fish migration or with displacement during pulse flows or flood control events

In addition, although most rearing juveniles migrate prior to June, some juveniles may continue to rear in the river above Orange Blossom Bridge (River Mile 46.9) throughout the summer and fall where temperatures are within tolerable ranges. However, based on snorkel surveys and outmigration data, it appears that very few juvenile salmon oversummer in the river. For instance, relatively low salmon densities are observed within the river after mid September (FFC unpublished data) and very few

juveniles are observed migrating the following winter (i.e., three to 29 individuals captured annually at Oakdale and Caswell combined; CFS unpublished data).

e. Fall-Run Chinook Juvenile Migration

For over a decade, rotary screw traps located at Caswell (River Mile 8.6) have collected data on out-migrating juvenile salmon. Rotary screw trap data indicate that about 99% of salmon juveniles migrate out of the Stanislaus River from January through May. (SRFG 2004). Fry migration generally occurs from January through March, followed by smolt migration from April through May. However, some juveniles have been captured at Caswell as early as December 22 (<1% migrating prior to January) and as late as July 3 (<1% migrating after May). (CFS unpublished data reports).

In the Stanislaus River, out-migration of juvenile salmon extends from rearing areas below Goodwin Dam (River Mile 58.4) to the river’s confluence with the San Joaquin River (River Mile 0.0).

f. Summary Fall-run Chinook Salmon Life Stage Timing and Geographic Location

From the above information, fall-run Chinook salmon life stage timing and geographic location within the Stanislaus River can be generalized as follows:

<u>Stage</u>	<u>Timing</u>	<u>Geographic Location</u>
Adult Migration	Late September - December	Goodwin Dam to confluence
Spawning	October – December	Goodwin Dam to Riverbank
Egg Incubation	October – March	Goodwin Dam to Riverbank
Juvenile Rearing	mid December – May	Goodwin Dam to Riverbank
	June – mid December	Goodwin Dam to Orange Blossom Bridge
Juvenile Migration	January – May	Goodwin Dam to confluence

2. Steelhead

a. Steelhead Adult Migration

Steelhead adults typically migrate from the ocean and into tributaries to spawn. However, unlike salmon, some adult steelhead may repeat their migration downstream out of the river after spawning to return to the ocean. (Shapovalov and Taft 1954; McEwan 2001).

In the Stanislaus River, there is little data regarding the migration patterns of adult steelhead since adults generally migrate during periods when river flows and turbidity are high making fish difficult to observe with standard adult monitoring techniques. A counting weir has been operated on the Stanislaus River from September to March in 2003-2004, September to April in 2004-2005, and September to December in 2005. Only two adult steelhead upstream migrants have been observed during these three years of monitoring. Of these two adult upstream migrants, one was observed in early January 2005 and the other during mid October 2005. Based upon this very limited data, it appears that adult steelhead may migrate into the Stanislaus River from at least October through January (CFS unpublished data). On the neighboring Mokelumne River, a longer time series of data (i.e., 12 years) exists to describe adult steelhead migration timing in the San Joaquin Basin. Results from the Mokelumne River study suggest that 97.7% of adult steelhead migration occurs from late September through March, although some fish have been observed as early as August 16 (Table 3; East Bay Municipal Utilities District unpublished data).

Limited data exists to describe the timing and frequency of occurrence of downstream migration after spawning. During three years of weir monitoring, nine spawned out adults that may have been migrating downstream out of the river to return to the ocean have been observed as early as December 27 and as late as March 18. It is generally believed that downstream migration of spawned out adults occurs soon after they have spawned. Based on this coupled with the few observations at the weir, adult downstream migration may occur from December through March.

Adult migration takes place in the Stanislaus River between the confluence with the San Joaquin River (River Mile 0.0) and Goodwin Dam (River Mile 58.4).

**Table 3. Generalized adult steelhead upstream migration timing pattern observed on the Mokelumne River at Woodbridge Dam during 1990-2001. Source: East Bay Municipal Utility District unpublished data.**

<u><i>Date</i></u>	<u><i>% Adult Steelhead</i></u>
Aug 1-15	0.0%
Aug 16-31	1.1%
Sep 1-15	1.1%
Sep 16-30	4.6%
Oct 1-15	7.4%
Oct 16-31	8.3%
Nov 1-15	14.0%
Nov 16-30	8.3%
Dec 1-15	9.5%
Dec 16-31	10.9%
Jan 1-15	7.2%
Jan 16-31	10.3%
Feb 1-15	8.9%
Feb 16-28	3.2%

Mar 1-15	3.4%
Mar 15-31	1.7%

b. Steelhead Spawning

As a result of poor visibility from high flows and turbid water conditions, there is little hard data regarding the spawning of steelhead in the Stanislaus River. However, based upon observations in the nearby Sacramento Basin (Hallock and others 1961) and limited data from the Stanislaus River (i.e., CFS unpublished weir and juvenile migration data), it is believed that steelhead spawn primarily between December and March.

During three years of weir monitoring, spawned out steelhead kelts have been observed as early as December 27 and as late as March 18 suggesting that spawning extends from at least late December through mid March (Table 4). Fry emergence is also an indicator of spawn timing and typically occurs 47 to 122 days after spawning (Barnhart 1986; Shapovalov and Taft 1954). Newly emerged rainbow/steelhead trout fry (i.e.,  $\leq 45$  mm) are typically observed in the Oakdale screw trap from March through May, and have been captured as early as January 24. Similarly, young rainbow/steelhead trout have been observed during snorkel surveys conducted by the FFC beginning in April. (Kennedy and Cannon 2002). These fry observations corroborate that spawning may extend from late December through mid March.

**Table 4. Monthly observations of steelhead kelts at the Stanislaus River weir during three seasons of monitoring.**

	2003-2004	2004-2005	2005-2006
December	1	0	0
January	2	1	No sample
February	2	0	No sample
March	1	2	No sample

Although no steelhead spawning surveys have been conducted in the Stanislaus River, it is believed that steelhead spawning primarily takes place between Goodwin Dam and Orange Blossom Bridge. (SRFG 2004).

c. Steelhead Egg Incubation

Steelhead egg incubation occurs from the time that eggs are deposited by spawning adults until they hatch and juveniles emerge. Length of time required for eggs to develop and hatch is dependant on water temperature and is quite variable; hatching varies from about 19 days at an average temperature of 60EF to about 80 days at an average of 42EF. (Barnhart 1986) After hatching, pre-emergent fry remain in the gravel living on yolk-sac reserves for another four to six weeks. (Shapovalov and Taft 1954); thus, incubation (i.e., deposition to emergence) may extend from 47 to 122 days. Based on estimated spawn timing, typical incubation temperatures, and emergent fry

observations (CFS unpublished juvenile migration data and FFC unpublished snorkel survey data observations), incubation in the Stanislaus River may occur from December through June.

d. Steelhead Juvenile Rearing

Juvenile rainbow/steelhead trout rearing in the Stanislaus River occurs year-round primarily between Goodwin Dam (River Mile 58.4) and Orange Blossom Bridge (River Mile 46.9). (CFS unpublished data; Kennedy and Cannon 2002). However, some rearing may occur at different times and locations. For instance, snorkel surveys by FFC indicate that the majority of steelhead rearing in the summer months takes place upstream of Orange Blossom Bridge, with the greatest abundance observed at Goodwin (River Mile 57.5) and Two-Mile Bar (River Mile 56.6). (Kennedy and Cannon 2002). In addition, some rearing may occur throughout the lower river below Orange Blossom Bridge during the winter months when temperatures in the lower river are within tolerable ranges. However, the number of juveniles rearing in this lower reach is anticipated to be small based on habitat suitability, angler observations, and limited snorkel survey data; and any rearing that occurs below Orange Blossom Bridge is generally believed to be associated with fish migration or with displacement during pulse flows or flood control events.

e. Steelhead Juvenile Migration

Over the past decade, the rotary screw traps at Caswell have typically been operated from January through June and the data indicates that steelhead outmigrate primarily from February through May (i.e., 95%). However, migration can begin as early as January and extend into June (CFS unpublished data reports).

The migration timing suggested by the Caswell data is also corroborated by observations made downstream at Mossdale on the San Joaquin River and in the neighboring Sacramento River Basin. To monitor emigration from the San Joaquin Basin, CDFG and the U.S. Fish and Wildlife Service (USFWS) operate a Kodiak trawl on the San Joaquin River near Mossdale on more of a year-round schedule and the trawl is believed to be more effective than rotary screw traps in capturing steelhead smolts. Similar to the timing suggested by catches at Caswell, steelhead were only captured from February through early June and 95% of the catch occurred from mid-March through May (USFWS unpublished data; Table 5). Additionally, Hallock and others (1961) found that juvenile steelhead in the Sacramento Basin migrated downstream during most months of the year, but the peak period of emigration occurred in the spring.

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**Table 5. Generalized timing pattern of steelhead outmigration from the San Joaquin Basin developed from Mossdale trawl catch data collected by CDFG and the USFWS from 1996 to 2004.**

<i><u>Date</u></i>	<i><u>% Juvenile Steelhead</u></i>
Feb 1-15	1.6%

Feb 16-29	0.0%
Mar 1-15	1.6%
Mar 16-31	3.1%
Apr 1-15	21.9%
Apr 16-30	29.7%
May 1-15	29.7%
May 16-31	10.9%
Jun 1-15	1.6%
Jun 16-30	0.0%

In the Stanislaus River, out-migration of juvenile steelhead extends from rearing areas below Goodwin Dam (River Mile 58.4) to the river’s confluence with the San Joaquin River (River Mile 0.0).

f. Summary Steelhead Life Stage Timing and Geographic Location

From the above, steelhead life stage timing and geographic location within the Stanislaus River can be expressed as follows:

<u>Stage</u>	<u>Timing</u>	<u>Geographic Location</u>
Adult Migration	Late September – March	Goodwin Dam to confluence
Spawning	December - March	Goodwin Dam to Orange Blossom Bridge
Egg Incubation	December – July	Goodwin Dam to Orange Blossom Bridge
Juvenile Rearing	Year-round	Goodwin Dam to Orange Blossom Bridge
Juvenile Migration	February – May	Goodwin Dam to confluence

B. Change in DO Compliance Point is Appropriate

The above information shows that neither salmon nor steelhead are located anywhere in the Stanislaus River downstream of Orange Blossom Bridge from June through August each year. Orange Blossom Bridge is located 31 miles upstream of Ripon. Yet, even though no salmon or steelhead are located between downstream of Orange Blossom Bridge from June through August, the current USBR permits require the DO concentration objective of 7.0 mg/L to be met at Ripon during this time period. Since the express purpose of the DO concentration requirement in the Stanislaus River is to support, protect and enhance the river’s salmon and steelhead fishery, it does not make any sense to require the USBR to continue to meet the DO concentration requirement at

Ripon during times of the year when there are no salmon or steelhead to benefit from such concentration.<sup>2</sup> In order to continue to protect the salmon and steelhead fishery while maximizing the available New Melones water for other beneficial uses,<sup>3</sup> the DO concentration compliance point for the period between June 1 and August 31 each year should be changed from Ripon to Orange Blossom Bridge.

Such a change is not unprecedented. Currently, there are four locations where more stringent DO concentration requirements than the general requirements established by the CRWQCB apply during certain specific times of the year. In the Sacramento River, the DO concentration between Keswick Dam and Hamilton City is 9.0 mg/L from June 1 through August 31. (2004 CRWQCB Basin Plan, p. III-5.00). In the Feather River, the DO concentration between Fish Barrier Dam to Honcut Creek is 8.0 mg/L from September 1 to the following May 31. (*Id.*). In the Merced River, the DO concentration is 8.0 mg/L all year from Cressy to New Exchequer Dam. (*Id.*). Finally, in the Tuolumne River, the DO concentration from Waterford to La Grange is 8.0 mg/L from October 15 to the following June 15. (*Id.*). Except for these specified times and locations, the general DO concentration limits established by the CRWQCB apply.

In each of these four instances, while it is not entirely clear as to the rationale behind the establishment of the more stringent DO concentration requirements for these specific reaches of river,<sup>4</sup> it appears that the reaches themselves constitute the primary spawning and rearing areas for salmon and/or steelhead. (*See* S.P. Cramer & Associates for Tuolumne and Merced Rivers; “Factors Affecting Chinook Salmon Spawning in the Lower Feather River (Fish Bulletin 179; Vol. 1 (2001)) p. 272 for Feather River, and NMFS (1997) for Sacramento River [winter run Chinook salmon]). That is, the DO concentration selected was then applied only to that portion of the river necessary to achieve the goal associated with the establishment of the DO concentration in the first place.

The same type of analysis should apply in the Stanislaus River. There are no salmon or steelhead downstream of Orange Blossom Bridge between June 1 and August 31 of each year. As such, the establishment and maintenance of the 7.0 mg/L DO concentration for some 31 miles between Orange Blossom Bridge and Ripon does not provide any benefit to either the salmon or steelhead fishery. The SWRCB should exercise the jurisdiction it has expressly reserved itself and change the DO concentration

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<sup>2</sup> The DO concentration of 7.0 mg/L requirement adopted by the CRWQCB is far in excess of what is needed by non-salmonid fishery resources. According to the E.P.A., DO concentrations in excess of 6.5 mg/L have no negative impact on non-salmonid fish at any life stage. (USEPA 1986).

<sup>3</sup> It must be remembered that the USBR’s permits require it to “release” water from water stored by the New Melones project to meet and maintain the DO concentration at Ripon. Since Orange Blossom Bridge is significantly closer to New Melones than is Ripon, it is expected that changing the compliance point will result in significant water savings during the critical summer months that could be made available for other beneficial uses consistent with the enumerated purposes of the New Melones project and the CVP.

<sup>4</sup> At least for the more stringent DO concentrations on the Tuolumne and Merced Rivers, there are no written records explaining how or why the reaches were chosen or the more stringent DO concentrations selected. (Personal communication between S.P. Cramer & Associates and Betty Yee of the CRWQCB, 2005).

compliance point between June 1 and August 31 of each year from Ripon to Orange Blossom Bridge.

#### IV. CONCLUSION

The over-riding legal and policy consideration regarding the development and use of water is to avoid waste and to maximize the reasonable and beneficial use of the scarce resource. In the case of the Stanislaus River salmon and steelhead fishery, the existing requirement that the DO concentration level be met year-round at Ripon is not in accordance with the overall policy of reasonable use. The needs of the salmon and steelhead fishery, for which the DO concentration level was specifically adopted, demonstrate that the compliance point for the DO concentration can be changed to Orange Blossom Bridge from June 1 through August 31 of each year. By so doing, the salmon and steelhead fisheries in the Stanislaus River will continue to be protected, and valuable water in New Melones reservoir can be applied to other beneficial uses that are not presently being met in full.

The USBR strongly urges the SWRCB to amend its permits for both storage at New Melones and direct diversion from the Stanislaus River at New Melones to change the DO compliance point from Ripon to Orange Blossom Bridge between June 1 and August 31 of each year.

Dated: October 1, 2006



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COUNSEL IDENTIFICATION AT END

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF CALIFORNIA

CONSOLIDATED SALMON CASES )  
SAN LUIS & DELTA-MENDOTA WATER )  
AUTHORITY, et al. v. LOCKE, et al. )  
STOCKTON EAST WATER DISTRICT v. )  
NATIONAL OCEANIC AND )  
ATMOSPHERIC ADMINISTRATION, et )  
al. )  
STATE WATER CONTRACTORS v. )  
LOCKE, et al., )  
KERN COUNTY WATER AGENCY, et al. )  
v. U.S. DEPARTMENT OF COMMERCE, )  
et al. )  
OAKDALE IRRIGATION DISTRICT, et al. )  
v. U.S. DEPARTMENT OF COMMERCE, )  
et al. )  
THE METROPOLITAN WATER )  
DISTRICT OF SOUTHERN CALIFORNIA )  
v. NATIONAL MARINE FISHERIES, et al. )

LEAD CASE NO: 1:09-cv-1053 OWW-DLB  
Consolidated Cases: 1:09-cv-1090 OWW-DLB  
1:09-cv-1378 OWW-DLB  
1:09-cv-1520 OWW-SMS  
1:09-cv-1580 OWW-DLB  
1:09-cv-1625 OWW-SMS

**DECLARATION OF AVRY DOTAN IN  
SUPPORT OF STANISLAUS RIVER  
PLAINTIFFS' MOTION FOR SUMMARY  
JUDGMENT**

Date: November 18-19, 2010  
Time: 9:00 A.M.  
Courtroom: 3  
Judge: Hon. Oliver W. Wanger

**Declaration of Avry Dotan**

- 1
- 2 1. I, Avry Dotan, declare that the facts set forth below are true and correct based on my own
- 3 personal knowledge and I could and would testify to them if called to do so.
- 4 2. I am a hydrologist and the owner and sole principal of AD Consultants, 15 Sullivan Drive,
- 5 Moraga, CA 94556.
- 6 3. I have over 25 years experience in modeling for water resources, environmental and
- 7 hydroelectric projects. I am specializing in computer modeling of complex water supply
- 8 projects, hydrology analysis, water temperature modeling, project operations, feasibility and
- 9 economic studies, and FERC licensing and re-licensing.
- 10 4. Since 1999 I have been the acting project manager and co-developer of the Stanislaus River
- 11 Water Temperature Model, Stanislaus-Lower SJR Temperature Model (CALFED ERP-02-
- 12 P28) and the San Joaquin River Basin-wide Water Temperature Model (CALFED ERP-06D-
- 13 S20).
- 14 5. I have developed these models in association with my sub-consultants Resource Management
- 15 Associates, Inc. (RMA) and Watercourse Engineering, Inc.

**DEVELOPMENT OF STANISLAUS RIVER TEMPERATURE MODEL**

- 16
- 17 6. Water temperature modeling of the San Joaquin River basin started as a grass-root project in
- 18 December 1999 when a group of Stanislaus river stakeholders decided to analyze the
- 19 relationship between operational alternatives, water temperature regimes and fish mortality in
- 20 the Stanislaus River. These stakeholders included the United States Bureau of Reclamation
- 21 (“USBR”), United States Fish and Wildlife Service (“FWS”), California Department of Fish
- 22 and Game (“CDFG”), Oakdale Irrigation District (“OID”), South San Joaquin Irrigation
- 23 District (“SSJID”), and Stockton East Water District (“SEWD”) (collectively the “Stanislaus
- 24 Stakeholders”). The Stanislaus Stakeholders decided to join resources and fund the
- 25 development of a high resolution reservoir operation - water temperature computer model
- 26 built on the HEC-5Q computer program.
- 27 7. The HEC-5Q is a generalized water quality computer program (software) designed by the US
- 28 Army Corps of Engineers that can be configured for any reservoir-river system. The HEC-5Q

1 is public domain software and can be obtained at no cost from the US Army Corps of  
2 Engineers.

- 3 8. The HEC-5Q is widely accepted software that has been applied to numerous reservoir-river  
4 systems in the US and worldwide. Examples of application of the HEC-5Q in the State of  
5 California in recent years (other than the Stanislaus and San Joaquin River) are: Russian  
6 River (Sonoma County Water Agency), Sacramento River (US Bureau of Reclamation) and  
7 the reach below Friant Dam in the upper San Joaquin River (US Bureau of Reclamation).  
8 The latter was subsequently connected to the San Joaquin Basin Wide Model, as discussed  
9 further.
- 10 9. The HEC-5Q allows assessing temperature and a conservative water quality constituent (such  
11 as dissolved oxygen and electrical conductivity) in basin-scale planning and management  
12 decision-making. For the Stanislaus (and later the San Joaquin River), however, only water  
13 temperature was considered.
- 14 10. The steps necessary to apply the HEC-5Q to a given system include: representation of the  
15 physical system (e.g, characteristics of reservoirs, water conveyers, rivers geometry, etc.),  
16 assembling hydrological and meteorological data (e.g., flows and weather data) and defining  
17 operating rules (e.g., flood control rules, diversions, in-stream flow requirements).
- 18 11. Once all of the above is implemented, the model is then calibrated. Calibration is a process in  
19 which various parameters are adjusted (e.g, heat exchange coefficients for air-water and  
20 sediment-water interface, stream bed roughness coefficients, etc.) until a good-fit of observed  
21 vs. simulated conditions (e.g, temperature profile in the reservoirs and temperatures along the  
22 stream) is obtained.
- 23 12. Model set up and calibration is usually the most labor intensive effort in the implementation  
24 of the HEC-5Q. Once the model is calibrated, running hypothetical scenarios are usually  
25 straight forward tasks as they involved replacing the historical data sets with new data sets  
26 that are usually defined outside the model itself (e.g, hypothetical diversions and in-stream  
27 flow scenarios). For example, some of the scenarios that we studied for the Stanislaus  
28 Stakeholders during the course of the work for the group were based on output from the

1 CALSIM II model.

2 13. For the Stanislaus Water Temperature Model, physical representation of the system included  
3 the characteristics of New Melones Reservoir, Tulloch Reservoir, Goodwin Pool and  
4 approximately 60 miles downstream to the confluence of the San Joaquin River.

5 14. In addition, special code was added to the model to accommodate several unique attributes,  
6 including complex geometry of the submerged (old) dam in New Melones Reservoir and the  
7 short residence time and unique diversion characteristics of Goodwin Pool

8 15. The old-new dam interaction came into play during the 1992 drought when New Melones  
9 was drawn down to almost dead-storage levels. Fortunately (modeling wise), extensive flow  
10 and temperature data were collected during that period that allowed us to calibrate the model  
11 for those critical conditions and ensure that this special code is properly implemented in the  
12 model. The old-new dam interaction is especially important when operating the system more  
13 aggressively as appears to be the case when operating for temperature control per Action  
14 III.1.2 of the BO.

15 16. The Stanislaus Water Temperature Model was calibrated for temperature data collected  
16 during the 1990 - 1999 historical period. The simulation period (i.e., the period for which the  
17 model conducted operations studies) was 1980 to 1999. This period was selected because it  
18 covered the full period since New Melones started filling up after the construction of the new  
19 Dam to the study date at the time. The simulation period was subsequently extended as the  
20 model evolved over the years.

21 17. The simulation period could have been extended to years prior to 1980, similar to the period  
22 modeled with CALSIM II, relatively easily using pre-processor tools already developed by  
23 RMA for this purpose. However, the Stanislaus Stakeholders agreed that the proposed study  
24 period 1980 to 1999 covers sufficient range of hydrologic condition (wet, normal, dry and  
25 critically dry), as well as filling and emptying cycle of New Melones, to provide the insight  
26 for temperature response in the system under hypothetical operational scenarios.

27 18. Furthermore, when modeling water temperature in a reservoir-stream system, the level of  
28 resolution of the model is by far more important than the length of the simulation period

1       itself. In the case of the Stanislaus River temperature modeling, the need to compute the  
2       temperature variation and extremes was very important as they are directly related to fish  
3       habitat conditions (i.e, egg development, fish survival and growth, out-migration, in-  
4       migration, etc.).

5       19. Once the Stanislaus Water Temperature was completed in 2001, the model was used by the  
6       Stanislaus Stakeholders to evaluate water temperature objectives at critical points in the river  
7       system that would enhance habitat conditions for fall-run Chinook salmon and Steelhead  
8       rainbow trout. This was done by running the model for different operational scenarios  
9       proposed, primarily, by the irrigation districts and CDFG (objectives were examined for each  
10      fish species individually, and then combined into one envelope of conditions for the two).

11     20. The HEC-5Q can simulate temperature conditions at any specified time interval resolution.  
12     For the Stanislaus Water Temperature Model, a 6-hour time interval was selected as it  
13     provided an adequate balance between run time (the shorter the time step the longer it takes  
14     to execute a run) and the level of resolution needed in order to capture the diurnal  
15     temperature variability in the stream (6-hour interval captures the minimum daily  
16     temperature, usually around 6:00 AM, and maximum daily temperature usually around 6:00  
17     PM). This “sub-daily” modeling is very important factor when studying temperature response  
18     in streams as temperatures could fluctuate significantly throughout the day as function of  
19     travel time and meteorological conditions (the farther the water travels from the source the  
20     closer it gets to ambient conditions). Sub-daily modeling is especially important when  
21     temperature objectives are also defined on a sub-daily basis. Modeling that would have  
22     coarse time steps (e.g., daily, weekly and monthly) tend to be biased towards the average and  
23     underestimate the extremes. **As a rule, modelers should employ time steps that are**  
24     **compatible with the level of resolution by which the results are tested.** This rationale was  
25     one of the primary reasons why the Stanislaus Water Temperature Model was developed, as  
26     the Stanislaus Stakeholders realized the need to evaluate the temperature regime in the basin  
27     on a sub-daily basis.

28     21. The Stanislaus Water Temperature Model was peer reviewed by Dr. Michael Deas, a

1 consultant retained by the Stanislaus Stakeholders to evaluate the suitability of the model for  
2 its intended purpose. After Dr. Deas submitted the peer review report in 2002 the model was  
3 unanimously accepted by the Stanislaus Stakeholders and adopted as the primary water  
4 temperature planning tool for the Stanislaus River. The Stanislaus River Water temperature  
5 Model has since been used by/on behalf the irrigation districts, CDFG and USBR.

6 **FIRST EXPANSION OF THE MODEL**

7 22. Upon reviewing modeling results, the Stanislaus Stakeholders recognized the need to extend  
8 the model to the Lower San Joaquin River thus enabling it to study the relationship between  
9 Stanislaus River operations and the temperature regime in the lower San Joaquin River as it  
10 flows to the Bay-Delta.

11 23. Due to limited funding available to the group, the Stanislaus Stakeholders asked me to  
12 submit a proposal to CALFED for the extension of the model.

13 24. In 2003, CALFED decided to fund the extension of the Stanislaus River Water Temperature  
14 Model to include the lower San Joaquin River (CALFED ERP-02-P28). A principal priority  
15 of this CALFED sponsored project was to develop a model capable of evaluating a wide  
16 range of alternatives for flow and water temperature management in the Stanislaus River and  
17 lower San Joaquin River. The project team was expanded and included Watercourse  
18 Engineering, Inc. and a peer review panel was assigned to assist in developing temperature  
19 criteria for the evaluation of model alternatives.

20 25. Once the model expansion was completed, the Stanislaus Stakeholders authorized the model  
21 to be used again to simulate different Stanislaus River operation scenarios, using water  
22 temperature objectives at critical points developed by CDFG, to estimate the magnitude and  
23 duration of water temperature conditions at critical points in the river and the effect on water  
24 supply and storage at New Melones. In 2006 I submitted a draft report to the Stanislaus  
25 Stakeholders describing the expanded model, the simulations conducted, and identifying the  
26 results of each simulation. In 2007 I submitted the final report to CALFED and released the  
27 final version of the model to the Stanislaus Stakeholders.  
28



**SECOND EXPANSION OF THE MODEL**

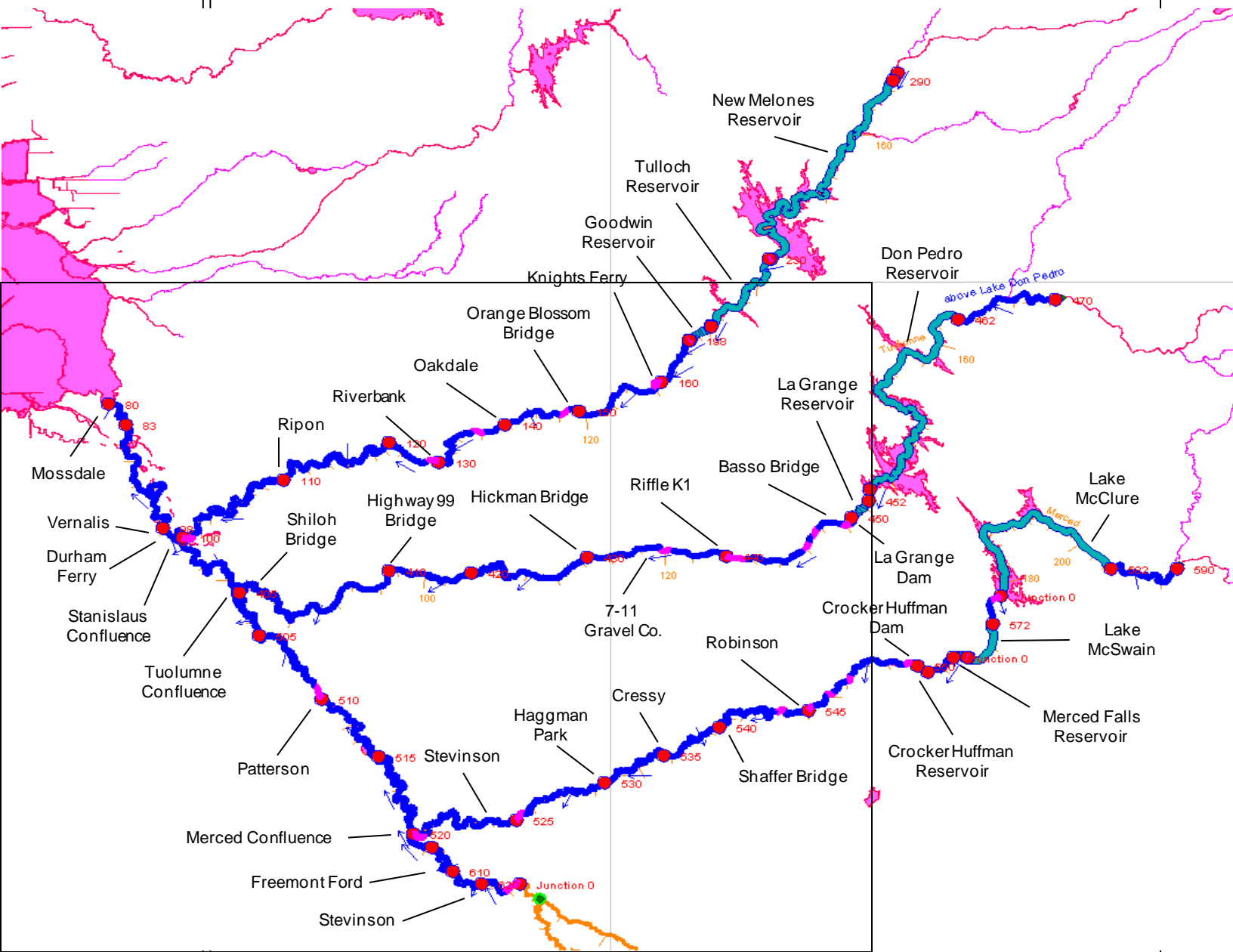
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26. The success of the Stanislaus work and the interest in this model expressed by the stakeholders from adjacent tributaries to the San Joaquin River (e.g. Tuolumne and Merced rivers), prompted CALFED to amend our existing contact and fund a second expansion of the model in 2004 (the work was done in parallel to finalizing our project report for the Stanislaus – Lower San Joaquin River Model). This extended the model to the entire San Joaquin River Basin below Stevinson (see the model extent on the map below). A beta version of the extended model, called the San Joaquin River Water Temperature Model (“SJRWTM”) was completed in 2006, peer reviewed by a group of scientists selected by CALFED, and approved by CALFED as a Directed Action (CALFED ERP-06D-S20) for further refinement and completion.
27. Through this second expansion, the Stanislaus Water Temperature Model became one component of the overall SJRWTM (the model can be run separately for each San Joaquin River tributary or for the entire San Joaquin River Basin as a whole).
28. As such, any references from now on in my declaration to the Stanislaus River Water Temperature Model imply the model developed for the Stanislaus River prior to the implementation of SJRWTM. Any references in my declaration to the SJRWTM imply the Stanislaus component within the SJRWTM.
29. As part of the development of SJRWTM, the simulation period was also extended through December 2007 and the model was re-calibrated given the additional data collected over this time period (hydrological, meteorological and observed temperature in reservoirs and streams).
30. In addition, more features were coded into the model to automate the computation process. Until then, the model was designed to compute the temperature response downstream to the reservoirs given prescribed release schedule. This so-called “top-down” approach is the classical way by which the original HEC-5Q operates. The new features used the “bottom-up” approach where target temperatures at compliance points are identified (could be at multiple locations and times in the year) and the model computes how much water should be

1 released from the reservoirs and when (taking into account travel time) in an attempt to meet  
2 the target temperature. Special constraints are imposed to ensure that the model's proposed  
3 releases are compatible with the physical system as well as with the operator's ability to  
4 manage those releases (e.g., ramping rates, channel capacity, maximum volume of water  
5 available to managers to mitigate temperature violations, etc.).

6 31. Upon finalizing the model, the HEC-5Q representation of the Friant reach, a separate model  
7 developed by the USBR under a contract with my sub-contractor RMA, was added to the  
8 model, thus making it a full San Joaquin Basin-wide model.

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1 testing phase of the model, the model was used to perform three broad categories of  
2 modeling studies: historical operations, alternative operations, and temperature target  
3 specification scenarios.

- 4 • Historical operations scenario – utilized historical hydrology and operations to form a  
5 baseline for comparative analysis with the other scenarios.
- 6 • Alternative operations scenario – focused primarily on the Stanislaus, where a set of  
7 prescriptive operations, such as instream flows, water allocations, and structural  
8 and/or operational changes, were implemented into the model.
- 9 • Temperature target specification scenarios – applied to the four-river model (all  
10 basins); temperature at key locations was specified and the system was re-operated to  
11 achieve those values.

12 33. The SJRWTM has already been used in several proceedings, including: analyses related to  
13 instream/temperature studies for the Stanislaus River, Friant Restoration Project,  
14 presentations for the SWRCB [303(d)/305(b)] workshop in 2007 (studies performed by the  
15 San Joaquin River Group Authority and CDFG), USBR Delta-Mendota Canal Recirculation  
16 Project, Tuolumne instream studies, and Tuolumne and Merced hydropower relicensing.

17 34. It is my understanding that the SJRWTM is intended to be the primary modeling and  
18 decision support tool for water temperature management in the San Joaquin River basin in  
19 the future.

#### 20 **OUTREACH, COLLABORATION AND TRAINING**

21 35. Since both the Stanislaus Water Temperature Model (including the expansion to include the  
22 lower San Joaquin River) and the SJRWTM were developed collaboratively by a variety of  
23 stakeholders, and beginning in 2002 with grant funding from CALFED, regular meetings  
24 were held by and among the stakeholders to discuss refinement, development, calibration and  
25 use of the two models.

26 36. Regarding the Stanislaus River Water Temperature Model, a standing committee known as  
27 the “Technical Advisory Committee” (“TAC”) was created. The TAC included  
28 representatives from the USBR and FWS.

1 37. On September 25, 2001, as part of the meetings of the TAC, we conducted a training session  
2 at the offices of OID in Oakdale and on how to run and use the Stanislaus River Water  
3 Temperature Model. Participants were asked to bring their individual laptops. During the  
4 training session the model was installed on their computers. Donald Smith, my sub-  
5 contractor from RMA presented an overview of the model's graphical user interface (GUI)  
6 which allows users to view modeling results, and then showed the steps needed to perform an  
7 actual run of the model. The model remained in the possession of the participants, and they  
8 were encouraged to continue to practice running the model after the training session. Two of  
9 the attendees at this training session were Randi Field of the USBR and Cesar Blanco of  
10 FWS. (See attendance sheet attached hereto as Exhibit A).

11 38. Regarding the SJRWTM, a kick-off meeting was held on April 22, 2005 at my office in  
12 Moraga, California. Representatives from NMFS, USBR and FWS all attended. The USBR  
13 attendee, Chief of Planning Lloyd Peterson, stated that the USBR was very pleased with their  
14 experience in using the HEC-5Q for the Sacramento River developed by exclusively for the  
15 USBR by RMA. He also mentioned the fact that the USBR is in the process of constructing a  
16 further extension of the model that would cover the area between Stevinson and Friant Dam  
17 on the upper San Joaquin River. The attendee from NMFS, Mr. Jeff McClain, indicated that  
18 one of NMFS' goals for the SJRWTM was to have a tool that would assess temperature on a  
19 sub-daily time step. (See Meeting Notes for April 22, 2005 meeting, attached hereto as  
20 Exhibit B).

21 39. During the April 22, 2005 kick-off meeting for the SJRWTM, a standing committee known  
22 as the "Super TAC" was established. The purpose of the Super TAC was to oversee  
23 implementation of the SJRWTM and development of alternatives to be evaluated with the  
24 SRJWTM. The Super TAC was expected to meet 4-5 times per year, and included  
25 representatives from the USBR, FWS and NMFS. (Also in Exhibit B).

26 40. Since 2000, there have been numerous TAC, Super TAC and other stakeholder meetings  
27 regarding the Stanislaus Water Temperature Model and the SJRWTM. Attendees have  
28 included Jack Rowel, Lloyd Peterson, Dave Robinson, Bill Green, Brian Deason, John

1 Hannon, Randi Field, Ken Yokoyama, Michael Tansey, Peggy Manza, Rick Johnson, Meri  
2 Moore, Lenore Thomas, Claire Hsu and Russ Yaworsky from the USBR, Madelyn Martinez,  
3 Jeff Mclain, Dennis Smith, Craig Anderson, and Erin Strange from NMFS, and Derek Hiltz,  
4 Joseph Terry, Craig Fleming, Scott Spaulding, Carl Mesick, Cesar Blanco, J.D. Wikert and  
5 Andrew Hamilton from FWS. (See various sign-up sheets, attached hereto as Exhibit C).

6 41. On October 30, 2007, we conducted another training session, this time for SJRWTM. The  
7 training session took place at the offices of Modesto Irrigation District in Modesto. The  
8 training was in the form of a presentation using a computer and projector by Donald Smith of  
9 RMA, and included step by step instruction on how to run the SJRWTM and view results.  
10 All the participants already had the SJRWTM installed on their laptop computer (the model  
11 itself and instructions how to install the model, run it, and view results were provided to the  
12 stakeholders several weeks in advance). During the presentation, a staff member of RMA and  
13 I walked around the room and provided assistance to people who struggled with keeping up  
14 with the pace of the training. Once again, the model loaded onto the participants' laptops  
15 remained in their possession and the participants were encouraged to continue practice using  
16 the model. Attendees at this training session included, among other stakeholders, Claire Hsu,  
17 David Mooney and John Hannon from the USBR, and Joseph Terry from FWS. (See  
18 attendance sheet attached hereto as Exhibit D).

19 42. On November 19, 2008, I sent again an email to all of the stakeholders for the SJRWTM,  
20 including the USBR, FWS and NMFS, which provided links to ftp site where the most recent  
21 version SJRWTM could be downloaded and detailed instructions for installing and running  
22 the model. (See, eg., AR 00089085-00089086). This was essentially the official pre-release  
23 of the SJRWTM with the intent to provide access to the model to stakeholders other than  
24 those who participated in the training session a year earlier.

25 43. On October 2009, I submitted the final project report to CALFED along with the final  
26 version of the model. Although the 2009 version was almost identical in terms of its  
27 functionality to the 2008 one, I have encouraged the stakeholders to use the latest version of  
28 the model as the best and final to eliminate any confusion about the various versions.

1 **REVIEW AND EVALUATION OF TEMPERATURE MODELING DONE FOR BO**

2 44. I was asked by the Stanislaus River Plaintiffs to review and evaluate the temperature  
3 modeling for the June 2009 Biological Opinion (BO), as it relates to the Stanislaus River.

4 Based on this review, I have formed the following opinions:

5 **45. Opinion 1 - The absence in the record of the actual temperature modeling tool used by**  
6 **Reclamation and NMFS limits the ability to assess whether the temperature modeling**  
7 **performed by the agencies provides any support for the Temperature Requirements of**  
8 **Action III.1.2**

9 46. On Wednesday, July 7, 2010, counsel for Stanislaus River Plaintiffs sent to me via e-mail  
10 one (1) Excel spreadsheet file, identified by the title "Field attached file –  
11 OCAP\_2008\_WaterTemp\_Stanislaus\_FWSFlows\_042109.xls." ("Federal Defendants'  
12 Stanislaus Temperature Results"). This file contains the results of a model run by the USBR  
13 regarding the impacts to temperature under one of the draft RPAs developed in 2009, but not  
14 of the RPA actually contained in the final BO. Counsel also forwarded to me, on the same  
15 day, a .pdf version of an e-mail from the NMFS administrative record, identified as NMFS  
16 AR 00211982. This email identifies the specific CALSIM II simulation that was the subject  
17 of the temperature run. On July 14, 2010 I received from counsel for Stanislaus River  
18 Plaintiffs a DVD which contained the specific CALSIM II simulation identified in NMFS  
19 AR 00211982, including all of the assumptions, inputs and other related materials. These  
20 materials can be found in the AR in the modeling DVD provided by the USBR.

21 47. In May 2010, and again in July 2010, I reviewed Appendix H of the August 2008 OCAP  
22 Biological Assessment which generally describes what is variously identified as either the  
23 "Reclamation Temperature Model" or "USBR Temperature Model." According to  
24 information provided to me by counsel for Stanislaus River Plaintiffs, the USBR  
25 Temperature Model" described in Exhibit H of the August 2008 OCAP BA is the model used  
26 to generate the results contained in the Federal Defendants' Stanislaus River Temperature  
27 Results.

28 48. Appendix H to the 2008 OCAP BA does not contain a copy of the USBR Temperature

1 Model. It directs readers to look at three reports, written by Rowell in 1979, 1990 and 1997,  
2 for a more detailed explanation of the USBR Temperature Model. I was not able to find any  
3 of those reports on-line, nor are they in the administrative record for this case.

4 49. Since the actual USBR Temperature Model that was used by Reclamation and NMFS was  
5 not made available in the administrative record for this case I was not able to evaluate its  
6 code to determine exactly how it works or to verify the results that are reported in the record.  
7 Moreover, without the actual model source code and/or its documentation, especially model  
8 calibration results, I was unable to determine whether the results it yields are valid or not.  
9 Thus, my review of the temperature modeling performed by the agencies relies on the limited  
10 information about the model that is in the record.

11 50. It is my understanding, and as explained in Appendix H to the 2008 OCAP BA, that “No  
12 formal process documented the quality assurance and data quality of the Reclamation  
13 Temperature Model. This model was developed at a time where specific documentation  
14 requirements were less stringent. A peer review of the Reclamation Temperature model has  
15 not been performed”.

16 51. Moreover, in absence of model calibration results, the agency modelers should have at least  
17 performed quality assurance (QA) checks for the USBR Temperature Model as part of the  
18 documentation of the BO itself. This could have been accomplished by simply simulating  
19 with the model the historical conditions in the river (e.g., a period for which water  
20 temperature data have been recorded) and comparing the simulated results with the observed  
21 data. I have not found any evidence in the record that the agency modelers performed these  
22 QA checks with the USBR Temperature Model in connection with the development of the  
23 BO.

24 **52. Opinion 2 – Mean Monthly Water Temperature data provide meaningless information**  
25 **regarding the temperature regime in the Stanislaus River in the context of meeting the**  
26 **temperature requirements of Action III.1.2.**

27 53. The BO specifies that compliance with the Stanislaus River temperature criteria set forth in  
28 Action III.1.2 “shall be measured based on a seven-day average daily maximum



1 temperature.” (BO, p. 621). The 7DADM is computed at the end of each day by adding the  
2 maximum temperature of the past seven consecutive days and dividing by seven. In  
3 practicality, this means that water managers must: a) keep track of the maximum temperature  
4 observed at the compliance point in the river every day and b) operate the system in any  
5 given day (i.e., make the appropriate release from Goodwin Dam for temperature control at  
6 the compliance location) in a way where the maximum temperature in that day added to the  
7 maximum temperature in the past six days and divided by seven, would not exceed the  
8 temperature required per Action III.1.2.

9 54. The fundamental question that a reasonably prudent temperature modeler must address,  
10 before even dealing with which is the appropriate computer model to be used in connection  
11 with the BO is how does the temperature in the river vary throughout the day and month and  
12 what level of resolution will provide meaningful information to assess temperature  
13 compliance per Action III.1.2.

14 55. To answer that question, I examined the observed water temperature at Orange Blossom  
15 Bridge (OBB), as recorded by the California Data Exchange Center (CDEC) maintained by  
16 the California Department of Water Resources (DWR). Figure 1 shows temperature variation  
17 in March 2010 at OBB. The figure shows that temperature could vary over 4° Fahrenheit (F)  
18 per day and over 8° F, from approximately 50° F to 58° F, throughout the month. The Mean  
19 Monthly Temperature in this case is 54° F, which is approximately 4° F below the monthly  
20 maximum and 4° F above the monthly minimum.

21 56. Figure 2 shows the computed 7DADM per the specification of Action III.1.2. The figure  
22 clearly shows that if the target temperature for the month is 55° F (which happened to be the  
23 temperature requirements for the month of March), then a Mean Monthly Temperature  
24 measurement would have shown 100% compliance with this requirements. However, if the  
25 measure for compliance is 7DADM, rather than a monthly mean, then approximately 50% of  
26 the time temperature would exceed the target and be out of compliance.

27 57. The USBR Temperature Model results provided by Federal Defendants, and which I  
28 reviewed, present temperature solely on a Mean Monthly basis with no mention to daily



1 maximums and/or 7DADM. From the description of the Reclamation Temperature Model in  
2 the record, this is the only type of temperature measurement that this model was capable of  
3 producing.

4 58. No reasonably prudent modeler could conclude that using a model that is only capable of  
5 assessing Mean Monthly Temperature should be used to predict compliance with respect to  
6 Action III.1.2, which requires compliance using the much finer 7DADM temperature  
7 measurement.

8 **59. Opinion 3 – The USBR Temperature Model is Too Coarse to Simulate, Predict or**  
9 **Evaluate the Feasibility of or the Impacts Associated With Meeting the Stanislaus River**  
10 **Temperature Requirements of Action III.1.2.**

11 60. To verify my Opinion 2, I sought to duplicate the analysis that Reclamation performed with  
12 the USBR Temperature Model with the SJRWTM to determine if there was a substantial  
13 difference in the results. Given that the record did not contain the USBR Temperature Model  
14 or any documentation about the methodology and assumptions embedded in the model to  
15 simulate temperatures in the Stanislaus River system, I had to evaluate the merit of the model  
16 as a modeling tool in the context of establishing the Stanislaus River Temperature  
17 Requirements per Action III.2.1, by reviewing the model results provided by the Federal  
18 Defendants. The evaluation process involved three steps:

19 61. First – I ran the SJRWTM for one case study produced by the Federal Defendants, as  
20 explained below.

21 62. Second – I compared the temperature variability at OBB, one of two compliance locations  
22 per Action III.1.2, as computed by the SJRWTM and the USBR Temperature Model.

23 63. Third – I evaluated the results of the two models in relation to the Temperature Requirements  
24 of Action III.1.2.

25 64. The case study that I have selected was labeled “Study 8.0 w/FWS Flows”. This case was  
26 identified to me by the Stanislaus River Plaintiff’s Counsel as the most conservative case  
27 upon which Action III.1.2 was ultimately based.

28 65. In order to produce the run with the SJRWTM, I had to match the total diversions at

1 Goodwin Dam and total release from Goodwin Dam to the Stanislaus River with those  
2 obtained from the CALSIM II results for this case. The CALSIM II results were extracted  
3 from the file:

4 “20090409\_OCAP\_Future\_Study8\_wQ4WQCPvnsQreqts\_&\_StanRPAw98\CONV\DSS\20  
5 20D09EDV.DSS”. This file was given to me by Mr. Dan Steiner, a consultant to the  
6 Stanislaus River Plaintiff’s Counsel. Mr. Steiner told me that this run contains the input  
7 hydrology that was used to run the USBR Temperature Model for the “Study 8.0 w/FWS  
8 Flows” case.

9 66. For quality assurance I have compared the New Melones storage as computed by the two  
10 models, as shown in Figure 3. The figure shows an overall good match between the two runs  
11 with minor mismatches in 1980 and early 2000. These mismatches are attributed to different  
12 boundary conditions in the two runs (CALSIM II starts at 1922 while the SJRWTM starts  
13 from the flood control rule curve in 1980) and probably slight differences in flood control  
14 rules between the two models. However, these mismatches are insignificant, in my opinion,  
15 as far as temperature outflow from New Melones is concerned.

16 67. My conclusion from the quality control check is that if there are discrepancies between the  
17 temperatures computed with the SJRWTM and the USBR Temperature Model, they must be  
18 attributed to the accuracy of the models themselves and not to the mass-balance calculations  
19 (i.e., inflow to New Melones, Goodwin diversion, Goodwin release, and the resulting storage  
20 in New Melones).

21 68. Next, I have examined the temperature at OBB as computed by the SJRWTM and the USBR  
22 Temperature Model. As shown in the example in Figure 4, temperature at OBB varies on an  
23 hourly basis within the day and on a daily basis within the month. While the SJRWTM  
24 computes the temperature variation throughout at 6-hour intervals and thus captures the daily  
25 maximums (and minimums), the USBR Temperature Model assumes constant temperature  
26 for the entire month.

27 69. Like with the previous example (observed data for the month of March 2010), the Mean  
28 Monthly Temperature as computed by the USBR Temperature Model, erroneously predicts

1 100% compliance with respect to the target, as shown in Figure 5. The SJRWTM, however,  
2 uses the 7DADM as a measure for compliance and shows a violation approximately 50% of  
3 the time, as also shown in Figure 5.

4 70. Figure 6 shows more examples where the Mean Monthly Temperature computed by the  
5 USBR Temperature Model predicts compliance with regard to the target while the SJRWTM  
6 that uses the 7DADM as a measure for compliance shows a violation.

7 71. It should be emphasized that none of results produced with the USBR Temperature Model  
8 that I was able to find in my review of the model discussed the relationship between the  
9 Mean Monthly Temperature and 7DADM which is the governing criterion for compliance.

10 72. In conclusion - the results generated by the USBR Temperature Model were so inaccurate  
11 that no reasonably prudent modeler could conclude that the USBR Temperature Model could  
12 serve as a useful tool for predicting compliance based upon a 7DADM compliance criterion.

13 73. **Opinion 4 – Even with the inaccuracy of the USBR Temperature Model, the modeling**  
14 **results demonstrate that the temperature requirements per Action III.1.2 are not**  
15 **attainable a significant percent of the time. This observation is even more pronounced**  
16 **using the SJRWTM.**

17 74. Figure 7 is a summary showing frequencies of meeting temperature targets (and violation of  
18 targets) specified for OBB per Action III.1.2. The case study again is “Study 8.0 w/FWS  
19 Flows”. The table in Figure 7 shows two columns for each month. One for modeling results  
20 produced by the SJRWTM (labeled “5Q”) and one produced by the USBR Temperature  
21 Model (labeled “NMFS”).

22 75. As shown in Figure 7, the NMFS’ results underestimate violations of the target 8 months out  
23 of the year (February to September). The NMFS violations are higher for October and  
24 November.

25 76. Given the above mentioned observation it is not clear to me what the rationale was for the  
26 temperature requirements set forth in Action III.1.2 as it is quite apparent that those  
27 objectives are not attainable a significant amount of the time even using the USBR  
28 Temperature Model as a predictive tool.

1 77. In conclusion – had the Federal Defendants used the SJRWTM to simulate the temperature  
2 condition under “Study 8.0 w/FWS Flows”, it would have been apparent that the temperature  
3 requirements under Action III.1.2 are not attainable even more often than estimated with the  
4 USBR Temperature Model.

5 **78. Opinion 5 – The USBR Temperature Model is deficient because it failed to evaluate the**  
6 **impact on New Melones storage when Action III.1.2 would be in place and therefore the**  
7 **feasibility of this proposed action.**

8 79. To analyze the feasibility of Action III.1.2, modeling wise, requires a two-step approach:  
9 First – minimum instream flow below Goodwin Dam is imposed on the system. Instream  
10 flow is the required minimum releases from Goodwin Dam downstream to the Stanislaus  
11 River as defined in Table 2E of the BO (Action III.1.3). Second – the temperature response  
12 to the minimum instream flow at the compliance locations is computed. If the 7DADM at  
13 the compliance location exceeds the target set forth in Action III.1.2 (temperature violation)  
14 there is a need to augment the minimum flow until the target is met. This type of analysis  
15 could be done either by a trial and error (probably the only option available when using the  
16 USBR Temperature Model) or by activating the “bottom up” feature in the SJRWTM as  
17 described above.

18 80. I have already discussed the fact that the USBR Temperature Model is not capable of  
19 assessing the 7DADM but rather is using Mean Monthly Temperature. But even at this  
20 coarse level of resolution, there is nothing in the record that indicates that the federal  
21 agencies took the second step and tried to quantify how much water is needed over and above  
22 the minimum flows specified in Table 2E (Action III.1.3) to prevent violations of the new  
23 temperature restrictions in Action III.1.2. Without this analysis, agency staff could not  
24 determine the additional impact on water system storage of imposing Action III.1.2.

25 81. The SJRWTM on the other hand, was available and could have been used to perform exactly  
26 this analysis. To illustrate the impact of Action III.1.2, I did so. I ran the SJRWTM in the  
27 two modes explained earlier: “top-down” mode where instream flows per Table 2E were  
28 imposed and “bottom-up” where minimum flows prescribed in Table 2E were augmented to

1 mitigate temperature violations at the compliance location (OBB in case). The difference  
2 between the two runs: 2E and Augmented 2E (labeled as case 2EA) provided the answers to  
3 key questions: 1) What would be the impact of the augmentation for temperature on New  
4 Melones storage, 2) To what extent the augmentation succeed to mitigate temperature  
5 violation, and 3) Are there any consequences for this type of operation (i.e., would aggressive  
6 operation for temperature in some years cause unmitigated conditions the following years,  
7 especially in dry and critically dry years).

8 82. It should be noted that one of the assumptions used in this analysis is that in any given  
9 month, only up to 1000 cfs could be used for temperature control (i.e., augmenting the  
10 amounts specified in Table 2E by up to 1000 additional cfs). The logic was to set a limit on  
11 the total release to prevent from draining the reservoir indefinitely.

12 83. The need to define this limit raises another fundamental question regarding the concepts  
13 associated with the development of the terms and conditions set forth in Action III.1.2.  
14 Modeling of reservoir-river system is essentially mathematical representation of the physical  
15 system and the rules by which it operates. When simulating system operation, models are  
16 design to mimic as close as possible a real-life decision making of water managers and  
17 facility operators by employing a set of rules and considerations for system limits and  
18 constraints. In the case of temperature control, rules and considerations could include: Are  
19 there ramping rates (how fast to increase or decrease releases from the dam when operating  
20 for temperature control)? How much water should be released before operators' give-up the  
21 ability to lower temperature to meet the target? Should releases for temperature control be  
22 made at all if the temperature outflow from the dam already exceed the target (but yet could  
23 improve temperature conditions at the target)? Should a minimum storage volume in the  
24 reservoirs be defined as a threshold for ceasing temperature control?

25 84. To the best of my knowledge, none of the above mentioned rules and considerations are  
26 mentioned as part of Action III.1.2, only temperature targets and the fact the water should be  
27 released to meet those targets. To me it appears that there is disconnect between Action  
28 III.1.2 and the practical aspects of this action, or, at best, that Action III.1.2 is simply

1 incomplete

2 85. Figures 8 to 12 show the results for the above-mentioned analysis, as follows:

3 86. Figure 8 shows the New Melones storage under cases 2E and 2EA. The figure shows that  
4 New Melones storage would be depleted by as much as 717 TAF during the 1987-1995.

5 87. Figure 9 shows the amount of water needed on a monthly and annual basis for temperature  
6 control. The figure shows that the annual amount would vary between 22 TAF and 190 TAF  
7 with average amount equal to almost 84 TAF.

8 88. Figure 10 shows the effectiveness of the temperature control: In the summer, temperature at  
9 OBB could be reduced down to the target levels as measured using the 7DADM criterion.  
10 However, the model shows that an additional 1000 cfs would not be sufficient to lower the  
11 temperature to the target in the spring and fall.

12 89. Figure 11 shows that successive operation for temperature would eventually cease to be  
13 effective as New Melones' cold pool of water would be depleted. In other words, conserving  
14 water in New Melones by limiting releases in the spring and fall, when the ability to reduce  
15 the temperature to the target is questionable, could be a more effective way for temperature  
16 control in the long run.

17 90. Figure 12 shows that even after operating for temperature control (from 2E to 2EA), there are  
18 still significant violations of the target temperatures.

19 **91. In conclusion – The USBR Temperature Model failed to provide the level of analysis**  
20 **necessary to allow the regulatory agencies to realize all the impacts associated with**  
21 **imposing the terms and conditions set forth in Action III.1.2.**

22 **92. In contrast, the SJRWTM is the most advanced temperature model that has ever been**  
23 **developed for the Stanislaus and the San Joaquin River, as whole. The SJRWTM was**  
24 **designed to directly address all the implications associated with temperature response**  
25 **to flow and storage in the system thus providing a realistic check about what can and**  
26 **cannot be achieved as far as temperature control is concerned. Also, the SJRWTP has a**  
27 **built-in logic to model the old-new dam interaction. This unique feature is especially**  
28 **important when operating the system more aggressively, as appears to be the case when**

1 operating for temperature control per Action III.1.2 of the BO, because as the water  
2 level in New Melones approaches the crest of the old dam, the cold pool of water behind  
3 the old dam is isolated and cannot be released for temperature control. Instead, warmer  
4 water is skimmed of the top layer of the pool behind the old dam, which exacerbates the  
5 thermal condition downstream. Based on the information in the record describing the  
6 USBR Temperature Model, there is nothing to suggest that the USBR Temperature  
7 Model has the capability to address this issue.

8 93. It should be noted that in 2006, in the peer review report of the OCAP, the panel  
9 addressed the weaknesses of monthly time-step models when applied to the needs of  
10 anadromous fish. The panel also identified the Stanislaus River Temperature Model as  
11 the preferred model for this task.

12 94. The Stanislaus River Temperature Model and then the SJRWTP were available to the  
13 Federal Defendants for almost six years. Unfortunately, they have not been used by the  
14 very same people who funded, supported and actively participated in their development  
15 since their infancy. Instead, the Federal Defendants have chosen an inferior model that  
16 raises more doubts about the validity of the results than insightful information that  
17 could lead to making informed decisions.

18 95. Beyond my conclusion that temperature targets are not attainable a significant amount  
19 of time, Action III.1.2 also has number of deficiencies that surfaced during my water  
20 temperature investigation and modeling. Action III.1.2 lacks in my opinion, basic rules,  
21 guidelines and constraints as to how the system should be operated for temperature  
22 control. There is disconnect between Action III.1.2 and the practical aspects of this  
23 action, or at best, Action III.1.2 is simply incomplete.

24  
25 Executed this 5th of August, 2010 in Moraga, California.

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27 \_\_\_\_\_  
28 AVRY DOTAN

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## MODELING DEMONSTRATES THAT NEW MELONES IS INCAPABLE OF REALSING SUFFICIENT WATER TO MEET THE REQUIREMENTS OF RPA ACTION III.1.2

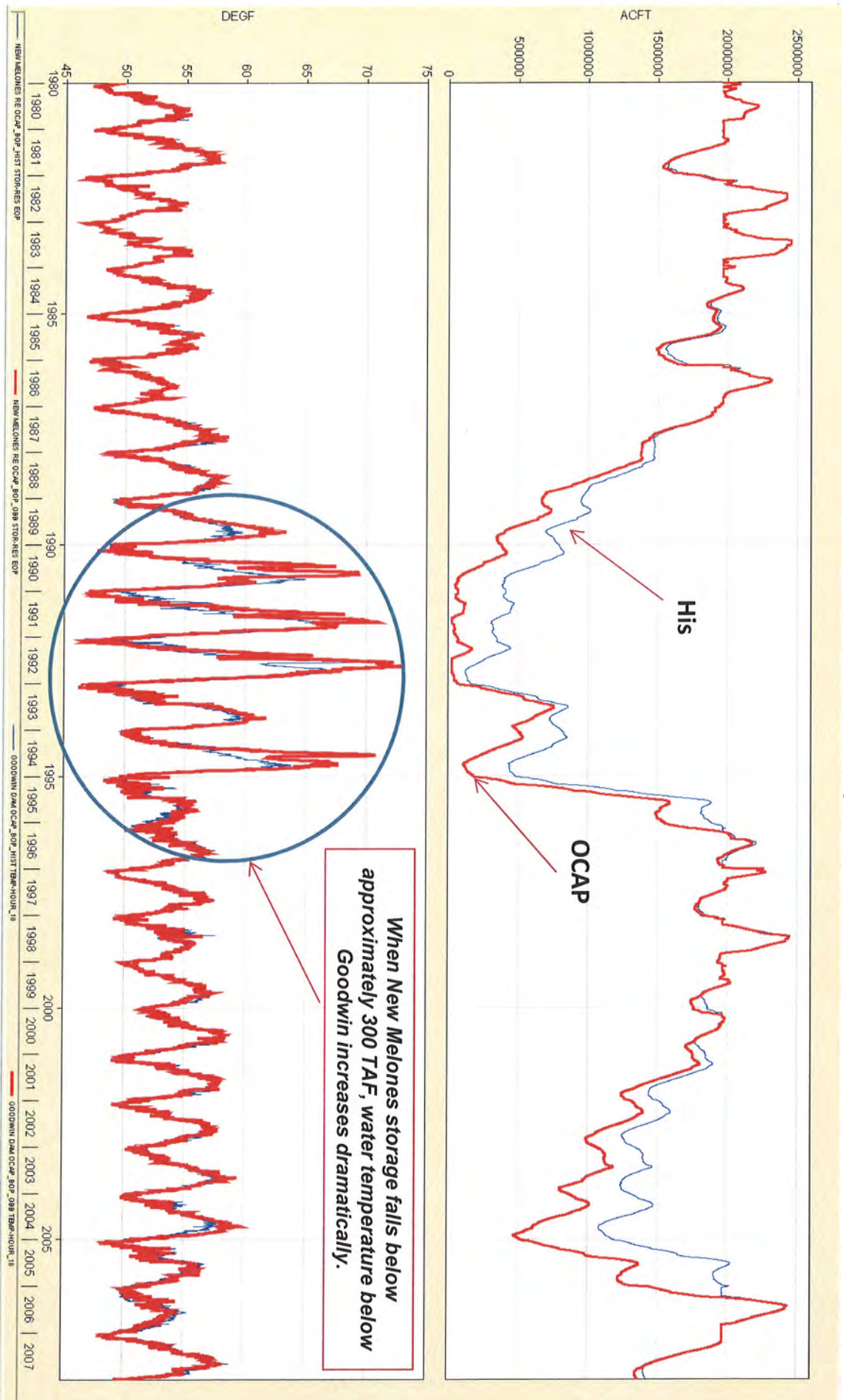
Action III.1.2 requires USBR to make cold water releases from New Melones to provide suitable temperatures for CV steelhead. (BO, p. 621). The compliance point is at Orange Blossom Bridge (OBB) downstream of Goodwin Dam, and temperature compliance shall be measured based on a seven (7) day average daily maximum temperature (7DADM). (BO, p. 622).

1. USBR used the Reclamation Temperature Model (not provided in the AR, described in Appendix H to the 2008 OCAP BA) to evaluate feasibility of meeting the temperature criteria.
  - a. The Reclamation model was not peer reviewed. (H-6)
  - b. The Reclamation model present temperature on a mean monthly basis, and cannot depict daily maximums or 7DADM. (H-9; Milligan Decl., ¶ 12)
  - c. The Reclamation model does not capture diurnal temperature variability. (Milligan Decl., ¶ 12).
  - d. Reclamation model cannot simulate actual operations strategies used to meet temperature objectives. (Milligan Decl., ¶ 12).
  - e. No modeling was done to assess potential impacts on storage due to flows released for temperature compliance. (Reed Decl., ¶ 30).
  - f. NMFS/USBR did not quantify how much water would need to be released to meet temperature. (Reed Decl., ¶ 31).
2. Modeling performed using the Reclamation model showed that there will be temperature exceedances. (BO, p. 622; US Reply Br., p. 132; Reed Decl. ¶ 25).
3. Dotan replicated the use of the Reclamation model using the San Joaquin River Water Temperature Model (SJRWTM). (Dotan Decl., ¶¶ 60-77).
  - a. The model run shows that there are temperature exceedances in every month except December, January and February, exceedances occur more than 25% of the time in the months of May, July, October and November, and 92% of the time in October. (Dotan Decl., ¶¶ 73-77, Fig. 7).
  - b. Dotan ran same data using the SJRWTM, which has a 6 hour timestep. Those runs found exceedances in all months except December and January, exceedances occur more than 18% of the time in the months of March, April, May, June, July, August, September, October and November, and exceedances of more than 40% of the time occur in the months of April, May, July, and October. (Dotan Decl., Fig. 7).
4. Dotan used the SJRWTM to model impacts to New Melones storage in releasing water to meet temperature requirement. Dotan modeled the required Appendix 2E flows, and ordered the model to use up to an additional 1,000 cfs to meet temperature. (Dotan Decl., ¶ 82).
  - a. In the period 1987-1995, New Melones storage would need to be depleted by as much as 717,000 AF when compared with required 2E releases to meet temperature. (Dotan Decl., ¶ 86, Fig. 8).
  - b. Even using up to an additional 1000 cfs does not result in 100% compliance. Still exceedances occur in every month except January, with exceedances occurring

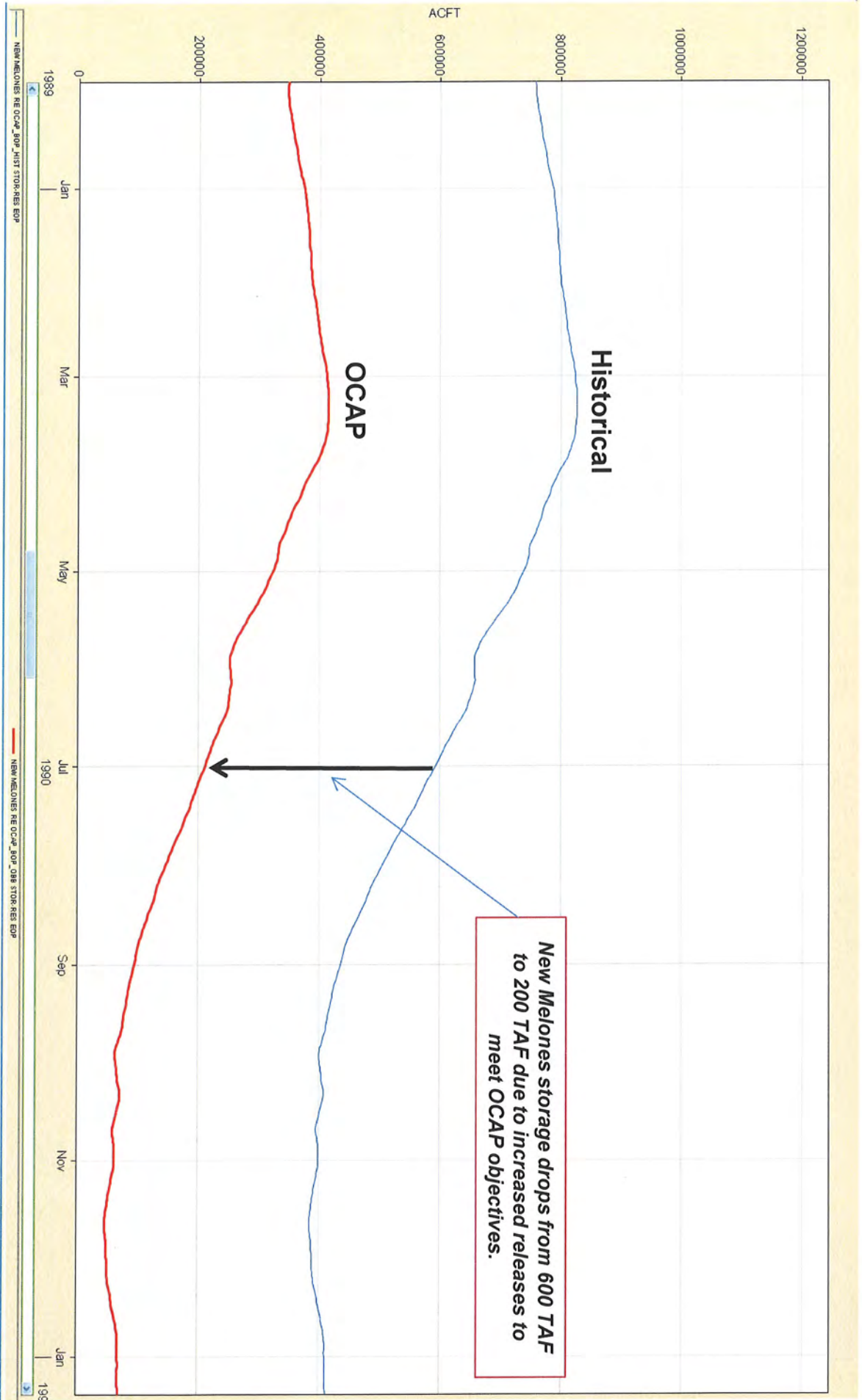
25% of the time or more in March, April, May, June, July, August, and October.  
(Dotan Decl., ¶ 90, Fig. 12).

- c. Successive operation to meet temperature will eventually deplete cold water pool.  
(Dotan Decl., ¶ 89, Fig. 11).

# New Melones Storage is depleted due to increased releases above Historical to meet OCAP Temperature Targets (1980-2007)

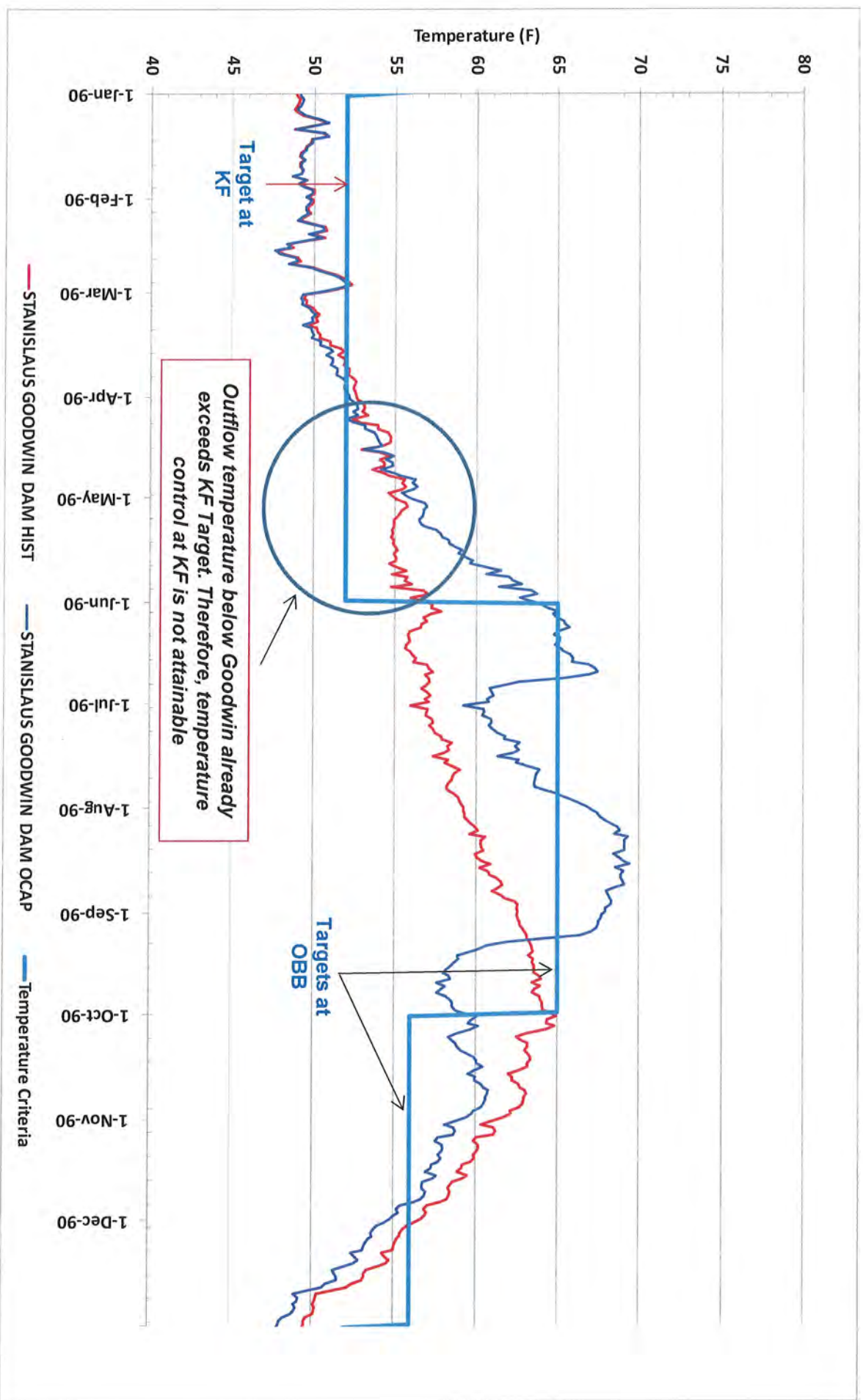


# New Melones Storage - Critical Year 1990

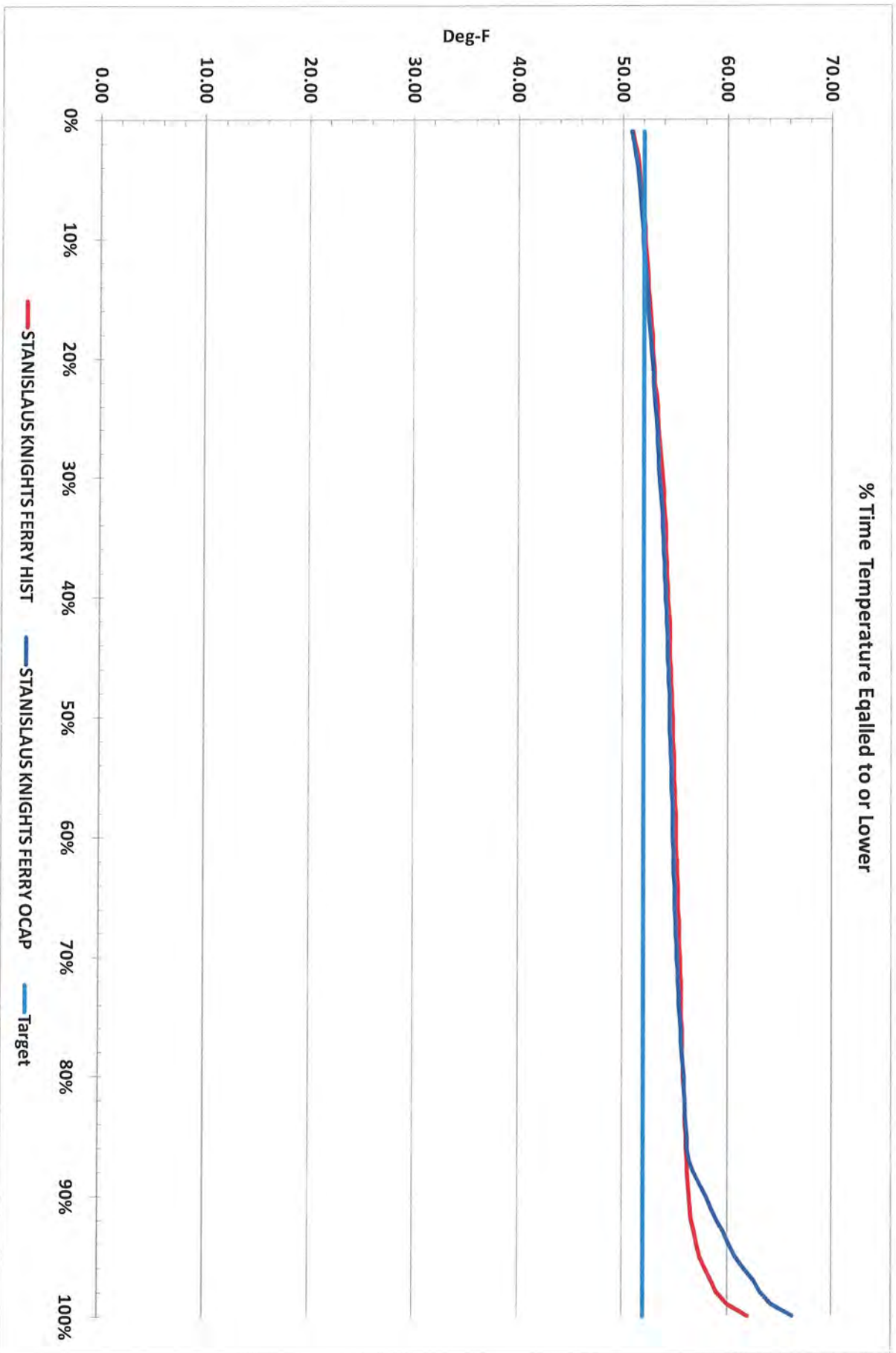




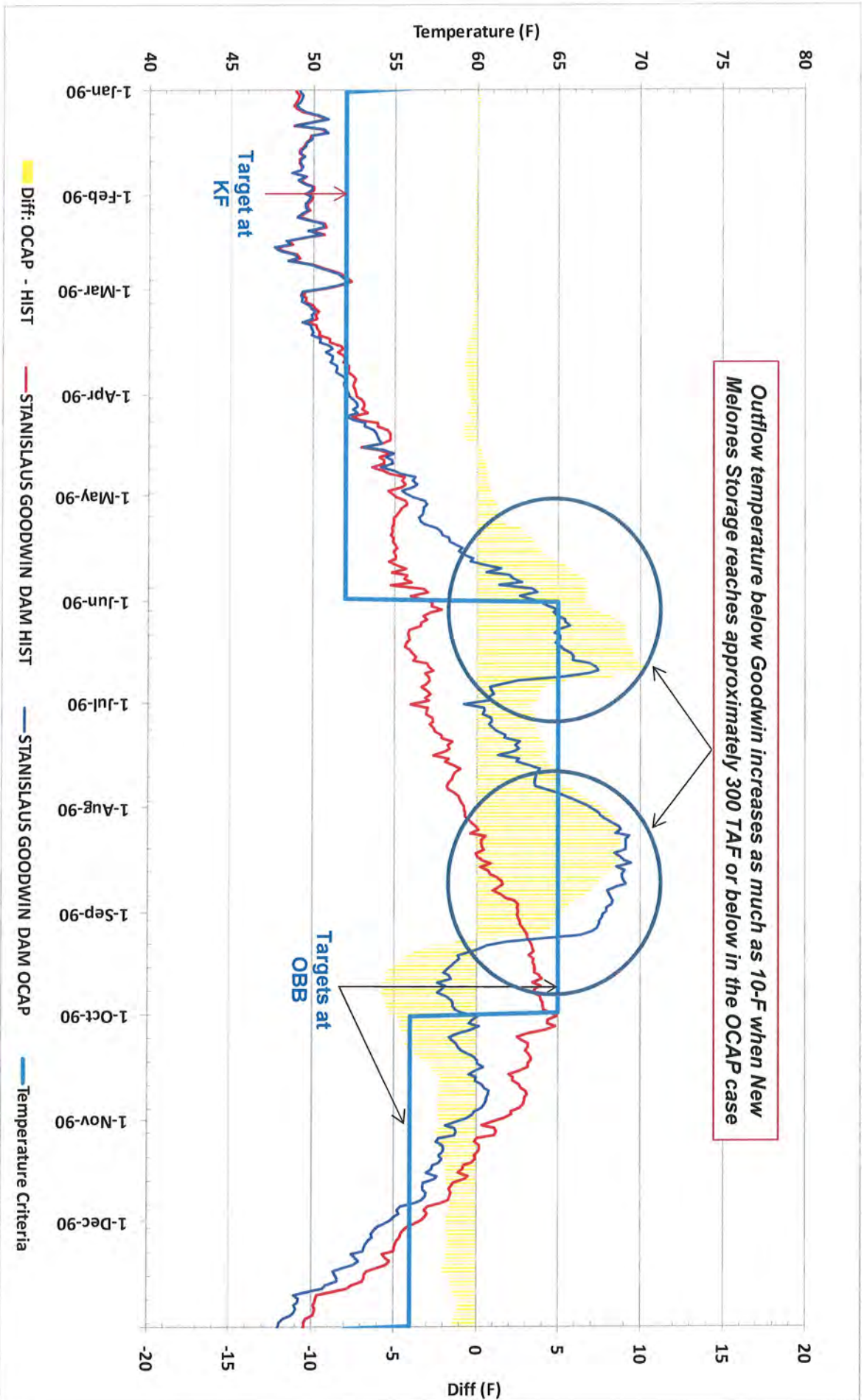
**Temperature Below Goodwin Dam in Relation to Target Temperature at Knights Ferry (KF) and Orange Blossom Bridge (OBB)  
 Example: 1990 (similar phenomenon would occur 90% of the time)**



**Target temperature at Knights Ferry can be met only about 10% of the time in the month of May with or without flow augmentation**

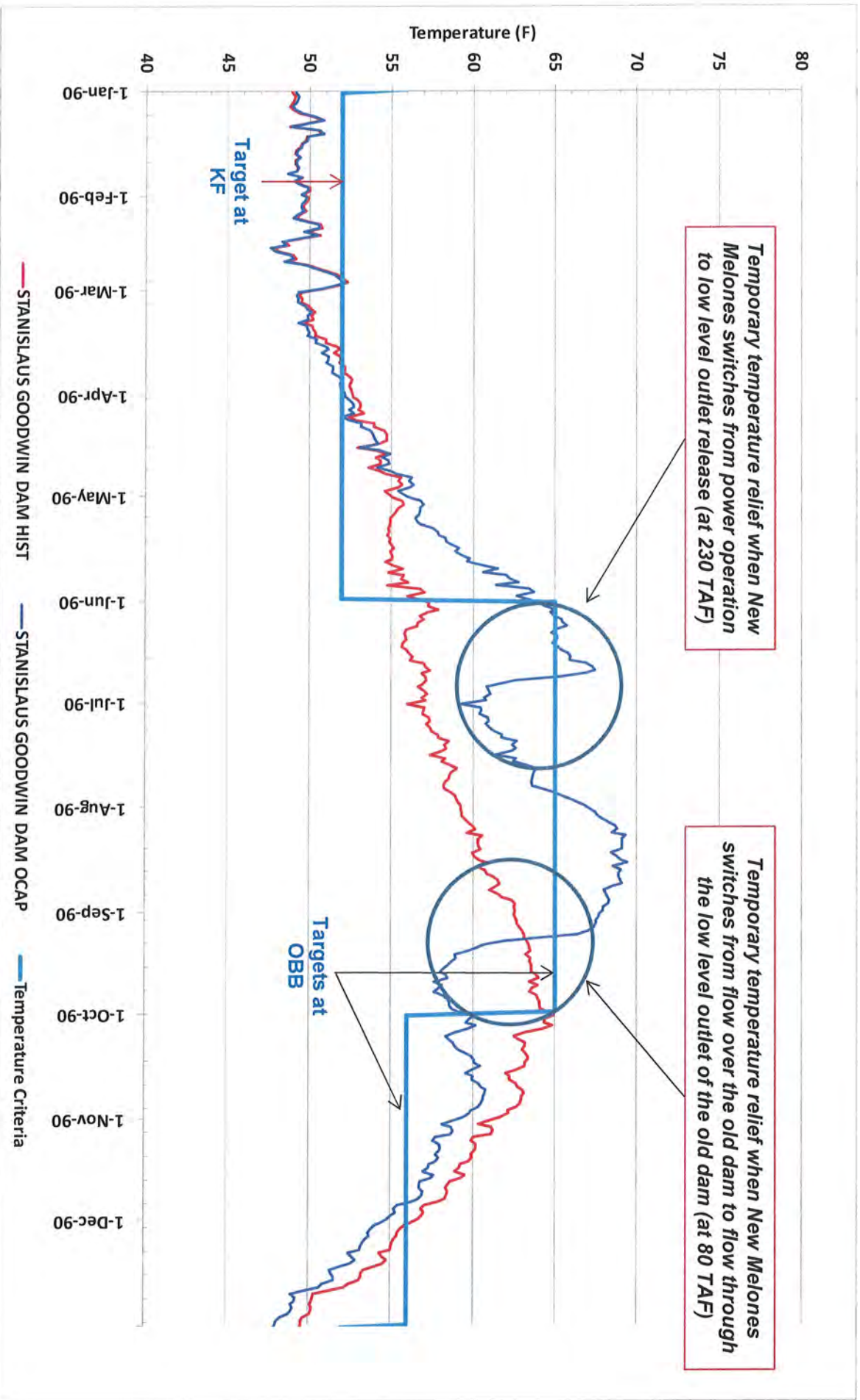


# Temperature Below Goodwin Dam in Relation to Target Temperature at Knights Ferry (KF) and Orange Blossom Bridge (OBB) Example: 1990



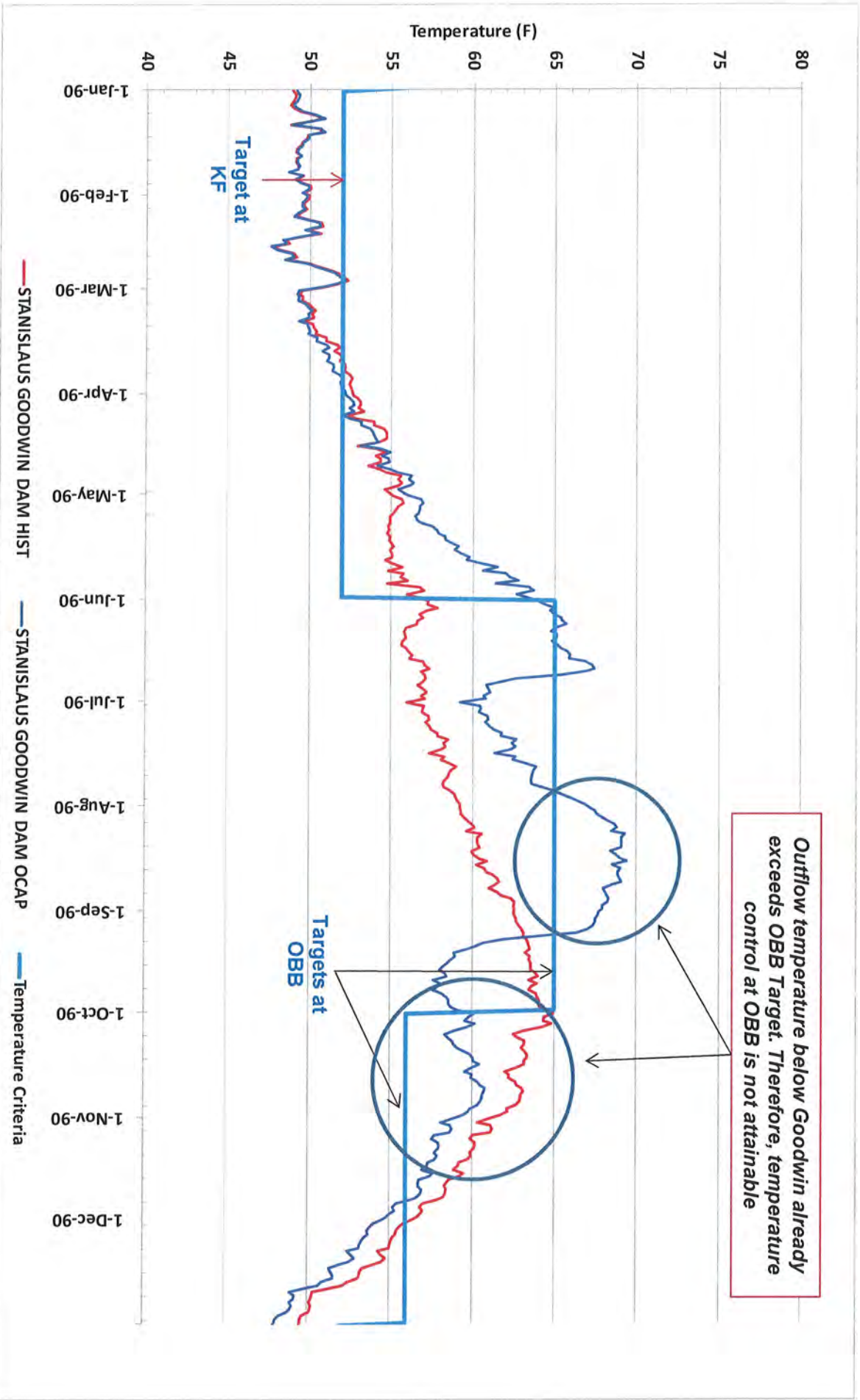


# Temperature Below Goodwin Dam in Relation to Target Temperature at Knights Ferry (KF) and Orange Blossom Bridge (OBB) Example: 1990

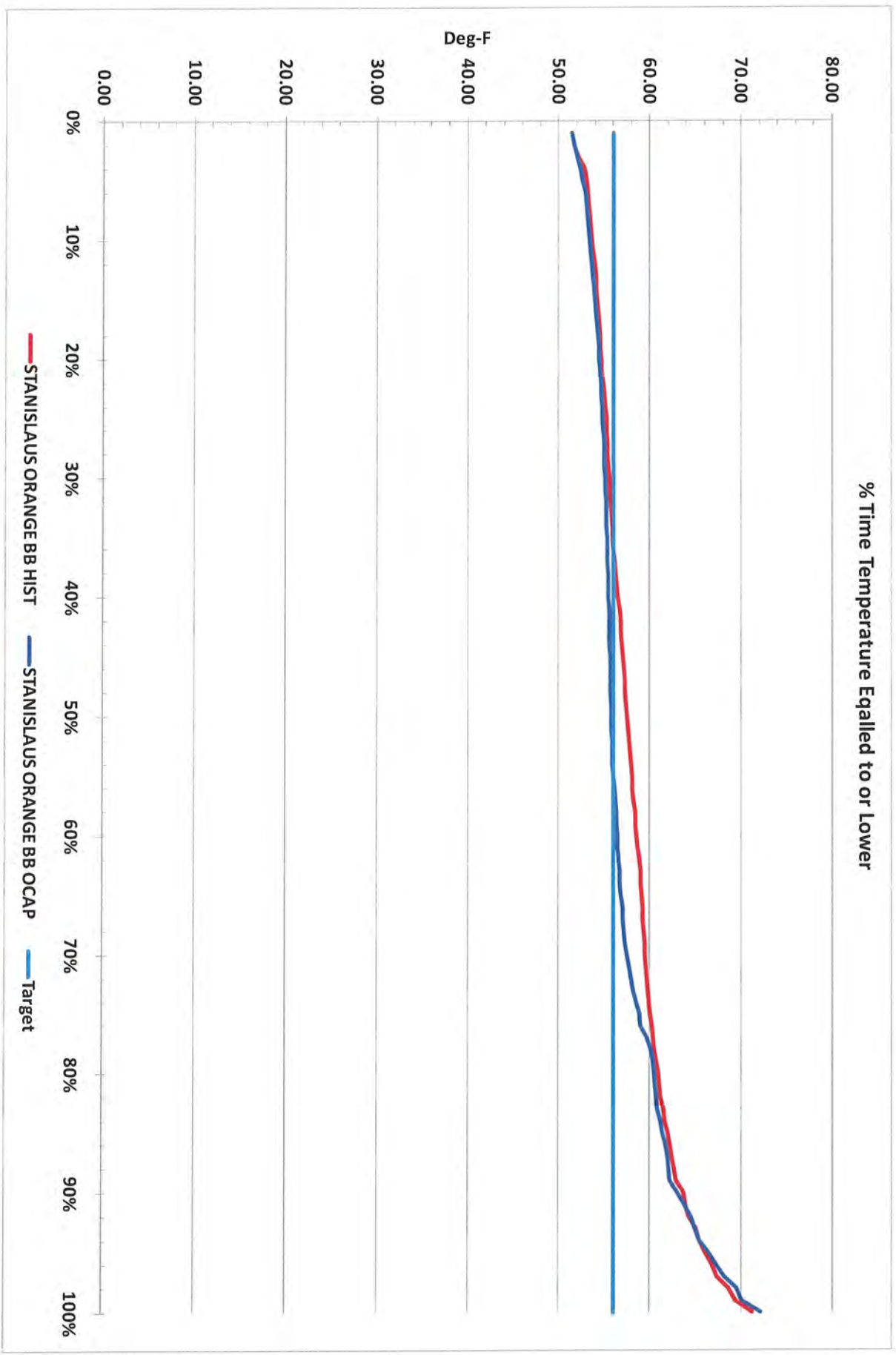




# Temperature Below Goodwin Dam in Relation to Target Temperature at Knights Ferry (KF) and Orange Blossom Bridge (OBB) Example: 1990



**Target temperature at Orange Blossom Bridge can be met only about 50% of the time in the month of October even after flow augmentation (about 15% increase over Historical)**



16%	47.3	46.3	49.1	47.3	50.9	49.5	51.8	48.8	53.3	50.7	55.2	54.5	60.7	60.6	60.4	61.2	58.0	58.7	54.4	57.8	52.3	53.3
18%	47.6	46.3	49.2	48.6	51.2	49.7	52.0	49.3	53.5	50.9	55.5	54.6	61.1	61.8	60.7	61.2	58.7	60.2	54.6	57.8	52.5	53.3
20%	47.7	46.3	49.3	48.6	51.3	49.7	52.2	49.3	53.6	50.9	55.7	54.6	61.5	61.8	61.0	61.2	59.0	60.2	54.7	58.1	52.6	55.5
22%	47.8	46.4	49.4	48.7	51.4	49.7	52.3	49.3	53.7	50.9	55.8	54.6	61.5	61.8	61.0	61.2	59.1	60.2	54.7	58.1	52.7	55.5
24%	47.9	46.4	49.6	48.7	51.6	49.7	52.7	49.5	54.1	51.9	56.1	55.8	62.2	62.0	61.5	62.0	59.5	60.9	55.0	58.1	53.0	55.5
26%	48.0	46.4	49.6	48.8	51.7	49.7	52.9	49.5	54.3	52.0	56.5	55.9	62.5	62.0	61.8	62.1	59.8	61.1	55.1	58.1	53.2	55.5
28%	48.1	47.1	49.7	48.8	51.9	50.1	53.1	49.7	54.4	53.0	56.8	56.3	62.6	62.3	61.9	62.8	60.1	62.2	55.2	58.7	53.4	55.5
30%	48.2	47.1	49.8	48.8	52.0	50.1	53.3	49.7	54.6	53.0	57.1	56.3	62.7	62.3	62.1	62.8	60.3	62.2	55.3	58.7	53.5	55.5
32%	48.3	47.5	49.9	48.9	52.2	50.4	53.4	50.1	54.8	53.1	57.3	57.1	62.9	62.6	62.2	63.2	60.4	62.4	55.4	58.9	53.7	55.5
34%	48.4	47.5	49.9	48.9	52.3	50.4	53.6	50.1	54.9	53.1	57.5	57.1	63.0	62.6	62.4	63.2	60.6	62.4	55.6	58.9	53.8	55.5
36%	48.5	47.8	50.0	49.2	52.4	50.8	53.7	50.5	55.1	53.7	57.6	57.9	63.2	62.6	62.5	63.2	60.8	62.8	55.7	58.9	53.9	55.5
38%	48.6	47.8	50.1	49.2	52.5	50.8	53.8	50.5	55.3	53.7	57.9	57.9	63.5	62.6	62.6	63.2	60.9	62.8	55.8	59.2	54.1	55.5
40%	48.6	48.1	50.2	49.6	52.6	51.0	54.0	50.6	55.4	54.2	58.0	58.6	63.8	62.8	62.8	63.2	61.0	62.9	56.0	59.2	54.2	55.5
42%	48.7	48.1	50.3	49.6	52.7	51.0	54.1	50.6	55.6	54.2	58.2	58.6	63.9	62.8	62.9	63.2	61.1	62.9	56.2	59.2	54.3	55.5
44%	48.8	48.1	50.5	49.8	52.8	51.4	54.2	51.6	55.7	55.5	58.4	58.7	64.1	63.1	63.1	63.3	61.2	63.0	56.3	59.2	54.5	55.5
46%	48.9	48.1	50.5	49.8	52.9	51.4	54.3	51.6	55.9	55.5	58.8	58.7	64.3	63.1	63.3	63.3	61.3	63.0	56.4	59.2	54.5	55.5
48%	49.0	48.1	50.6	50.1	53.0	51.5	54.5	51.9	56.0	55.5	59.6	61.5	64.4	63.2	63.4	63.3	61.5	63.3	56.6	59.2	54.6	55.5
50%	49.0	48.1	50.7	50.1	53.2	51.5	54.6	51.9	56.2	55.5	60.2	61.5	64.6	63.2	63.6	63.3	61.7	63.3	56.7	59.4	54.7	56.0
52%	49.1	48.1	50.8	50.2	53.3	51.5	54.8	51.9	56.3	55.5	60.9	61.5	64.7	63.2	63.7	63.3	61.7	63.3	56.8	59.5	54.8	56.0
54%	49.2	48.2	51.0	50.2	53.4	51.7	54.9	53.2	56.5	55.9	61.6	61.7	64.9	63.4	63.9	63.8	61.9	63.7	57.0	59.5	54.9	56.0
56%	49.3	48.2	51.1	50.2	53.5	51.7	55.0	53.2	56.6	55.9	62.1	61.7	65.0	63.4	63.9	63.8	62.1	63.7	57.2	59.6	54.9	56.0
58%	49.3	48.2	51.3	50.5	53.6	52.3	55.1	53.2	56.8	56.2	62.4	61.8	65.1	63.7	64.1	63.9	62.3	63.9	57.3	59.6	55.1	56.0
60%	49.4	48.2	51.3	50.5	53.8	52.3	55.2	53.2	56.9	56.2	62.8	61.8	65.1	63.7	64.2	63.9	62.4	63.9	57.5	59.7	55.2	56.0
62%	49.5	48.6	51.4	50.6	54.0	52.4	55.3	53.2	57.1	56.6	63.1	62.0	65.3	64.7	64.3	64.0	62.5	64.2	57.8	59.7	55.3	56.0
64%	49.6	48.6	51.6	50.6	54.1	52.4	55.5	53.2	57.3	56.6	63.4	62.0	65.4	64.7	64.5	64.0	62.7	64.2	57.9	59.7	55.4	56.0
66%	49.7	48.8	51.7	50.8	54.2	52.8	55.6	53.5	57.4	56.8	63.7	62.9	65.5	64.7	64.6	64.2	62.8	64.4	58.1	59.7	55.6	56.0
68%	49.8	48.8	51.8	50.8	54.4	52.8	55.8	53.5	57.6	56.8	64.0	62.9	65.6	64.7	64.7	64.2	63.0	64.4	58.3	59.7	55.8	56.0
70%	49.9	49.2	51.9	51.5	54.6	53.3	55.9	53.8	57.8	57.3	64.2	63.1	65.7	65.1	64.8	64.3	63.2	64.4	58.6	60.3	55.9	56.0
72%	50.0	49.2	52.0	51.5	54.7	53.3	56.1	53.8	58.0	57.3	64.4	63.1	65.9	65.1	64.9	64.3	63.4	64.4	59.0	60.3	56.1	56.0
74%	50.1	49.2	52.2	51.6	54.8	53.6	56.3	54.4	58.2	57.4	64.5	63.9	66.0	65.3	65.1	64.5	63.7	64.7	60.0	60.7	56.3	56.0
76%	50.2	49.4	52.3	51.6	55.0	53.6	56.5	54.5	58.4	57.4	64.7	64.0	66.2	65.3	65.1	64.5	64.1	64.7	60.3	60.7	56.4	56.0
78%	50.3	49.4	52.4	51.6	55.1	53.6	56.6	54.5	58.6	57.4	64.9	64.0	66.4	65.3	65.3	64.5	64.3	64.7	60.6	61.1	56.7	57.0
80%	50.5	49.7	52.5	51.7	55.4	54.1	56.8	54.6	58.8	57.5	65.1	64.0	66.5	65.6	65.5	64.8	64.8	64.7	60.9	61.1	56.9	57.0
82%	50.7	49.7	52.7	51.7	55.6	54.1	57.1	54.6	59.0	57.5	65.3	64.0	66.7	65.6	65.7	64.8	65.1	64.7	61.3	61.8	57.1	57.0
84%	50.8	49.8	53.0	51.9	55.9	54.2	57.3	54.8	59.3	57.6	65.5	64.1	66.9	65.8	66.0	65.3	65.6	65.0	61.8	61.8	57.4	57.0
86%	51.0	49.8	53.1	51.9	56.1	54.2	57.6	54.8	59.5	57.6	65.8	64.1	67.2	65.8	66.4	65.3	66.2	65.0	62.0	61.8	57.6	57.0
88%	51.2	50.3	53.3	51.9	56.3	54.4	57.8	55.8	59.7	58.6	66.0	64.3	67.5	66.0	67.1	65.3	68.2	65.5	63.0	62.1	58.0	57.0
90%	51.5	50.3	53.6	51.9	56.6	54.4	58.0	55.8	60.1	58.6	66.3	64.3	67.8	66.0	67.8	65.3	68.6	65.5	64.0	62.1	58.3	57.0
92%	51.7	50.9	54.0	53.1	57.0	54.7	58.3	56.2	60.5	58.8	66.6	65.5	68.3	66.1	69.1	66.0	68.9	66.6	65.2	64.5	58.6	58.0
94%	52.0	50.9	54.3	53.1	57.4	54.7	58.5	56.2	61.1	58.8	67.0	65.5	69.4	66.1	69.8	66.0	69.2	66.6	66.2	64.5	59.1	58.0
96%	52.4	52.1	54.8	54.0	58.2	56.6	58.9	57.5	63.4	61.6	67.4	65.8	70.1	68.3	70.7	66.2	69.5	68.3	66.8	65.9	60.2	59.0
98%	53.2	52.1	55.1	54.0	59.0	56.6	60.0	57.5	65.4	61.6	68.0	65.8	70.9	68.3	71.6	66.2	69.9	68.3	67.4	65.9	61.9	59.0
100%	53.9	52.1	58.4	54.0	60.8	56.6	63.9	57.5	67.6	61.6	69.6	65.8	74.0	68.3	73.1	66.2	71.0	68.3	69.7	65.9	63.3	59.0
Case	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS	5Q	NMFS
Target	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	56.0	56.0	56.0	56.0

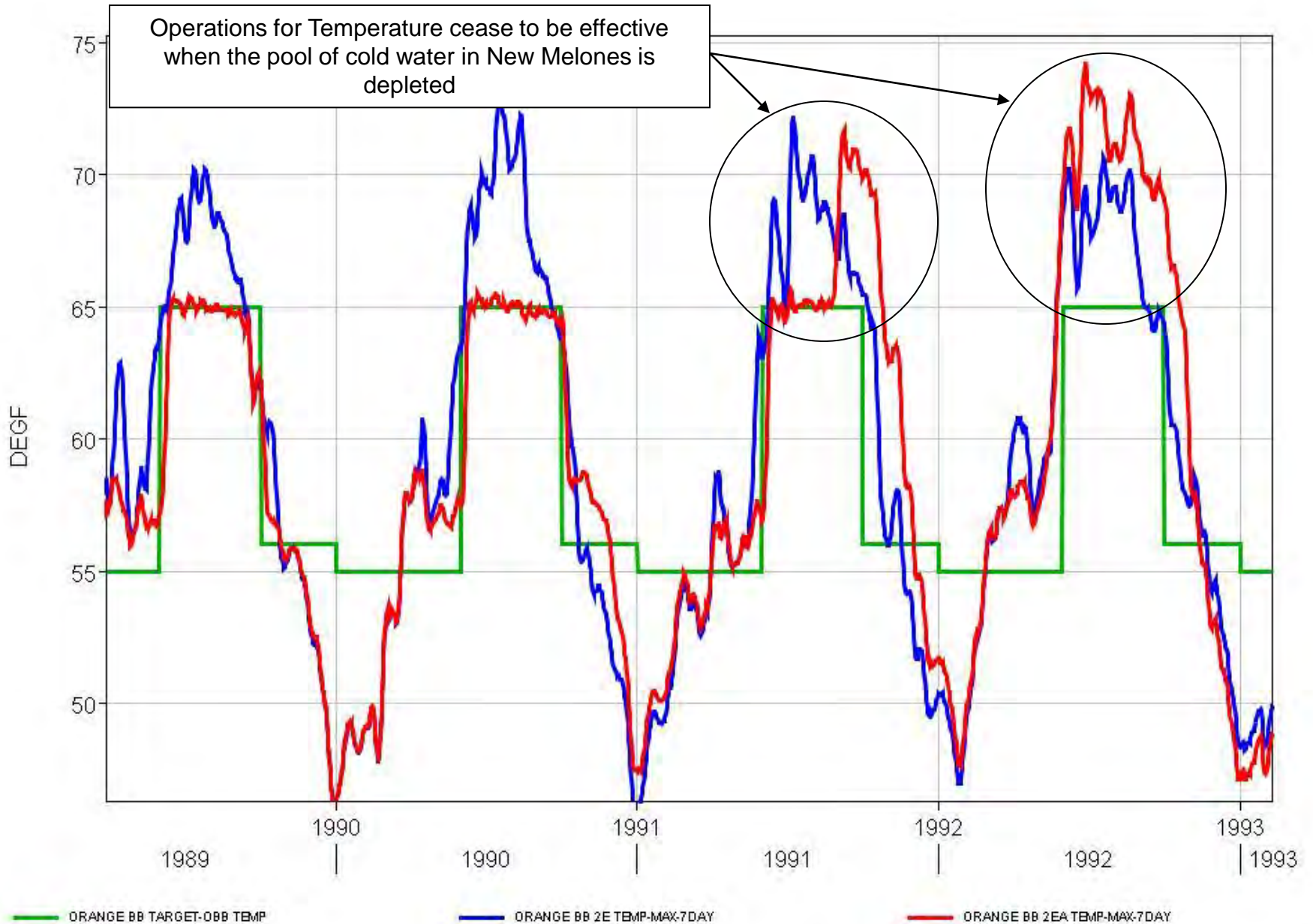
Case 1:09-cv-01023-LJS Document 1-1 Filed 02/06/10 Page 1 of 1

5Q Above target 5Q Below Target

# Figure - 11

Case 1:09-cv-01053-LJG-DLB Document 442-19 Filed 08/06/10 Page 1 of 1

## Augmentation for Temperature from 2E to 2EA

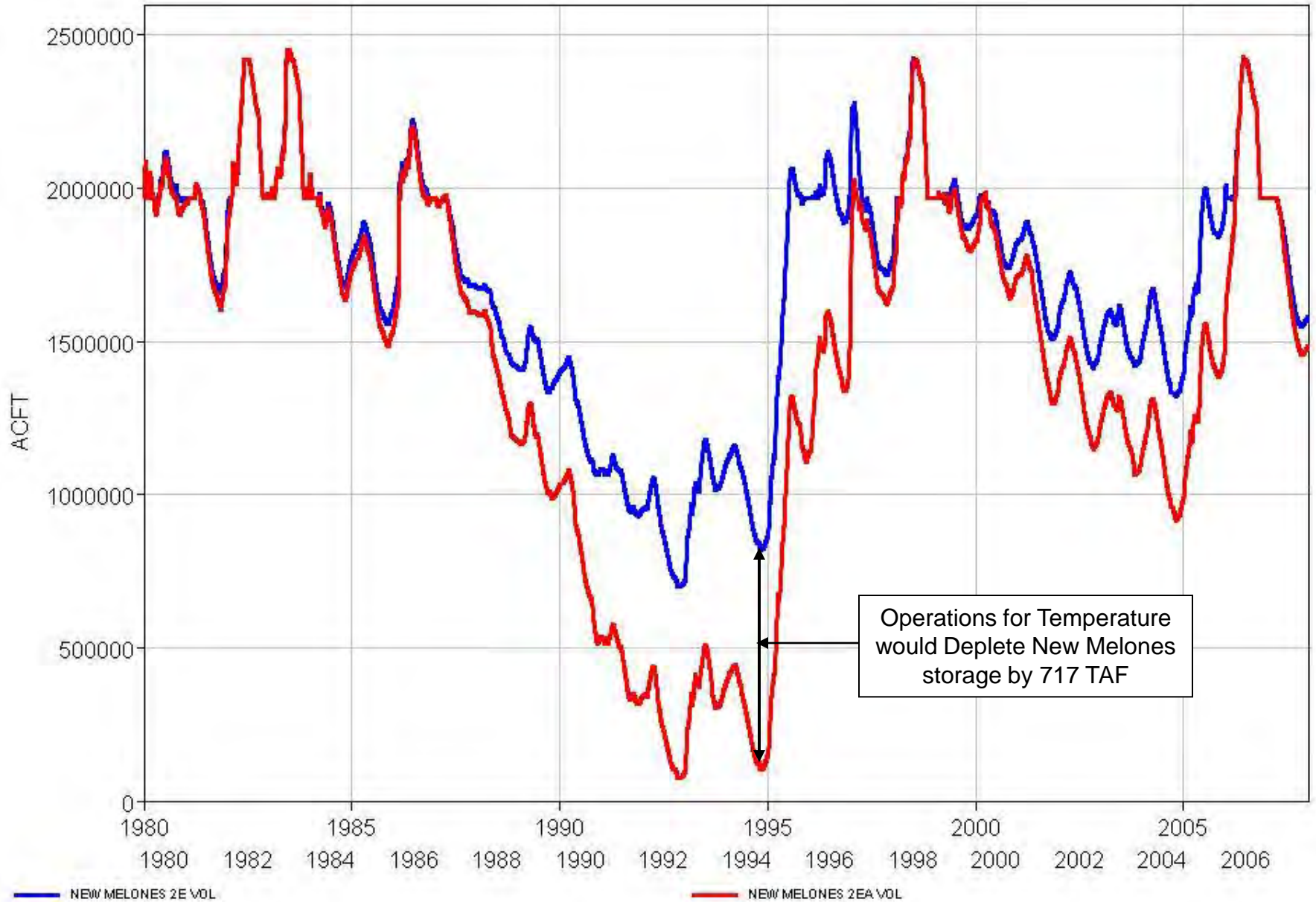






# Figure - 8

## New Melones Storage: 2E vs. 2EA



## Summary of Floodplain Modeling and Geomorphic Flows

cbec conducted modeling (SRH-2D) for a 5.7 mile reach extending from Orange Blossom Bridge (OBB; RM 46.9) to Lovers Leap (RM 52.6). This reach was selected because LiDAR and bathymetry data was available and the reach represents much of the primary juvenile salmon rearing habitat. The model was developed with the intent to (1) identify the presence, or lack thereof, of floodplain habitat along the Lower Stanislaus River that would be available for salmon rearing, and (2) understand the behavior of geomorphically significant flows in forming and maintaining the channel and transporting sediment.

Floodplain inundation modeling results indicate the following:

- Total floodplain inundation area in the modeled reach was essentially 0 acres at <3,000 cfs. A total of 35 acres was available at 5,000 cfs, and 82 acres at 8,000 cfs.
- It would take (1) at least a 2-year post-dam flow to begin to inundate some fraction of the 35 acres of near-channel floodplain; (2) at least a 5-year post-dam flow to inundate some fraction of an additional 47 acres of overflow channel floodplain; and (3) a post-dam 100-year base flood (approximately 8,000 cfs) to inundate the entire 82 acres of available floodplain. It would be expected that floodplain areas below and above 5,000 cfs would be inundated on average 19 days and 6 days, respectively, in a given year.
- Based on extrapolations, the total acreage for the entire primary rearing reach is estimated to be 85 acres at 5,000 cfs and 200 acres at 8,000 cfs. As such, the flow release schedule stated in the National Marine Fisheries Service (NMFS 2009) Biological Opinion would result in very little floodplain inundation, which will provide little benefit to salmonids, particularly in the case of steelhead since floodplain is probably “not important to steelhead... given that there is little evidence of their extensive use of floodplain habitat in California” (Moyle 2009), and their preference for mid-channel and margin habitat as observed in the Stanislaus River (FISHBIO, personal observations).
- Based on this study, much larger pulse flows (than 8,000 cfs) would be required and/or topographic manipulation (e.g., Honolulu Bar Floodplain Enhancement Project- see description below) to reconnect floodplains to the present day river.

Channel forming and maintenance flows results indicate the following:

- Based on assumption that channel maintenance flows refer to mobilization of  $d_{50}$ -sized particles and greater, flows in the 3,000-5000 cfs range may provide some limited mobilization since modeled depth-averaged shear stresses were sufficient to mobilize  $d_{50}$  in this range at 43% of sites (i.e., 3 of 7) analyzed.
- Based on the assumption that channel forming flows refer to mobilization of  $d_{84}$ -sized particles and greater (which is our best assumption for total mobility of the channel bed, although not necessarily indicative of channel forming flows), channel forming flows will not be achieved under existing flood control limitations (i.e., no flows greater than 8,000 cfs released). At no modeled flow (i.e., 3,000 to 8,000) was the depth-averaged shear stress above that required to mobilize  $d_{84}$ -sized material. Channel forming flows would realistically require a minimum of a 5-year pre-dam flow, and as determined by Kondolf et al. (2001), the 5-year pre-dam flow that was partially responsible for forming the river prior to gravel mining and flow regulation was 19,100 cfs.
- Mobilization of spawning gravels may actually be detrimental to existing and restored

gravel supplies within the river channel. For instance, flows in the 5,000 to 6,000 range have been observed to displace gravel from restored gravel augmentation sites below Goodwin Dam into deep, downstream pools (FISHBIO personal observations) where it is of no use to spawning and rearing fish. Due to the severe gravel deficit and existence of several deep pools in the canyon, restored gravels can be expected to be lost to these mined areas at flows greater than 5,000 cfs.

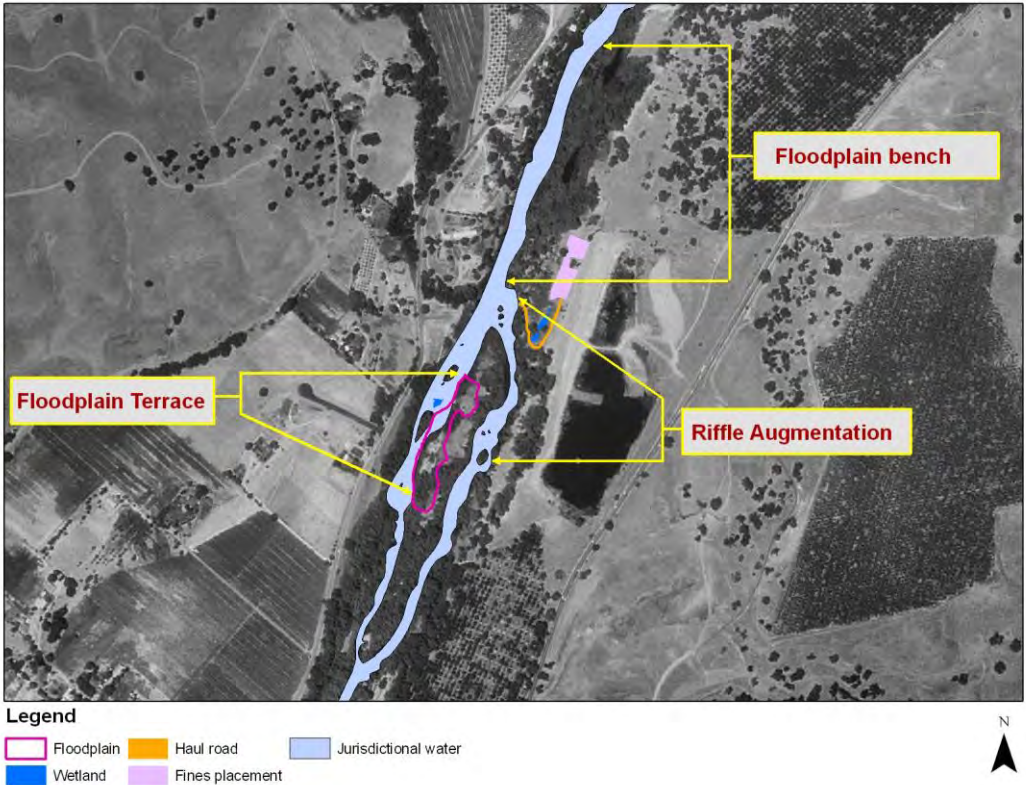
## **Honolulu Bar Floodplain Enhancement Project**

The Honolulu Bar Floodplain Enhancement Project (RM 49 to RM 50.5) was recently completed (end of September 2012; Figure 1). It was designed to restore several aquatic and riparian habitat elements in the Stanislaus River including 2.4 acres of floodplain habitat on the inside edge of a mid-channel island, 0.7 acres of floodplain bench in the south side of the river upstream of the mid-channel island, 0.4 acres of spawning riffle in the river adjacent to the mid-channel island, 3.85+ acres of native vegetation, and increased frequency and duration of flow connectivity in one mile of side channel habitat (Figure 2). Objectives of the Project include (1) restoring seasonally inundated floodplain habitat, (2) restoring year-round rearing habitat, (3) addressing an existing adult stranding issue, (4) increasing usable spawning habitat area, (5) increasing hiding cover, velocity refugia, habitat complexity, and instream habitat types, and (6) restoring native vegetation.





**Figure 1. Side channel and restored floodplain looking northeast. Approximately 4.5-6 feet of materials were removed to lower gradient to increase amount of juvenile salmon rearing habitat over a wider range of flows.**



**Figure 2. Honolulu Bar Floodplain Enhancement Project general footprints.**

## Summary of Key Findings from Stanislaus River Studies

### Juvenile Migration Timing

- Juvenile Chinook migration can be temporarily stimulated by changes in flow, but the effect is short lived (few days) (Demko et al. 2001, 2000, 1996; Demko and Cramer 1995).
- Juvenile salmon migration typically begins in January and most juveniles migrate by May 15 (Table 1).
- Except in wet and above normal years, 0.7% or less of total juvenile salmon (i.e., fry, parr, and smolts), and 0.8% or less of salmon smolts outmigrate during June.
- Juvenile *O. mykiss* may be found migrating downstream throughout the year, but the majority of outmigration to the ocean occurs episodically between March and May. Based on Caswell RST catches, the majority of juvenile *O. mykiss* outmigrate by mid to late May (Table 2).

### Juvenile Outmigrant Survival

- Over a decade of rotary screw trap monitoring in the Stanislaus River shows that
  - flow has a strong positive relationship with migration survival of Chinook fry (Pyper et al. 2006). Benefits to adult escapement of increased fry survival in the Stanislaus are uncertain (Baker and Morhardt 2001; SRFG 2004; SJRGA 2008; Pyper and Justice 2006).
  - abundance ratios for parr and smolts were only weakly correlated with flows (Pyper and Justice 2006).
- Smolt survival (CWT) studies conducted by CDFG at flows ranging from 600 cfs to 1,500 cfs and at 4,500 cfs have shown that smolt survival is highly variable and not improved by higher flows in the Stanislaus River (SRFG 2004; CDFG unpublished data), which is consistent with Pyper and Justice (2006) results above.

### Adult upstream migration timing

- Operations at the Stanislaus River Weir (2003-2011) indicate that more than 97% of adult FRCS migrate after October 1 (Figure 1).
- Adult FRCS migration rate and timing are not dependent upon flows, water temperature or dissolved oxygen concentrations (Pyper and others 2006).
- Prolonged, high-volume fall pulse flows are not warranted, since equivalent stimulation of adult migration may be achieved through modest pulses (Pyper and others 2006). Relatively modest pulse-flow events (increase of ~200 cfs for 3 days) were found to stimulate migration for a short duration (2-3 day migration); while longer duration high-volume pulses did not substantially increase migration duration or magnitude (3-4 day migration).

### Spawn timing and distribution

- The majority (98%) of Chinook salmon spawning occurs between October 15 and December 31.
- Historically, the spawning reach of the Stanislaus was described by G.H. Clark in the 1920s as extending from Knights Ferry to Oakdale, and this continues to be the reach where most spawning activity occurs. A small proportion of late-season spawning

(less than 5%) occurs down to Riverbank, and 95% of this activity occurs after November 30.

*O. mykiss* Abundance and Distribution

- Snorkel surveys conducted since 2002 have provided the most extensive data set on the distribution and between-year abundance of adult and juvenile *O. mykiss*. Surveys are performed bi-weekly at seven sample reaches between Goodwin Dam (RM 58.4) and Valley Oak (RM 41). Data indicate *O. mykiss* distribution is highest in the first four miles of river below Goodwin Dam—which consists primarily of high gradient canyon environment—with over 80% of the *O. mykiss* population inhabiting this reach of river.
- Summer population estimates calculated from intensive snorkel surveys between Goodwin Dam and Oakdale during 2009-2011 indicate that abundance is relatively stable across years, ranging from approximately 13,000-17,000 individuals.

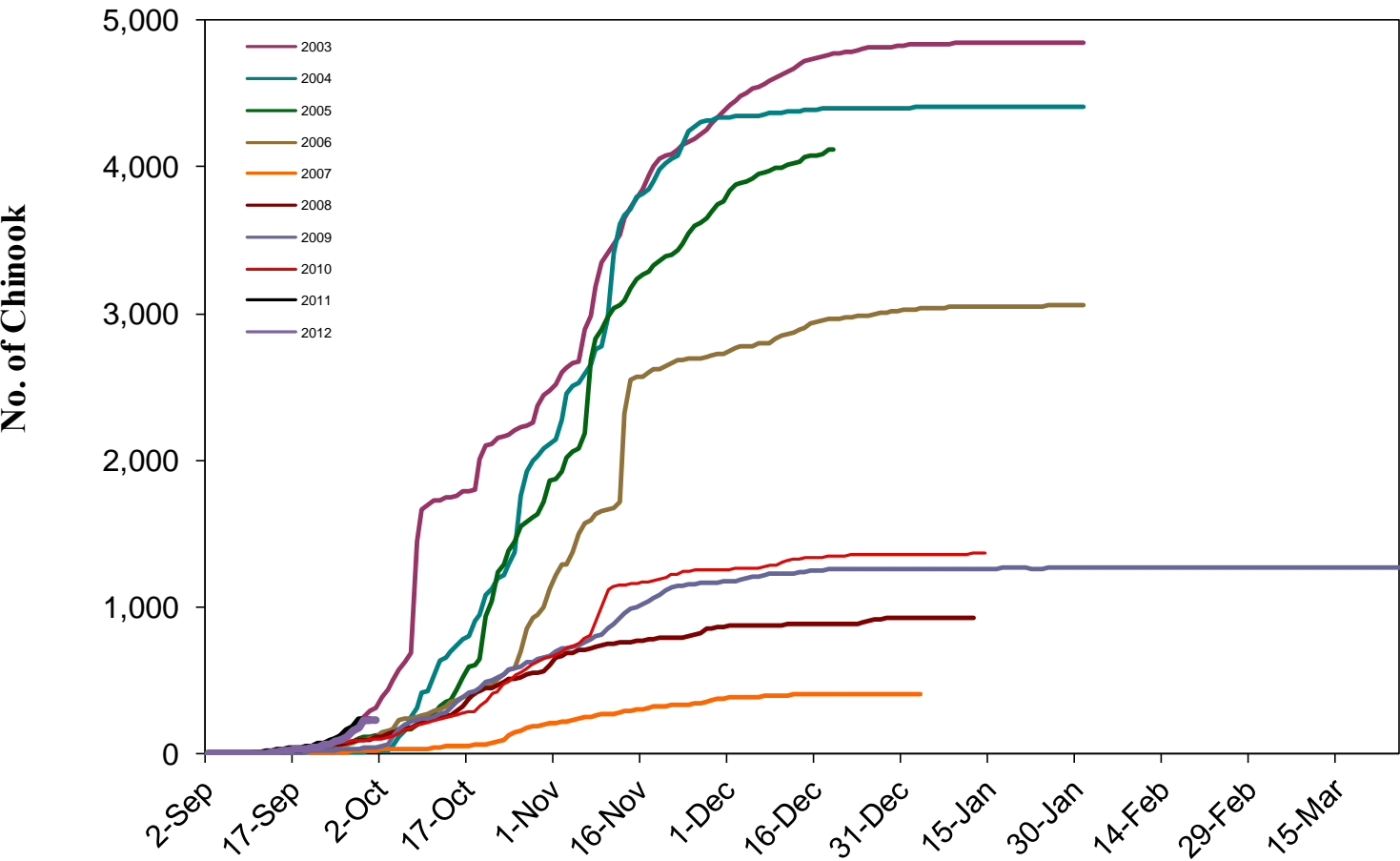
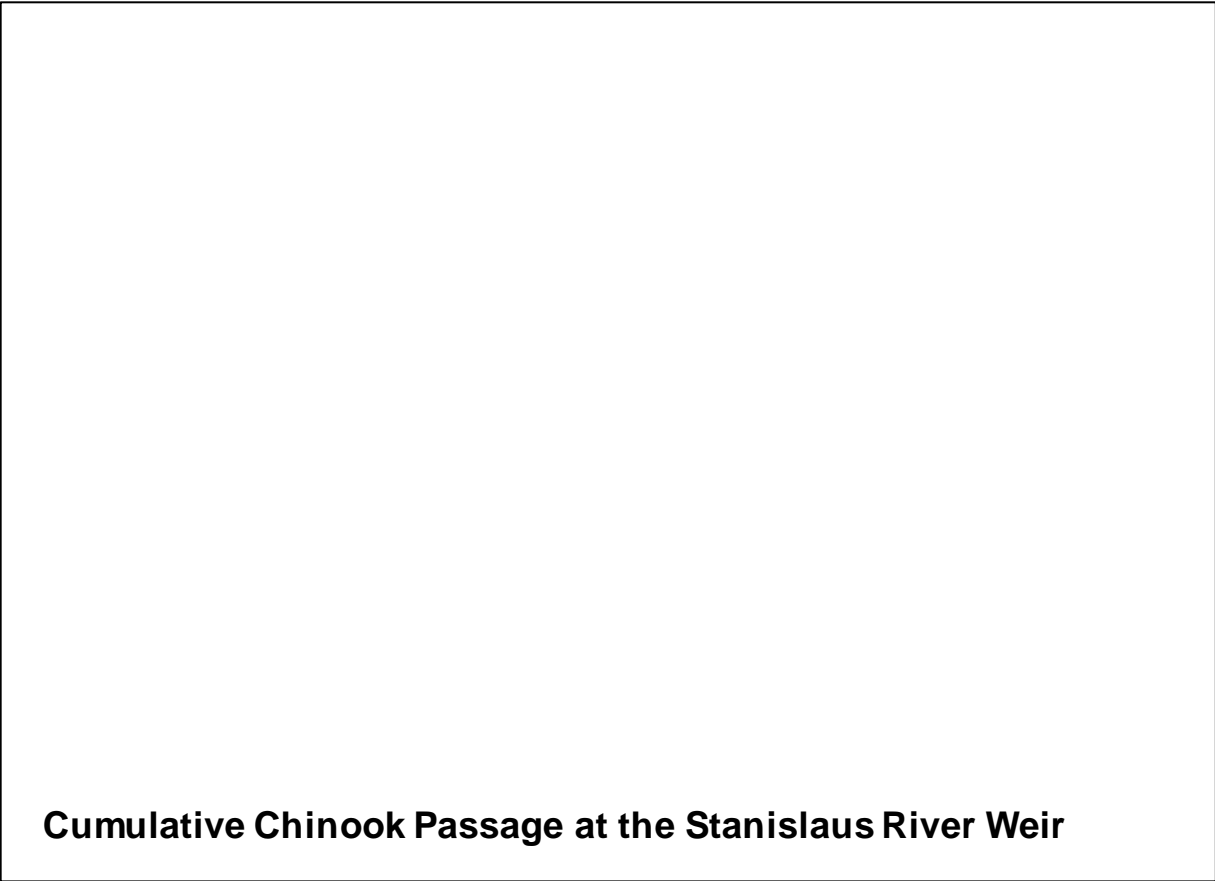
**Table 1. Stanislaus River juvenile Chinook salmon outmigration timing at Caswell (RM 8.6; 1998-2005).**

		Wet (n=2)	Above Normal (n=2)	Below Normal (n=1)	Dry (n=3)	Critical (n=0)
Fry	Jan 1-15	0.7%	0.0%	0.0%	0.0%	-
	Jan 16-31	22.5%	12.4%	39.3%	0.1%	-
	Feb 1-15	22.6%	26.0%	3.3%	0.4%	-
	Feb 16-28	11.8%	27.4%	1.4%	14.4%	-
	Mar 1-15	8.8%	8.9%	2.9%	17.6%	-
	Mar 16-31	7.9%	7.7%	8.3%	5.3%	-
Smolt	Apr 1- 15	3.9%	4.5%	4.5%	16.3%	-
	Apr 16-30	3.9%	5.1%	26.5%	21.0%	-
	May 1-15	8.6%	3.5%	11.3%	17.8%	-
	May 16-31	7.0%	3.3%	2.5%	6.4%	-
	Jun 1- 15	2.1%	1.0%	0.1%	0.7%	-
	Jun 16-30	0.3%	0.2%	0.0%	0.0%	-

**Table 2. Stanislaus River juvenile *O. mykiss* outmigration timing by water year type at Caswell (RM 8.6; 1995-2011).**

**Table 3. Geographic and temporal distribution of spawning in the Stanislaus, 2000-2005.**

	Above Normal Wet (n=7)	Below Normal (n=3)	Below Normal (n=2)	Below Normal Dry (n=3)	Critical (n=2)
<b>STANISLAUS RIVER</b>					
Date	%Redds Observed <sup>1</sup>	<i>Distribution of Redds</i> <sup>2</sup>			
		Goodwin	Knights Ferry to Horseshoe	Horseshoe to Oakdale	Oakdale to Riverbank
Before Oct 1	0.6%	2.8%	0.0%	37.7%	0.0%
Mar 1-5	17.5%	5.0%	32.1%	7.7%	61.3%
Mar 6-31	10.5%	17.5%	0.0%	55.0%	9.2%
Apr 1-15	16.8%	8.3%	17.5%	0.0%	55.0%
Apr 16-30	29.4%	15.1%	23.1%	51.4%	12.0%
May 1-15	15.8%	13.9%	13.6%	49.5%	12.0%
May 16-30	29.4%	19.0%	38.3%	3.8%	38.9%
Jun 1-15	19.0%	19.7%	3.8%	38.9%	16.1%
Jun 16-31	19.0%	5.0%	4.5%	0.0%	44.6%
Jul 1-15	17.9%	2.8%	0.0%	0.0%	46.5%
Jul 16-30	0.0%	5.0%	0.0%	0.0%	0.0%



**New Melones Forecast and Allocations**

Annual Volume in 1,000 acre-feet							Spreadsheet Canal	
Three Settings: New	1997 IOP – Current SJR	Current Forecast	Pre-2012 District Proposal	SEWD	CSJWCD	Vernalis Water Quality	Vernalis Flow Objective	Upstream VAMP flow
0	1	2	3	4	5			
<ul style="list-style-type: none"> <li>1997 IOP – Current SJR</li> <li>Current Forecast</li> <li>Pre-2012 District Proposal</li> </ul>	0	0	0	0	0	0	0	Release for Vernalis
<ul style="list-style-type: none"> <li>Upstream Stanislaus River (above Stanislaus River Confluence)</li> <li>Existing FERC and other Tributary Instream flow requirements</li> <li>Pre-SJRRP Friant</li> <li>No STRAY/VAMP</li> <li>“Add Water” incorporated when necessary to maintain New Melones Storage &gt; 150 TAF during 1986-1992 drought sequence</li> </ul>	1400	98	0	0	0	70	0	Release for Vernalis
<ul style="list-style-type: none"> <li>“Add Water” incorporated when necessary to maintain New Melones Storage &gt; 150 TAF during 1986-1992 drought sequence</li> </ul>	2000	125	0	0	0	80	0	Release for Vernalis
	2499.99	345	10	49	175	0		Vernalis water quality
	2500	345	10	80	175	1000		
	3000	467	10	80	250	1000		Stanislaus River Fish
	6000	467	10	80	250	1000		Stanislaus fish pattern
	7000	467	10	80	250	1000		Off, uses NMI based
	8000	467	10	80	250	1000		
<ul style="list-style-type: none"> <li>1997 IOP – Current SJR</li> </ul>								Release for DO Req
								Critical Year DO Req
								Max Goodwin Release
								Initial Allocations
								NM Index (Oct 192
Form of lookup between indices:	Interpolate	Interpolate	Interpolate	Interpolate	Interpolate	Lookup		New Melones Stor
Threshold cutoff for interpolation:	NA	0	0	0	1400			

**Stanislaus Instream Fish Flow Requirement Monthly Distribution**

Flow in CFS									
Days	Lookup Period	Month	Lookup Reference	Breakpoints of Flow Distribution Schedules - 1,000 Acre-ft and Period Schedules - CFS					
				0	0.0	98.4	243.3	253.8	310.3
15	10_1	Oct	1	0	110	200	250	250	
16	10_2	Oct	2	0	110	200	250	250	
15	11_1	Nov	3	0	200	250	275	300	
15	11_2	Nov	4	0	200	250	275	300	
15	12_1	Dec	5	0	200	250	275	300	
16	12_2	Dec	6	0	200	250	275	300	
15	1_1	Jan	7	0	125	250	275	300	
16	1_2	Jan	8	0	125	250	275	300	
15	2_1	Feb	9	0	125	250	275	300	
13	2_2	Feb	10	0	125	250	275	300	
15	3_1	Mar	11	0	125	250	275	300	
16	3_2	Mar	12	0	125	250	275	300	
14	4_1	Apr	13	0	250	300	300	900	
16	4_2	Apr	14	0	500	1500	1500	1500	
15	5_1	May	15	0	500	1500	1500	1500	
16	OID/SSJD: Formula	May	16	0	250	300	300	900	
15	commitments calculation.	Jun	17	0	0	200	200	250	
15	Vernalis flow requirement (February-June, including pulse)	Jun	18	0	200	200	200	250	
15	75% exceedence parameters.	Jun	19	0	0	200	200	250	
16	7_2	Jul	20	0	0	200	200	250	
15	8_1	Aug	21	0	0	200	200	250	
16	8_2	Aug	22	0	0	200	200	250	
15	9_1	Sep	23	0	0	200	200	250	
15	9_2	Sep	24	0	0	200	200	250	
Equivalent Volume 1,000 Acre-feet:				0.0	98.9	245.7	256.2	311.5	

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### New Melones Forecast and Allocations

Annual Volume in 1,000 acre-feet

Spreadsheet Canal

Current New – RPA Melones Forecast Index	Instream Fish	SEWD	CSJWCD	Vernalis Water Quality	Vernalis Flow Objective	Upstream VAMP flow
New Melones Forecast Index equals end-of-February storage plus March through September inflow	98.4	10	0	400	0	Release for Vernalis
1000	98.4	10	0	400	0	
1000.1	98.4	10	0	400	0	Release for Vernalis
1399.9	98.4	10	0	400	0	Vernalis water quality
1400	185.3	10	49	400	99999	
1724.9	185.3	10	49	400	99999	Stanislaus River Fis
1725	234.1	10	49	400	99999	Stanislaus fish patte
2177.9	234.1	10	49	400	99999	Off, uses NMI ba
2178	346.7	75	80	400	99999	
2386.9	346.7	75	80	400	99999	Release for DO Req
2387	461.7	75	80	400	99999	Critical Year DO Re
2500	461.7	75	80	400	99999	
2761.9	461.7	75	80	400	99999	Max Goodwin Relea
2762	589	75	80	400	99999	
3000	589	75	80	400	99999	Initial Allocations
6000	589	75	80	400	99999	NM Index (Oct 192
Form of lookup between indices:	Interpolate	Interpolate	Interpolate	Interpolate	Lookup	New Melones Stor
Threshold cutoff for interpolation:	NA	0	0	0	1400	

### Stanislaus Instream Fish Flow Requirement Monthly Distribution

Flow in CFS

Days	Lookup Period	Month	Lookup Reference	Breakpoints of Flow Distribution Schedules - 1,000 Acre-feet and Period Schedules - CFS				
				0	0.0	98.9	185.3	234.2
15	OID/SUIT: Formula for water, occasionally not fully used according to land use and commitments calculation.	Oct	1	0	110	577	636	774
16		Oct	2	0	110	577	636	774
15	Vernalis flow requirement (February-June, including pulse) per D1641, using forecasted 75% Exceedance parameters	Nov	3	0	200	200	200	200
15		Nov	4	0	200	200	200	200
15	Additional critical year RPA schedule (98.4 TAP) added for years when NMI < 1,406 TAF consistent with BO modeling. Such schedule is not included in Table 2P. Flow schedules do not include releases for BO temperature requirements	Dec	5	0	200	200	200	200
16		Dec	6	0	200	200	200	200
15		Jan	7	0	125	213	219	226
16		Jan	8	0	125	213	219	226
15	Allocation for CVP Contractors is arbitrary but contributes to viable operation during all periods except during 1987-1992 drought.	Feb	9	0	125	214	221	229
13		Feb	10	0	125	214	221	229
15		Mar	11	0	125	200	200	200
16		Mar	12	0	125	200	200	200
14		Apr	13	0	250	200	500	1471
16		Apr	14	0	500	677	1000	1548
15		May	15	0	500	677	1000	1548
16		May	16	0	250	150	284	1031
15		Jun	17	0	0	150	200	363
15		Jun	18	0	0	150	200	363
15		Jul	19	0	0	150	200	250
16		Jul	20	0	0	150	200	250
15		Aug	21	0	0	150	200	250
16		Aug	22	0	0	150	200	250
15		Sep	23	0	0	150	200	250
15		Sep	24	0	0	150	200	250
Equivalent Volume 1,000 Acre-feet:				0.0	98.9	185.3	234.2	346.7

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### New Melones Forecast and Allocations

Annual Volume in 1,000 acre-feet

Spreadsheet Canal

New Melones Forecast Index	District Proposal				Vernalis Water Quality	Vernalis Flow Objective	Upstream VAMP flow
	Instream Fish	SEWD	CSJWCD				
0	1	2	3	4	5		
New Melones Forecast Index equals end-of-February storage plus March through September inflow	9999	10	0	100	0	Release for Vernalis	
1299.999	9999	10	0	100	0		
1400	9999	10	0	100	0	Release for Vernalis	
1401	9999	10	49	100	0	Vernalis water quality	
1800	9999	10	49	100	0		
1801	99999	75	80	100	0	Stanislaus River Fis	
2500	99999	75	80	100	0	Stanislaus fish patte	
2501	999999	75	80	100	0	Off, uses NMI ba	
7000	999999	75	80	100	0		
8000	999999	75	80	100	0	Release for DO Req Critical Year DO Re	
						Max Goodwin Relea	
						<b>Initial Allocations</b> NM Index (Oct 192	
Form of lookup between indices:	Interpolate	Interpolate	Interpolate	Interpolate	Lookup	<b>New Melones Stor</b>	
Threshold cutoff for interpolation:	NA	0	0	0	0		

### Stanislaus Instream Fish Flow Requirement Monthly Distribution

Flow in CFS

Days	Lookup Period	Month	Lookup Reference	Breakpoints of Flow Distribution Schedules - 1,000 Acre-feet and Period Schedules - CFS				
15	0_1	0	0.0	98.9	185.3	234.2	346.7	
16	10_2	1	1	0	110	577	636	774
15	11_1	2	2	0	110	577	636	774
15	11_2	3	3	0	200	400	200	200
15	12_1	4	4	0	200	200	200	200
15	12_2	5	5	0	200	200	200	200
16	1_1	6	6	0	200	200	200	200
16	1_2	7	7	0	125	213	219	226
16	2_1	8	8	0	125	213	219	226
15	2_2	9	9	0	125	214	221	229
13	3_1	10	10	0	174	214	221	229
15	3_2	11	11	0	235	200	200	200
16	4_1	12	12	0	318	200	200	200
14	4_2	13	13	0	250	200	500	1471
16	5_1	14	14	0	500	677	1000	1548
15	5_2	15	15	0	500	677	1000	1548
16	6_1	16	16	0	250	150	284	1031
15	6_2	17	17	0	0 (SEWD)	150	200	363
15	7_1	18	18	59	0 (10 SEWD)	150	200	363
15	7_2	19	19	0	155	150	200	250
16	8_1	20	20	0	0	150	200	250
15	8_2	21	21	0	0	150	200	250
16	9_1	22	22	0	0	150	200	250
15	9_2	23	23	0	0	150	200	250
15	9_2	24	24	0	0	150	200	250
Equivalent Volume 1,000 Acre-feet:				0.0	98.9	185.3	234.2	346.7

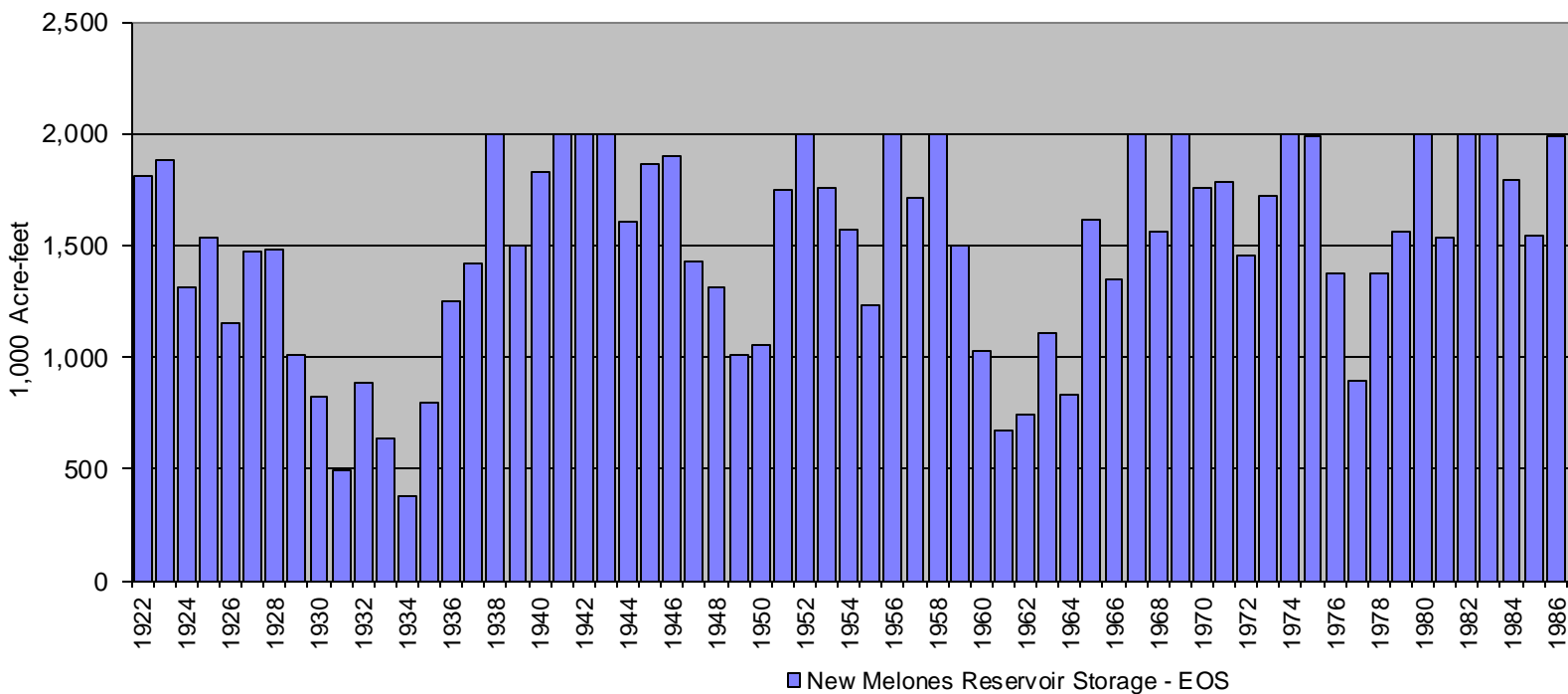
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**New Melones End-of-September Reservoir Storage**

1997 IOP – Adapted to Current SJR

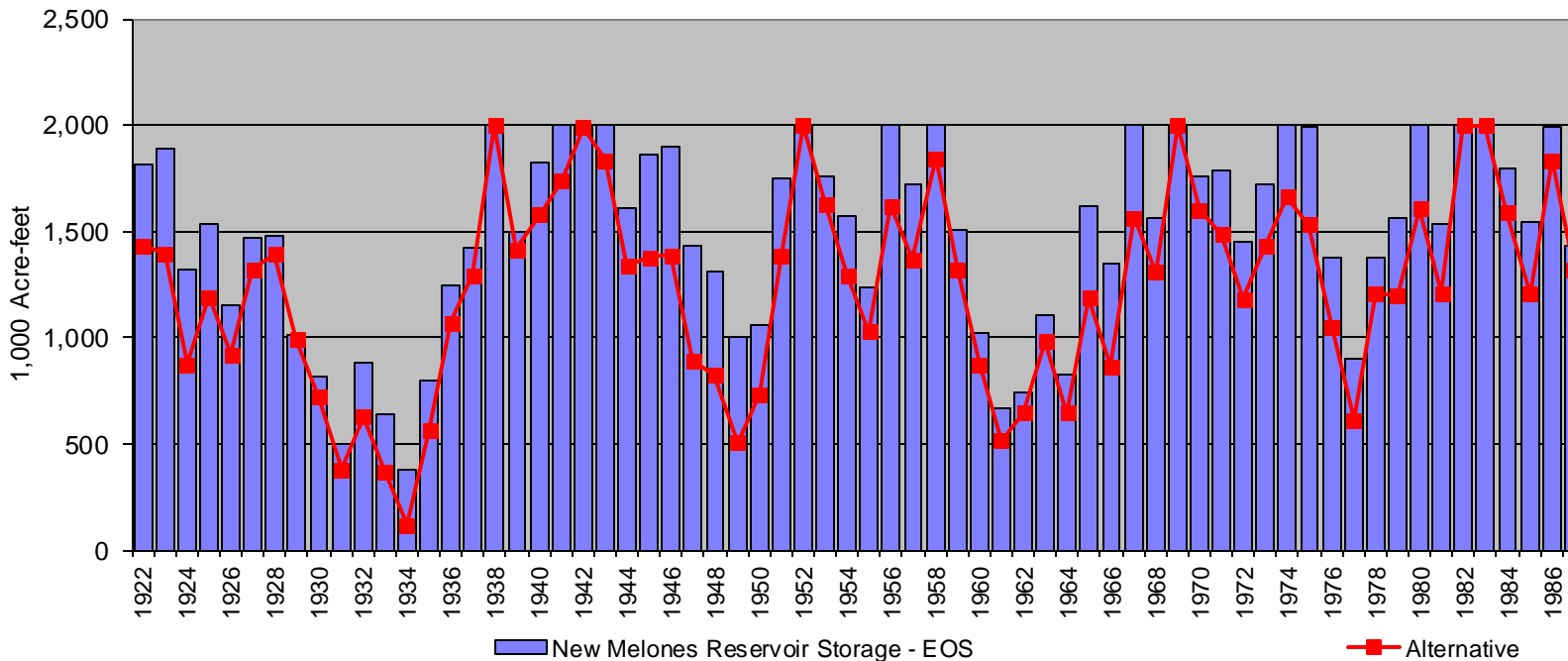
Current River – RPA



1997 IOP – Adapted to Current SJR (Blue Bar) v Current River RPA (Red Line)

1997 IOP – Adapted to Current SJR (Blue Bar) v September 2012 District Proposal (Red Line)

September 2012 District Proposal (Blue Bar) v Current River RPA (Red Line)

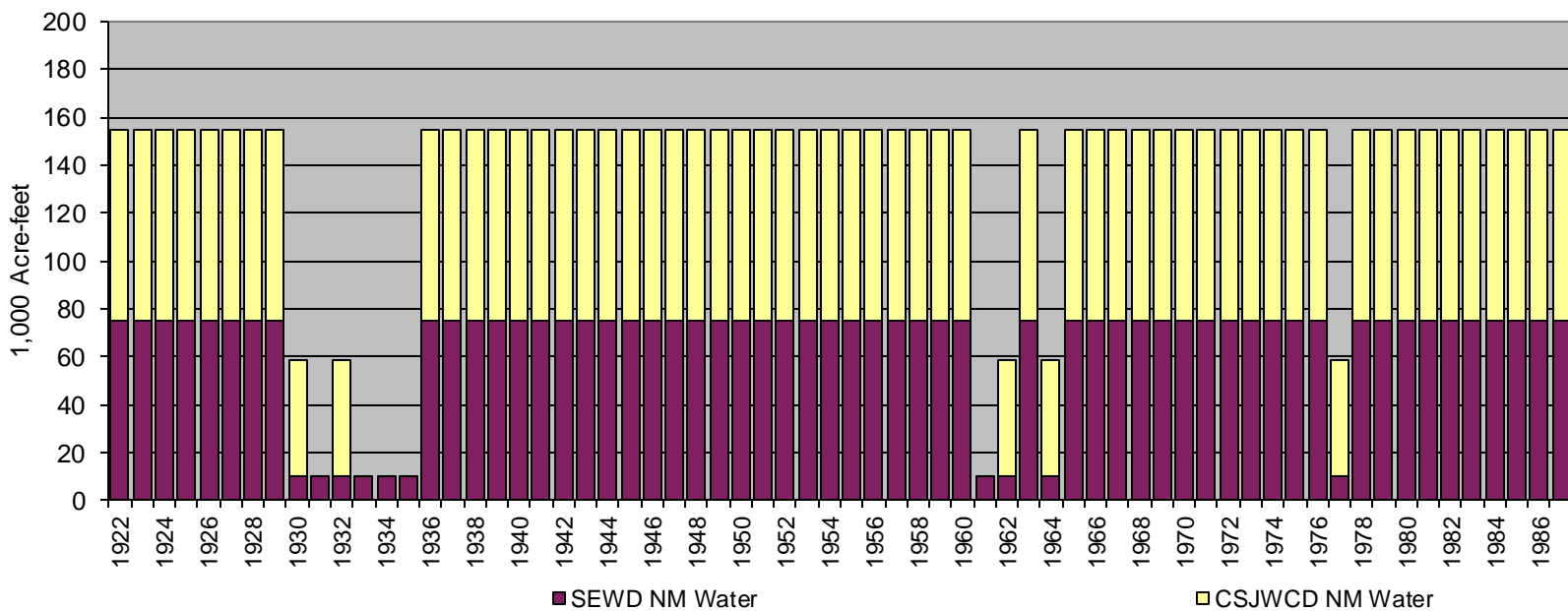


**CVP Contractor Annual Allocations**

1997 IOP – Adapted to Current SJR

Current River – RPA

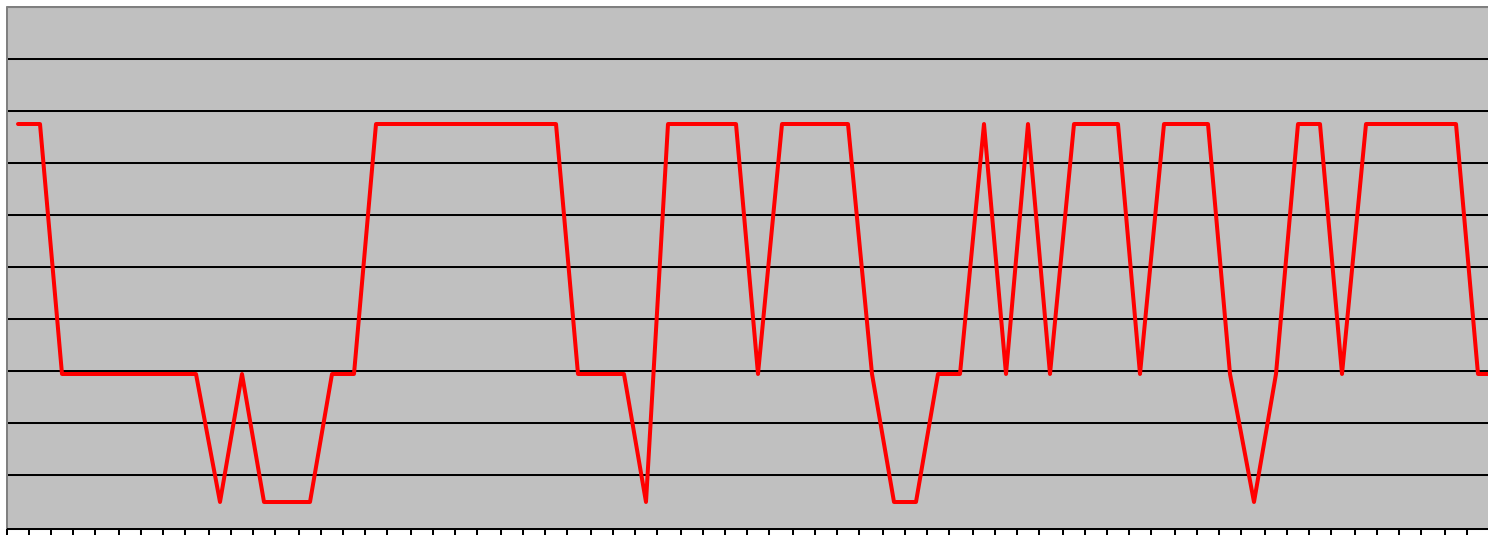
September 2012 District Proposal



1997 IOP – Adapted to Current SJR (Bars) v Current River RPA (Red Line)

1997 IOP – Adapted to Current SJR (Bars) v September 2012 District Proposal (Red Line)

September 2012 District Proposal (Bars) v Current River RPA (Red Line)

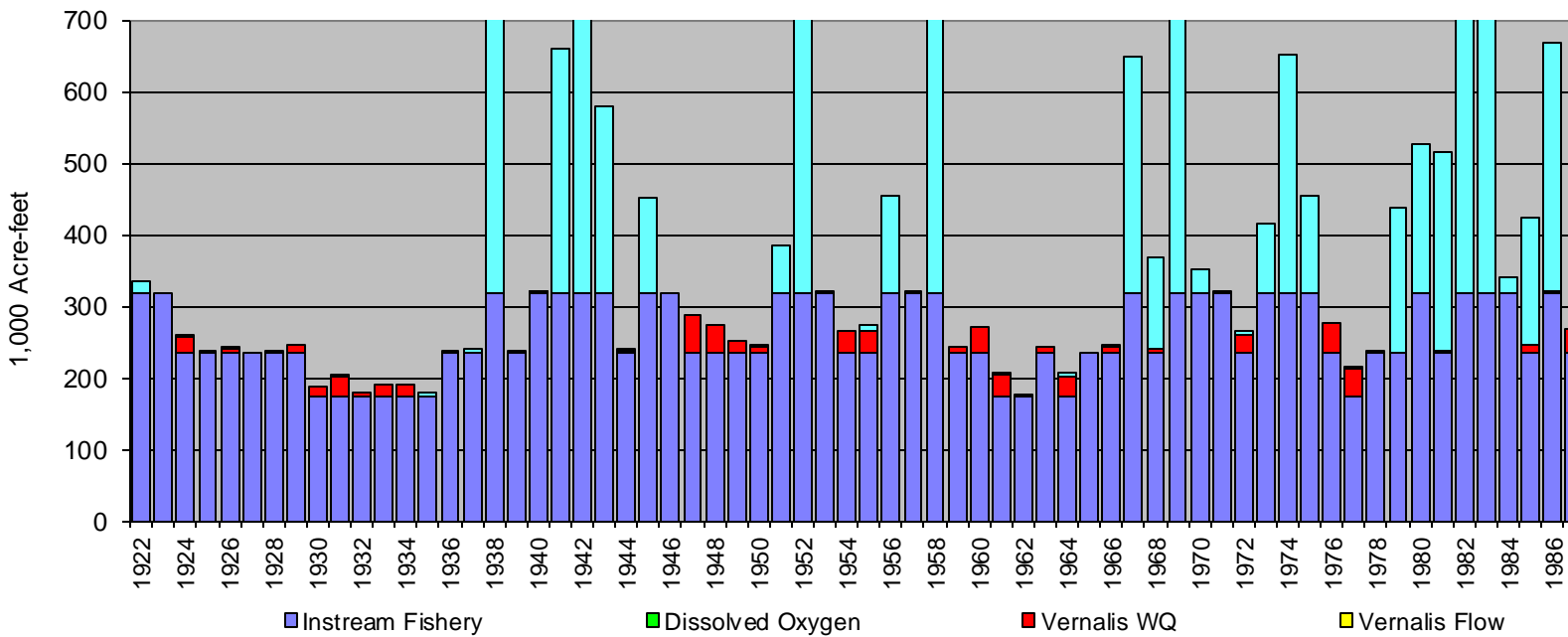


**Goodwin Dam Annual Releases to Stanislaus River**

1997 IOP – Adapted to Current SJR

Current River – RPA

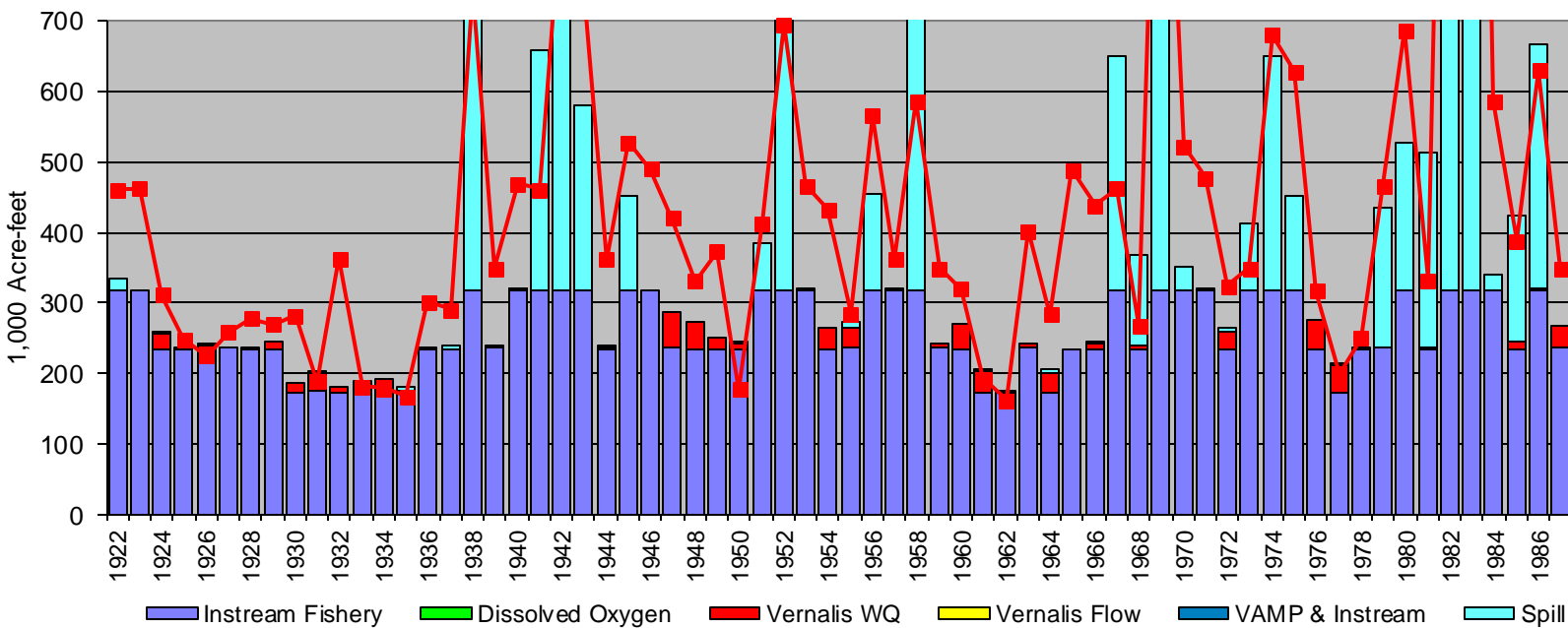
September 2012 District Proposal



1997 IOP – Adapted to Current SJR (Bars) v Current River RPA (Red Line)

1997 IOP – Adapted to Current SJR (Bars) v September 2012 District Proposal (Red Line)

September 2012 District Proposal (Bars) v Current River RPA (Red Line)

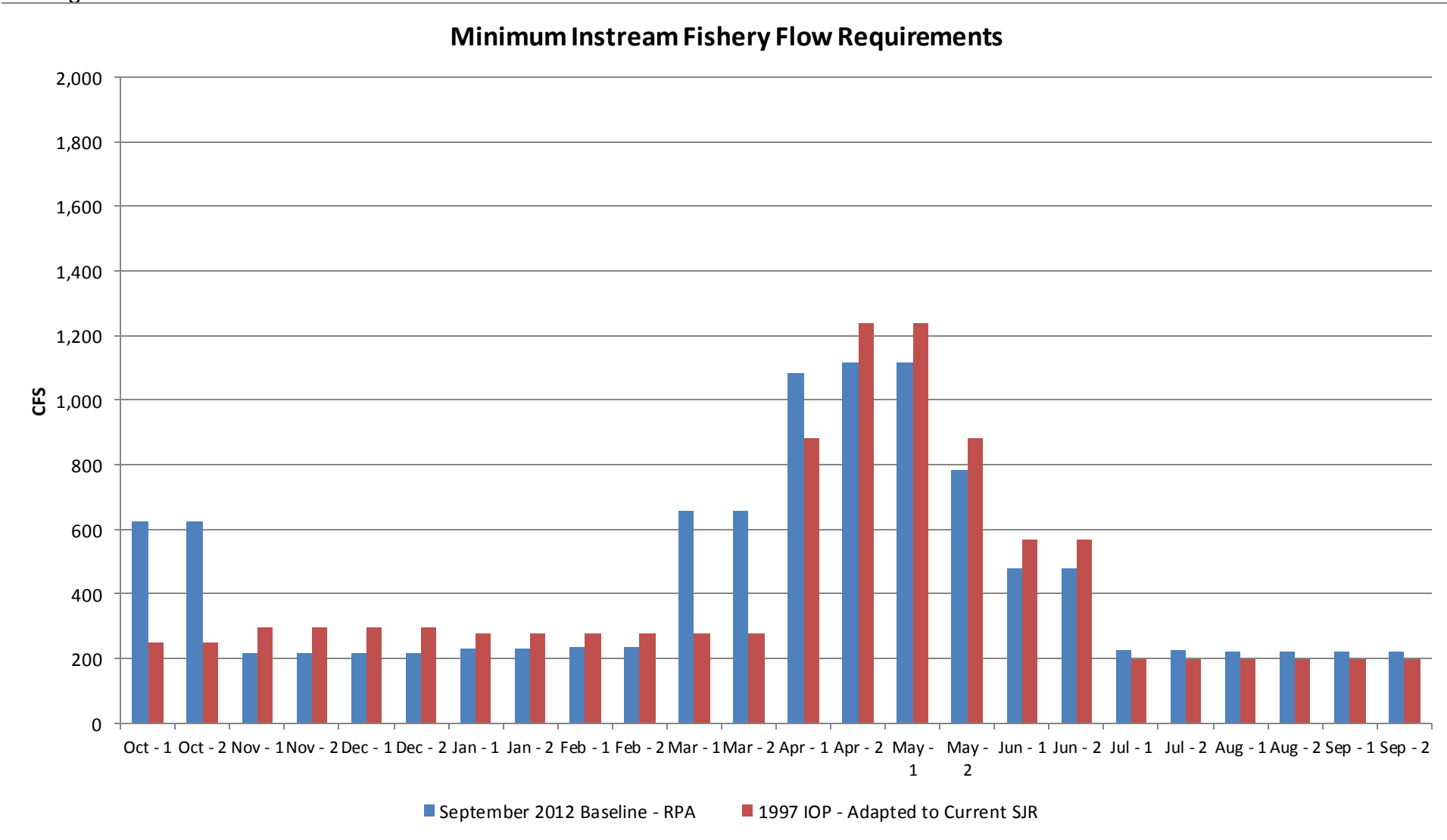


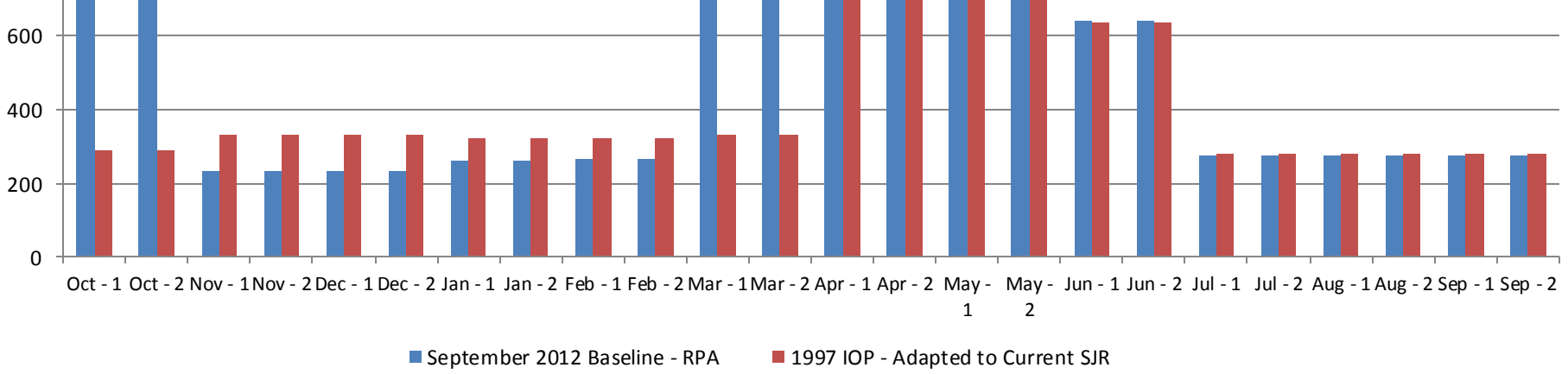
Minimum Instream Fishery Requirement

Average Period CFS

Year Type	Work Product - Subject to Revision	Subject to Revision	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012	Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	449	449	-122	-122	-122	-122	-88	-88	-84	-84	1,138	1,138	
25% AN Ave	417	417	-95	-95	-95	-95	-62	-62	-58	-58	461	461	
25% BN Ave	398	398	-96	-96	-96	-96	-64	-64	-61	-61	-55	-55	
25% D Ave	236	236	-11	-11	-11	-11	15	15	16	16	7	7	
10% D Ave	163	163	11	11	11	11	29	29	30	30	7	7	
All Avg	374	374	-80	-80	-80	-80	-49	-49	-46	-46	378	378	

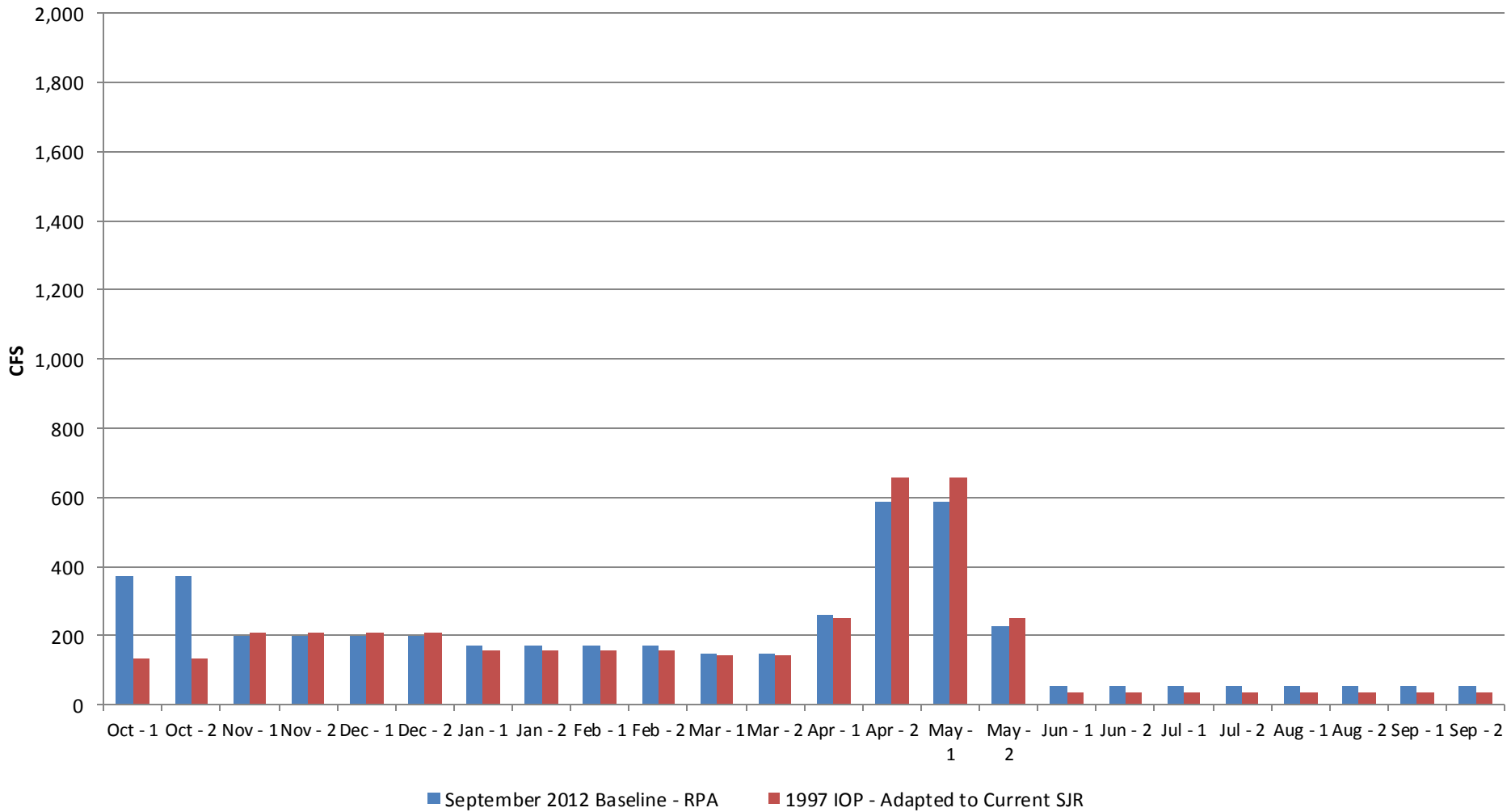
Average All Years





Average 25% Dry Years

Minimum Instream Fishery Flow Requirements





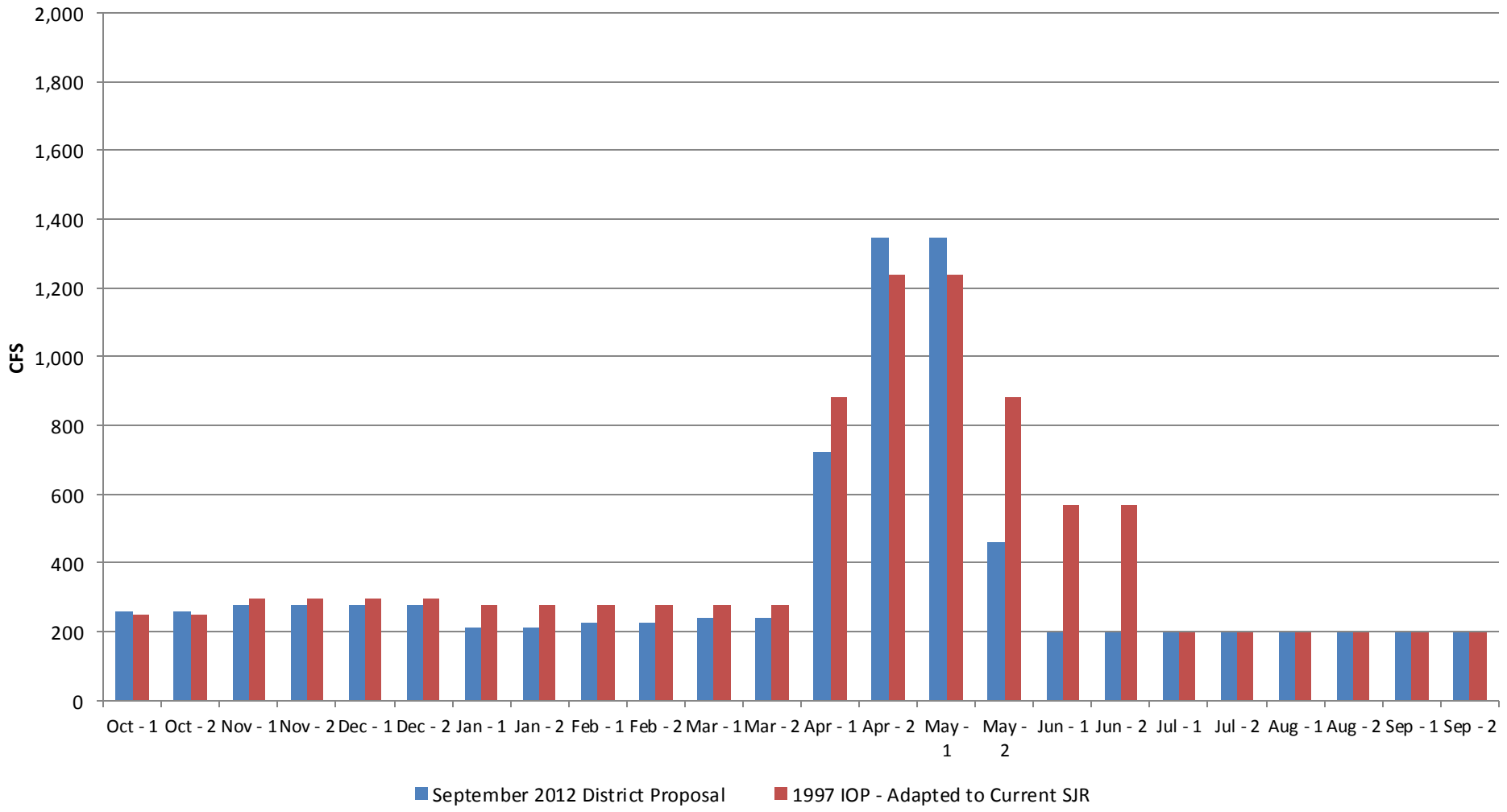
Minimum Instream Fishery Requirement

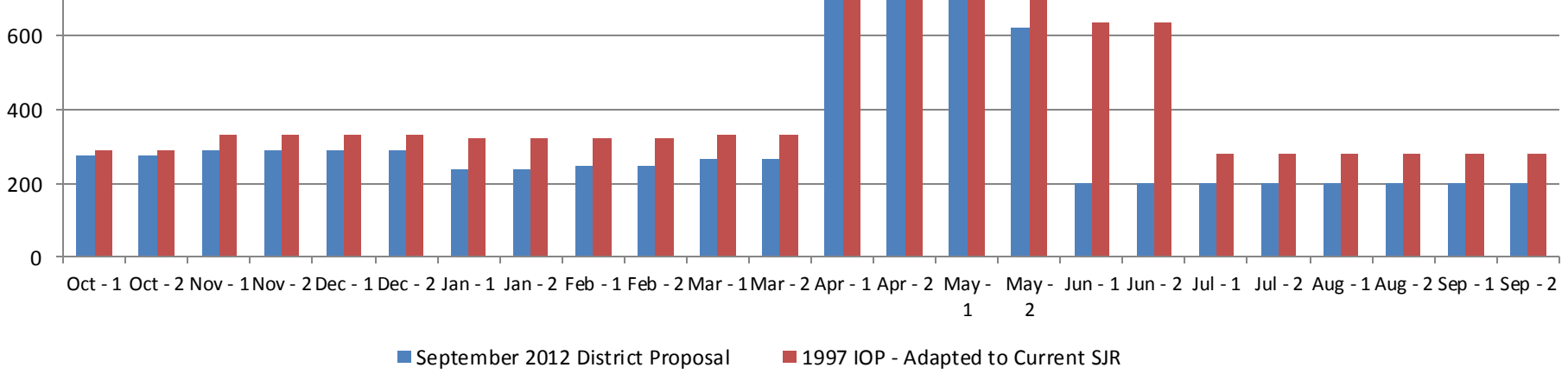
Average Period CFS

Year Type	Work Product - Oct - 1	Subject to Revision - Oct - 2	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012 - Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	-28	-28	-42	-42	-42	-42	-93	-93	-85	-85	-93	-93
25% AN Ave	-14	-14	-40	-40	-40	-40	-84	-84	-75	-75	-68	-68
25% BN Ave	-6	-6	-24	-24	-24	-24	-97	-97	-82	-82	-55	-55
25% D Ave	85	85	28	28	28	28	-8	-8	15	15	58	58
10% D Ave	97	97	22	22	22	22	25	25	48	48	82	82
All Avg	10	10	-19	-19	-19	-19	-70	-70	-56	-56	-39	-39

Average All Years

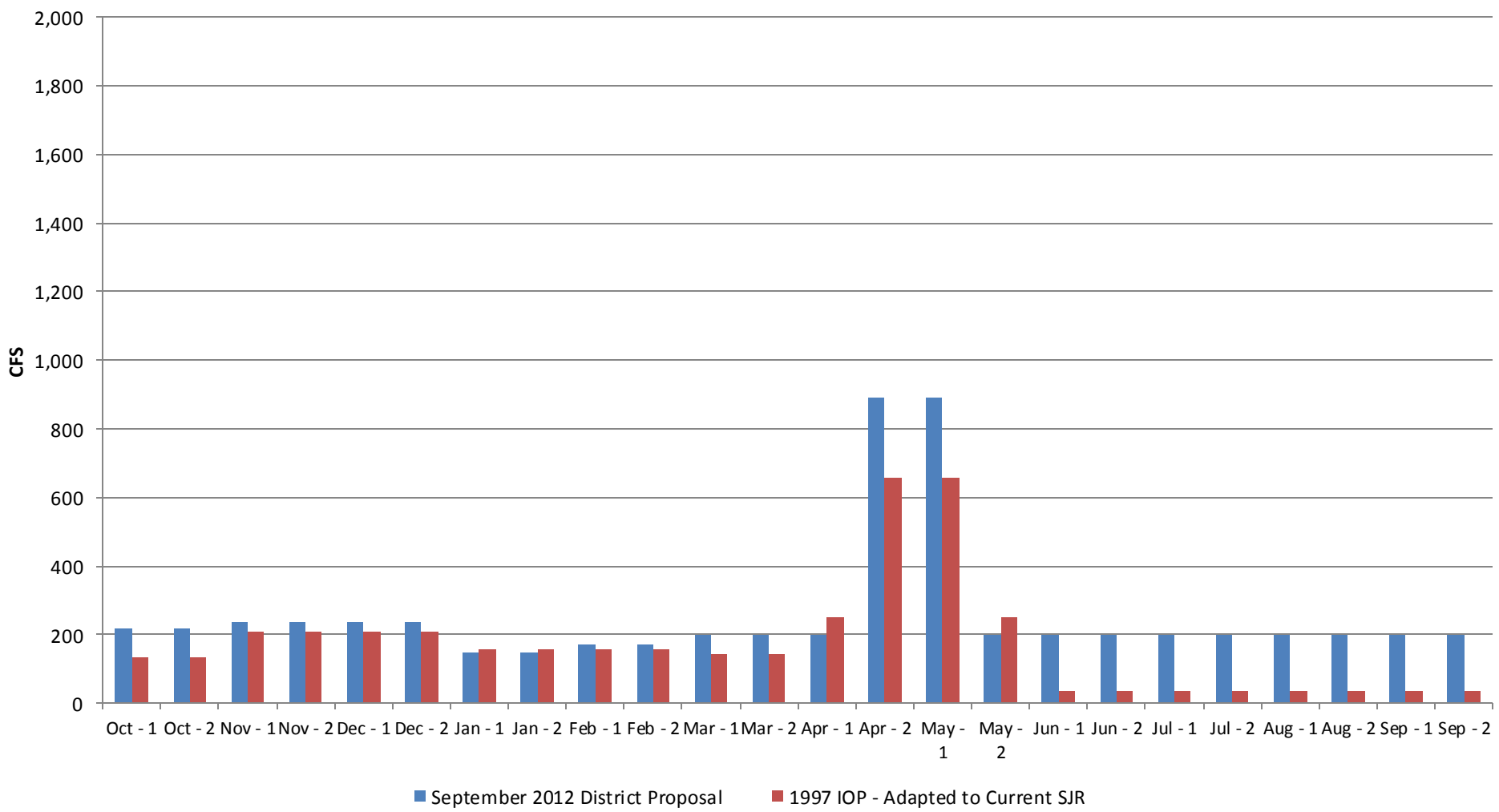
Minimum Instream Fishery Flow Requirements





Average 25% Dry Years

Minimum Instream Fishery Flow Requirements

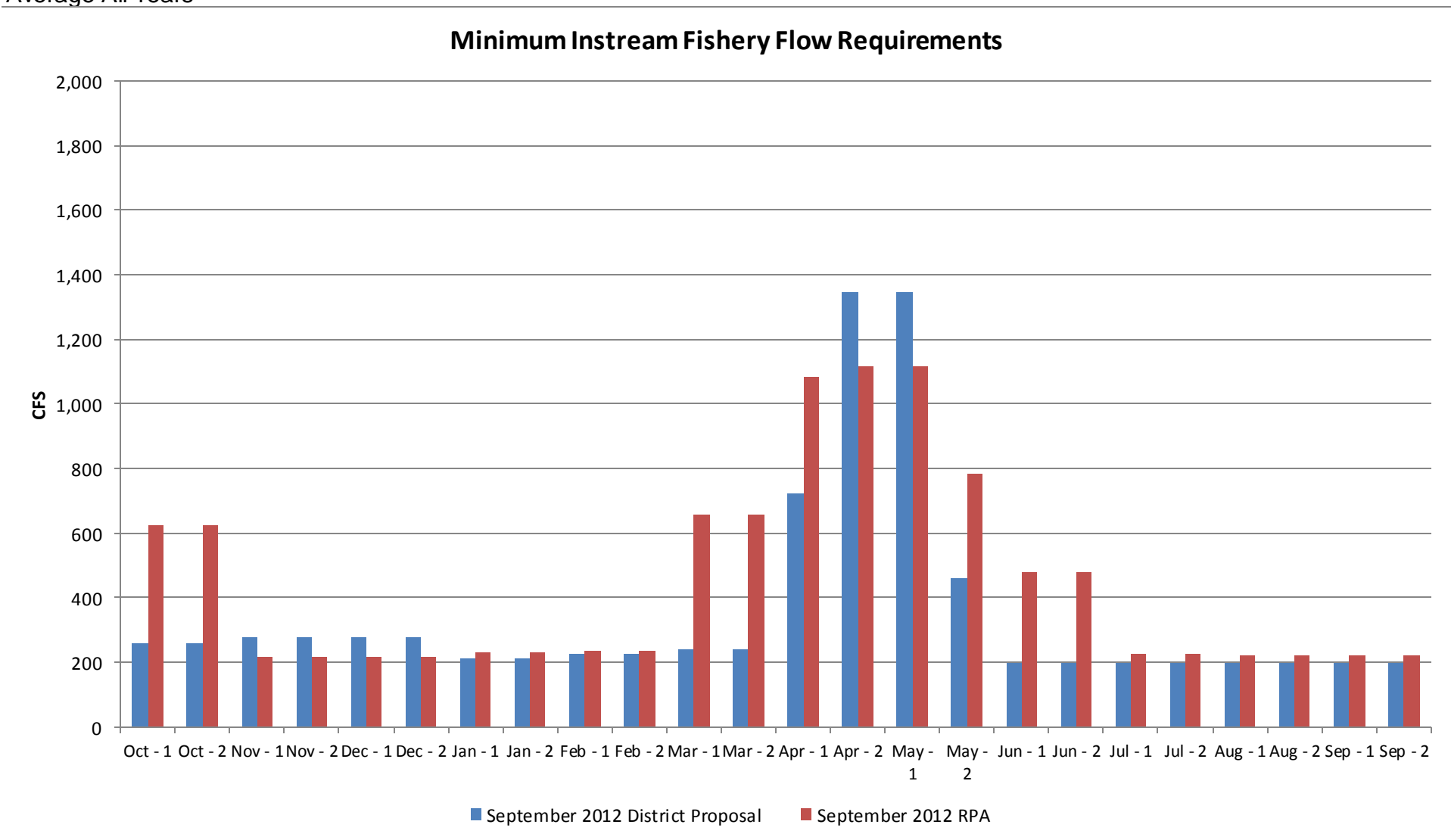


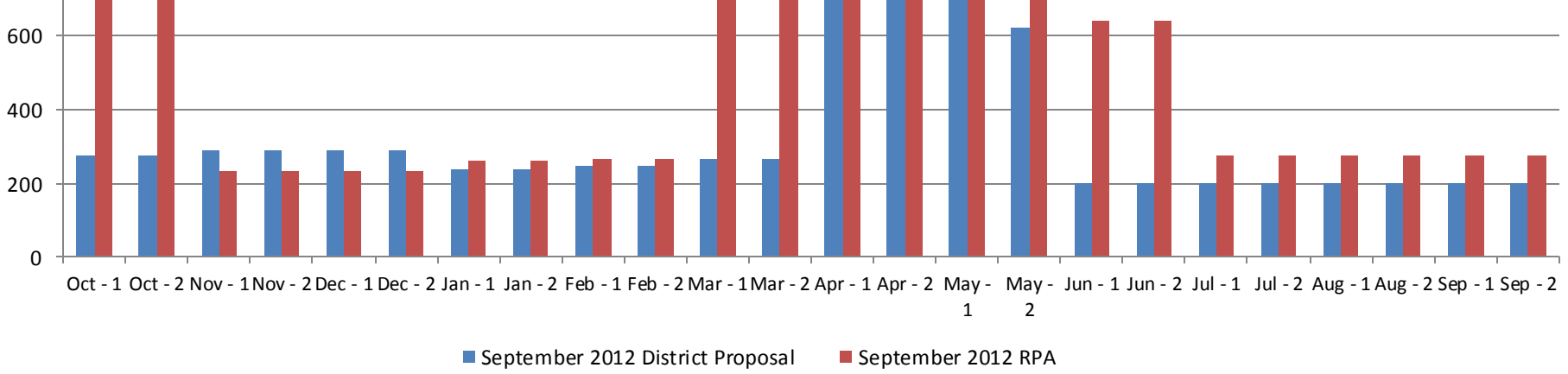
Minimum Instream Fishery Requirement

Average Period CFS

Year Type	Work Product - Subject to Revision	Subject to Revision	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012	September 30, 2012	Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	-477	-477	80	80	80	80	-5	-5	-1	-1	-1,231	-1,231		
25% AN Ave	-431	-431	55	55	55	55	-22	-22	-16	-16	-529	-529		
25% BN Ave	-404	-404	72	72	72	72	-32	-32	-21	-21	0	0		
25% D Ave	-151	-151	39	39	39	39	-23	-23	-1	-1	50	50		
10% D Ave	-66	-66	12	12	12	12	-5	-5	18	18	76	76		
All Avg	-364	-364	61	61	61	61	-21	-21	-10	-10	-417	-417		

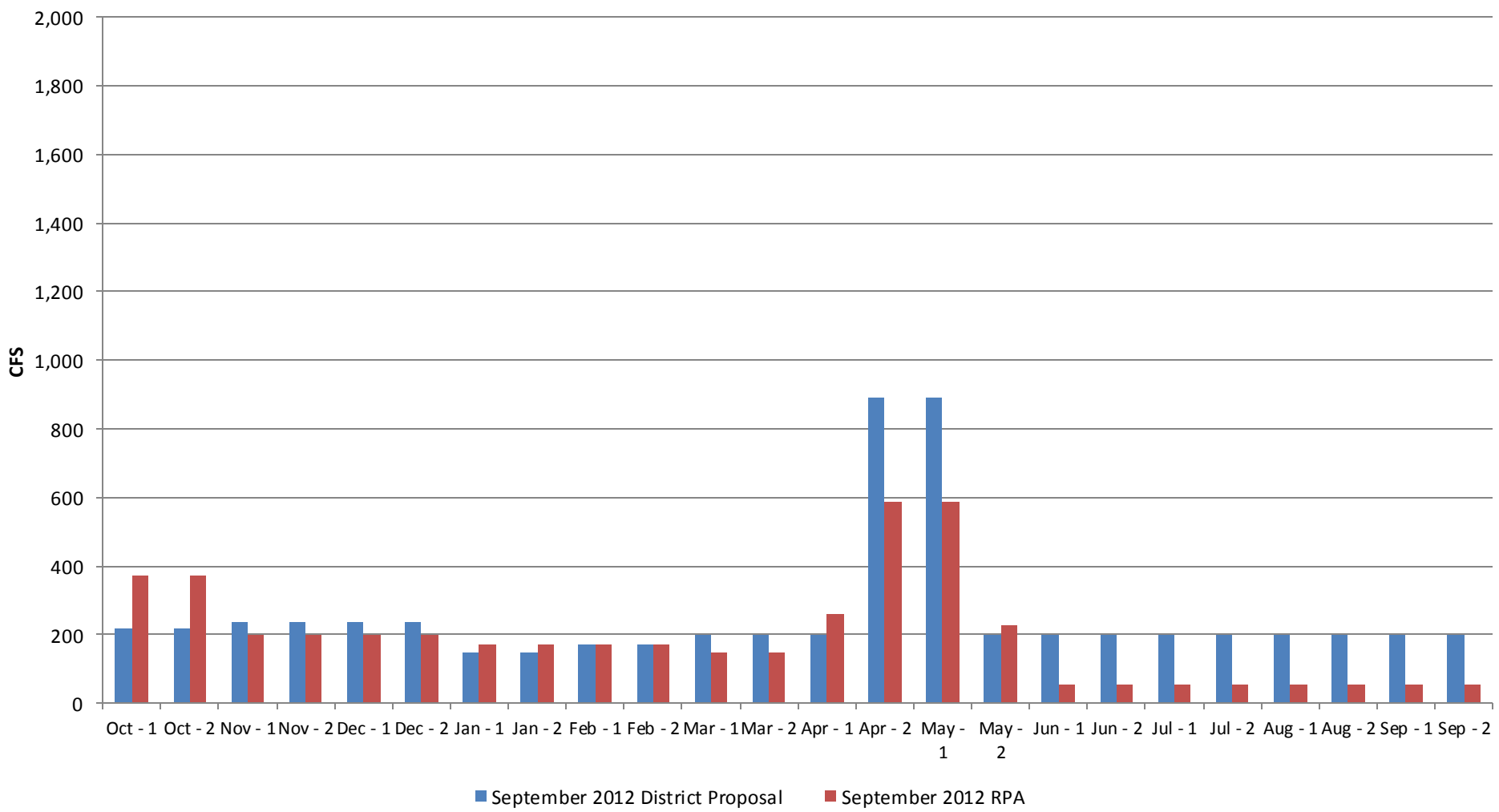
Average All Years





Average 25% Dry Years

Minimum Instream Fishery Flow Requirements

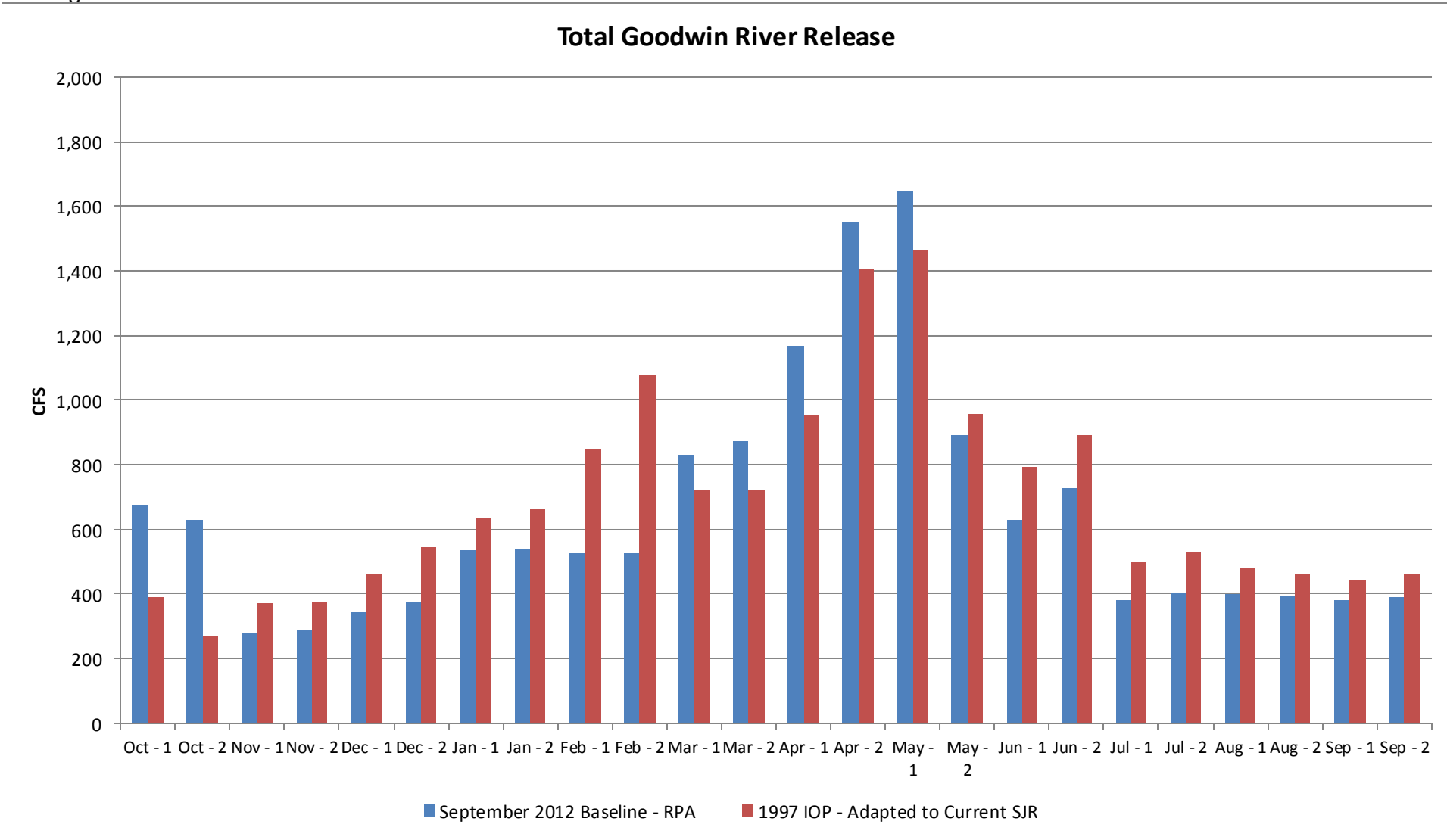


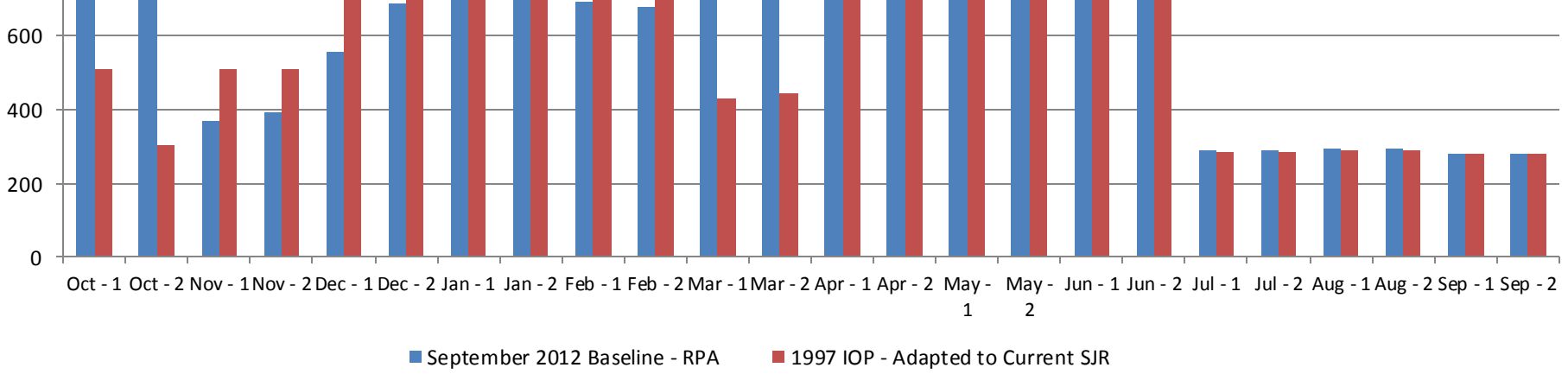
Minimum Instream Fishery Requirement

Average Period CFS

Year Type	Work Product - Oct - 1	Subject to Revision Oct - 2	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012 Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	305	411	-124	-124	-158	-179	-193	-298	-1,128	-1,993	-9	191
25% AN Ave	259	403	-140	-119	-211	-398	-154	-156	-194	-292	418	401
25% BN Ave	346	398	-96	-96	-96	-96	-64	-64	-54	-61	-10	-11
25% D Ave	236	206	-11	-11	-11	-11	16	16	58	60	24	24
10% D Ave	163	163	11	11	11	11	31	31	49	49	3	3
All Avg	287	361	-92	-87	-117	-168	-97	-123	-322	-558	103	148

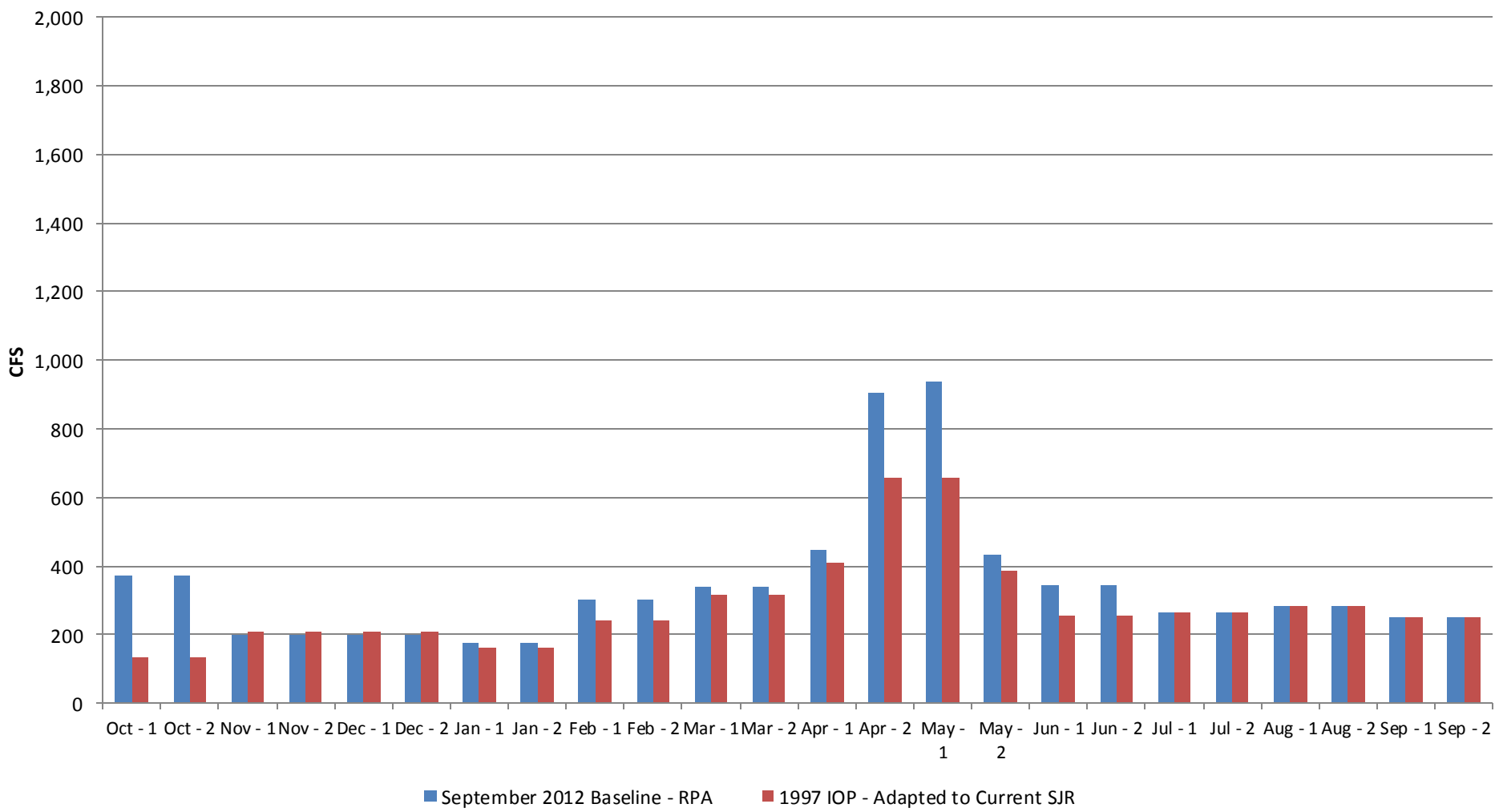
Average All Years





Average 25% Dry Years

Total Goodwin River Release

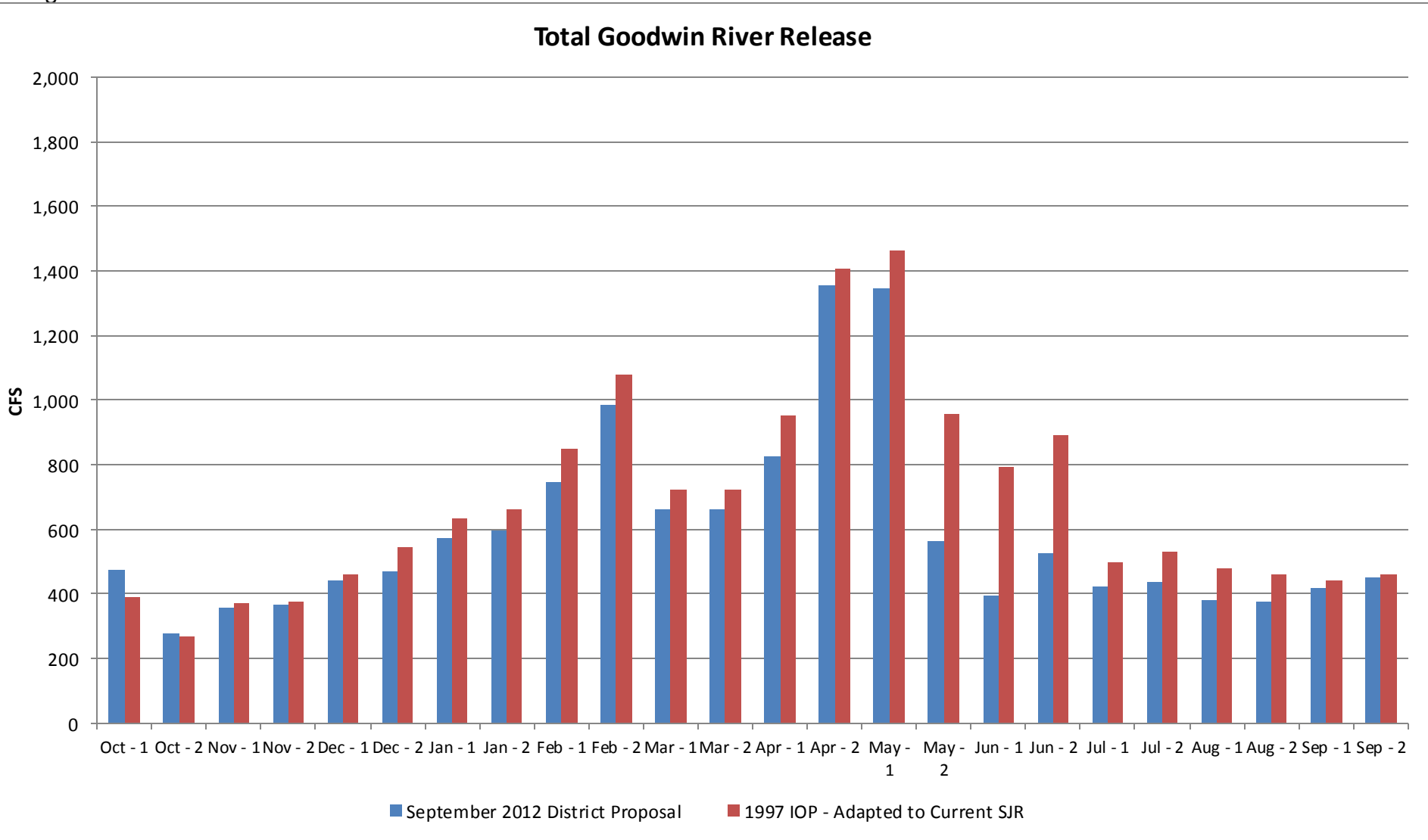


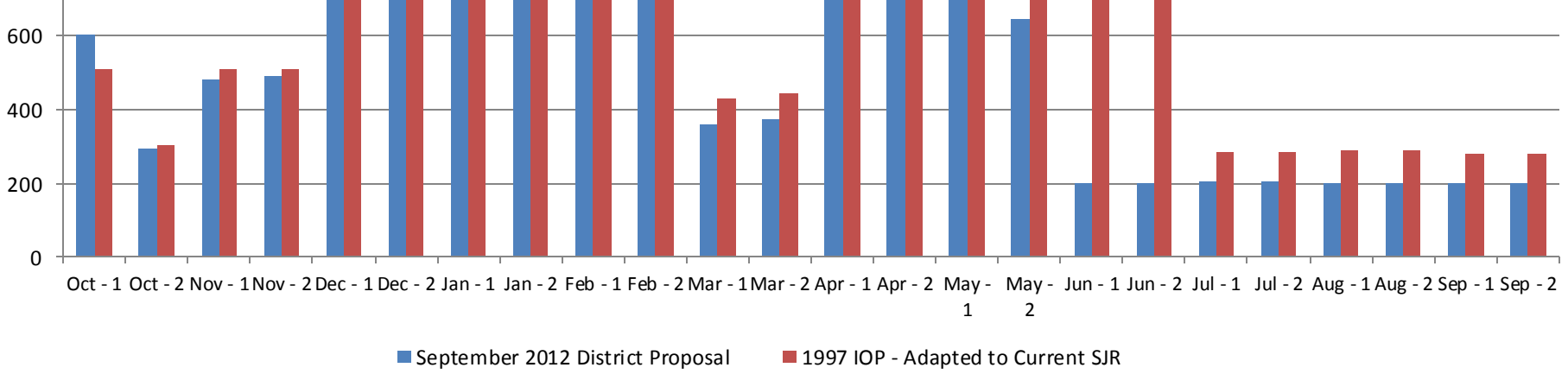
Minimum Instream Fishery Requirement

Average Period CFS

Year Type	Work Product - Oct - 1	Subject to Revision Oct - 2	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012 Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	26	-23	-29	-22	-56	-18	-43	-120	-405	-295	-156	-146
25% AN Ave	99	-9	-28	-20	-26	-313	-142	-125	-35	-110	-67	-70
25% BN Ave	128	-4	-17	-17	-10	1	-50	-18	-12	-30	-52	-53
25% D Ave	85	85	28	28	28	28	-9	-9	38	40	15	14
10% D Ave	97	97	22	22	22	22	22	22	60	60	20	19
All Avg	84	13	-11	-7	-15	-74	-60	-66	-101	-96	-64	-63

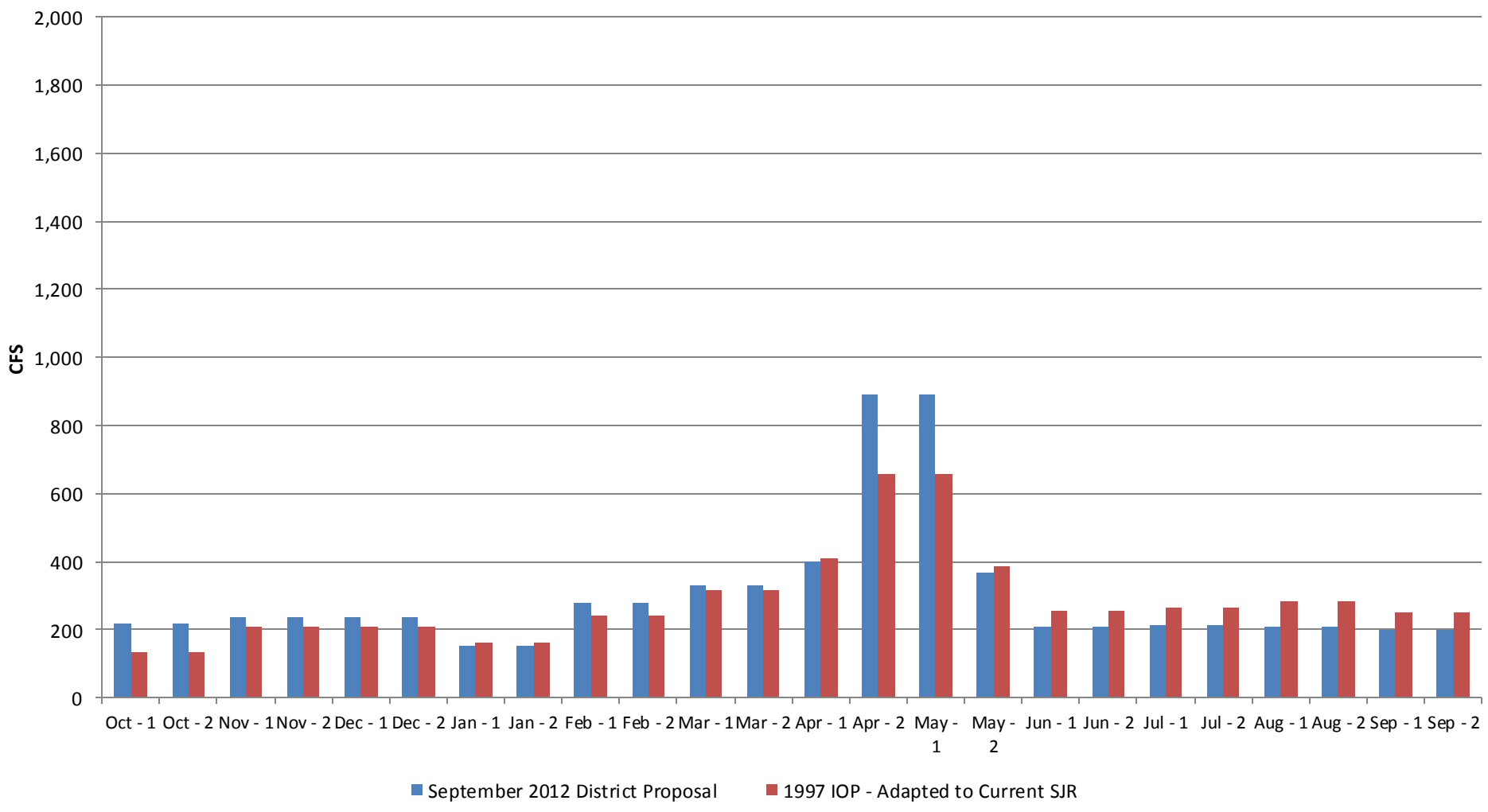
Average All Years





Average 25% Dry Years

Total Goodwin River Release



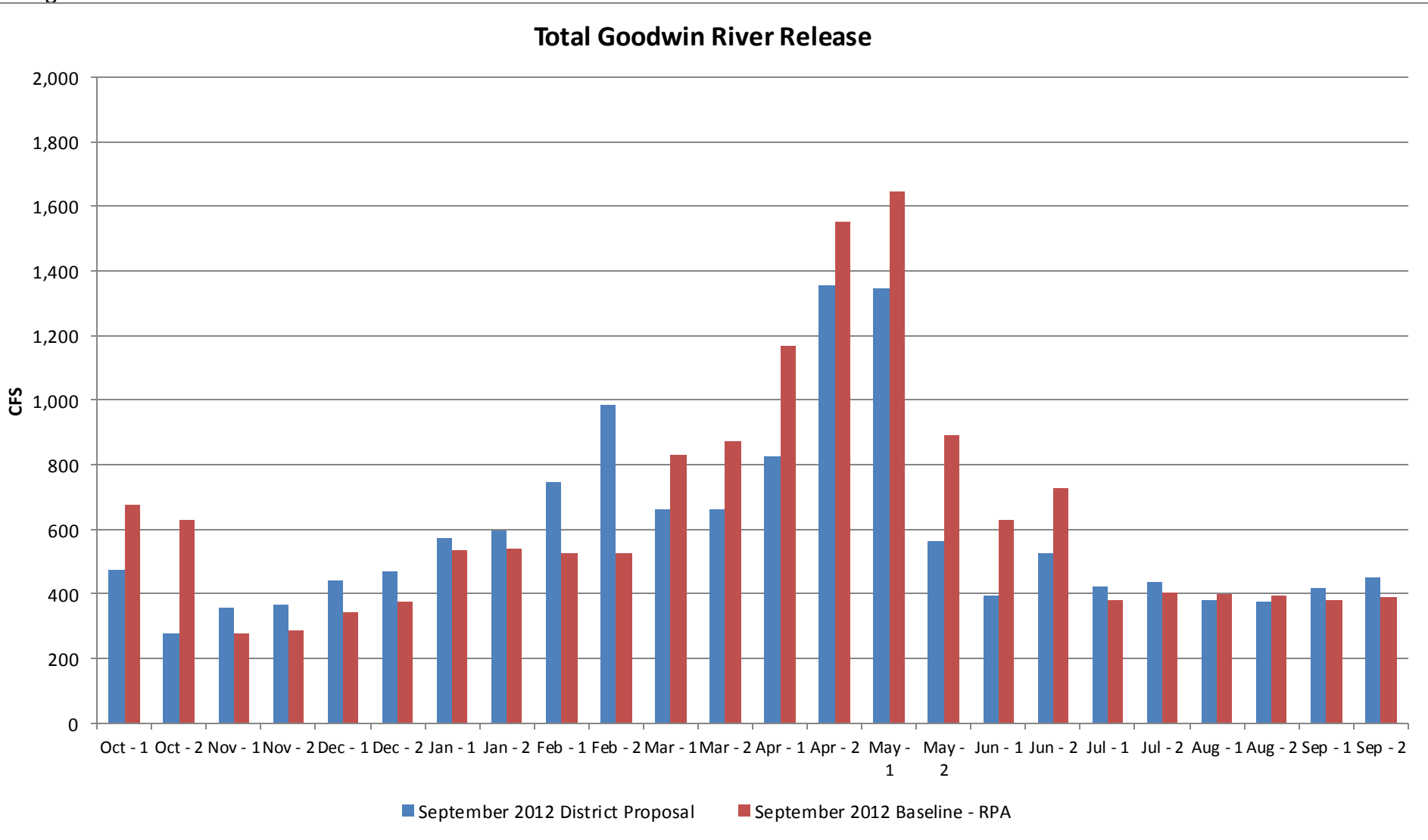


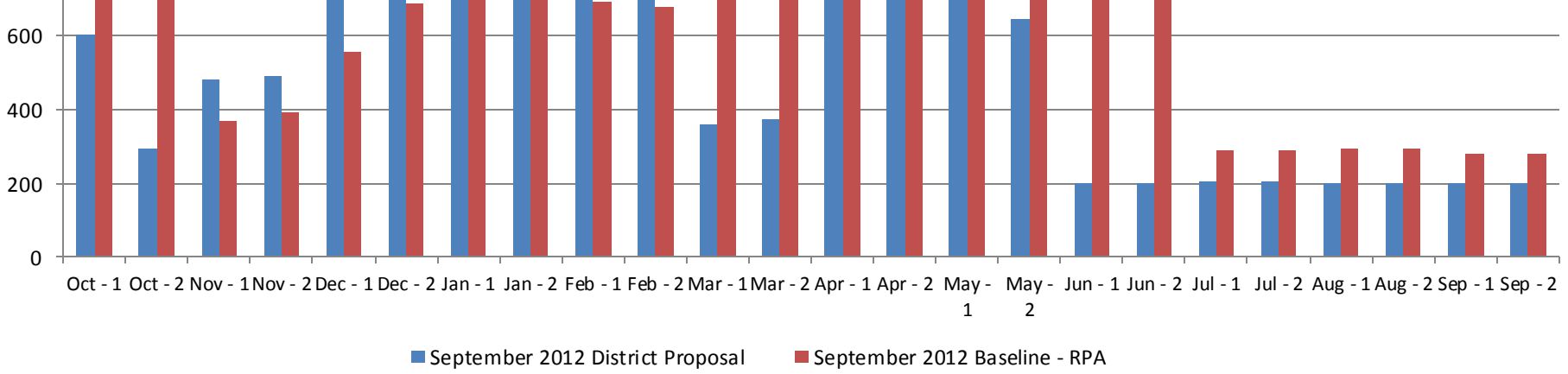
Minimum Instream Fishery Requirement

Average Period CFS

Year Type	Work Product - Oct - 1	Subject to Revision - Oct - 2	Nov - 1	Nov - 2	Dec - 1	Dec - 2	DBS - September 30, 2012 - Jan - 1	Jan - 2	Feb - 1	Feb - 2	Mar - 1	Mar - 2
25% W Ave	-279	-434	94	102	101	160	150	179	723	1,698	-147	-337
25% AN Ave	-166	-412	112	99	185	85	12	32	159	182	-485	-471
25% BN Ave	-218	-402	79	79	86	96	14	46	42	31	-43	-42
25% D Ave	-151	-151	39	39	39	39	-25	-25	-20	-20	-9	-10
10% D Ave	-66	-66	12	12	12	12	-9	-9	10	10	17	15
All Avg	-203	-348	80	79	102	94	37	57	221	461	-167	-210

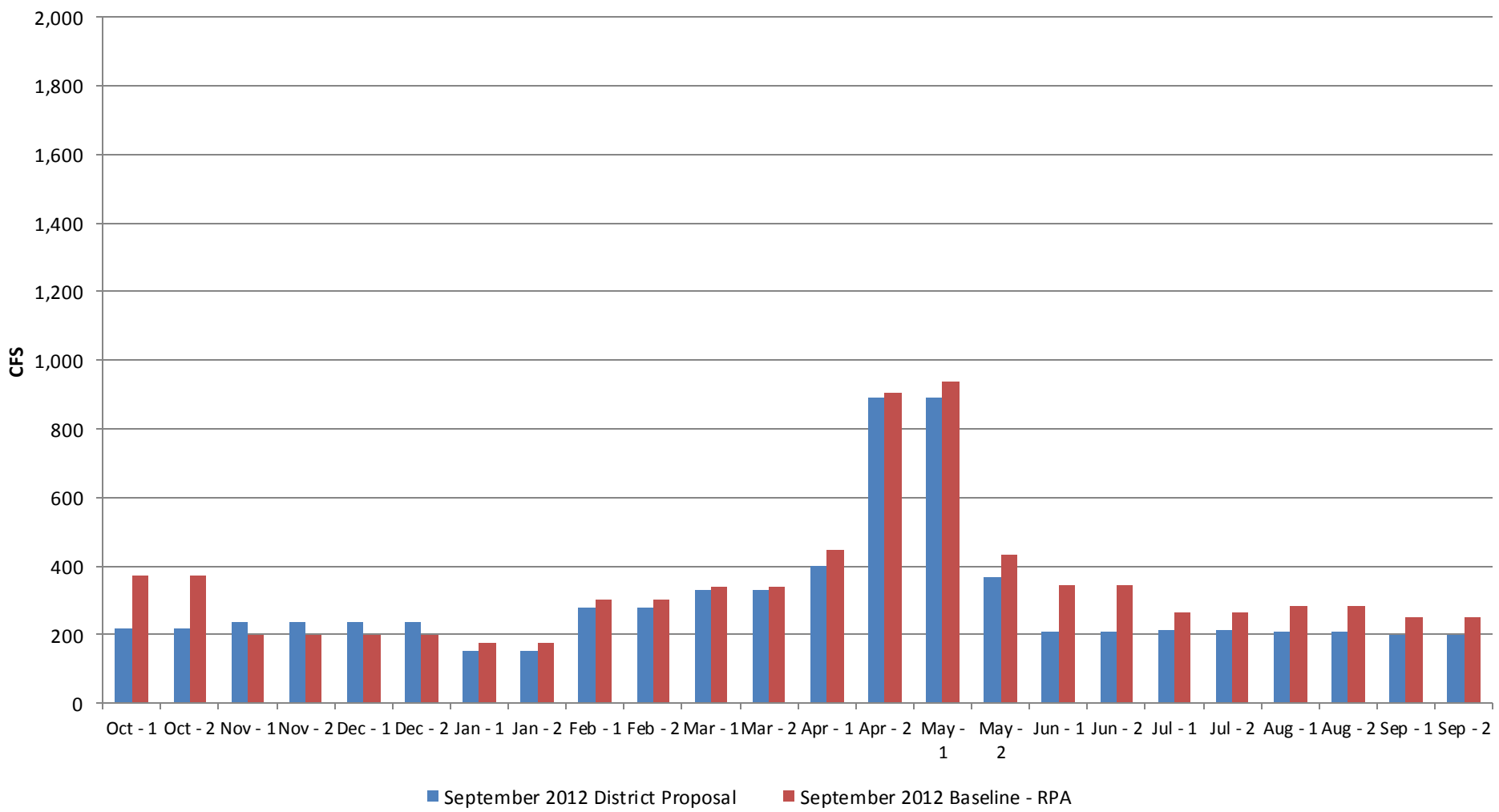
Average All Years





Average 25% Dry Years

Total Goodwin River Release



1943	1538	1930	0	484	10	80	468	0	0	51	713	194	3090
1944	649	1584	0	547	8	39	301	5	0	0	307	0	2397
1945	1228	1776	0	474	10	80	399	0	0	60	492	32	2722
1946	1175	1858	0	481	10	80	418	0	0	26	444	0	2801
1947	634	1460	0	600	7	33	274	11	22	0	308	0	2334
1948	853	1463	0	489	4	18	209	27	30	0	267	0	2186
1949	732	1328	0	583	1	6	155	39	18	0	211	0	2065
1950	1027	1494	0	549	5	25	239	18	4	0	674	413	2254
1951	1656	1733	0	505	10	80	394	0	0	30	486	63	2697
1952	1844	2000	0	496	10	80	467	0	0	0	1063	596	3430
1953	965	1763	0	546	10	80	393	0	0	0	393	0	2695
1954	882	1596	0	590	9	45	329	2	4	0	335	0	2462
1955	656	1395	0	516	2	12	180	25	35	0	322	82	2121
1956	1825	2000	0	527	10	80	467	0	0	95	631	70	3082
1957	878	1729	0	557	10	80	382	0	0	0	382	0	2649
1958	1599	2000	0	419	10	80	467	0	0	0	896	429	3200
1959	624	1560	0	556	7	37	292	8	0	0	299	0	2374
1960	574	1247	0	583	0	0	126	30	61	0	217	0	2001
1961	446	929	0	497	0	0	109	23	66	0	199	2	1623
1962	863	1050	0	540	0	0	113	44	15	0	172	0	1715
1963	1227	1526	0	481	4	19	214	26	4	0	244	0	2198
1964	632	1281	0	578	1	6	154	29	40	0	228	5	2062
1965	1666	1867	0	500	10	80	445	0	0	102	547	0	2910
1966	733	1582	0	552	9	43	319	2	0	0	322	0	2439
1967	1831	2000	0	486	10	80	468	0	0	0	939	471	3297
1968	670	1600	0	534	8	40	308	4	0	0	487	175	2413
1969	2118	2000	0	502	10	80	467	0	0	0	1465	999	3474
1970	1321	1695	0	528	10	80	399	0	0	67	496	30	2720
1971	1066	1716	0	528	10	80	377	0	1	13	391	0	2627
1972	764	1460	0	600	7	32	270	12	7	0	291	2	2325
1973	1237	1751	0	490	10	80	374	0	0	0	488	113	2618
1974	1500	1951	0	439	10	80	467	0	0	97	719	155	3045
1975	1210	1805	0	492	10	80	450	0	0	152	656	54	2927
1976	467	1381	0	511	2	10	173	26	48	0	247	0	2105
1977	271	982	0	381	0	0	105	23	72	0	203	3	1540
1978	1311	1574	0	454	5	22	227	21	0	0	249	1	2228
1979	1139	1630	0	529	10	80	375	0	0	100	722	247	2619
1980	1721	1920	0	481	10	80	467	0	0	104	607	36	3005
1981	634	1573	0	540	7	35	286	9	0	0	614	320	2361
1982	2229	2000	0	429	10	80	467	0	0	0	1880	1413	3419
1983	2900	2000	0	413	10	80	468	0	0	0	2320	1853	3965
1984	1621	1783	0	549	10	80	410	0	0	0	431	21	2765
1985	744	1577	0	510	8	39	302	4	1	0	514	206	2400
1986	1869	1932	0	475	10	80	467	0	0	0	777	310	3149
1987	497	1480	0	531	5	24	237	16	25	0	278	0	2248
1988	390	1099	0	460	0	0	115	23	76	0	214	0	1759
1989	648	950	0	548	0	0	110	36	70	0	216	0	1648
1990	491	658	0	527	0	0	95	32	68	0	195	0	1354
1991	502	437	0	526	0	0	75	29	53	0	159	1	1068
1992	459	198	0	506	0	0	58	63	41	0	166	4	830
1993	1275	827	0	477	0	0	100	63	33	0	197	1	1428
1994	501	546	0	529	0	0	88	47	62	0	201	4	1244
1995	2160	1869	0	452	10	80	383	0	0	0	589	206	2653
1996	1512	1968	0	517	10	80	467	0	0	0	1623	1157	3024
1997	1902	1653	0	556	10	80	406	0	0	97	559	56	2749
1998	1876	2000	0	444	10	80	467	0	0	0	1322	856	3374
1999	1326	1866	0	508	10	80	433	0	0	12	544	99	2860
2000	1062	1802	0	488	10	80	394	0	0	21	441	26	2702
2001	588	1549	0	469	6	28	253	12	19	0	284	0	2286
2002	710	1369	0	548	3	13	185	21	53	0	259	0	2132
2003	896	1405	0	530									2155

All units in 1,000 acre-feet unless otherwise noted.

Vernalis WQ Release from Goodwin (1)

DO Release from Goodwin (1)

1943	1538	1835	0	484	75	80	588	0	0	50	757	120	3090
1944	649	1338	0	547	75	80	347	3	0	12	362	0	2289
1945	1228	1380	0	474	75	80	462	0	0	67	528	0	2455
1946	1175	1388	0	481	75	80	462	0	0	29	491	0	2441
1947	634	891	0	600	10	49	235	15	38	134	421	0	1872
1948	853	821	0	489	10	49	185	27	39	80	331	0	1607
1949	732	506	0	583	10	49	185	25	19	144	373	0	1400
1950	1027	733	0	549	10	0	98	51	22	0	178	6	1397
1951	1656	1386	0	505	75	80	347	3	0	60	414	3	2371
1952	1844	2000	0	496	75	80	587	0	0	0	697	110	3125
1953	965	1630	0	546	75	80	462	0	5	0	467	0	2695
1954	882	1294	0	590	75	80	347	3	12	72	433	0	2325
1955	656	1028	0	516	10	49	235	13	20	10	285	8	1791
1956	1825	1621	0	527	75	80	462	0	3	101	565	0	2759
1957	878	1369	0	557	75	80	347	3	8	4	362	0	2329
1958	1599	1844	0	419	75	80	587	0	0	0	587	0	2843
1959	624	1319	0	556	75	80	347	3	0	0	350	0	2267
1960	574	874	0	583	10	49	234	15	23	48	321	0	1737
1961	446	516	0	497	10	0	98	24	69	0	193	2	1206
1962	863	647	0	540	10	0	98	46	18	0	163	1	1305
1963	1227	982	0	481	10	49	235	15	4	148	402	0	1799
1964	632	647	0	578	10	49	185	22	33	38	284	5	1483
1965	1666	1188	0	500	75	80	347	3	0	140	490	0	2243
1966	733	863	0	552	10	49	234	14	2	189	439	0	1777
1967	1831	1564	0	486	75	80	462	0	0	0	462	0	2528
1968	670	1308	0	534	10	49	234	15	1	11	269	8	2070
1969	2118	2000	0	502	75	80	587	0	0	0	1273	686	3337
1970	1321	1601	0	528	75	80	462	0	0	62	523	0	2720
1971	1066	1484	0	528	75	80	462	0	7	9	478	0	2536
1972	764	1184	0	600	10	49	234	15	15	58	325	3	2087
1973	1237	1430	0	490	75	80	347	3	0	0	350	0	2329
1974	1500	1662	0	439	75	80	587	0	0	94	681	0	2839
1975	1210	1531	0	492	75	80	462	0	0	167	629	0	2699
1976	467	1048	0	511	10	49	234	14	29	40	317	0	1845
1977	271	615	0	381	10	0	98	22	77	0	200	3	1171
1978	1311	1211	0	454	10	49	234	15	0	0	250	1	1863
1979	1139	1197	0	529	75	80	347	3	0	113	466	3	2231
1980	1721	1606	0	481	75	80	587	0	0	101	688	0	2818
1981	634	1211	0	540	10	49	234	15	0	79	333	5	2034
1982	2229	2000	0	429	75	80	587	0	0	0	1761	1175	3362
1983	2900	2000	0	413	75	80	588	0	0	0	2256	1668	3965
1984	1621	1589	0	549	75	80	587	0	0	0	587	0	2765
1985	744	1204	0	510	75	80	347	2	1	33	388	5	2182
1986	1869	1835	0	475	75	80	587	0	0	0	630	44	2954
1987	497	1324	0	531	10	49	235	15	20	80	350	0	2139
1988	390	773	0	460	10	49	185	15	64	74	338	0	1551
1989	648	570	0	548	10	0	98	37	74	0	210	0	1265
1990	491	282	0	527	10	0	98	26	94	0	218	0	978
1991	502	150	116	526	10	0	99	23	57	0	180	1	673
1992	459	150	275	506	10	0	98	24	71	0	197	4	536
1993	1275	766	0	477	10	0	98	64	33	0	196	1	1381
1994	501	474	0	529	10	0	98	19	88	0	209	4	1183
1995	2160	1655	0	452	75	80	462	0	0	0	462	0	2577
1996	1512	1871	0	517	75	80	587	0	0	0	1548	961	3013
1997	1902	1545	0	556	75	80	462	0	0	102	569	5	2749
1998	1876	2000	0	444	75	80	587	0	0	0	1185	598	3295
1999	1326	1706	0	508	75	80	588	0	0	9	597	0	2860
2000	1062	1580	0	488	75	80	462	0	0	24	488	3	2587
2001	588	1292	0	469	10	49	234	12	18	64	328	0	2062
2002	710	874	0	548	10	49	234	11	35	203	483	0	1846
2003	896	712	0	530									1612

All units in 1,000 acre-feet unless otherwise noted.

Vernalis WQ Release from Goodwin (1)

DO Release from Goodwin

1943	1538	2000	0	484	75	80	318	0	0	0	580	261	3090
1944	649	1606	0	547	75	80	235	0	1	0	238	1	2464
1945	1228	1865	0	474	75	80	318	0	0	0	452	134	2748
1946	1175	1902	0	481	75	80	318	0	0	0	318	0	2801
1947	634	1431	0	600	75	80	236	0	51	0	287	0	2395
1948	853	1312	0	489	75	80	235	0	39	0	275	0	2152
1949	732	1006	0	583	75	80	235	0	15	0	251	0	1893
1950	1027	1056	0	549	75	80	235	0	7	0	243	0	1901
1951	1656	1747	0	505	75	80	318	0	0	0	385	67	2661
1952	1844	2000	0	496	75	80	318	0	0	0	998	680	3430
1953	965	1761	0	546	75	80	318	0	2	0	319	0	2695
1954	882	1569	0	590	75	80	235	0	30	0	266	0	2470
1955	656	1235	0	516	75	80	236	0	29	0	273	8	2098
1956	1825	2000	0	527	75	80	318	0	0	0	454	137	2979
1957	878	1717	0	557	75	80	318	0	2	0	320	0	2649
1958	1599	2000	0	419	75	80	318	0	0	0	828	510	3197
1959	624	1502	0	556	75	80	236	0	7	0	243	0	2374
1960	574	1025	0	583	75	80	235	0	35	0	271	0	1947
1961	446	668	0	497	10	0	174	0	31	0	207	2	1365
1962	863	746	0	540	10	49	174	0	0	0	174	0	1449
1963	1227	1104	0	481	75	80	236	0	7	0	243	0	1877
1964	632	829	0	578	10	49	174	0	26	0	206	5	1620
1965	1666	1617	0	500	75	80	235	0	0	0	235	0	2453
1966	733	1347	0	552	75	80	235	0	7	0	243	1	2232
1967	1831	2000	0	486	75	80	318	0	0	0	650	332	3071
1968	670	1559	0	534	75	80	235	0	5	0	368	128	2413
1969	2118	2000	0	502	75	80	318	0	0	0	1413	1096	3474
1970	1321	1761	0	528	75	80	318	0	0	0	350	33	2720
1971	1066	1782	0	528	75	80	318	0	3	0	321	0	2706
1972	764	1453	0	600	75	80	235	0	25	0	265	5	2407
1973	1237	1725	0	490	75	80	318	0	0	0	414	96	2603
1974	1500	2000	0	439	75	80	318	0	0	0	652	334	3045
1975	1210	1993	0	492	75	80	318	0	0	0	453	135	2927
1976	467	1372	0	511	75	80	235	0	41	0	276	0	2240
1977	271	896	0	381	10	49	174	0	38	0	214	2	1502
1978	1311	1373	0	454	75	80	235	0	0	0	236	1	2128
1979	1139	1562	0	529	75	80	236	0	0	0	436	201	2402
1980	1721	2000	0	481	75	80	318	0	0	0	526	209	3005
1981	634	1535	0	540	75	80	235	0	1	0	515	278	2381
1982	2229	2000	0	429	75	80	318	0	0	0	1823	1505	3419
1983	2900	2000	0	413	75	80	318	0	0	0	2255	1937	3965
1984	1621	1792	0	549	75	80	318	0	0	0	341	24	2765
1985	744	1548	0	510	75	80	235	0	11	0	424	178	2423
1986	1869	1991	0	475	75	80	318	0	2	0	667	347	3149
1987	497	1430	0	531	75	80	236	0	33	0	269	0	2297
1988	390	991	0	460	10	49	174	0	55	0	229	0	1692
1989	648	771	0	548	10	49	174	0	43	0	217	0	1508
1990	491	456	0	527	10	0	174	0	53	0	227	0	1159
1991	502	187	0	526	10	0	174	0	22	0	197	0	838
1992	459	150	257	506	10	0	174	0	33	0	211	4	563
1993	1275	757	0	477	10	0	174	0	32	0	206	0	1381
1994	501	452	0	529	10	0	174	0	50	0	228	4	1169
1995	2160	1752	0	452	75	80	318	0	0	0	418	100	2550
1996	1512	2000	0	517	75	80	318	0	0	0	1558	1240	3024
1997	1902	1755	0	556	75	80	318	0	0	0	489	171	2749
1998	1876	2000	0	444	75	80	318	0	0	0	1260	942	3374
1999	1326	1903	0	508	75	80	318	0	0	0	478	160	2860
2000	1062	1820	0	488	75	80	318	0	0	0	346	29	2702
2001	588	1486	0	469	75	80	235	0	30	0	266	0	2316
2002	710	1162	0	548	75	80	235	0	49	0	284	0	2060
2003	896	1047	0	530									1921

All units in 1,000 acre-feet unless otherwise noted.

1 **1.C.2.3 Attachments to Comments of South Delta**  
2 **Water Agency**

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## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, April 30, 2013

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	23 %
Vernalis Base Flow : Monthly average *	>= 1,140 or 710 cfs	2,193 cfs
7 Day average *	>=912 or 568 cfs	3,789 cfs
Habitat Protection, X2 / Flow	19 days at Chipps Island 30 days at Collinsville	21 days 30 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	120 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	36 mg/l
14dm EC at Emmaton	<= 0.45 mS/cm	0.56 mS/cm
14dm EC at Jersey Point	<= 0.45 mS/cm	0.29 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	0.6 mS/cm
Brandt Bridge	<= 1.0 mS/cm	0.7 mS/cm
Old River Near Tracy	<=1.0 mS/cm	0.9 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.6 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 3 Open / 0 Closed / 0 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

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

Previous Month's Index (8RI for Mar.): 1.713 MAF  
 Water Year Type: Dry  
 Sacramento valley water year type index (40/30/30) @ 50%:6.0 MAF (Dry)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.8 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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:  
 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

\* 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
04/01/2013	6.10	3.98	15,753	20.40	10.76	10.71	5.58	5.04	3.81	2.51	1.50
04/02/2013	5.89	3.95	18,249	19.07	12.11	11.05	4.96	4.43	4.00	2.09	1.60
04/03/2013	5.68	3.94	19,557	17.99	10.63	11.27	4.13	3.61	4.12	1.55	1.67
04/04/2013	5.66	4.03	20,780	18.47	10.05	11.40	3.74	3.24	4.17	1.22	1.71
04/05/2013	5.47	3.85	21,744	17.08	8.69	11.37	3.04	2.57	4.17	0.89	1.70
04/06/2013	5.36	3.78	19,484	16.65	8.40	11.25	2.61	2.18	4.10	0.68	1.69
04/07/2013	5.33	3.85	17,737	16.82	8.42	11.09	2.49	2.07	4.00	0.50	1.64
04/08/2013	6.02	4.02	17,513	15.14	7.68	10.80	2.38	1.97	3.83	0.63	1.57
04/09/2013	5.43	3.58	18,388	13.97	5.75	10.37	1.44	1.13	3.60	0.53	1.48
04/10/2013	5.54	3.68	16,350	13.62	6.35	9.96	1.66	1.32	3.36	0.39	1.38
04/11/2013	5.87	3.92	15,537	14.70	6.97	9.60	1.88	1.51	3.18	0.41	1.30
04/12/2013	5.93	4.06	15,110	14.94	7.18	9.26	1.77	1.41	2.97	0.46	1.21
04/13/2013	6.00	4.13	13,928	15.54	7.48	8.84	1.91	1.54	2.69	0.47	1.06
04/14/2013	5.87	4.21	13,201	15.01	7.03	8.39	1.90	1.53	2.40	0.48	0.91
04/15/2013	6.05	4.36	13,006	16.10	7.53	8.16	2.00	1.62	2.15	0.58	0.78
04/16/2013	5.30	3.81	11,996	12.75	5.11	7.66	1.18	0.91	1.90	0.40	0.66
04/17/2013	4.62	3.44	11,692	10.87	3.83	7.18	0.91	0.68	1.69	0.35	0.57
04/18/2013	4.51	3.45	10,332	14.05	6.29	6.91	1.32	1.03	1.53	0.33	0.51
04/19/2013	4.84	3.53	9,139	16.43	8.65	6.90	2.74	2.30	1.51	0.55	0.48
04/20/2013	4.93	3.50	8,211	18.80	11.88	7.15	4.52	3.99	1.64	1.65	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	0.68
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	15.82	8.80	7.88	7.37	2.65	4.18	1.12
04/24/2013	6.07	4.19	6,605	25.78	18.18	9.65	9.84	9.43	3.23	5.31	1.47
04/25/2013	6.47	4.25	7,038	26.40	18.77	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

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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
04/01/2013	1.20	0.79	0.38	0.32	0.33	0.25	0.63	9.74	8.00	7.90	7.75	3.11
04/02/2013	1.01	0.82	0.36	0.33	0.29	0.26	0.53	9.77	7.51	7.61	7.52	2.60
04/03/2013	0.84	0.84	0.33	0.33	0.27	0.26	0.52	9.61	7.35	7.46	7.60	2.15
04/04/2013	0.77	0.86	0.32	0.33	0.26	0.26	0.57	9.47	7.28	7.48	7.69	1.53
04/05/2013	0.66	0.87	0.30	0.33	0.22	0.27	0.65	9.37	6.87	7.44	7.30	1.30
04/06/2013	0.58	0.88	0.29	0.33	0.21	0.27	0.63	9.27	6.78	7.23	7.32	1.08
04/07/2013	0.55	0.87	0.28	0.33	0.21	0.27	0.62	9.06	6.94	7.19	7.26	0.63
04/08/2013	0.54	0.86	0.29	0.32	0.22	0.27	0.61	8.94	6.75	7.06	7.37	1.11
04/09/2013	0.44	0.83	0.26	0.32	0.19	0.26	0.55	9.05	6.48	6.78	6.94	0.58
04/10/2013	0.42	0.80	0.26	0.32	0.19	0.26	0.55	8.39	6.17	6.56	7.11	0.53
04/11/2013	0.44	0.77	0.26	0.31	0.20	0.25	0.54	7.59	5.89	6.56	6.86	0.48
04/12/2013	0.43	0.74	0.26	0.31	0.20	0.25	0.53	6.84	5.87	6.37	6.58	0.53
04/13/2013	0.41	0.68	0.25	0.30	0.20	0.24	0.50	6.51	6.19	6.08	6.29	0.56
04/14/2013	0.40	0.62	0.25	0.29	0.21	0.23	0.45	6.60	6.01	6.06	6.22	0.67
04/15/2013	0.44	0.57	0.26	0.28	0.22	0.22	0.43	6.39	5.85	5.98	6.20	0.72
04/16/2013	0.38	0.52	0.24	0.27	0.19	0.21	0.39	6.58	5.80	6.01	6.10	0.45
04/17/2013	0.33	0.48	0.24	0.27	0.18	0.21	0.38	6.63	5.74	6.00	6.08	0.42
04/18/2013	0.32	0.45	0.23	0.26	0.18	0.20	0.37	6.20	5.51	5.95	5.98	0.37
04/19/2013	0.33	0.43	0.23	0.26	0.19	0.20	0.39	6.00	5.23	5.71	5.70	1.21
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

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

## 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
04/01/2013	0.29	0.33	0.28	0.27	0.29	0.42	0.49	313	33	30	r
04/02/2013	0.29	0.33	0.28	0.28	0.29	0.66	0.50	251	34	30	r
04/03/2013	0.30	0.33	0.28	0.28	0.29	0.72	0.48	199	35	29	b
04/04/2013	0.29	0.33	0.28	0.29	0.29	0.69	0.48	174	36	30	b
04/05/2013	0.30	0.34	0.28	0.29	0.29	0.72	0.48	140	37	30	b
04/06/2013	0.29	0.34	0.28	0.29	0.29	0.76	0.48	114	38	31	b
04/07/2013	0.29	0.34	0.28	0.30	0.29	0.77	0.48	105	39	31	b
04/08/2013	0.29	0.33	0.28	0.29	0.28	0.72	0.46	103	38	31	b
04/09/2013	0.28	0.32	0.27	0.29	0.28	0.75	0.48	69	38	31	b
04/10/2013	0.27	0.32	0.27	0.30	0.28	0.79	0.48	63	39	31	b
04/11/2013	0.27	0.31	0.27	0.29	0.28	0.70	0.48	70	38	31	b
04/12/2013	0.27	0.31	0.27	0.29	0.26	0.69	0.47	66	38	31	b
04/13/2013	0.26	0.31	0.27	0.29	0.27	0.69	0.47	61	37	34	b
04/14/2013	0.27	0.30	0.26	0.28	0.30	0.71	0.47	57	36	34	b
04/15/2013	0.27	0.28	0.26	0.28	0.31	0.57	0.76	69	35	36	b
04/16/2013	0.27	0.29	0.26	0.29	0.31	0.68	0.86	51	36	37	b
04/17/2013	0.26	0.29	0.26	0.28	0.33	0.68	0.88	36	35	35	f
04/18/2013	0.25	0.28	0.25	0.28	0.34	0.68	0.86	31	35	37	f
04/19/2013	0.25	0.28	0.26	0.28	0.34	0.61	0.81	34	34	38	f
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	38	f
04/22/2013	0.24	0.29	0.25	0.27	0.33	0.46	0.60	206	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	f
04/26/2013	0.26	0.29	0.26	0.27	0.31	0.35	0.43	537	32	36	b
04/27/2013	0.25	0.29	0.26	0.28	0.32	0.32	0.40	524	34	36 e	b
04/28/2013	0.26	0.29	0.26	0.28	0.32	0.32	0.35	544	35	36 e	b
04/29/2013	0.26	0.30	0.26	0.28	0.29	0.31	0.32	581	35	36	b
04/30/2013	0.26	0.30	0.26	0.28	0.31	0.34	0.33	535	34	36	b

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
04/01/2013	0.81	0.85	0.93	0.83	1.21	0.98	0.94	0.80
04/02/2013	0.78	0.85	0.94	0.84	1.21	0.99	0.89	0.80
04/03/2013	0.79	0.85	0.89	0.84	1.14	1.01	0.81	0.81
04/04/2013	0.85	0.86	0.84	0.85	1.11	1.02	0.82	0.81
04/05/2013	0.82	0.86	0.83	0.85	1.09	1.02	0.88	0.82
04/06/2013	0.83	0.87	0.87	0.86	1.05	1.03	0.89	0.82
04/07/2013	0.82	0.87	0.88	0.86	1.02	1.04	0.89	0.83
04/08/2013	0.82	0.87	0.88	0.87	1.04	1.05	0.90	0.84
04/09/2013	0.83	0.88	0.89	0.87	1.02	1.06	0.90	0.84
04/10/2013	0.83	0.88	0.90	0.88	1.06	1.06	0.93	0.85
04/11/2013	0.81	0.88	0.91	0.88	1.13	1.07	0.94	0.86
04/12/2013	0.76	0.88	0.93	0.89	1.16	1.08	0.95	0.87
04/13/2013	0.75	0.87	0.94	0.89	1.15	1.09	0.94	0.88
04/14/2013	0.73	0.87	0.94	0.90	1.16	1.09	0.88	0.89
04/15/2013	0.67	0.86	0.92	0.90	1.13	1.10	0.87	0.90
04/16/2013	0.62	0.85	0.88	0.90	1.07	1.10	0.79	0.90
04/17/2013	0.48	0.84	0.84	0.90	1.02	1.10	0.76	0.90
04/18/2013	0.43	0.83	0.76	0.90	1.02	1.11	0.63	0.90
04/19/2013	0.35	0.81	0.65	0.89	1.04	1.11	0.55	0.89
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	0.26	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

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

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh

Tuesday, June 04, 2013

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	14 %
Vernalis Base Flow : Monthly average *	>= 710 cfs	900 cfs
7 Day average *	>= 568 cfs	900 cfs
Habitat Protection, X2 / Flow		
	30 days at Collinsville	4 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	155 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	41 mg/l
14dm EC at Emmaton	<= 0.45 mS/cm	0.39 mS/cm
14dm EC at Jersey Point	<= 0.45 mS/cm	0.33 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.4 mS/cm
Brandt Bridge	<= 0.7 mS/cm	0.4 mS/cm
Old River Near Tracy	<=0.7 mS/cm	0.6 mS/cm
Old River Near Middle River	<=0.7 mS/cm	mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 1 Open / 0 Closed / 2 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

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

Previous Month's Index (8RI 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  
 mht - 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:  
 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

\* 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
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	9,695	23.57	9.40	12.98	7.95	7.45	7.45	4.07	4.31
05/10/2013	6.06	4.08	10,994	22.85	8.69	12.37	7.50	6.98	7.32	3.91	4.21
05/11/2013	6.04	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
05/20/2013	5.64	3.65	9,987	19.36	2.12	6.24	4.63	4.10	5.74	1.81	3.01
05/21/2013	5.76	3.94	9,870	23.02	2.39	5.62	6.82	6.29	5.65	2.74	2.88
05/22/2013	5.98	3.76	9,066	22.35	2.32	5.00	6.13	5.59	5.50	2.58	2.76
05/23/2013	5.96	3.77	9,551	22.31	2.36	4.50	6.24	5.70	5.37	2.49	2.64
05/24/2013	6.16	3.92	9,224	23.18	2.30	4.04	6.72	6.19	5.32	2.83	2.57
05/25/2013	6.46	4.10	9,069	24.10	2.27	3.65	7.40	6.88	5.37	3.17	2.55
05/26/2013	6.59	4.23	9,123	24.61	2.06	3.23	7.75	7.24	5.47	3.70	2.58
05/27/2013	6.52	4.13	8,997	24.24	1.75	2.82	7.48	6.97	5.57	3.35	2.60
05/28/2013	6.29	4.18	9,358	23.47	1.61	2.44	6.76	6.23	5.61	3.21	2.62
05/29/2013	6.04	4.17	9,502	23.58	1.59	2.15	6.82	6.29	5.65	3.23	2.66
05/30/2013	5.57	3.93	9,779	21.54	1.55	2.05	5.75	5.21	5.65	2.53	2.63
05/31/2013	5.38	3.71	10,488	19.57	1.48	1.99	4.64	4.11	5.60	1.95	2.63
06/01/2013	5.67	3.76	9,583	19.02	1.45	1.94	4.66	4.13	5.61	1.86	2.64
06/02/2013	6.13	4.02	9,053	20.43	1.52	1.91	5.41	4.87	5.70	2.22	2.69
06/03/2013	6.45	4.49	8,563	23.94	7.89	2.32	7.18	6.66	5.88	3.35	2.80
06/04/2013	6.55	4.57	7,386	25.19	16.19	3.31	8.01	7.52	5.97	3.96	2.89

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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
05/06/2013	1.87	1.76	0.39	0.35	0.67	0.68	0.42	11.57	9.68	10.58	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	1.66	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	NR
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
05/20/2013	0.73	1.19	0.29	0.33	0.21	0.41	NR	9.41	5.03	5.33	2.87	2.79
05/21/2013	0.99	1.14	0.31	0.33	0.27	0.38	NR	8.64	4.43	4.88	2.50	4.05
05/22/2013	1.05	1.09	0.32	0.32	0.27	0.35	NR	8.81	4.36	4.77	2.25	3.64
05/23/2013	1.09	1.06	0.31	0.32	0.28	0.33	NR	9.16	4.31	4.59	2.60	3.57
05/24/2013	1.21	1.04	0.33	0.32	0.33	0.31	0.28	9.18	5.54	5.28	4.32	4.16
05/25/2013	1.43	1.04	0.34	0.32	0.43	0.31	0.26	9.15	6.83	6.34	5.06	3.98
05/26/2013	1.61	1.07	0.36	0.32	0.59	0.32	0.25	9.39	7.47	6.86	6.19	4.71
05/27/2013	1.53	1.09	0.34	0.32	0.54	0.34	0.26	10.04	7.64	7.48	6.47	4.41
05/28/2013	1.37	1.11	0.33	0.32	0.45	0.35	0.25	10.26	7.57	7.88	7.16	4.44
05/29/2013	1.40	1.13	0.34	0.32	0.47	0.35	0.26	10.43	7.18	7.32	7.19	4.02
05/30/2013	1.09	1.13	0.32	0.32	0.34	0.35	0.29	10.38	6.67	7.33	6.95	3.54
05/31/2013	0.90	1.13	0.30	0.32	0.26	0.35	0.39	10.26	6.56	7.79	6.68	2.87
06/01/2013	0.86	1.14	0.30	0.32	0.27	0.35	0.36	10.19	6.68	7.36	7.25	2.92
06/02/2013	0.98	1.16	0.31	0.32	0.28	0.36	0.37	10.03	6.83	7.29	7.20	3.58
06/03/2013	1.26	1.20	0.35	0.32	0.38	0.37	0.32	9.86	7.12	7.97	7.89	4.31
06/04/2013	1.61	1.24	0.40	0.33	0.57	0.39	0.30	10.18	7.10	8.90	7.64	5.07

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

## 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
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	36	s
05/12/2013	0.31	0.34	0.30	0.31	0.31	0.29	NR	351	43	36	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	220	46	42	s
05/18/2013	0.31	0.34	0.31	0.33	NR	0.36	NR	166	47	38	s
05/19/2013	0.31	0.34	0.31	0.33	NR	0.39	NR	151	47	39	s
05/20/2013	0.31	0.34	0.30	0.33	NR	0.42	NR	164	47	40	s
05/21/2013	0.31	0.33	0.30	0.32	NR	0.44	NR	246	46	42	s
05/22/2013	0.31	0.33	0.30	0.32	NR	0.45	0.45	265	46	42	s
05/23/2013	0.30	0.33	0.30	0.32	NR	0.46	0.48	278	46	43	s
05/24/2013	0.30	0.33	0.30	0.32	NR	0.44	0.48	317	45	44	s
05/25/2013	0.30	0.33	0.30	0.31	NR	0.45	0.47	385	44	44 e	s
05/26/2013	0.30	0.32	0.30	0.31	NR	0.42	0.47	444	43	44 e	s
05/27/2013	0.30	0.32	0.30	0.31	NR	0.43	0.47	416	42	44 e	s
05/28/2013	0.30	0.32	0.30	0.31	NR	0.42	0.49	367	43	42	s
05/29/2013	0.30	0.32	0.29	0.31	NR	0.42	0.50	376	43	45	s
05/30/2013	0.30	0.32	0.29	0.31	0.38	0.43	0.50	277	43	45	s
05/31/2013	0.30	0.32	0.29	0.31	0.37	0.48	0.52	215	43	45 e	s
06/01/2013	0.30	0.33	0.29	0.31	0.36	0.46	0.52	204	42	45 e	s
06/02/2013	0.30	0.33	0.29	0.30	0.35	0.43	0.50	241	41	45 e	s
06/03/2013	0.30	0.33	0.28	0.30	0.34	0.41	0.48	330	39	44	s
06/04/2013	0.30	0.32	0.28	0.29	0.33	0.40	0.44	443	38	41	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
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	0.28	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
05/20/2013	0.48	0.26	0.50	0.26	0.60	0.39	0.55	NC
05/21/2013	0.50	0.27	0.52	0.27	0.67	0.39	0.57	NC
05/22/2013	0.52	0.28	0.54	0.27	0.68	0.39	0.58	NC
05/23/2013	0.53	0.29	0.56	0.28	0.66	0.39	0.59	NC
05/24/2013	0.54	0.30	0.56	0.29	0.70	0.40	0.62	NC
05/25/2013	0.53	0.31	0.57	0.30	0.74	0.41	0.63	NC
05/26/2013	0.51	0.32	0.57	0.31	0.77	0.42	0.56	NC
05/27/2013	0.52	0.32	0.59	0.32	0.77	0.43	0.54	NC
05/28/2013	0.56	0.34	0.61	0.34	0.78	0.45	0.58	NC
05/29/2013	0.54	0.35	0.62	0.35	0.81	0.46	0.55	NC
05/30/2013	0.53	0.36	0.62	0.37	0.81	0.48	0.62	NC
05/31/2013	0.57	0.37	0.62	0.38	0.82	0.50	0.59	NC
06/01/2013	0.56	0.38	0.62	0.39	0.84	0.51	0.63	NC
06/02/2013	0.56	0.39	0.63	0.41	0.89	0.53	0.62	NC
06/03/2013	0.55	0.41	0.62	0.42	0.92	0.55	0.69	NC
06/04/2013	0.59	0.42	0.61	0.44	0.93	0.57	0.68	NC

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, June 27, 2013

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	25 %
Vernalis Base Flow : Monthly average *	>= 710 cfs	763 cfs
7 Day average *	>= 568 cfs	672 cfs
Habitat Protection, X2 / Flow		
	30 days at Collinsville	27 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	178 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	40 mg/l
14dm EC at Emmaton	<= 0.45 mS/cm	0.44 mS/cm
14dm EC at Jersey Point	<= 0.45 mS/cm	0.37 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.6 mS/cm
Brandt Bridge	<= 0.7 mS/cm	0.6 mS/cm
Old River Near Tracy	<=0.7 mS/cm	0.9 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.6 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 3 Open / 0 Closed / 0 Full Tide Open  
 Flashboard Status : Out  
 Boat Lock Status : Closed

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

Previous Month's Index (8RI 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  
 mht - 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:  
 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

\* NDOL, 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
05/29/2013	6.04	4.17	9,502	23.58	1.59	2.15	6.82	6.29	5.65	3.23	2.66
05/30/2013	5.57	3.93	9,779	21.54	1.55	2.05	5.75	5.21	5.65	2.53	2.63
05/31/2013	5.38	3.71	10,488	19.57	1.48	1.99	4.64	4.11	5.60	1.95	2.63
06/01/2013	5.67	3.76	9,583	19.02	1.45	1.94	4.66	4.13	5.61	1.86	2.64
06/02/2013	6.13	4.02	9,053	20.43	1.52	1.91	5.41	4.87	5.70	2.22	2.69
06/03/2013	6.45	4.49	8,563	23.94	7.89	2.32	7.18	6.66	5.88	3.35	2.80
06/04/2013	6.55	4.57	7,386	25.19	16.19	3.31	8.01	7.52	5.97	3.96	2.89
06/05/2013	6.55	4.52	7,243	25.18	15.54	4.25	7.66	7.15	6.08	4.01	2.99
06/06/2013	6.61	4.54	7,307	24.66	15.14	5.17	7.40	6.88	6.17	2.76	3.01
06/07/2013	6.62	4.52	7,507	24.01	14.92	6.07	7.23	6.71	6.20	3.69	3.07
06/08/2013	6.60	4.75	7,527	23.41	16.14	7.06	7.70	7.19	6.22	4.16	3.14
06/09/2013	7.09	5.07	6,899	26.86	17.96	8.19	10.24	9.85	6.41	5.78	3.29
06/10/2013	6.74	4.67	7,371	25.20	15.39	9.17	8.01	7.51	6.45	4.40	3.36
06/11/2013	6.26	4.39	7,262	23.15	14.10	10.06	6.65	6.12	6.44	3.22	3.37
06/12/2013	6.11	4.28	7,472	22.24	14.23	10.96	6.60	6.07	6.43	3.16	3.36
06/13/2013	5.62	3.99	7,196	21.30	13.17	11.79	5.74	5.19	6.42	2.58	3.36
06/14/2013	5.16	3.80	7,413	19.46	11.64	12.52	4.71	4.18	6.43	2.21	3.38
06/15/2013	5.49	4.07	7,374	21.18	13.41	13.38	5.95	5.41	6.52	2.78	3.45
06/16/2013	5.52	3.90	6,959	20.98	13.47	14.23	6.12	5.58	6.57	2.64	3.48
06/17/2013	5.73	3.79	7,541	22.59	12.82	14.58	6.07	5.53	6.49	2.53	3.42
06/18/2013	6.15	3.99	7,458	23.41	13.86	14.42	6.49	5.95	6.38	2.78	3.33
06/19/2013	5.98	3.86	7,162	22.07	13.73	14.29	6.25	5.72	6.28	2.79	3.25
06/20/2013	6.14	3.87	7,222	22.49	13.91	14.20	6.40	5.86	6.20	2.66	3.24
06/21/2013	6.42	4.11	7,284	23.76	14.74	14.18	6.91	6.38	6.18	3.28	3.21
06/22/2013	6.61	4.23	7,950	24.47	15.64	14.15	7.60	7.08	6.17	3.79	3.19
06/23/2013	6.82	4.41	8,129	25.63	16.97	14.08	8.74	8.27	6.06	4.17	3.07
06/24/2013	6.82	4.33	7,283	25.37	15.53	14.09	7.90	7.40	6.05	3.94	3.04
06/25/2013	6.56	4.29	7,411	24.94	10.20	13.81	7.45	6.93	6.11	3.65	3.07
06/26/2013	6.28	4.23	7,529	23.80	9.40	13.46	7.17	6.65	6.15	3.66	3.10
06/27/2013	5.92	4.09	7,111	22.50	12.92	13.45	6.73	6.20	6.22	3.16	3.15

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
05/29/2013	1.40	1.13	0.34	0.32	0.47	0.35	0.26	10.43	7.18	7.32	7.19	4.02
05/30/2013	1.09	1.13	0.32	0.32	0.34	0.35	0.29	10.38	6.67	7.33	6.95	3.54
05/31/2013	0.90	1.13	0.30	0.32	0.26	0.35	0.39	10.26	6.56	7.79	6.68	2.87
06/01/2013	0.86	1.14	0.30	0.32	0.27	0.35	0.36	10.19	6.68	7.36	7.25	2.92
06/02/2013	0.98	1.16	0.31	0.32	0.28	0.36	0.37	10.03	6.83	7.29	7.20	3.58
06/03/2013	1.26	1.20	0.35	0.32	0.38	0.37	0.32	9.86	7.12	7.97	7.89	4.31
06/04/2013	1.61	1.24	0.40	0.33	0.57	0.39	0.30	10.18	7.10	8.90	7.64	5.07
06/05/2013	1.52	1.28	0.40	0.34	0.57	0.41	0.31	10.55	7.51	8.69	7.64	4.73
06/06/2013	1.53	1.31	0.40	0.34	0.48	0.43	0.31	11.79	7.81	8.97	7.64	
06/07/2013	1.58	1.33	0.42	0.35	0.52	0.44	0.34	12.76	7.99	9.95	8.09	4.84
06/08/2013	1.77	1.36	0.43	0.36	0.63	0.45	0.33	11.95	8.33	10.00	8.55	4.91
06/09/2013	2.43	1.42	0.60	0.37	1.25	0.50	0.29	11.59	8.76	9.99	9.63	7.18
06/10/2013	1.80	1.43	0.43	0.38	0.78	0.52	0.33	12.07	8.73	10.69	8.74	5.40
06/11/2013	1.50	1.44	0.38	0.38	0.47	0.52	0.39	12.42	8.73	9.91	8.63	4.17
06/12/2013	1.50	1.45	0.40	0.39	0.42	0.52	0.40	12.49	8.52	9.85	8.76	3.99
06/13/2013	1.27	1.46	0.38	0.39	0.33	0.51	0.37	12.53	8.15	9.37	8.29	3.61
06/14/2013	1.18	1.48	0.35	0.40	0.27	0.52	0.37	12.59	8.05	9.06	8.27	3.03
06/15/2013	1.21	1.51	0.36	0.40	0.33	0.52	0.36	12.58	8.20	8.95	8.74	4.09
06/16/2013	1.13	1.52	0.36	0.40	0.28	0.52	0.36	12.24	8.51	8.99	8.52	3.97
06/17/2013	1.08	1.51	0.34	0.40	0.29	0.51	0.38	12.82	8.43	9.73	8.20	3.55
06/18/2013	1.19	1.48	0.35	0.40	0.33	0.50	0.36	12.56	9.86	9.86	8.46	4.18
06/19/2013	1.27	1.46	0.35	0.40	0.36	0.48	0.37	12.33	9.59	9.62	8.45	3.44
06/20/2013	1.23	1.44	0.34	0.39	0.36	0.47	0.32	11.76	9.47	10.21	8.75	3.79
06/21/2013	1.47	1.43	0.37	0.39	0.49	0.47	0.28	11.58	9.60	10.00	9.35	4.15
06/22/2013	1.67	1.42	0.40	0.39	0.57	0.47	0.25	11.43	9.80	10.03	9.55	4.76
06/23/2013	2.03	1.40	0.42	0.37	0.74	0.43	0.28	11.38	10.01	10.00	10.25	5.61
06/24/2013	1.88	1.40	0.40	0.37	0.64	0.42	0.30	11.59	9.95	10.18	10.32	5.36
06/25/2013	1.75	1.42	0.39	0.37	0.54	0.42	0.27	11.76	9.77	9.90	10.69	5.41
06/26/2013	1.63	1.43	0.38	0.37	0.50	0.43	0.27	11.85	9.62	10.59	11.01	4.65
06/27/2013	1.47	1.44	0.37	0.37	0.40	0.44	0.28	12.06	9.45	11.06	10.77	3.87

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

## 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
05/29/2013	0.30	0.32	0.29	0.31	NR	0.42	0.50	376	43	45	s
05/30/2013	0.30	0.32	0.29	0.31	0.38	0.43	0.50	277	43	45	s
05/31/2013	0.30	0.32	0.29	0.31	0.37	0.48	0.52	215	43	45 e	s
06/01/2013	0.30	0.33	0.29	0.31	0.36	0.46	0.52	204	42	45 e	s
06/02/2013	0.30	0.33	0.29	0.30	0.35	0.43	0.50	241	41	45 e	s
06/03/2013	0.30	0.33	0.28	0.30	0.34	0.41	0.48	330	39	44	s
06/04/2013	0.30	0.32	0.28	0.29	0.33	0.40	0.44	443	38	41	s
06/05/2013	0.29	0.35	0.28	0.29	0.32	0.44	0.48	415	38	40	s
06/06/2013	0.29	0.35	0.28	0.29	0.31	0.43	0.46	417	38	43	s
06/07/2013	0.30	0.37	0.29	0.29	0.31	0.43	0.48	434	37	39	s
06/08/2013	0.30	0.37	0.29	0.29	0.31	0.43	0.49	492	37	39 e	s
06/09/2013	0.32	0.37	0.29	0.29	0.30	0.40	0.46	703	37	39 e	s
06/10/2013	0.32	0.39	0.29	0.29	0.30	0.46	0.44	503	38	39 e	s
06/11/2013	0.32	0.39	0.30	0.29	0.30	0.42	0.53	409	38	37	s
06/12/2013	0.31	0.40	0.31	0.30	0.30	0.46	0.49	409	39	37	s
06/13/2013	0.32	0.39	0.31	0.30	0.31	0.48	0.49	334	39	38	s
06/14/2013	0.32	0.38	0.30	0.30	0.31	0.42	0.50	305	40	39	s
06/15/2013	0.32	0.38	0.30	0.30	0.31	0.38	0.45	314	40	40	s
06/16/2013	0.32	0.37	0.30	0.30	0.32	0.38	0.45	291	40	41	s
06/17/2013	0.32	0.36	0.29	0.30	0.32	0.40	0.48	273	40	42	s
06/18/2013	0.32	0.35	0.29	0.30	0.31	0.39	0.47	308	39	42	s
06/19/2013	0.32	0.35	0.29	0.29	0.31	0.36	0.43	334	39	41	s
06/20/2013	0.32	0.36	0.29	0.29	0.31	0.34	0.42	322	38	42	s
06/21/2013	0.31	0.36	0.29	0.29	0.31	0.35	0.38	398	38	41	s
06/22/2013	0.31	0.36	0.29	0.29	0.31	0.35	0.36	463	38	41 e	s
06/23/2013	0.31	0.35	0.28	0.29	0.30	0.35	0.36	578	37	41 e	s
06/24/2013	0.31	0.35	0.28	0.29	0.30	0.35	0.36	528	37	39	s
06/25/2013	0.30	0.34	0.28	0.29	0.30	0.34	0.41	488	37	39	s
06/26/2013	0.30	0.34	0.28	0.29	0.30	0.33	0.38	450	36	41	s
06/27/2013	0.30	0.35	0.28	0.28	0.30	0.34	0.38	398	35	40	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
05/29/2013	0.54	0.35	0.62	0.35	0.81	0.46	0.55	NC
05/30/2013	0.53	0.36	0.62	0.37	0.81	0.48	0.62	NC
05/31/2013	0.57	0.37	0.62	0.38	0.82	0.50	0.59	NC
06/01/2013	0.56	0.38	0.62	0.39	0.84	0.51	0.63	NC
06/02/2013	0.56	0.39	0.63	0.41	0.89	0.53	0.62	NC
06/03/2013	0.55	0.41	0.62	0.42	0.92	0.55	0.69	NC
06/04/2013	0.59	0.42	0.61	0.44	0.93	0.57	0.68	NC
06/05/2013	0.55	0.43	0.62	0.45	0.95	0.59	0.66	NC
06/06/2013	0.56	0.44	0.62	0.47	0.95	0.62	0.66	NC
06/07/2013	0.52	0.45	0.62	0.48	0.94	0.64	0.66	NC
06/08/2013	0.52	0.46	0.63	0.49	0.91	0.66	0.67	NC
06/09/2013	0.52	0.47	0.59	0.51	0.90	0.68	0.67	NC
06/10/2013	0.52	0.48	0.59	0.52	0.81	0.70	0.65	NC
06/11/2013	0.54	0.50	0.63	0.53	0.78	0.71	0.63	0.56
06/12/2013	0.53	0.51	0.63	0.55	0.78	0.73	0.63	0.57
06/13/2013	0.54	0.52	0.63	0.56	0.80	0.74	0.63	0.58
06/14/2013	0.55	0.52	0.64	0.57	0.81	0.76	0.69	0.60
06/15/2013	0.53	0.53	0.63	0.58	0.87	0.78	0.69	0.61
06/16/2013	0.56	0.53	0.62	0.59	0.90	0.79	0.70	0.62
06/17/2013	0.56	0.54	0.62	0.60	0.89	0.81	0.69	0.62
06/18/2013	0.58	0.54	0.63	0.60	0.88	0.82	0.67	0.63
06/19/2013	0.58	0.54	0.62	0.61	0.89	0.83	0.64	0.63
06/20/2013	0.58	0.55	0.64	0.61	0.94	0.84	0.67	0.64
06/21/2013	0.57	0.55	0.64	0.61	1.02	0.85	0.66	0.64
06/22/2013	0.56	0.55	0.64	0.62	1.11	0.86	0.68	0.64
06/23/2013	0.53	0.55	0.65	0.62	1.11	0.88	0.69	0.64
06/24/2013	0.58	0.55	0.67	0.62	1.13	0.89	0.66	0.65
06/25/2013	0.63	0.55	0.69	0.63	1.18	0.90	0.60	0.65
06/26/2013	0.64	0.56	0.69	0.63	1.20	0.92	0.46	0.64
06/27/2013	0.59	0.56	0.68	0.63	1.21	0.93	0.42	0.64

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, August 06, 2013

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	45 %
NDOI, monthly average *	>= 3,500 cfs	5,553 cfs
NDOI, 7 day average*	>= 2,500 cfs	5,553 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	216 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	166 mg/l
14dm EC at Emmaton	<= 1.67 mS/cm	0.66 mS/cm
14dm EC at Jersey Point	<= 1.35 mS/cm	1.19 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.5 mS/cm
Brandt Bridge	<= 0.7 mS/cm	0.7 mS/cm
Old River Near Tracy	<=0.7 mS/cm	0.8 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.7 mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                    3 Open / 0 Closed / 0 Full Tide Open  
 Flashboard Status : Out  
 Boat Lock Status : Closed

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

Previous Month's Index (8RI 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  
 mht - 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:  
 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

\* 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
07/08/2013	6.70	4.61	4,134	26.14	16.49	14.36	9.88	9.47	7.33	5.46	3.93
07/09/2013	6.39	4.35	5,204	24.47	15.62	14.74	8.90	8.44	7.44	4.67	4.00
07/10/2013	6.20	4.44	5,217	25.61	16.17	15.23	9.26	8.82	7.59	4.99	4.09
07/11/2013	6.12	4.43	5,226	26.21	16.10	15.45	9.30	8.85	7.78	5.18	4.24
07/12/2013	5.87	4.36	5,079	25.71	15.33	15.59	8.99	8.54	8.00	4.91	4.39
07/13/2013	5.56	4.24	5,014	24.84	14.42	15.66	8.31	7.82	8.16	4.48	4.52
07/14/2013	5.79	4.25	5,090	25.16	15.03	15.78	8.70	8.23	8.34	4.60	4.64
07/15/2013	6.11	4.33	4,884	26.04	15.65	15.99	9.18	8.74	8.55	4.94	4.80
07/16/2013	6.18	4.30	4,724	27.04	15.76	16.08	9.14	8.69	8.69	4.96	4.90
07/17/2013	6.28	4.13	5,300	25.12	14.96	16.10	8.23	7.74	8.70	4.34	4.92
07/18/2013	6.60	4.29	5,476	25.42	14.81	16.01	8.78	8.31	8.70	4.68	4.93
07/19/2013	6.77	4.47	5,365	25.83	16.76	15.92	9.47	9.03	8.69	5.29	4.97
07/20/2013	6.94	4.63	5,001	26.95	17.54	15.87	10.38	10.00	8.74	6.13	5.02
07/21/2013	7.21	4.83	4,974	28.62	17.39	15.86	11.37	11.05	8.84	7.02	5.12
07/22/2013	7.24	4.76	5,198	28.27	17.78	15.95	11.22	10.90	8.94	6.84	5.22
07/23/2013	6.89	4.47	5,352	27.81	17.11	16.06	10.44	10.07	9.06	6.09	5.32
07/24/2013	6.52	4.42	4,989	27.22	14.75	15.96	10.18	9.79	9.13	5.98	5.39
07/25/2013	6.32	4.50	5,130	27.04	14.18	15.82	10.46	10.08	9.21	6.08	5.45
07/26/2013	5.96	4.42	5,780	26.61	13.49	15.69	10.29	9.90	9.31	5.95	5.53
07/27/2013	6.01	4.37	6,288	26.62	14.11	15.66	9.95	9.54	9.43	5.81	5.62
07/28/2013	6.27	4.46	6,029	27.17	14.02	15.59	9.85	9.43	9.52	5.88	5.71
07/29/2013	6.34	4.52	4,962	27.56	13.56	15.44	10.05	9.65	9.59	5.95	5.79
07/30/2013	6.22	4.37	5,034	26.53	13.40	15.27	9.65	9.23	9.62	5.52	5.83
07/31/2013	6.28	4.43	5,510	26.43	12.77	15.12	9.64	9.22	9.73	5.60	5.92
08/01/2013	6.22	4.34	5,127	26.29	11.50	14.88	9.32	8.88	9.77	5.12	5.95
08/02/2013	6.16	4.27	5,669	25.38	10.11	14.41	8.81	8.34	9.72	4.70	5.90
08/03/2013	6.30	4.36	6,242	26.46	7.72	13.71	9.27	8.82	9.64	5.14	5.83
08/04/2013	6.41	4.40	6,130	26.94	6.32	12.91	9.85	9.44	9.52	5.40	5.72
08/05/2013	6.31	4.32	5,050	26.71	5.77	12.06	9.43	8.99	9.39	5.12	5.60
08/06/2013	6.23	4.30	5,101	26.82	10.46	11.58	9.46	9.02	9.31	5.17	5.53

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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



## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
07/08/2013	2.75	1.90	0.79	0.51	0.65	0.45	0.33	11.96	11.05	12.13	10.94	6.27
07/09/2013	2.61	1.96	0.76	0.54	0.54	0.45	0.33	12.16	10.58	11.34	10.73	5.71
07/10/2013	2.64	2.03	0.82	0.57	0.56	0.45	0.34	12.29	10.37	11.32	11.05	6.14
07/11/2013	2.64	2.11	0.86	0.60	0.55	0.46	0.39	12.38	10.21	11.74	10.90	6.15
07/12/2013	2.53	2.20	0.86	0.64	0.45	0.47	0.44	12.45	10.12	11.69	11.05	6.32
07/13/2013	2.40	2.28	0.86	0.68	0.40	0.48	0.43	12.57	10.01	11.54	10.70	5.42
07/14/2013	2.44	2.36	0.89	0.71	0.39	0.49	0.41	12.66	10.05	11.57	10.69	5.94
07/15/2013	2.52	2.44	0.93	0.75	0.45	0.50	0.41	12.74	10.10	11.81	10.79	6.58
07/16/2013	2.50	2.51	0.93	0.79	0.45	0.51	0.41	14.06	10.10	11.56	11.17	6.14
07/17/2013	2.40	2.55	0.90	0.81	0.44	0.52	0.43	15.17	9.99	11.52	11.08	5.75
07/18/2013	2.46	2.57	0.93	0.84	0.54	0.53	0.37	15.12	10.04	12.26	11.33	6.40
07/19/2013	2.79	2.58	1.02	0.86	0.72	0.54	0.32	14.77	10.22	12.45	11.91	6.26
07/20/2013	3.22	2.62	1.12	0.89	0.98	0.56	0.27	14.56	10.36	12.56	11.87	7.45
07/21/2013	3.61	2.68	1.24	0.92	1.22	0.60	0.25	14.93	10.52	12.48	11.91	8.34
07/22/2013	3.71	2.75	1.25	0.95	1.24	0.64	0.28	15.39	10.73	12.28	12.00	8.49
07/23/2013	3.34	2.80	1.08	0.98	0.91	0.66	0.33	15.27	10.91	12.11	12.22	7.61
07/24/2013	3.19	2.84	1.15	1.00	0.86	0.69	0.31	15.72	11.19	12.30	12.93	6.83
07/25/2013	3.21	2.88	1.19	1.02	0.89	0.71	0.32	15.46	11.68	13.44	13.27	7.43
07/26/2013	3.12	2.92	1.20	1.05	0.76	0.73	0.32	15.13	11.38	12.79	12.69	7.47
07/27/2013	2.99	2.96	1.18	1.07	0.65	0.75	0.36	15.06	11.17	12.49	12.64	6.90
07/28/2013	2.99	3.00	1.17	1.09	0.60	0.77	0.37	15.25	11.26	12.76	12.41	7.23
07/29/2013	3.11	3.05	1.20	1.11	0.59	0.78	0.45	15.49	11.45	12.49	12.25	7.22
07/30/2013	3.02	3.08	1.20	1.13	0.48	0.78	0.52	16.73	11.34	12.54	12.38	6.89
07/31/2013	2.99	3.12	1.21	1.15	0.53	0.78	0.52	17.93	11.12	12.45	12.86	6.48
08/01/2013	2.91	3.16	1.20	1.17	0.57	0.79	0.52	e	e	14.26	12.62	6.07
08/02/2013	2.81	3.16	1.18	1.18	0.57	0.78	0.51	17.62	10.77	13.75	12.82	5.65
08/03/2013	2.92	3.14	1.21	1.19	0.65	0.75	0.42	17.36	10.89	13.33	12.38	6.10
08/04/2013	2.98	3.09	1.23	1.19	0.72	0.72	0.39	16.97	10.95	12.78	12.42	6.75
08/05/2013	2.82	3.03	1.18	1.18	0.68	0.68	0.36	16.81	10.87	12.82	12.05	5.96
08/06/2013	2.88	2.99	1.18	1.19	0.68	0.66	0.33	16.77	10.81	12.48	11.81	6.24

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

## 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
07/08/2013	0.40	0.45	0.36	0.30	0.28	0.27	0.30	806	41	35	s
07/09/2013	0.42	0.47	0.39	0.33	0.28	0.27	0.31	763	48	36	s
07/10/2013	0.44	0.50	0.39	0.35	0.29	0.28	0.29	771	53	37	s
07/11/2013	0.46	0.54	0.41	0.36	0.30	0.29	0.29	770	55	39	s
07/12/2013	0.48	0.55	0.42	0.38	0.31	0.30	0.29	737	60	43	s
07/13/2013	0.50	0.57	0.44	0.40	0.34	0.31	0.30	695	65	49	s
07/14/2013	0.53	0.61	0.46	0.41	0.36	0.31	0.30	706	69	55	s
07/15/2013	0.55	0.64	0.48	0.42	0.38	0.32	0.30	733	72	60	s
07/16/2013	0.56	0.66	0.51	0.44	0.39	0.32	0.30	727	77	65	s
07/17/2013	0.59	0.66	0.53	0.47	0.40	0.32	0.31	696	84	69	s
07/18/2013	0.61	0.68	0.56	0.49	0.42	0.33	0.32	714	90	74	s
07/19/2013	0.64	0.72	0.57	0.51	0.43	0.36	0.32	818	95	76	s
07/20/2013	0.67	0.75	0.58	0.51	0.46	0.38	0.34	957	95	83	s
07/21/2013	0.72	0.78	0.60	0.52	0.48	0.38	0.34	1,080	97	89	s
07/22/2013	0.75	0.79	0.62	0.53	0.51	0.37	0.35	1,112	100	96	s
07/23/2013	0.76	0.81	0.64	0.55	0.53	0.39	0.37	992	106	100	s
07/24/2013	0.77	0.82	0.65	0.57	0.55	0.40	0.36	945	112	108	s
07/25/2013	0.79	0.83	0.66	0.59	0.56	0.41	0.37	952	115	116	s
07/26/2013	0.81	0.84	0.68	0.60	0.56	0.41	0.37	922	119	113	s
07/27/2013	0.82	0.84	0.69	0.62	0.58	0.41	0.39	882	123	116	s
07/28/2013	0.84	0.83	0.73	0.65	0.59	0.41	0.40	881	131	121	s
07/29/2013	0.85	0.82	0.75	0.68	0.59	0.42	0.42	922	139	120	s
07/30/2013	0.86	0.82	0.77	0.70	0.61	0.43	0.44	890	145	128	s
07/31/2013	0.87	0.82	0.78	0.71	0.62	0.46	0.44	882	148	132	s
08/01/2013	0.88	0.81	0.77	0.71	0.63	0.50	0.46	857	148	136	s
08/02/2013	0.88	0.79	0.75	0.70	0.65	0.49	0.46	826	145	139	s
08/03/2013	0.87	0.78	0.75	0.68	0.67	0.50	0.47	859	139	146	s
08/04/2013	0.89	0.80	0.75	0.66	0.70	0.49	0.46	879	135	152	s
08/05/2013	0.89	0.81	0.74	0.66	0.71	0.48	0.46	827	135	157	s
08/06/2013	0.89	0.80	0.76	0.67	0.74	0.48	0.44	848	138	166	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
07/08/2013	0.50	0.55	0.71	0.65	0.82	0.95	0.66	0.63
07/09/2013	0.52	0.55	0.71	0.65	0.78	0.95	0.64	0.62
07/10/2013	0.48	0.54	0.69	0.65	0.78	0.95	0.60	0.62
07/11/2013	0.49	0.54	0.68	0.66	0.79	0.95	0.62	0.62
07/12/2013	0.55	0.54	0.71	0.66	0.79	0.95	0.67	0.62
07/13/2013	0.46	0.54	0.73	0.66	0.79	0.95	0.69	0.63
07/14/2013	0.48	0.54	0.74	0.66	0.80	0.95	0.70	0.63
07/15/2013	0.50	0.54	0.73	0.67	0.81	0.95	0.70	0.63
07/16/2013	0.53	0.54	0.72	0.67	0.81	0.94	0.68	0.63
07/17/2013	0.49	0.53	0.70	0.67	0.82	0.94	0.65	0.62
07/18/2013	0.51	0.53	0.68	0.68	0.85	0.94	0.68	0.62
07/19/2013	0.54	0.53	0.68	0.68	0.86	0.94	0.66	0.62
07/20/2013	0.52	0.53	0.75	0.68	0.86	0.94	0.69	0.63
07/21/2013	0.53	0.53	0.81	0.69	0.85	0.93	0.68	0.63
07/22/2013	0.51	0.52	0.82	0.69	0.88	0.92	0.69	0.63
07/23/2013	0.48	0.52	0.81	0.70	0.86	0.91	0.70	0.63
07/24/2013	0.49	0.52	0.79	0.70	0.86	0.91	0.69	0.63
07/25/2013	0.54	0.52	0.76	0.70	0.86	0.89	0.70	0.63
07/26/2013	0.49	0.51	0.73	0.70	0.86	0.88	0.72	0.64
07/27/2013	0.51	0.51	0.70	0.71	0.86	0.87	0.73	0.65
07/28/2013	0.49	0.51	0.67	0.71	0.87	0.86	0.74	0.66
07/29/2013	0.52	0.50	0.67	0.70	0.89	0.85	0.73	0.67
07/30/2013	0.53	0.50	0.66	0.70	0.89	0.85	0.72	0.67
07/31/2013	0.53	0.50	0.65	0.70	0.90	0.85	0.71	0.67
08/01/2013	0.45	0.50	0.65	0.70	0.91	0.85	0.69	0.68
08/02/2013	0.53	0.50	0.65	0.71	0.92	0.85	0.68	0.68
08/03/2013	0.47	0.50	0.66	0.71	0.92	0.85	0.69	0.68
08/04/2013	0.47	0.50	0.68	0.71	0.87	0.85	0.70	0.68
08/05/2013	0.51	0.50	0.70	0.71	0.85	0.85	0.70	0.68
08/06/2013	0.53	0.50	0.71	0.71	0.87	0.85	0.70	0.69

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, October 24, 2013

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	33 %
NDOI, monthly average *	>= 4,000 cfs	3,801 cfs
NDOI, 7 day average*	>= 3,000 cfs	3,574 cfs
Rio Vista flow, monthly average *	>= 4,000 cfs	3,939 cfs
Rio Vista flow, 7 day average*	>= 3,000 cfs	3,663 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	165 days	216 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	115 mg/l

Maximum 30 day running average of mean daily EC at:

Vernalis	<=1.0 mS/cm	0.5 mS/cm
Brandt Bridge	<=1.0 mS/cm	0.6 mS/cm
Old River Near Tracy	<=1.0 mS/cm	0.8 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.6 mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                    3 Open / 0 Closed / 0 Full Tide Open  
Flashboard Status : Out  
Boat Lock Status : Closed

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

Previous Month's Index (8RI for May): 1.430 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  
mht - 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:  
(Note: below label begins on October 1, 2013)  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
09/25/2013	5.94	4.30	4,585	24.18	16.69	16.72	9.31	8.87	8.62	5.15	4.97
09/26/2013	5.61	4.16	4,430	22.95	14.82	16.55	8.37	7.89	8.51	4.85	4.91
09/27/2013	5.32	3.91	4,202	22.69	15.22	16.41	7.77	7.26	8.37	4.23	4.82
09/28/2013	5.37	3.89	3,921	22.68	15.08	16.28	8.30	7.81	8.28	4.16	4.74
09/29/2013	5.46	3.96	4,304	24.79	16.71	16.26	9.24	8.79	8.26	4.73	4.70
09/30/2013	5.44	3.97	4,067	25.18	16.98	16.29	9.63	9.20	8.30	5.20	4.73
10/01/2013	5.56	3.99	4,302	25.62	17.85	16.33	10.13	9.74	8.40	5.42	4.78
10/02/2013	5.48	3.91	4,055	25.43	18.03	16.47	9.88	9.47	8.54	5.78	4.88
10/03/2013	5.38	3.82	4,312	25.67	17.63	16.57	9.64	9.21	8.65	5.94	4.99
10/04/2013	5.39	3.72	4,027	25.37	16.46	16.50	9.09	8.64	8.63	5.99	5.06
10/05/2013	5.58	3.72	3,970	26.43	18.29	16.61	10.48	10.10	8.71	5.44	5.09
10/06/2013	5.76	3.82	3,366	26.81	19.03	16.80	10.61	10.25	8.85	5.89	5.16
10/07/2013	6.13	4.10	3,522	27.82	20.04	17.11	11.63	11.34	9.09	6.97	5.33
10/08/2013	6.31	4.20	3,865	28.75	20.52	17.38	12.36	12.13	9.34	7.87	5.54
10/09/2013	6.47	4.43	4,189	29.86	22.19	17.77	13.47	13.34	9.65	8.27	5.77
10/10/2013	6.28	4.41	4,135	29.23	21.27	18.23	12.95	12.77	10.00	7.80	5.98
10/11/2013	5.98	4.22	3,949	28.16	21.10	18.65	12.72	12.52	10.38	7.40	6.20
10/12/2013	5.92	4.18	3,762	28.27	20.77	19.06	12.62	12.41	10.71	8.16	6.49
10/13/2013	5.58	4.02	3,618	27.76	19.67	19.27	12.17	11.93	10.93	7.57	6.69
10/14/2013	5.37	3.79	4,033	27.41	19.61	19.46	11.72	11.44	11.09	7.30	6.84
10/15/2013	5.50	3.88	3,671	28.01	19.89	19.61	11.95	11.68	11.23	7.35	6.98
10/16/2013	5.62	3.92	3,635	28.99	20.68	19.80	12.61	12.40	11.44	8.09	7.14
10/17/2013	5.90	4.01	3,786	29.17	21.26	20.06	13.16	13.00	11.71	8.59	7.33
10/18/2013	6.05	4.16	3,626	29.26	21.87	20.44	13.70	13.59	12.06	9.52	7.59
10/19/2013	6.10	4.15	3,731	29.21	20.86	20.62	13.73	13.62	12.31	9.41	7.87
10/20/2013	6.12	4.21	3,365	28.95	22.14	20.85	14.08	14.01	12.58	9.96	8.16
10/21/2013	6.12	4.27	3,163	29.25	22.18	21.00	14.66	14.65	12.82	10.20	8.39
10/22/2013	5.97	4.20	3,033	28.07	20.96	21.03	13.04	12.87	12.87	8.84	8.46
10/23/2013	6.06	4.34	4,176	29.73	22.41	21.05	14.78	14.77	12.97	10.33	8.61
10/24/2013	5.91	4.47	3,922	30.27	22.55	21.14	15.64	15.73	13.19	10.86	8.83

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
09/25/2013	2.90	2.80	0.97	1.08	NR	NC	0.53	15.49	e	13.86	15.28	6.04
09/26/2013	2.62	2.75	0.92	1.05	NR	NC	0.51	15.38	12.36	14.35	15.23	5.99
09/27/2013	2.37	2.70	0.85	1.02	0.56	NC	0.48	15.33	11.91	14.82	15.22	5.40
09/28/2013	2.49	2.67	0.86	0.99	0.59	NC	0.47	15.11	12.02	14.76	15.20	5.81
09/29/2013	2.62	2.65	0.85	0.97	0.66	NC	0.47	14.68	12.23	14.61	15.18	5.73
09/30/2013	2.76	2.63	0.85	0.95	0.72	NC	0.47	14.39	12.36	14.40	15.15	6.39
10/01/2013	2.89	2.65	0.86	0.93	0.78	NC	0.47	14.34	12.35	14.23	15.33	6.75
10/02/2013	2.79	2.67	0.81	0.92	0.74	NC	0.46	14.44	12.35	14.19	15.27	7.18
10/03/2013	2.66	2.68	0.82	0.91	0.63	NC	0.51	14.66	12.27	14.05	15.22	6.58
10/04/2013	2.26	2.65	0.81	0.89	0.50	NC	0.49	15.02	12.08	13.81	15.11	6.59
10/05/2013	2.74	2.64	0.83	0.88	0.94	NC	0.44	15.86	12.73	14.55	15.46	6.54
10/06/2013	3.18	2.68	0.86	0.87	1.15	NC	0.44	16.37	12.84	14.99	16.02	7.49
10/07/2013	3.66	2.76	0.91	0.87	1.48	NC	0.44	16.49	12.98	15.21	16.41	8.38
10/08/2013	4.19	2.87	0.98	0.87	1.67	NC	0.43	16.46	12.87	15.46	16.73	9.39
10/09/2013	4.84	3.00	1.13	0.88	1.95	NC	0.42	16.63	13.50	16.18	16.98	9.96
10/10/2013	4.83	3.16	1.20	0.90	1.85	1.02	0.41	16.85	13.98	16.84	17.29	9.76
10/11/2013	4.45	3.31	1.04	0.91	1.75	1.10	0.44	17.15	14.01	16.79	16.94	8.37
10/12/2013	4.27	3.44	1.04	0.93	1.72	1.18	0.44	17.35	14.14	16.95	17.47	9.31
10/13/2013	4.21	3.55	1.02	0.94	1.53	1.24	0.46	17.50	14.45	16.80	17.67	8.71
10/14/2013	3.84	3.63	0.97	0.95	1.47	1.30	0.49	17.64	14.48	16.97	17.75	8.42
10/15/2013	4.07	3.71	0.95	0.95	1.57	1.35	0.50	17.76	14.58	16.86	17.96	9.53
10/16/2013	4.52	3.84	1.03	0.97	2.03	1.45	0.53	17.79	14.75	16.96	18.05	9.45
10/17/2013	4.84	3.99	1.10	0.99	2.26	1.56	0.56	17.85	14.85	17.30	17.73	10.38
10/18/2013	5.45	4.22	1.33	1.03	2.40	1.70	0.56	17.94	15.00	17.72	17.65	10.97
10/19/2013	5.54	4.42	1.35	1.06	2.55	1.81	0.54	18.06	15.00	17.42	18.05	10.77
10/20/2013	5.68	4.60	1.41	1.10	2.82	1.93	0.52	18.25	15.08	17.49	18.18	10.77
10/21/2013	5.73	4.75	1.43	1.14	2.99	2.04	0.51	18.42	15.11	17.69	18.37	11.40
10/22/2013	4.82	4.79	1.18	1.16	2.25	2.08	0.54	18.55	15.09	17.59	18.50	10.70
10/23/2013	5.94	4.87	1.67	1.19	2.94	2.15	0.65	18.68	15.11	17.28	18.45	11.50
10/24/2013	5.98	4.95	1.73	1.23	3.22	2.25	0.70	18.78	15.13	17.78	18.43	12.17

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

## 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
09/25/2013	0.82	1.01	0.71	0.66	0.86	0.57	0.58	853	136	209	b
09/26/2013	0.82	0.99	0.70	0.66	0.93	0.58	0.57	763	135	212	b
09/27/2013	0.79	0.98	0.67	0.66	0.93	0.55	0.58	685	135	212	b
09/28/2013	0.75	0.96	0.63	0.65	0.93	0.55	0.58	723	132	202	b
09/29/2013	0.73	0.94	0.61	0.62	0.93	0.55	0.56	764	123	202	b
09/30/2013	0.72	0.92	0.60	0.59	0.92	0.54	0.52	809	117	202	b
10/01/2013	0.71	0.90	0.60	0.57	0.93	0.55	0.52	851	112	211	b
10/02/2013	0.71	0.89	0.59	0.56	0.90	0.53	0.51	819	109	204	b
10/03/2013	0.70	0.87	0.59	0.55	0.90	0.53	0.51	776	107	190	b
10/04/2013	0.69	0.85	0.57	0.56	0.89	0.52	0.50	649	108	182	b
10/05/2013	0.66	0.83	0.54	0.56	0.89	0.51	0.50	803	109	190	b
10/06/2013	0.65	0.82	0.53	0.54	0.85	0.52	0.50	943	104	182	b
10/07/2013	0.64	0.81	0.53	0.53	0.80	0.51	0.50	1,094	99	188	b
10/08/2013	0.64	0.80	0.53	0.51	0.77	0.50	0.50	1,264	95	165	b
10/09/2013	0.65	0.81	0.52	0.50	0.76	0.50	0.50	1,471	93	168	b
10/10/2013	0.65	0.81	0.50	0.50	0.73	0.50	0.50	1,469	92	168	b
10/11/2013	0.65	0.80	0.50	0.49	0.70	0.50	0.51	1,347	91	158	b
10/12/2013	0.65	0.80	0.50	0.49	0.69	0.51	0.51	1,290	90	153	b
10/13/2013	0.65	0.79	0.49	0.49	0.67	0.50	0.51	1,271	90	149	b
10/14/2013	0.65	0.78	0.49	0.49	0.64	0.49	0.51	1,152	90	147	b
10/15/2013	0.64	0.78	NR	0.49	0.64	0.50	0.51	1,225	89	137	b
10/16/2013	0.64	0.79	NR	0.49	0.63	0.49	0.51	1,369	89	131	b
10/17/2013	0.65	0.80	NR	0.48	0.62	0.48	0.52	1,471	88	129	b
10/18/2013	0.67	0.82	0.55	0.48	0.61	0.48	0.52	1,665	88	128	b
10/19/2013	0.68	0.83	0.55	0.48	0.59	0.45	0.53	1,694	88	128 e	b
10/20/2013	0.70	0.86	0.55	0.48	0.59	0.46	0.52	1,739	88	128 e	b
10/21/2013	0.71	0.87	0.56	0.49	0.59	0.46	0.52	1,754	89	121	b
10/22/2013	0.70	0.84	0.55	0.49	0.59	0.46	0.55	1,465	89	121	b
10/23/2013	0.74	0.93	0.58	0.49	0.58	0.46	0.52	1,821	90	118	b
10/24/2013	0.77	0.96	0.57	0.50	0.57	0.48	0.51	1,835	91	115	b

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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

**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
09/25/2013	0.31	0.55	0.54	0.67	0.85	0.84	0.45	0.63
09/26/2013	0.32	0.54	0.40	0.66	0.80	0.84	0.36	0.62
09/27/2013	0.31	0.53	0.36	0.65	0.71	0.84	0.35	0.61
09/28/2013	0.28	0.52	0.37	0.64	0.66	0.83	0.37	0.61
09/29/2013	0.30	0.51	0.36	0.63	0.65	0.83	0.36	0.60
09/30/2013	0.40	0.51	0.34	0.62	0.60	0.82	0.34	0.59
10/01/2013	0.50	0.50	0.35	0.60	0.63	0.82	0.36	0.58
10/02/2013	0.55	0.50	0.42	0.59	0.60	0.81	0.43	0.57
10/03/2013	0.58	0.50	0.50	0.58	0.60	0.80	0.52	0.56
10/04/2013	0.62	0.50	0.58	0.58	0.63	0.80	0.57	0.56
10/05/2013	0.58	0.50	0.64	0.58	0.64	0.79	0.63	0.56
10/06/2013	0.58	0.51	0.65	0.57	0.69	0.78	0.66	0.56
10/07/2013	0.61	0.51	0.68	0.57	0.74	0.78	0.67	0.56
10/08/2013	0.64	0.51	0.66	0.57	0.81	0.78	0.65	0.56
10/09/2013	0.58	0.51	0.66	0.57	0.86	0.78	0.66	0.56
10/10/2013	0.61	0.51	0.70	0.57	0.88	0.78	0.69	0.56
10/11/2013	0.66	0.52	0.71	0.57	0.90	0.79	0.69	0.56
10/12/2013	0.61	0.52	0.68	0.57	0.89	0.79	0.68	0.57
10/13/2013	0.65	0.53	0.70	0.58	0.86	0.79	0.71	0.57
10/14/2013	0.67	0.53	0.74	0.58	0.86	0.79	0.74	0.57
10/15/2013	0.62	0.53	0.71	0.58	0.86	0.79	0.71	0.58
10/16/2013	0.51	0.53	0.75	0.58	0.89	0.79	0.74	0.58
10/17/2013	0.52	0.53	0.75	0.59	0.91	0.79	0.72	0.59
10/18/2013	0.54	0.52	0.62	0.59	0.90	0.79	0.60	0.59
10/19/2013	0.63	0.53	0.59	0.59	0.90	0.79	0.58	0.59
10/20/2013	0.63	0.53	0.60	0.59	0.88	0.79	0.60	0.58
10/21/2013	0.58	0.52	0.68	0.59	0.83	0.79	0.68	0.58
10/22/2013	0.57	0.52	0.71	0.59	0.80	0.78	0.70	0.59
10/23/2013	0.55	0.53	0.67	0.59	0.80	0.78	0.67	0.59
10/24/2013	0.47	0.53	0.65	0.59	0.84	0.78	0.65	0.58

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value



## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, June 03, 2014

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	13 %
NDOI, 14 day average*	>= 4,000 cfs	

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	123 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	79 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	1.57 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.44 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.2 mS/cm
Brandt Bridge	<=0.7 mS/cm	0.3 mS/cm
Old River Near Tracy	<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.3 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :            0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2014)

Previous Month's Index (8RI for Apr): 1.712 MAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.1 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
05/05/2014	5.45	4.17	4,476	23.19	16.64	9.49	10.00	9.60	8.18	6.13	4.91
05/06/2014	5.06	3.92	3,943	22.08	15.43	10.37	9.43	8.99	8.23	5.61	4.97
05/07/2014	5.11	3.74	4,277	22.48	15.71	11.36	9.19	8.74	8.34	5.24	5.06
05/08/2014	5.25	3.74	3,520	23.77	15.93	12.35	9.32	8.88	8.48	5.23	5.16
05/09/2014	5.33	3.70	3,013	23.42	16.51	13.39	9.79	9.37	8.61	5.68	5.28
05/10/2014	5.48	3.68	3,438	23.84	16.46	14.43	9.78	9.37	8.73	5.75	5.36
05/11/2014	5.36	3.55	4,515	23.09	14.23	15.31	9.01	8.55	8.80	5.74	5.47
05/12/2014	5.53	3.62	4,437	24.14	16.99	15.87	9.42	8.98	8.93	5.94	5.59
05/13/2014	5.72	3.68	4,313	25.00	17.61	16.13	10.17	9.77	9.14	6.28	5.74
05/14/2014	5.91	3.82	4,025	25.35	18.42	16.42	11.07	10.74	9.35	6.95	5.90
05/15/2014	6.22	4.08	3,746	26.55	18.80	16.64	12.35	12.12	9.60	8.19	6.11
05/16/2014	6.36	4.25	2,927	27.33	19.67	16.89	13.39	13.25	9.89	9.27	6.35
05/17/2014	6.47	4.31	3,476	28.58	21.44	17.20	14.33	14.28	10.20	9.61	6.58
05/18/2014	6.36	4.36	3,741	28.63	19.43	17.38	14.38	14.34	10.50	9.69	6.81
05/19/2014	6.16	4.31	3,389	28.32	20.85	17.68	14.16	14.10	10.82	9.64	7.06
05/20/2014	5.81	4.16	3,511	27.56	19.88	17.99	13.48	13.34	11.13	8.90	7.29
05/21/2014	5.61	4.03	4,150	25.70	19.91	18.29	12.67	12.47	11.40	8.43	7.52
05/22/2014	5.80	4.05	3,536	26.05	18.41	18.47	12.98	12.80	11.68	8.36	7.74
05/23/2014	6.01	4.15	3,340	26.48	19.83	18.71	13.65	13.54	11.97	9.39	8.01
05/24/2014	6.07	4.15	3,223	27.41	16.55	18.71	13.97	13.88	12.30	9.71	8.29
05/25/2014	6.20	4.18	3,393	27.90	20.36	19.15	13.90	13.81	12.67	9.96	8.60
05/26/2014	6.28	4.20	3,665	27.98	20.24	19.38	14.17	14.10	13.04	10.05	8.89
05/27/2014	6.27	4.19	3,615	28.16	21.26	19.65	14.58	14.55	13.38	10.40	9.18
05/28/2014	6.26	4.04	3,611	27.61	19.33	19.71	14.08	14.01	13.61	9.80	9.39
05/29/2014	6.13	4.13	4,288	27.91	20.56	19.84	13.96	13.88	13.74	9.14	9.45
05/30/2014	6.27	4.31	3,924	28.60	21.25	19.95	14.76	14.76	13.85	10.48	9.54
05/31/2014	6.19	4.25	3,948	28.32	20.55	19.89	14.73	14.72	13.88	10.47	9.60
06/01/2014	6.06	4.34	4,232	27.92	19.37	19.88	14.57	14.54	13.89	10.43	9.65
06/02/2014	6.09	4.52	3,978	29.39	21.13	19.90	15.70	15.80	14.01	10.99	9.75
06/03/2014	5.66	4.29	3,407	28.79	19.74	19.89	14.47	14.43	14.09	9.93	9.82

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville	
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	
05/05/2014	3.03	2.32	0.67	0.55	0.63		NC	0.40	8.95	6.18	6.25	6.11	7.91
05/06/2014	2.65	2.35	0.62	0.56	0.57		NC	0.39	9.08	-0.01 m	6.50	6.57	6.70
05/07/2014	2.35	2.39	0.56	0.57	0.52		NC	0.40	9.29	6.77	6.83	6.81	6.35
05/08/2014	2.50	2.45	0.56	0.57	0.54		NC	0.43	9.46	6.74	3.65	6.64	6.60
05/09/2014	2.65	2.50	0.57	0.58	0.57		NC	0.52	9.64	6.81	6.59	6.16	7.24
05/10/2014	2.72	2.56	0.58	0.58	0.63		NC	0.56	9.83	6.75	6.91	5.86	7.36
05/11/2014	2.35	2.59	0.55	0.59	0.54	0.57	0.52	10.00	6.60	6.98	6.05	6.55	
05/12/2014	2.63	2.64	0.58	0.59	0.59	0.58	0.52	10.17	7.23	7.45	6.30	7.26	
05/13/2014	2.97	2.72	0.61	0.60	0.72 e	0.60	0.52	10.29	7.30	7.19	6.39	8.42	
05/14/2014	3.46	2.81	0.70	0.61	0.84	0.63	0.44	10.25	7.82	7.35	6.59	8.85	
05/15/2014	4.23	2.92	0.83	0.63	1.04	0.66	0.40	10.34	8.19	7.77	6.87	10.64	
05/16/2014	4.77	3.06	1.00	0.66	1.30	0.71	0.42	10.55	8.44	7.87	6.70	11.14	
05/17/2014	5.19	3.21	1.12	0.69	1.54	0.77	0.41	11.09	8.33	7.61	7.31	11.19	
05/18/2014	5.64	3.37	1.24	0.73	1.62	0.83	0.42	11.67	8.58	7.09	8.01	11.56	
05/19/2014	5.43	3.54	1.21	0.77	1.53	0.90	0.52	11.97	8.86	7.93	8.70	11.71	
05/20/2014	5.03	3.71	1.12	0.80	1.32	0.95	0.50	12.25	9.31	8.57	9.47	10.94	
05/21/2014	4.40	3.85	1.01	0.83	1.12	0.99	0.54	12.32	10.27	8.59	9.72	10.52	
05/22/2014	4.53	4.00	1.05	0.87	1.16	1.04	0.50	12.38	10.21	9.62	9.55	10.80	
05/23/2014	4.85	4.16	1.15	0.91	1.35	1.09	0.51	12.60	10.75	10.10	9.05	11.40	
05/24/2014	5.13	4.33	1.22	0.96	1.49	1.15	0.46	12.81	10.47	10.10	9.08	11.53	
05/25/2014	5.20	4.53	1.25	1.01	1.58	1.23	0.41	12.98	10.48	9.95	9.10	11.44	
05/26/2014	5.40	4.73	1.35	1.06	1.66	1.30	0.39	13.18	10.32	10.14	9.55	11.68	
05/27/2014	5.60	4.92	1.37	1.12	1.74	1.38	0.36	13.27	10.23	10.33	9.96	12.18	
05/28/2014	5.62	5.07	1.40	1.17	1.66	1.44	0.33	13.44	9.71	10.21	10.12	11.48	
05/29/2014	5.60	5.17	1.31	1.20	1.58	1.47	0.34	13.40	9.79	10.50	10.62	11.82	
05/30/2014	6.25	5.28	1.66	1.25	1.80	1.51	0.33	13.38	10.32	10.36	10.33	12.31	
05/31/2014	6.13	5.34	1.76	1.29	1.80	1.53	0.34	13.49	9.41	9.92	10.12	12.01	
06/01/2014	6.17	5.38	1.82	1.33	1.69	1.53	0.41	13.59	9.85	10.12	10.24	12.19	
06/02/2014	6.68	5.47	2.11	1.40	1.87	1.56	0.43	13.60	9.69	9.64	10.57	12.99	
06/03/2014	6.01	5.54	1.74	1.44	1.55	1.57	0.44	13.67	9.95	10.27	10.99	11.86	

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

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
05/05/2014	1.52	0.43	0.53	0.42	0.41	0.42	0.47	0.44	896	69	61	b
05/06/2014	1.25	0.44	0.54	0.43	0.41	0.42	0.46	0.44	773	70	61	b
05/07/2014	1.15	0.44	0.54	0.43	0.42	0.42	0.46	0.43	679	71	61	b
05/08/2014	1.21	0.44	0.54	0.44	0.42	0.42	0.46	0.43	726	72	61	b
05/09/2014	1.25	0.45	0.55	0.44	0.42	0.43	0.45	0.45	774	72	65	b
05/10/2014	1.25	0.46	0.55	0.44	0.43	0.43	0.47	0.46	796	73	62	b
05/11/2014	1.01	0.46	0.54	0.44	0.43	0.43	0.48	0.47	678	73	62	b
05/12/2014	1.30	0.45	0.55	0.44	0.43	0.43	0.48	0.46	766	74	63	b
05/13/2014	1.59	0.45	0.55	0.44	0.43	0.44	0.48	0.46	877	75	63	b
05/14/2014	1.89	0.46	0.55	0.44	0.43	0.47	0.48	0.46	1,033	75	64	b
05/15/2014	2.34	0.46	0.56	0.44	0.43	0.49	0.48	0.47	1,279	75	68	b
05/16/2014	2.93	0.48	0.57	0.45	0.43	0.51	0.48	0.47	1,449	75	70	b
05/17/2014	3.40	0.49	0.58	0.45	0.43	0.52	0.48	0.47	1,583	74	73	b
05/18/2014	3.56	0.51	0.63	0.46	0.43	0.53	0.47	0.47	1,726	75	74	b
05/19/2014	3.40	0.52	0.65	0.47	0.43	0.54	0.47	0.46	1,658	75	75	b
05/20/2014	2.78	0.53	0.67	0.48	0.44	0.55	0.47	0.46	1,533	75	75	b
05/21/2014	2.37	0.55	0.65	0.49	0.44	0.56	0.46	0.45	1,331	76	76	b
05/22/2014	2.51	0.56	0.67	0.50	0.45	0.56	0.48	0.46	1,372	78	76	b
05/23/2014	2.81	0.59	0.71	0.52	0.46	0.55	0.49	0.47	1,475	81	75	b
05/24/2014	3.10	0.60	0.73	0.54	0.46	0.55	0.49	0.48	1,565	83	75 e	b
05/25/2014	3.37	0.63	0.75	0.56	0.48	0.55	0.49	0.48	1,588	86	75 e	b
05/26/2014	3.43	0.65	0.79	0.58	0.48	0.55	0.48	0.48	1,648	88	75 e	b
05/27/2014	3.62	0.67	0.81	0.59	0.49	0.55	0.48	0.48	1,712	91	75	b
05/28/2014	3.33	0.69	0.84	0.62	0.50	0.55	0.48	0.48	1,718	93	78	b
05/29/2014	3.16	0.71	0.85	0.63	0.52	0.56	0.48	0.48	1,713	97	77	b
05/30/2014	3.64	0.74	0.89	0.65	0.54	0.57	0.48	0.48	1,922	103	78	b
05/31/2014	3.63	0.77	0.88	0.65	0.56	0.57	0.49	0.33	1,884	108	78 e	b
06/01/2014	3.59	0.79	0.91	0.65	0.57	0.57	0.49	0.03	1,897	110	78 e	b
06/02/2014	3.83	0.84	0.97	0.67	0.58	0.57	0.49	0.39	2,057	113	79	b
06/03/2014	3.13	0.81	0.97	0.68	0.58	0.57	0.50	0.50	1,845	112	79	b

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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

# 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
05/05/2014	0.18	0.44	0.19	0.45	1.09	1.17	0.19	0.50
05/06/2014	0.18	0.41	0.20	0.43	1.10	1.17	0.20	0.48
05/07/2014	0.18	0.38	0.20	0.41	1.12	1.17	0.21	0.45
05/08/2014	0.15	0.34	0.21	0.40	1.13	1.17	0.21	0.42
05/09/2014	0.15	0.31	0.19	0.37	1.14	1.17	0.21	0.39
05/10/2014	0.14	0.28	0.18	0.35	1.16	1.16	0.19	0.35
05/11/2014	0.13	0.25	0.17	0.32	1.15	1.16	0.19	0.32
05/12/2014	0.13	0.23	0.16	0.28	1.14	1.16	0.18	0.29
05/13/2014	0.12	0.21	0.16	0.25	1.16	1.15	0.17	0.26
05/14/2014	0.13	0.19	0.15	0.22	1.16	1.15	0.17	0.24
05/15/2014	0.11	0.17	0.15	0.20	1.14	1.15	0.16	0.22
05/16/2014	0.12	0.16	0.15	0.19	1.13	1.14	0.16	0.20
05/17/2014	0.16	0.16	0.14	0.17	1.09	1.13	0.14	0.18
05/18/2014	0.21	0.15	0.17	0.17	1.07	1.13	0.15	0.18
05/19/2014	0.24	0.16	0.20	0.17	1.03	1.12	0.19	0.17
05/20/2014	0.23	0.16	0.24	0.17	1.02	1.11	0.23	0.18
05/21/2014	0.21	0.16	0.29	0.18	0.99	1.10	0.28	0.18
05/22/2014	0.24	0.16	0.32	0.18	0.95	1.09	0.33	0.19
05/23/2014	0.25	0.17	0.34	0.19	0.93	1.08	0.34	0.19
05/24/2014	0.26	0.17	0.34	0.19	0.89	1.07	0.35	0.20
05/25/2014	0.27	0.18	0.35	0.20	0.89	1.07	0.35	0.21
05/26/2014	0.24	0.18	0.36	0.21	0.84	1.06	0.37	0.21
05/27/2014	0.26	0.19	0.38	0.22	0.85	1.05	0.38	0.22
05/28/2014	0.30	0.19	0.39	0.23	0.81	1.04	0.39	0.23
05/29/2014	0.32	0.19	0.39	0.23	0.80	1.04	0.39	0.24
05/30/2014	0.28	0.20	0.40	0.24	0.81	1.03	0.40	0.24
05/31/2014	0.28	0.20	0.40	0.25	0.80	1.02	0.39	0.25
06/01/2014	0.30	0.20	0.40	0.25	0.81	1.01	0.41	0.26
06/02/2014	0.32	0.21	0.41	0.26	0.85	1.00	0.43	0.27
06/03/2014	0.31	0.21	0.42	0.27	0.87	1.00	0.47	0.27

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

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Wednesday, July 02, 2014

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	16 %
NDOI, monthly average *	>= 3,000 cfs	3,772 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	152 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	99 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	1.33 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.35 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.4 mS/cm
Brandt Bridge	<=0.7 mS/cm	0.5 mS/cm
Old River Near Tracy	<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.6 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                    3 Open / 0 Closed / 0 Full Tide Open  
 Flashboard Status : Out  
 Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2014)

Previous Month's Index (8RI for Apr): 1.712 MAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.1 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 14 day average is progressive daily mean for the first thirteen days of the month.

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
06/03/2014	5.66	4.29	3,407	28.79	19.74	19.89	14.47	14.43	14.09	9.93	9.82
06/04/2014	5.35	4.16	4,591	27.20	19.00	19.83	13.36	13.21	14.14	8.99	9.86
06/05/2014	5.66	4.22	4,248	27.47	18.32	19.82	13.60	13.48	14.19	9.26	9.93
06/06/2014	5.90	4.28	4,086	29.29	18.61	19.73	13.88	13.79	14.21	9.68	9.95
06/07/2014	6.01	4.25	4,565	28.65	17.46	19.80	13.82	13.72	14.20	9.62	9.94
06/08/2014	6.05	4.13	4,796	27.88	17.81	19.62	12.86	12.67	14.12	8.58	9.84
06/09/2014	6.28	4.23	4,840	28.48	18.70	19.51	13.16	13.00	14.04	8.80	9.76
06/10/2014	6.56	4.62	4,202	30.47	21.02	19.49	15.39	15.45	14.10	10.77	9.78
06/11/2014	7.07	4.88	3,628	31.62	21.73	19.66	16.60	16.80	14.30	11.90	9.93
06/12/2014	6.99	4.64	3,762	31.77	20.29	19.64	15.93	16.05	14.46	11.03	10.07
06/13/2014	6.81	4.38	4,203	30.00 e	17.00 e	19.34	14.50 e	14.47 e	14.44	9.00 e	9.96
06/14/2014	6.60	4.30	4,138	29.99	15.12	18.95	14.12	14.05	14.39	8.44	9.82
06/15/2014	6.61	4.42	4,254	30.81	20.28	19.02	14.98	15.00	14.42	9.81	9.77
06/16/2014	6.50	4.43	4,503	30.40	19.95	18.93	15.20	15.24	14.38	9.54	9.67
06/17/2014	6.07	4.22	4,853	29.07	17.98	18.81	13.49	13.36	14.31	9.14	9.61
06/18/2014	5.58	3.99	5,638	27.67	18.04	18.74	12.43	12.21	14.23	8.34	9.57
06/19/2014	5.77	4.05	5,389	27.51	16.66	18.62	12.61	12.40	14.16	8.33	9.50
06/20/2014	6.00	4.05	5,290	27.49	18.80	18.63	12.72	12.52	14.07	8.42	9.41
06/21/2014	6.29	4.21	5,001	28.90	20.46	18.85	13.20	13.05	14.02	8.49	9.33
06/22/2014	6.29	4.25	4,979	28.45	20.96	19.07	13.26	13.11	14.05	8.73	9.34
06/23/2014	6.37	4.30	5,050	29.00	21.25	19.25	13.32	13.17	14.06	9.02	9.35
06/24/2014	6.44	4.43	5,336	29.69	21.72	19.30	13.89	13.80	13.94	9.16	9.24
06/25/2014	6.58	4.48	5,321	29.83	21.90	19.32	12.83	12.64	13.65	9.21	9.05
06/26/2014	6.55	4.44	5,610	29.81	21.38	19.39	13.54	13.42	13.46 e	8.91	8.89
06/27/2014	6.45	4.40	6,093	29.41	21.05	19.68	13.29	13.14	13.36	8.71	8.87
06/28/2014	6.39	4.37	6,055	29.23	19.48	19.99	12.80	12.61	13.26	8.39	8.87
06/29/2014	6.23	4.33	5,407	28.31	19.82	19.96	12.22	11.98	13.05	7.76	8.72
06/30/2014	6.19	4.52	5,195	28.34	20.32	19.99	12.44	12.22	12.83	7.89	8.61
07/01/2014	6.36	4.89	4,042	31.17	21.23	20.22	14.14	14.07	12.88	9.47	8.63
07/02/2014	5.97	4.64	3,503	30.09	19.77	20.34	13.13	12.97	12.93	8.89	8.67

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
06/03/2014	6.01	5.54	1.74	1.44	1.55	1.57	0.44	13.67	9.95	10.27	10.99	11.86
06/04/2014	5.59	5.63	1.68	1.49	1.22	1.58	0.41	13.76	10.39	11.27	11.82	10.62
06/05/2014	5.69	5.71	1.70	1.54	1.20	1.58	0.45	13.90	10.59	11.89	12.61	11.05
06/06/2014	5.83	5.78	1.84	1.59	1.30	1.58	0.43	14.18	11.00	12.41	13.11	11.70
06/07/2014	5.67	5.82	1.81	1.63	1.31	1.57	0.41	14.54	11.43	14.12	13.08	10.97
06/08/2014	5.43	5.83	1.65	1.66	1.29	1.55	0.38	15.02	12.07	14.99	13.65	9.52
06/09/2014	5.61	5.85	1.55	1.67	1.43	1.53	0.37	15.57	12.88	14.76	14.56	10.16
06/10/2014	6.60	5.92	2.17	1.73	1.94	1.54	0.33	16.05	13.50	14.65	15.45	11.16
06/11/2014	7.27	6.04	2.69	1.82	2.63	1.61	0.33	16.68	14.00	14.91	15.85	13.21
06/12/2014	6.93	6.13	2.24	1.89	2.29	1.66	0.33	17.74	14.97	15.48	16.10	12.48
06/13/2014	6.00 e	6.12	2.00 e	1.91	1.96	1.68	0.33 e	18.34	14.71	15.81	16.48	12.00 e
06/14/2014	5.96	6.10	1.58	1.90	1.70	1.67	0.33	18.31	14.70	15.64	16.50	12.00 e
06/15/2014	6.24	6.11	1.92	1.90	1.98	1.69	0.32	18.26	15.32	15.51	17.09	11.40
06/16/2014	6.14	6.07	1.83	1.88	2.05	1.70	0.45	18.25	15.80	15.12	17.21	11.12
06/17/2014	5.42	6.03	1.56	1.87	1.70	1.71	0.51	18.27	15.50	15.34	17.40	10.62
06/18/2014	4.83	5.97	1.37	1.85	1.38	1.72	0.48	18.25	15.11	15.05	17.34	10.07
06/19/2014	4.68	5.90	1.38	1.83	1.35	1.74	0.51	18.26	15.04	15.64	17.17	10.30
06/20/2014	4.66	5.82	1.31	1.79	1.32	1.74	0.47	18.18	15.59	16.75	16.92	9.74
06/21/2014	5.01	5.77	1.31	1.75	1.40	1.74	0.45	17.88	15.84	16.63	17.05	10.21
06/22/2014	5.15	5.75	1.29	1.73	1.49	1.76	0.52	17.77	15.98	16.37	17.19	9.36
06/23/2014	5.17	5.72	1.30	1.71	1.45	1.76	0.57	17.74	15.99	16.57	17.01	10.36
06/24/2014	5.44	5.64	1.52	1.66	1.49	1.73	0.53	17.69	16.09	16.20	17.19	9.90
06/25/2014	5.56	5.51	1.56	1.58	1.59	1.65	0.45	17.71	15.91	16.42	17.60	10.11
06/26/2014	5.39	5.40	1.52	1.53	1.46	1.59	0.41	17.90	16.16	16.00	17.69	10.21
06/27/2014	5.04	5.34	1.40	1.49	1.32	1.55	0.35	18.03	16.17	16.30	17.48	9.75
06/28/2014	4.70	5.25	1.30	1.47	1.18	1.51	0.32	18.02	16.35	16.02	17.61	9.36
06/29/2014	4.32	5.11	1.17	1.42	1.07	1.45	0.38	18.02	16.36	16.06	17.66	8.80
06/30/2014	4.53	4.99	1.23	1.37	1.07	1.38	0.44	17.97	16.44	15.77	17.67	9.48
07/01/2014	5.21	4.98	1.44	1.36	1.28	1.35	0.39	17.84	16.57	15.77	17.64	11.05
07/02/2014	4.69	4.97	1.19	1.35	1.10	1.33	0.36	18.65	16.45	15.49	17.57	10.33

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



## Delta Water Quality Conditions

Date	Emmaton mdEC	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
06/03/2014	3.13	0.81	0.97	0.68	0.58	0.57	0.50	0.50	1,845	112	79	b
06/04/2014	2.58	0.85	0.98	0.70	0.58	0.58	0.50	0.51	1,711	114	79	b
06/05/2014	2.51	0.88	1.03	0.74	0.60	0.58	0.51	0.51	1,742	120	80	b
06/06/2014	2.58	0.92	1.13	0.77	0.63	0.59	0.52	0.52	1,786	127	80	b
06/07/2014	2.61	0.94	1.19	0.81	0.65	0.59	0.53	0.53	1,736	133	82	b
06/08/2014	2.51	0.98	1.21	0.84	0.67	0.59	0.54	0.53	1,661	136	83	b
06/09/2014	2.82	0.99	1.23	0.85	0.69	0.61	0.54	0.53	1,718	141	82	b
06/10/2014	3.73	1.02	1.39	0.89	0.73	0.61	0.56	0.54	2,033	153	85	b
06/11/2014	4.76	1.08	1.49	0.91	0.75	0.60	0.58	0.53	2,246	159	82	b
06/12/2014	4.45	1.12	1.51	0.92	0.75	0.64	0.58	0.54	2,136	158	80	b
06/13/2014	3.00 e	1.12 e	1.30 e	0.90 e	0.80 e	0.65 e	0.60 e	0.54 e	1,841 e	171 e	88	b
06/14/2014	2.66	1.12	1.30	0.93	0.78	0.65	0.60	0.54	1,829	165	85	b
06/15/2014	3.97	1.11	1.39	0.96	0.80	0.64	0.61	0.54	1,917	172	82	b
06/16/2014	4.11	1.12	1.38	0.95	0.81	0.64	0.61	0.54	1,886	174	82	b
06/17/2014	3.39	1.10	1.32	0.94	0.81	0.63	0.62	0.54	1,657	175	88	b
06/18/2014	2.76	1.07	1.27	0.94	0.82	0.63	0.63	0.54	1,468	175	88	b
06/19/2014	2.70	1.04	1.26	0.93	0.81	0.62	0.64	0.54	1,421	175	88	b
06/20/2014	2.61	1.04	1.25	0.92	0.82	0.62	0.65	0.54	1,415	176	88	b
06/21/2014	2.88	1.04	1.25	0.93	0.83	0.61	0.66	0.54	1,526	178	85	b
06/22/2014	2.85	1.03	1.24	0.91	0.82	0.61	0.67	0.54	1,570	178	85	b
06/23/2014	2.80	1.02	1.24	0.91	0.82	0.62	0.67	0.54	1,576	177	85	b
06/24/2014	2.70	1.00	1.22	0.90	0.82	0.66	0.69	0.54	1,663	176	92	b
06/25/2014	3.03	0.98	1.24	0.89	0.81	0.63	0.69	0.54	1,702	175	95	b
06/26/2014	2.87	0.97	1.24	0.87	0.80	0.64	0.70	0.54	1,647	172	91	b
06/27/2014	2.72	0.95	1.22	0.87	0.79	0.64	0.71	0.54	1,535	169	92	b
06/28/2014	2.52	0.93	1.19	0.86	0.79	0.65	0.73	0.57	1,426	168	95	b
06/29/2014	2.19	0.91	1.17	0.85	0.78	0.67	0.74	0.73	1,307	166	97	b
06/30/2014	2.30	0.86	1.14	0.85	0.77	0.69	0.72	0.72	1,372	165	97	b
07/01/2014	2.93	0.81	1.16	0.85	0.77	0.70	0.71	0.70	1,590	162	93	b
07/02/2014	2.24	0.86	1.14	0.83	0.76	0.71	0.70	0.69	1,425	161	99	b

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:

(Note: below label begins on October 1, 2013)

c = excess Delta conditions

b = balanced Delta conditions

r = excess Delta conditions with restrictions:

**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
06/03/2014	0.31	0.21	0.42	0.27	0.87	1.00	0.47	0.27
06/04/2014	0.30	0.22	0.44	0.28	1.02	0.99	0.49	0.28
06/05/2014	0.30	0.22	0.45	0.28	1.10	0.99	0.51	0.29
06/06/2014	0.36	0.23	0.46	0.29	1.20	1.00	0.51	0.30
06/07/2014	0.38	0.23	0.46	0.30	1.22	1.00	0.51	0.31
06/08/2014	0.37	0.24	0.47	0.31	1.24	1.00	0.51	0.33
06/09/2014	0.37	0.25	0.48	0.32	1.25	1.01	0.52	0.34
06/10/2014	0.43	0.26	0.46	0.33	1.01	1.00	0.51	0.35
06/11/2014	0.43	0.27	0.44	0.34	0.90	0.99	0.54	0.36
06/12/2014	0.44	0.28	0.46	0.35	0.84	0.98	0.55	0.37
06/13/2014	0.40 e	0.29	0.48 e	0.36	0.80 e	0.97	0.55 e	0.38
06/14/2014	0.40	0.30	0.50	0.37	0.79	0.96	0.58	0.40
06/15/2014	0.38	0.31	0.50	0.38	0.80	0.95	0.59	0.41
06/16/2014	0.37	0.31	0.52	0.40	0.85	0.94	0.60	0.43
06/17/2014	0.37	0.32	0.54	0.41	0.91	0.94	0.60	0.44
06/18/2014	0.36	0.32	0.56	0.42	0.94	0.93	0.62	0.46
06/19/2014	0.35	0.33	0.57	0.43	0.94	0.93	0.62	0.47
06/20/2014	0.45	0.34	0.57	0.44	1.00	0.93	0.63	0.48
06/21/2014	0.42	0.34	0.56	0.45	0.95	0.93	0.63	0.49
06/22/2014	0.39	0.35	0.55	0.46	0.94	0.93	0.63	0.50
06/23/2014	0.45	0.35	0.56	0.46	0.91	0.93	0.64	0.51
06/24/2014	0.43	0.36	0.57	0.47	0.87	0.93	0.64	0.52
06/25/2014	0.46	0.37	0.58	0.48	0.85	0.93	0.64	0.53
06/26/2014	0.45	0.37	0.59	0.49	0.86	0.93	0.69	0.54
06/27/2014	0.44	0.38	0.60	0.49	0.89	0.93	0.79	0.55
06/28/2014	0.45	0.38	0.61	0.50	0.96	0.94	0.88	0.57
06/29/2014	0.42	0.39	0.63	0.51	0.99	0.95	0.91	0.59
06/30/2014	0.38	0.39	0.63	0.52	1.08	0.95	0.90	0.60
07/01/2014	0.40	0.39	0.63	0.52	1.05	0.96	0.86	0.62
07/02/2014	0.35	0.39	0.63	0.53	1.00	0.97	0.86	0.63

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, August 04, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	8 %
NDOI, monthly average *	>= 3,000 cfs	3,774 cfs
NDOI, 7 day average*	>= 2,000 cfs	3,774 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	124 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	167 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	2.54 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.84 mS/cm
14dm EC at San Andreas Landing	<= 0.87 mS/cm	0.61 mS/cm
14dm EC at Terminous	<= 0.54 mS/cm	0.14 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.7 mS/cm
Brandt Bridge	<=0.7 mS/cm	1.1 mS/cm
Old River Near Tracy	<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River	<=0.7 mS/cm	1.1 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :	3 Open / 0 Closed / 0 Full Tide Open
Flashboard Status : Out	Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF

Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)

San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - mean high tides  
 md - mean daily  
 14 dm - fourteen day running mean  
 NR - No Record  
 NC - 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:  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:  
 - 7 day average is progressive daily mean for the first six days of the month.  
 - Monthly average is progressive daily mean from the beginning of the month

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
07/06/2015	6.36	4.60	2,702	31.87	21.78	21.21	16.59	16.79	15.78	12.22	11.17
07/07/2015	6.14	4.42	3,311	30.36	20.13	21.29	15.97	16.09	16.01	11.26	11.35
07/08/2015	6.41	4.47	3,072	30.48	19.10	21.28	16.17	16.32	16.23 e	11.35	11.52
07/09/2015	6.44	4.42	2,854	30.48	21.09	21.38	15.75	15.85	16.39	11.09	11.66
07/10/2015	6.57	4.34	3,498	29.91	19.86	21.29	15.26	15.31	16.43	10.68	11.68
07/11/2015	6.72	4.48	3,851	30.15	21.75	21.26	15.84	15.96	16.41	11.25	11.65
07/12/2015	6.75	4.53	3,723	30.82	21.81	21.33	16.12	16.26	16.43	11.55	11.66
07/13/2015	6.81	4.59	4,018	30.83	21.95	21.34	15.86	15.98	16.45	11.54	11.70
07/14/2015	6.89	4.61	4,169	31.16	22.52	21.57	16.38	16.55	16.55	11.48	11.75
07/15/2015	6.84	4.64	3,911	30.77	20.98	21.52	16.10	16.24	16.56	11.57	11.77
07/16/2015	6.91	4.78	3,881	32.00	22.88	21.60	16.70	16.92	16.56	12.34	11.79
07/17/2015	6.80	4.80	3,682	31.39	22.42	21.59	16.81	17.04	16.53	12.23	11.76
07/18/2015	6.77	4.82	4,139	31.15	20.09	21.38	16.79	17.02	16.47	12.26	11.72
07/19/2015	6.26	4.42	4,202	30.09	16.68	20.93	14.99	15.01	16.24	10.44	11.52
07/20/2015	5.89	4.38	4,388	29.15	19.50	20.77	14.28	14.23	16.05	9.82	11.35
07/21/2015	6.02	4.52	3,359	29.86	20.47	20.79	14.95	14.96	15.97	10.30	11.28
07/22/2015	6.21	4.60	3,358	30.86	18.77	20.77	15.42	15.49	15.91	10.46	11.21
07/23/2015	6.09	4.44	3,149	29.69	18.79	20.60	14.50	14.46	15.81	9.65	11.11
07/24/2015	6.09	4.25	3,079	28.36	20.39	20.64	13.73	13.62	15.69	9.03	10.99
07/25/2015	6.36	4.34	3,024	29.19	20.13	20.53	14.21	14.15	15.57	9.73	10.89
07/26/2015	6.70	4.63	3,183	30.95	19.09	20.33	15.28	15.33	15.50	10.65	10.82
07/27/2015	6.72	4.61	2,775	29.83	17.19	19.99	15.06	15.09	15.43	9.64	10.69
07/28/2015	6.78	4.61	3,510	30.25	19.25	19.76	15.17	15.21	15.34	10.54	10.62
07/29/2015	6.87	4.71	3,365	30.72	21.93	19.83	16.01	16.14	15.33	11.36	10.60
07/30/2015	7.14	4.86	3,357	31.63	23.39	19.86	17.39	17.68	15.39	12.76	10.63
07/31/2015	7.14	4.80	3,521	31.40	22.71	19.88	17.22	17.49	15.42	12.70	10.67
08/01/2015	7.03	4.74	3,908	31.08	21.44	19.98	17.07	17.33	15.44	12.48	10.68
08/02/2015	6.79	4.67	3,823	31.04	18.14	20.08	16.87	17.10	15.59	12.16	10.81
08/03/2015	6.45	4.61	3,638	30.09	18.88	20.04	16.59	16.79	15.77	11.57	10.93
08/04/2015	6.11	4.41	3,725	30.46	17.23	19.81	15.68	15.77	15.83	10.89	10.97

Antioch Tides measured in feet relative to the NAVD88 Datum  
 Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.  
 Chippis 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 : Not Computed due to insufficient data  
 BR : Below Rating  
 e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
07/06/2015	7.29	6.65	2.42	2.12	5.77	4.62	3.61	2.77	0.62	0.65	0.14	0.16
07/07/2015	6.76	6.78	2.16	2.17	5.10	4.74	3.11	2.85	0.57	0.65	0.15	0.15
07/08/2015	6.90	6.91	2.10	2.20	5.18	4.89	3.21	2.94	0.55	0.65	0.15	0.15
07/09/2015	6.84	7.00	2.09	2.23	5.02	5.03	3.11	3.03	0.54	0.65	0.14	0.15
07/10/2015	6.66	7.02	1.98	2.24	4.66	5.10	2.77	3.09	0.54	0.64	0.14	0.15
07/11/2015	7.17	7.03	2.08	2.23	4.83	5.15	2.88	3.11	0.57	0.63	0.14	0.15
07/12/2015	7.37	7.08	2.30	2.24	5.20	5.21	3.00	3.15	0.61	0.63	0.14	0.15
07/13/2015	6.71	7.10	2.01	2.23	4.81	5.23	2.93	3.17	0.59	0.62	0.14	0.15
07/14/2015	6.99	7.15	1.97	2.23	5.01	5.27	2.94	3.20	0.58	0.62	0.14	0.15
07/15/2015	7.01	7.16	2.06	2.22	4.84	5.27	2.99	3.21	0.60	0.62	0.14	0.14
07/16/2015	7.15	7.13	2.18	2.21	5.21	5.27	3.10	3.20	0.63	0.61	0.14	0.14
07/17/2015	7.07	7.11	2.28	2.20	5.32	5.24	3.06	3.17	0.62	0.61	0.14	0.14
07/18/2015	7.06	7.06	2.28	2.18	5.34	5.20	3.03	3.13	0.62	0.60	0.14	0.14
07/19/2015	6.06	6.93	1.90	2.13	4.11	5.03	2.38	3.01	0.52	0.58	0.14	0.14
07/20/2015	5.73	6.82	1.59	2.07	3.75	4.88	2.14	2.90	0.50	0.57	0.14	0.14
07/21/2015	6.08	6.77	1.70	2.04	3.73	4.79	2.11	2.83	0.57	0.57	0.15	0.14
07/22/2015	6.38	6.73	1.62	2.00	3.54	4.67	2.13	2.75	0.61	0.58	0.14	0.14
07/23/2015	6.08	6.68	1.64	1.97	3.14	4.53	1.77	2.66	0.59	0.58	0.15	0.14
07/24/2015	5.84	6.62	1.57	1.94	2.68	4.39	1.50	2.57	0.58	0.58	0.15	0.14
07/25/2015	6.09	6.54	1.59	1.91	3.03	4.26	1.59	2.48	0.59	0.59	0.14	0.14
07/26/2015	6.45	6.48	1.66	1.86	3.76	4.16	2.01	2.41	0.63	0.59	0.14	0.14
07/27/2015	6.40	6.46	1.82	1.85	3.86	4.09	2.36	2.36	0.63	0.59	0.14	0.14
07/28/2015	6.57	6.43	1.74	1.83	4.11	4.03	2.51	2.33	0.63	0.59	0.14	0.14
07/29/2015	6.86	6.42	1.77	1.81	4.68	4.02	2.74	2.32	0.64	0.60	0.14	0.14
07/30/2015	7.52	6.44	2.26	1.82	5.39	4.03	3.24	2.33	0.67	0.60	0.14	0.14
07/31/2015	7.26	6.46	2.14	1.81	5.56	4.05	3.21	2.34	0.65	0.60	0.14	0.14
08/01/2015	7.13	6.46	2.13	1.79	5.69	4.07	3.30	2.36	0.62	0.60	0.14	0.14
08/02/2015	6.99	6.53	2.06	1.81	5.67	4.18	3.28	2.42	0.59	0.61	0.14	0.14
08/03/2015	6.96	6.61	1.97	1.83	5.51	4.31	3.17	2.49	0.56	0.61	0.14	0.14
08/04/2015	6.56	6.65	1.80	1.84	4.81	4.39	2.73	2.54	0.51	0.61	0.14	0.14

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 14dm : fourteen day running mean  
 NR : No Record  
 NC : Not Computed due to insufficient data  
 BR : Below Rating  
 e : estimated value

## 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
07/06/2015	0.99	1.81	0.74	0.75	0.80	0.72	0.78	2,252	159	170	b
07/07/2015	0.97	1.81	0.72	0.75	0.80	0.72	0.77	2,082	158	169	b
07/08/2015	0.94	1.84	0.72	0.74	0.80	0.72	0.77	2,127	156	170	b
07/09/2015	0.95	1.80	0.70	0.74	0.80	0.71	0.77	2,110	155	171	b
07/10/2015	0.94	1.78	0.71	0.73	0.79	0.73	0.76	2,050	153	170	b
07/11/2015	0.95	1.82	0.72	0.73	0.79	0.73	0.77	2,213	152	170 e	b
07/12/2015	0.98	1.89	0.75	0.72	0.78	0.73	0.77	2,278	151	170 e	b
07/13/2015	0.98	1.85	0.75	0.73	0.79	0.73	0.77	2,066	152	172	b
07/14/2015	0.96	1.75	0.76	0.73	0.78	0.73	0.77	2,156	153	170	b
07/15/2015	0.95	1.76	0.77	0.73	0.78	0.73	0.76	2,162	153	169	b
07/16/2015	0.97	1.80	0.81	0.73	0.78	0.73	0.77	2,206	153	168	b
07/17/2015	1.02	1.75	0.79	0.73	0.78	0.73	0.77	2,181	154	169	b
07/18/2015	1.02	1.76	0.78	0.74	0.77	0.73	0.77	2,180	155	169 e	b
07/19/2015	0.99	1.68	0.75	0.74	0.77	0.73	0.76	1,861	155	169 e	b
07/20/2015	0.94	1.59	0.76	0.72	0.76	0.73	0.76	1,755	150	170	b
07/21/2015	0.93	1.59	0.77	0.74	0.77	0.73	0.76	1,865	155	167	b
07/22/2015	0.94	1.59	0.77	0.73	0.77	0.73	0.76	1,962	154	168	b
07/23/2015	0.93	1.56	0.75	0.73	0.77	0.73	0.76	1,865	153	168	b
07/24/2015	0.92	1.52	0.74	0.73	0.77	0.75	0.76	1,791	153	170	b
07/25/2015	0.91	1.54	0.74	0.72	0.77	0.77	0.76	1,869	151	170 e	b
07/26/2015	0.91	1.59	0.75	0.72	0.77	0.76	0.76	1,985	149	170 e	b
07/27/2015	0.92	1.59	0.76	0.71	0.77	0.76	0.76	1,969	148	172	b
07/28/2015	0.93	1.60	0.77	0.71	0.77	0.76	0.76	2,022	148	171	b
07/29/2015	0.92	1.63	0.77	0.71	0.77	0.76	0.76	2,116	147	178	b
07/30/2015	0.97	1.73	0.76	0.71	0.77	0.76	0.76	2,326	147	172	b
07/31/2015	0.97	1.79	0.77	0.71	0.77	0.75	0.76	2,242	147	171	b
08/01/2015	0.96	1.79	0.75	0.71	0.77	0.74	0.76	2,201	147	171 e	b
08/02/2015	0.95	1.77	0.73	0.71	0.76	0.73	0.76	2,156	147	171 e	b
08/03/2015	0.94	1.72	0.72	0.71	0.75	0.72	0.75	2,148	147	169	b
08/04/2015	0.93	1.66	0.71	0.70	0.75	0.72	0.75	2,019	146	167	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 NR : No Record  
 NC : 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 conditions  
 r = excess Delta conditions with restrictions:

**Delta Water Quality Conditions****South Delta Stations**

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
07/06/2015	0.74	0.69	1.16	1.05	0.96	1.04	1.17	1.05
07/07/2015	0.87	0.70	1.14	1.05	0.96	1.04	1.17	1.06
07/08/2015	0.98	0.71	1.13	1.06	0.96	1.04	1.15	1.07
07/09/2015	0.66	0.71	1.13	1.07	0.95	1.03	1.12	1.09
07/10/2015	0.59	0.70	1.12	1.08	0.96	1.03	1.11	1.10
07/11/2015	0.57	0.70	1.12	1.08	0.95	1.03	1.11	1.11
07/12/2015	0.57	0.69	1.11	1.09	0.93	1.03	1.11	1.12
07/13/2015	0.56	0.69	1.10	1.09	0.92	1.02	1.11	1.13
07/14/2015	0.53	0.69	1.09	1.10	0.93	1.02	1.11	1.14
07/15/2015	0.52	0.68	1.08	1.10	0.95	1.02	1.12	1.15
07/16/2015	0.66	0.68	1.08	1.10	0.99	1.01	1.12	1.16
07/17/2015	0.78	0.68	1.08	1.10	0.99	1.01	1.11	1.16
07/18/2015	0.78	0.68	1.09	1.10	0.98	1.01	1.11	1.17
07/19/2015	0.75	0.68	1.08	1.10	0.96	1.01	1.11	1.17
07/20/2015	0.61	0.68	1.07	1.10	0.95	1.01	1.11	1.17
07/21/2015	0.83	0.69	1.07	1.10	0.95	1.01	1.11	1.16
07/22/2015	0.75	0.69	1.08	1.10	0.95	1.00	1.10	1.16
07/23/2015	0.55	0.68	1.08	1.10	0.98	1.00	1.11	1.15
07/24/2015	0.41	0.67	1.06	1.11	1.01	1.00	1.11	1.15
07/25/2015	0.54	0.67	1.06	1.11	1.06	0.99	1.12	1.14
07/26/2015	0.74	0.67	1.07	1.11	1.04	0.99	1.12	1.14
07/27/2015	0.80	0.67	1.07	1.11	1.01	0.99	1.11	1.13
07/28/2015	0.94	0.68	1.07	1.11	1.01	0.99	1.12	1.13
07/29/2015	0.87	0.69	1.08	1.10	0.97	0.99	1.09	1.13
07/30/2015	0.93	0.70	1.09	1.10	0.95	0.98	1.11	1.12
07/31/2015	0.71	0.71	1.10	1.10	0.93	0.98	1.11	1.12
08/01/2015	0.51	0.70	1.10	1.10	0.94	0.98	1.10	1.12
08/02/2015	0.36	0.68	1.10	1.10	0.94	0.97	1.09	1.12
08/03/2015	0.45	0.67	1.09	1.10	0.96	0.97	1.09	1.12
08/04/2015	0.54	0.67	1.08	1.09	0.98	0.97	1.09	1.11

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

30dm : thirty day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

**Delta Water Quality Conditions****Suisun Marsh Stations**

Date	Collinville	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
07/06/2015	12.99	14.39	19.31	18.29	15.86	21.77
07/07/2015	12.38	14.26	19.12	18.46	15.92	21.97
07/08/2015	12.80	14.67	18.96	18.64	16.18	22.09
07/09/2015	12.49	14.71	18.96	18.84	16.56	22.16
07/10/2015	11.91	14.67	19.26	18.82	16.76	22.09
07/11/2015	12.00	14.63	19.44	19.00	17.05	21.94
07/12/2015	12.67	14.90	19.47	19.25	17.15	21.90
07/13/2015	12.06	14.79	19.87	19.36	17.60	21.69
07/14/2015	12.37	14.77	19.77	19.55	18.11	21.61
07/15/2015	12.58	15.16	20.14	18.74	18.23	21.59
07/16/2015	13.14	15.75	20.37	18.11	19.02	21.34
07/17/2015	13.01	15.78	20.27	20.12	19.67	21.33
07/18/2015	13.34	15.42	20.23	20.32	19.62	21.29
07/19/2015	11.27	15.56	19.83	20.17	19.01	21.39
07/20/2015	11.06	15.59	19.76	21.02	18.84	21.44
07/21/2015	12.02	15.79	19.95	22.67	18.98	21.28
07/22/2015	11.81	16.12	20.02	21.55	19.15	21.18
07/23/2015	10.37	16.13	20.01	20.92	18.81	21.21
07/24/2015	10.00	15.77	19.83	20.63	18.57	21.39
07/25/2015	10.88	15.30	19.75	20.29	18.53	21.46
07/26/2015	12.05	14.95	19.99	19.99	19.04	21.22
07/27/2015	10.81	14.55	20.02	19.85	19.08	21.08
07/28/2015	11.89	14.61	19.94	19.64	19.04	21.05
07/29/2015	11.73	15.18	20.10	19.58	18.96	20.94
07/30/2015	13.36	15.42	20.08	19.43	19.31	20.73
07/31/2015	13.71	15.47	20.10	20.25	19.23	20.90
08/01/2015	13.60	15.73	20.14	21.31	19.31	21.04
08/02/2015	13.09	16.37	20.22	21.19	19.53	21.26
08/03/2015	12.77	16.59	20.11	21.00	19.58	21.45
08/04/2015	12.03	16.18	20.32	20.76	19.33	21.51

Electrical Conductivity (EC) units: milliSiemens per Centimeter

mht : mean high tides

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value



## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, September 11, 2014

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	30 %
NDOI, monthly average *	>= 3,000 cfs	3,405 cfs
NDOI, 7 day average*	>= 2,000 cfs	3,649 cfs

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### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	223 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	141 mg/l
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	0.4 mS/cm
Brandt Bridge	<=1.0 mS/cm	0.7 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.1 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.6 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                    3 Open / 0 Closed / 0 Full Tide Open  
Flashboard Status : In  
Boat Lock Status : Open

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### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2014)

Previous Month's Index (8RI for Apr): 1.712 MAF  
Water Year Type: Critical  
Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)  
San Joaquin valley water year type index (60/20/20) @ 75%: 1.1 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
Chlorides (Cl) in milligrams per liter  
mht - 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:  
(Note: below label begins on October 1, 2013)  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
- 14 day average is progressive daily mean for the first thirteen days of the month.

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
08/13/2014	6.09	4.39	2,509	29.95	20.99	19.91	13.40	13.26	12.78	7.15	6.20
08/14/2014	6.01	4.27	1,907	29.08	20.17	20.08	12.97	12.79	12.81	6.89	6.35
08/15/2014	6.10	4.28	3,475	28.37	20.41	20.11	12.92	12.74	12.86	6.93	6.48
08/16/2014	6.18	4.31	2,464	-- NR	19.66	20.12	12.81	12.62	12.89	6.96	6.59
08/17/2014	6.31	4.40	1,818	-- NR	20.45	20.21	13.22	13.07	12.94	7.23	6.70
08/18/2014	6.44	4.54	2,794	-- NR	21.36	20.32	13.78	13.67	13.10	7.62	6.83
08/19/2014	6.47	4.57	2,840	-- NR	21.50	20.45	13.98	13.89	13.25	7.88	6.99
08/20/2014	6.34	4.57	2,449	-- NR	21.07	20.61	14.02	13.94	13.40	7.90	7.15
08/21/2014	6.38	4.47	3,343	-- NR	18.20	20.38	13.21	13.05	13.36	7.44	7.22
08/22/2014	6.36	4.56	3,300	-- NR	21.03	20.43	13.81	13.71	13.38	7.81	7.29
08/23/2014	6.39	4.53	2,636	-- NR	19.61	20.28	13.74	13.63	13.36	7.74	7.34
08/24/2014	6.39	4.61	4,311	-- NR	19.71	20.32	14.05	13.98	13.41	8.09	7.43
08/25/2014	6.34	4.58	3,508	-- NR	21.91	20.58	14.08	14.01	13.45	8.02	7.50
08/26/2014	6.12	4.40	3,081	-- NR	20.66	20.48	13.10	12.94	13.38	7.68	7.52
08/27/2014	5.83	4.24	3,393	-- NR	20.44	20.44	12.54	12.32	13.31	7.42	7.54
08/28/2014	5.65	4.27	3,105	-- NR	19.97	20.43	12.47	12.24	13.27	7.52	7.59
08/29/2014	5.78	4.34	2,788	-- NR	19.50	20.36	12.40	12.17	13.23	7.74	7.64
08/30/2014	5.92	4.27	3,417	-- NR	19.47	20.35	12.34	12.10	13.19	7.42	7.68
08/31/2014	5.96	4.27	2,807	-- NR	19.58	20.29	12.21	11.96	13.12	7.41	7.69
09/01/2014	6.11	4.29	3,183	-- NR	19.66	20.16	11.79	11.51	12.96	7.04	7.65
09/02/2014	6.43	4.57	3,268	31.28	21.42	20.16	13.35	13.21	12.91	8.05	7.66
09/03/2014	6.61	4.68	2,410	30.51	21.46	20.19	13.73	13.63	12.89	8.45	7.70
09/04/2014	6.82	4.87	3,055	30.61	22.29	20.48	14.43	14.39	12.99	8.77	7.80
09/05/2014	6.63	4.76	3,975	30.65	22.18	20.56	14.62	14.60	13.05	8.97	7.88
09/06/2014	6.72	4.61	3,018	29.77	20.90	20.65	14.15	14.09	13.08	8.69	7.95
09/07/2014	6.63	4.58	2,782	29.84	18.71	20.58	14.24	14.18	13.10	8.72	7.99
09/08/2014	6.55	4.62	4,957	30.28	21.40	20.54	14.57	14.54	13.13	9.01	8.06
09/09/2014	6.37	4.45	4,140	29.44	16.65	20.26	13.82	13.72	13.19	8.42	8.12
09/10/2014	6.14	4.42	2,798	29.27	20.13	20.24	13.44	13.30	13.26	8.02	8.16
09/11/2014	6.35	4.55	3,870	29.18	18.27	20.11	13.77	13.66	13.36	8.40	8.22

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville	
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	
08/13/2014	4.97		NC	1.39	1.26	1.17	1.14	0.40	18.53	16.32	17.38	17.93	8.22
08/14/2014	4.74		NC	1.32	1.27	1.16	1.16	0.46	18.56	16.36	17.84	17.73	7.52
08/15/2014	4.80		NC	1.33	1.28	1.17	1.17	0.51	18.72	16.40	17.93	17.64	7.72
08/16/2014	4.75		NC	1.31	1.29	1.18	1.19	0.49	18.65	16.43	17.82	17.61	8.09
08/17/2014	4.98		NC	1.37	1.30	1.23	1.21	0.47	18.58	16.43	17.80	17.78	8.29
08/18/2014	5.15		NC	1.50	1.33	1.31	1.24	0.44	18.56	16.48	17.83	17.81	8.45
08/19/2014	5.32		NC	1.52	1.35	1.44	1.27	0.42	18.61	16.55	17.48	17.91	8.72
08/20/2014	5.47		NC	1.60	1.39	1.51	1.31	0.47	18.58	16.59	17.47	17.84	8.55
08/21/2014	5.14		NC	1.46	1.40	1.40	1.31	0.55	18.72	16.58	17.83	17.81	8.52
08/22/2014	5.26		NC	1.44	1.41	1.37	1.31	0.57	18.71	16.60	17.67	18.01	8.15
08/23/2014	5.17		NC	1.45	1.41	1.40	1.31	0.55	18.73	16.67	17.58	17.90	8.34
08/24/2014	5.43	5.05		1.49	1.42	1.47	1.31	0.49	18.71	16.80	17.54	18.01	8.79
08/25/2014	5.29	5.13		1.43	1.43	1.43	1.32	0.50	18.68	16.99	17.51	18.13	8.82
08/26/2014	4.81	5.09		1.27	1.42	1.19	1.32	0.49	18.83	16.99	17.13	18.10	8.29
08/27/2014	4.41	5.05		1.18	1.41	1.05	1.31	0.46	18.98	16.98	17.03	18.09	8.53
08/28/2014	4.41	5.03		1.15	1.39	0.99	1.30	0.46	19.06	17.01	17.78	17.86	8.23
08/29/2014	4.46	5.00		1.20	1.38	0.96	1.28	0.47	18.99	18.13	18.43	18.12	8.80
08/30/2014	4.41	4.98		1.19	1.38	0.92	1.26	0.48	18.96	18.78	18.42	18.17	8.36
08/31/2014	4.37	4.93		1.13	1.36	0.89	1.24	0.44	18.92	18.30	18.31	18.15	8.56
09/01/2014	4.47	4.89		1.17	1.33	0.88	1.21	0.45	18.79	17.99	18.16	18.09	8.18
09/02/2014	5.03	4.87		1.33	1.32	1.03	1.18	0.46	18.49	17.77	17.90	18.15	9.32
09/03/2014	5.18	4.85		1.44	1.31	1.14	1.15	0.48	18.27	17.55	18.02	18.07	10.01
09/04/2014	5.59	4.88		1.57	1.32	1.25	1.14	0.47	17.98	17.33	18.07	18.13	10.12
09/05/2014	5.67	4.91		1.63	1.33	1.47	1.15	0.50	17.88	17.18	17.94	17.70	9.97
09/06/2014	5.35	4.92		1.53	1.34	1.32	1.14	0.50	17.89	16.99	17.49	17.30	10.66
09/07/2014	5.34	4.91		1.49	1.34	1.25	1.13	0.46	17.95	16.59	17.24	16.36	10.22
09/08/2014	5.55	4.93		1.53	1.34	1.30	1.12	0.45	17.96	16.19	16.63	15.34	10.73
09/09/2014	5.00	4.95		1.35	1.35	1.19	1.12	0.45	18.13	15.36	15.29	13.63	10.13
09/10/2014	5.01	4.99		1.35	1.36	1.17	1.13	0.44	17.83	14.48	14.25	12.68	9.86
09/11/2014	5.33	5.05		1.41	1.38	1.29	1.15	0.45	16.98	13.80	14.07	12.03	10.77

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

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
08/13/2014	2.68	0.73	0.81	0.66	0.61	0.88	0.56	0.58	1,513	123	124	b
08/14/2014	2.42	0.74	0.79	0.66	0.62	0.88	0.56	0.57	1,438	123	126	b
08/15/2014	2.40	0.78	0.78	0.67	0.62	0.88	0.56	0.56	1,458	124	127	b
08/16/2014	2.32	0.76	0.81	0.67	0.62	0.88	0.56	0.58	1,444	125	127	b
08/17/2014	2.43	0.81	0.84	0.68	0.63	0.89	0.56	0.57	1,516	126	128	b
08/18/2014	2.72	0.78	0.82	0.67	0.63	0.90	0.55	0.55	1,569	126	128	b
08/19/2014	3.03	0.82	0.81	0.66	0.63	0.86	0.56	0.56	1,623	126	128	b
08/20/2014	3.15	0.79	0.77	0.68	0.63	0.90	0.57	0.57	1,672	125	130	b
08/21/2014	2.78	0.83	0.75	0.68	0.63	0.90	0.57	0.58	1,566	126	130	b
08/22/2014	2.83	0.79	0.75	0.70	0.63	0.90	0.57	0.58	1,606	127	131	b
08/23/2014	2.93	0.82	0.70	0.62	0.64	0.90	0.57	0.58	1,578	129	131	b
08/24/2014	3.03	0.83	0.67	0.70	0.64	0.91	0.56	0.60	1,659	130	132	b
08/25/2014	3.11	0.80	0.66	0.70	0.64	0.91	0.57	0.59	1,615	130	133	b
08/26/2014	2.64	0.83	0.66	0.70	0.65	0.91	0.57	0.58	1,463	131	132	b
08/27/2014	2.14	0.82	0.66	0.69	0.65	0.91	0.57	0.61	1,335	133	134	b
08/28/2014	2.16	0.70	0.68	0.68	0.66	0.91	0.57	0.59	1,335	133	134	b
08/29/2014	2.09	0.80	0.67	0.65	0.66	0.91	0.57	0.57	1,350	135	135	b
08/30/2014	1.98	0.80	0.63	0.65	0.67	0.91	0.56	0.55	1,335	136	139	b
08/31/2014	1.77	0.79	0.59	0.63	0.66	0.91	0.55	0.57	1,321	136	140	b
09/01/2014	1.65	0.76	0.62	0.63	0.66	0.91	0.56	0.57	1,355	135	139	b
09/02/2014	2.16	0.78	0.69	0.65	0.65	0.91	0.57	0.56	1,531	133	139	b
09/03/2014	2.39	0.79	0.76	0.59	0.65	0.90	0.57	0.57	1,580	131	137	b
09/04/2014	2.65	0.76	0.94	0.62	0.64	0.90	0.57	0.57	1,710	130	138	b
09/05/2014	2.76	0.81	1.03	0.67	0.64	0.91	0.57	0.56	1,736	129	139	b
09/06/2014	2.52	0.82	1.04	0.68	0.64	0.92	0.56	0.56	1,633	128	139 e	b
09/07/2014	2.65	0.81	1.05	0.69	0.64	0.92		NR 0.57	1,632	128	139 e	b
09/08/2014	2.88	0.82	1.07	0.69	0.64	0.92		NR 0.60	1,698	129	140	b
09/09/2014	2.62	0.79	1.03	0.69	0.64	0.91		NR 0.58	1,521	129	142	b
09/10/2014	2.48	0.80	1.01	0.69	0.64	0.90	0.56	0.58	1,524	130	141	b
09/11/2014	2.72	0.77	1.01	0.70	0.65	0.91		NR 0.57	1,626	132	141	b

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:

(Note: below label begins on October 1, 2013)

c = excess Delta conditions

b = balanced Delta conditions

r = excess Delta conditions with restrictions:

# 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
08/13/2014	0.36	0.32	0.68	0.70	1.16	1.16	0.56	0.78
08/14/2014	0.40	0.33	0.68	0.70	1.19	1.16	0.54	0.77
08/15/2014	0.40	0.33	0.69	0.70	1.22	1.17	0.54	0.75
08/16/2014	0.40	0.33	0.70	0.70	1.19	1.18	0.55	0.74
08/17/2014	0.38	0.34	0.71	0.69	1.22	1.19	0.55	0.73
08/18/2014	0.40	0.34	0.73	0.69	1.26	1.20	0.56	0.72
08/19/2014	0.42	0.34	0.74	0.69	1.26	1.21	0.56	0.71
08/20/2014	0.44	0.35	0.75	0.69	1.27	1.22	0.55	0.70
08/21/2014	0.44	0.35	0.74	0.70	1.23	1.23	0.55	0.69
08/22/2014	0.47	0.36	0.74	0.70	1.16	1.24	0.56	0.68
08/23/2014	0.45	0.36	0.74	0.70	1.09	1.24	0.57	0.67
08/24/2014	0.44	0.37	0.74	0.70	1.08	1.24	0.58	0.66
08/25/2014	0.44	0.37	0.73	0.70	1.01	1.23	0.59	0.66
08/26/2014	0.42	0.37	0.71	0.70	0.96	1.23	0.59	0.65
08/27/2014	0.43	0.38	0.68	0.70	0.95	1.22	0.59	0.64
08/28/2014	0.45	0.38	0.66	0.70	0.94	1.20	0.58	0.64
08/29/2014	0.42	0.39	0.65	0.70	0.94	1.19	0.59	0.63
08/30/2014	0.48	0.39	0.65	0.70	0.94	1.18	0.62	0.63
08/31/2014	0.48	0.40	0.64	0.69	0.94	1.16	0.64	0.63
09/01/2014	0.46	0.40	0.64	0.69	0.99	1.15	0.63	0.63
09/02/2014	0.55	0.41	0.65	0.69	1.06	1.14	0.62	0.62
09/03/2014	0.56	0.42	0.65	0.69	1.04	1.13	0.63	0.62
09/04/2014	0.50	0.42	0.66	0.69	1.03	1.12	0.63	0.61
09/05/2014	0.45	0.43	0.70	0.69	1.00	1.11	0.64	0.61
09/06/2014	0.42	0.43	0.70	0.69	0.96	1.09	0.64	0.61
09/07/2014	0.38	0.43	0.70	0.69	0.96	1.08	0.64	0.60
09/08/2014	0.40	0.43	0.69	0.69	0.95	1.08	0.65	0.60
09/09/2014	0.48	0.43	0.68	0.69	0.91	1.07	0.65	0.59
09/10/2014	0.46	0.44	0.66	0.69	0.94	1.07	0.66	0.59
09/11/2014	0.58	0.44	0.67	0.69	1.08	1.06	0.64	0.60

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

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, December 11, 2014

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	51 %
NDOI, monthly average *	>= 4,500 cfs	16,956 cfs
NDOI, 7 day average*	>= 3,500 cfs	20,811 cfs
Rio Vista flow, monthly average *	>= 4,500 cfs	16,058 cfs
Rio Vista flow, 7 day average*	>= 3,500 cfs	20,424 cfs

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### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	310 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	150 mg/l
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	0.6 mS/cm
Brandt Bridge	<=1.0 mS/cm	0.6 mS/cm
Old River Near Tracy	<=1.0 mS/cm	0.7 mS/cm
Old River Near Middle River	<=1.0 mS/cm	mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                   0 Open / 0 Closed / 3 Full Tide Open  
Flashboard Status : In  
Boat Lock Status : Open

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### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, December 1, 2014)

Previous Month's Index (8RI for Nov): 0.46 MAF  
Water Year Type: Dry  
Sacramento valley water year type index (40/30/30) @ 50%: 5.6 MAF (Dry)  
San Joaquin valley water year type index (60/20/20) @ 75%: 1.4 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
Chlorides (Cl) in milligrams per liter  
mht - 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:  
(Note: below label begins on October 1, 2013)  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
- 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
11/12/2014	5.62	4.26	5,109	27.60	14.18	16.60	13.01	12.84	13.56	8.67	9.20
11/13/2014	5.30	3.75	4,812	26.52	14.37	16.15	11.89	11.62	13.36	7.84	9.07
11/14/2014	5.30	3.97	5,733	26.31	13.89	15.70	12.86	12.67	13.19	8.02	8.90
11/15/2014	5.33	3.79	5,818	26.16	12.32	15.03	12.50	12.28	12.99	7.85	8.72
11/16/2014	5.21	3.54	5,573	25.76	11.40	14.42	11.43	11.13	12.82	7.25	8.56
11/17/2014	5.26	3.51	5,480	26.61	11.80	14.10	11.85	11.57	12.73	7.43	8.46
11/18/2014	5.51	3.68	4,870	27.83	11.69	13.84	12.88	12.69	12.74	8.27	8.44
11/19/2014	5.97	3.97	3,357	29.37	12.58	13.61	14.09	14.02	12.85	9.45	8.52
11/20/2014	6.07	4.05	4,423	29.80	13.02	13.49	14.98	14.99	12.99	9.92	8.60
11/21/2014	6.17	4.09	4,271	29.93	13.39	13.40	15.09	15.12	13.12	10.33	8.70
11/22/2014	6.47	4.25	4,450	30.26	14.62	13.46	15.83	15.94	13.33	10.60	8.84
11/23/2014	6.12	3.92	5,015	29.01	13.53	13.47	14.75	14.74	13.44	10.25	8.95
11/24/2014	5.97	3.81	5,361	28.74	13.74	13.34	13.98	13.90	13.44	9.52	8.95
11/25/2014	5.71	3.69	4,553	28.09	17.38	13.42	13.59	13.47	13.36	9.04	8.89
11/26/2014	5.74	3.76	4,714	28.50	20.97	13.91	13.77	13.66	13.42	8.95	8.91
11/27/2014	5.66	3.90	3,825	28.93	21.40	14.41	14.45	14.41	13.61	9.33	9.02
11/28/2014	5.59	4.03	3,016	28.38	22.26	15.01	15.00	15.02	13.78	9.97	9.15
11/29/2014	5.81	4.18	2,892	28.29	22.16	15.71	15.39	15.46	14.01	10.29	9.33
11/30/2014	5.91	4.06	3,297	28.42	21.90	16.46	15.04	15.06	14.29	10.13	9.53
12/01/2014	5.87	3.92	5,770	28.18	21.44	17.15	14.48	14.45	14.49	9.98	9.72
12/02/2014	6.27	4.22	5,410	28.46	21.96	17.88	15.17	15.21	14.67	10.28	9.86
12/03/2014	7.13	4.89	11,695	29.64	19.93	18.41	16.92	17.16	14.90	10.97	9.97
12/04/2014	7.05	4.86	17,961	29.14	22.34	19.07	15.41	15.48	14.93	9.95	9.97
12/05/2014	6.90	4.73	22,572	27.88	20.73	19.60	13.84	13.74	14.84	8.58	9.85
12/06/2014	6.80	4.71	26,063	26.61	19.25	19.93	12.11	11.86	14.54	7.25	9.61
12/07/2014	6.65	4.50	32,406	24.73	17.01	20.18	9.68	9.26	14.15	5.16	9.24
12/08/2014	6.52	4.51	23,448	23.85	14.88	20.26	8.55	8.07	13.74	4.13	8.86
12/09/2014	6.25	4.43	16,919	22.51	10.68	19.78	7.21	6.68	13.25	3.37	8.45
12/10/2014	6.13	4.42	14,101	22.13	9.36	18.95	6.95	6.42	12.73	2.94	8.02
12/11/2014	6.74	5.23	10,167	24.82	13.55	18.39	8.57	8.09	12.28	3.27	7.59

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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
11/12/2014	5.25	5.74	1.50	1.59	1.71	1.81	0.78	18.27	15.33	16.35	16.40	9.45
11/13/2014	4.65	5.62	1.37	1.56	1.63	1.76	0.78	19.06	15.32	15.77	15.85	8.43
11/14/2014	4.96	5.49	1.23	1.52	1.36	1.69	0.79	19.97	15.30	15.81	16.34	8.87
11/15/2014	4.72	5.35	1.17	1.47	1.19	1.61	0.80	20.31	15.11	15.89	16.16	9.50
11/16/2014	4.27	5.26	1.08	1.45	1.07	1.56	0.80	20.65	15.39	15.83	15.85	8.81
11/17/2014	4.43	5.20	1.09	1.42	1.11	1.52	0.79	20.64	15.34	15.85	15.96	9.09
11/18/2014	5.00	5.18	1.18	1.41	1.27	1.51	0.78	20.16	15.31	15.91	16.46	9.19
11/19/2014	6.02	5.24	1.44	1.41	1.65	1.52	0.75	19.26	15.37	15.89	16.66	10.45
11/20/2014	6.46	5.31	1.58	1.41	1.94	1.55	0.76	18.77	15.38	16.94	16.85	11.49
11/21/2014	6.52	5.38	1.67	1.42	2.17	1.60	0.75	18.41	15.39	17.86	16.81	12.35
11/22/2014	7.35	5.51	2.00	1.45	2.61	1.67	0.74	18.57	15.51	17.59	17.06	11.74
11/23/2014	6.50	5.58	1.67	1.46	2.01	1.69	0.82	18.75	15.43	17.34	16.86	11.74
11/24/2014	6.10	5.59	1.63	1.45	1.96	1.69	0.75	19.23	15.50	17.07	16.97	10.97
11/25/2014	5.93	5.58	1.60	1.44	1.83	1.68	0.66	19.50	15.32	16.79	17.03	10.24
11/26/2014	6.03	5.64	1.70	1.46	1.91	1.69	0.62	19.64	15.12	16.75	17.07	10.19
11/27/2014	6.37	5.76	1.83	1.49	2.06	1.72	0.64	19.45	15.21	16.72	17.08	10.80
11/28/2014	6.78	5.89	2.07	1.55	2.31	1.79	0.69	19.11	15.32	16.60	17.20	11.77
11/29/2014	7.21	6.07	2.21	1.63	2.56	1.89	0.73	18.31	15.38	16.77	17.34	12.24
11/30/2014	7.13	6.27	2.15	1.70	2.49	1.99	0.81	18.27	15.25	16.45	17.24	11.96
12/01/2014	6.87	6.45	2.00	1.77	2.32	2.08	0.74	18.45	NR	16.27	17.26	11.78
12/02/2014	7.22	6.61	2.21	1.84	2.44	2.16	0.62	17.94	14.88	16.30	17.29	12.33
12/03/2014	8.87	6.81	3.15	1.96	3.29	2.28	0.35	16.70	13.72	15.59	17.21	12.83
12/04/2014	8.51	6.96	3.11	2.07	2.76	2.34	0.36	16.58	12.67	16.53	17.16	12.68
12/05/2014	7.48	7.03	2.74	2.15	1.66	2.30	0.44	16.32	11.36	17.14	16.71	10.90
12/06/2014	6.36	6.95	2.52	2.19	1.05	2.19	0.48	16.19	12.47	16.58	16.35	9.06
12/07/2014	4.96	6.84	2.12	2.22	0.81	2.10	0.54	16.04	11.74	15.63	15.82	6.69
12/08/2014	4.09	6.70	1.94	2.24	0.72	2.01	0.59	16.76	11.76	14.81	16.16	5.54
12/09/2014	3.40	6.52	1.77	2.25	0.66	1.93	0.61	16.62	11.91	14.09	16.44	4.04
12/10/2014	2.96	6.30	1.75	2.26	0.58	1.84	0.64	16.75	11.80	13.59	16.21	3.86
12/11/2014	3.53	6.10	2.11	2.28	0.57	1.73	0.54	15.16	11.81	13.34	15.09	3.97

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



## Delta Water Quality Conditions

Date	Emmaton mdEC	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
11/12/2014	3.32	0.94	1.06	0.77	0.77	0.86	0.61	0.59	1,602	164	150 e	b
11/13/2014	3.21	0.92	1.04	0.76	0.77	0.84	0.60	0.57	1,410	163	150 e	b
11/14/2014	2.93	0.91	1.02	0.75	0.77	0.85	0.65	0.57	1,509	162	150 e	b
11/15/2014	2.41	0.90	1.01	0.75	0.76	0.85	0.68	0.57	1,434	161	150 e	b
11/16/2014	1.93	0.90	0.99	0.76	0.76	0.85	0.68	0.58	1,290	161	150 e	b
11/17/2014	2.16	0.87	0.99	0.75	0.76	0.84	0.69	0.59	1,341	161	150 e	b
11/18/2014	2.46	0.81	0.99	0.74	0.76	0.84	0.71	0.65	1,522	160	150 e	b
11/19/2014	3.43	0.76	1.00	0.73	0.75	0.84	0.72	0.62	1,847	158	150 e	b
11/20/2014	3.92	0.83	0.99	0.72	0.74	0.83	0.71	0.65	1,988	156	150 e	b
11/21/2014	4.33	0.83	0.99	0.71	0.73	0.83	0.69	0.65	2,005	153	150 e	b
11/22/2014	4.85	0.81	1.00	0.69	0.72	0.79	0.69	0.65	2,272	150	150 e	b
11/23/2014	4.01	0.84	0.98	0.69	0.71	0.82	0.68	0.65	1,999	147	150 e	b
11/24/2014	3.81	0.84	0.97	0.68	0.70	0.81	0.68	0.62	1,874	144	150 e	b
11/25/2014	3.58	0.84	0.96	0.68	0.68	0.81	0.66	0.65	1,820	140	150 e	b
11/26/2014	3.60	0.85	0.97	0.68	0.67	0.80	0.66	0.65	1,851	138	150 e	b
11/27/2014	3.92	0.86	0.98	0.68	0.66	0.81	0.65	0.64	1,960	135	150 e	b
11/28/2014	4.29	0.88	1.00	0.68	0.66	0.80	0.64	0.63	2,088	134	150 e	b
11/29/2014	4.47	0.94	1.02	0.67	0.66	0.80	0.63	0.62	2,226	133	150 e	b
11/30/2014	4.56	0.97	1.01	0.67	0.65	0.79	0.62	0.63	2,202	133	150 e	b
12/01/2014	4.02	1.00	1.00	0.67	0.65	0.79	0.62	0.63	2,117	132	150 e	b
12/02/2014	4.29	1.06	1.03	0.68	0.65	0.75	0.60	0.63	2,230	132	150 e	b
12/03/2014	5.54	1.18	1.13	0.69	0.65	0.70	0.60	0.64	2,756	132	150 e	b
12/04/2014	4.29	1.23	1.17	0.71	0.65	0.67	0.61	0.63	2,640	133	150 e	b
12/05/2014	3.15	1.30	1.19	0.75	0.66	0.67	0.59	0.63	2,312	136	150 e	b
12/06/2014	1.27	1.37	1.22	0.78	0.69	0.65	0.58	0.62	1,957	141	150 e	b
12/07/2014	0.79	1.38	1.22	0.82	0.71	0.64	0.59	0.61	1,510	147	150 e	b
12/08/2014	0.68	1.36	1.25	0.86	0.74	0.64	0.59	0.60	1,231	156	150 e	b
12/09/2014	0.55	1.32	1.26	0.91	0.77	0.64	0.58	0.58	1,013	165	150 e	b
12/10/2014	0.55	1.27	1.28	0.90	0.81	0.63	0.60	0.58	874	174	150 e	b
12/11/2014	0.88	1.25	1.35	0.89	0.82	0.63	0.62	0.58	1,055	175	150 e	b

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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

# 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
11/12/2014	0.52	0.36	0.42	0.40	0.52	0.85	0.46	0.42
11/13/2014	0.54	0.36	0.44	0.40	0.55	0.84	0.50	0.42
11/14/2014	0.54	0.36	0.45	0.39	0.62	0.83	0.54	0.41
11/15/2014	0.53	0.36	0.47	0.39	0.67	0.83	0.57	0.41
11/16/2014	0.53	0.36	0.49	0.39	0.68	0.82	0.57	0.41
11/17/2014	0.53	0.37	0.50	0.39	0.72	0.82	0.56	0.41
11/18/2014	0.52	0.37	0.51	0.38	0.74	0.81	0.57	0.41
11/19/2014	0.52	0.37	0.51	0.38	0.77	0.81	0.57	0.42
11/20/2014	0.53	0.37	0.51	0.38	0.76	0.81	0.56	0.42
11/21/2014	0.54	0.38	0.52	0.38	0.73	0.80	0.55	0.42
11/22/2014	0.56	0.39	0.54	0.38	0.71	0.80	0.55	0.42
11/23/2014	0.59	0.40	0.53	0.38	0.72	0.79	0.56	0.41
11/24/2014	0.61	0.41	0.54	0.37	0.70	0.78	0.57	0.41
11/25/2014	0.62	0.42	0.54	0.37	0.72	0.77	0.59	0.42
11/26/2014	0.62	0.43	0.55	0.38	0.74	0.77	0.62	0.42
11/27/2014	0.64	0.44	0.56	0.39	0.76	0.76	0.62	0.43
11/28/2014	0.66	0.45	0.58	0.40	0.75	0.75	NR	NC
11/29/2014	0.68	0.47	0.59	0.41	0.75	0.74	NR	NC
11/30/2014	0.68	0.48	0.59	0.42	0.75	0.73	NR	NC
12/01/2014	0.63	0.50	0.58	0.43	0.76	0.72	0.67	NC
12/02/2014	0.61	0.51	0.57	0.44	0.80	0.71	0.67	NC
12/03/2014	0.58	0.52	0.58	0.46	0.85	0.70	0.62	NC
12/04/2014	0.51	0.53	0.59	0.47	0.82	0.70	0.61	NC
12/05/2014	0.56	0.54	0.59	0.48	0.73	0.69	0.59	NC
12/06/2014	0.61	0.55	0.61	0.50	0.69	0.69	0.52	NC
12/07/2014	0.64	0.56	0.61	0.51	0.68	0.69	0.55	NC
12/08/2014	0.72	0.57	0.63	0.52	0.66	0.70	0.60	NC
12/09/2014	0.88	0.59	0.65	0.53	0.65	0.70	0.63	NC
12/10/2014	0.91	0.60	0.71	0.54	0.69	0.71	0.67	NC
12/11/2014	0.81	0.61	0.84	0.56	0.79	0.72	0.80	NC

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

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Monday, January 05, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	18 %
NDOI, monthly average *	>= 4,500 cfs	11,148 cfs
NDOI, 7 day average*	>= 3,500 cfs	11,148 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	mg/l
14dm EC at Jersey Point	<= 2.20 mS/cm	0.33 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	0.9 mS/cm
Brandt Bridge	<=1.0 mS/cm	0.9 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.1 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.9 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                    0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, December 1, 2014)

Previous Month's Index (8RI for Nov): 0.46 MAF  
 Water Year Type: Dry  
 Sacramento valley water year type index (40/30/30) @ 50%: 5.6 MAF (Dry)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.4 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
12/07/2014	6.65	4.50	32,406	24.73	17.01	20.18	9.68	9.26	14.15	5.16	9.24
12/08/2014	6.52	4.51	23,448	23.85	14.88	20.26	8.55	8.07	13.74	4.13	8.86
12/09/2014	6.25	4.43	16,919	22.51	10.68	19.78	7.21	6.68	13.25	3.37	8.45
12/10/2014	6.13	4.42	14,101	22.13	9.36	18.95	6.95	6.42	12.73	2.94	8.02
12/11/2014	6.74	5.23	10,167	24.82	13.55	18.39	8.57	8.09	12.28	3.27	7.59
12/12/2014	6.33	4.93	25,695	19.25	13.35	17.75	6.86	6.33	11.66	2.87	7.08
12/13/2014	5.96	4.32	33,149	16.73	9.77	16.87	4.11	3.59	10.81	1.17	6.43
12/14/2014	5.81	4.16	45,427	14.83	7.00	15.80	2.48	2.06	9.89	0.63	5.75
12/15/2014	6.01	4.48	49,468	14.07	6.95	14.77	1.90	1.53	8.96	0.29	5.06
12/16/2014	6.67	4.88	60,179	13.76	6.14	13.64	1.77	1.42	7.98	0.26	4.34
12/17/2014	6.79	4.82	56,774	13.49	5.25	12.59	1.24	0.95	6.82	0.21	3.58
12/18/2014	6.90	4.80	51,404	10.83	3.01	11.21	0.85	0.63	5.76	0.22	2.88
12/19/2014	7.15	4.91	49,639	9.23	2.51	9.91	0.71	0.52	4.81	0.27	2.29
12/20/2014	7.15	4.93	50,919	7.10	1.62	8.65	0.61	0.44	4.00	0.25	1.79
12/21/2014	7.21	4.91	50,884	5.23	1.29	7.52	0.58	0.41	3.37	0.25	1.44
12/22/2014	6.91	4.67	47,468	3.74	0.83	6.52	0.53	0.38	2.82	0.23	1.16
12/23/2014	6.85	4.68	46,826	3.31	0.69	5.81	0.51	0.36	2.37	0.22	0.93
12/24/2014	7.13	4.93	45,175	3.45	0.73	5.19	0.48	0.34	1.93	0.22	0.74
12/25/2014	6.35	4.53	41,454	2.05	0.54	4.26	0.41	0.28	1.37	0.21	0.52
12/26/2014	5.77	4.27	36,676	2.48	0.46	3.34	0.38	0.26	0.94	0.22	0.33
12/27/2014	5.80	4.06	30,711	3.74	0.46	2.68	0.38	0.26	0.70	0.22	0.26
12/28/2014	5.83	3.93	26,911	5.42	0.60	2.22	0.36	0.24	0.57	0.23	0.23
12/29/2014	6.01	3.95	22,778	7.09	1.27	1.81	0.35	0.24	0.48	0.24	0.23
12/30/2014	6.29	3.76	19,102	7.63	1.57	1.49	0.38	0.26	0.40	0.25	0.23
12/31/2014	5.91	3.77	16,496	8.33	1.97	1.25	0.37	0.25	0.35	0.25	0.23
01/01/2015	6.34	4.07	14,652	11.50	3.41	1.28	0.74	0.54	0.34	0.28	0.24
01/02/2015	6.47	4.23	12,327	13.23	5.05	1.46	1.18	0.91	0.37	0.30	0.24
01/03/2015	6.37	4.24	10,567	-- NR	5.54	1.74	NR	-- NR		0.35	0.25
01/04/2015	6.22	4.05	9,481	-- NR	5.75	2.06	NR	-- NR		0.36	0.25
01/05/2015	6.02	3.94	8,715	13.82	5.84	2.42	1.82	1.46		0.43	0.27

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chippis 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

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville	
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	
12/07/2014	4.96	6.84	2.12	2.22	0.81	2.10	0.54	16.04	11.74	15.63	15.82	6.69	
12/08/2014	4.09	6.70	1.94	2.24	0.72	2.01	0.59	16.76	11.76	14.81	16.16	5.54	
12/09/2014	3.40	6.52	1.77	2.25	0.66	1.93	0.61	16.62	11.91	14.09	16.44	4.04	
12/10/2014	2.96	6.30	1.75	2.26	0.58	1.84	0.64	16.75	11.80	13.59	16.21	3.86	
12/11/2014	3.53	6.10	2.11	2.28	0.57	1.73	0.54	15.16	11.81	13.34	15.09	3.97	
12/12/2014	2.73	5.81	1.64	2.25	0.68	1.61	0.28	13.44	2.63	8.67	14.94	3.84	
12/13/2014	2.12	5.45	1.33	2.18	0.63	1.48	0.36	12.98	4.15	7.47	14.06	1.58	
12/14/2014	1.70	5.06	1.17	2.11	0.50	1.33	0.45	13.18	5.16	7.99	13.71	0.84	
12/15/2014	1.48	4.67	1.07	2.05	0.40	1.20	0.45	13.00	4.35	7.64	13.28	0.28	
12/16/2014	1.31	4.25	1.00	1.96	0.30	1.04	0.34	11.33	3.20	6.69	12.25	0.28	
12/17/2014	1.21	3.70	0.86	1.80	0.37	0.83	0.35	9.68	2.80	6.17	10.70	0.17	
12/18/2014	1.06	3.17	0.74	1.63	0.38	0.66	0.46	9.23	4.82	7.47	9.79	0.24	
12/19/2014	0.89	2.70	0.64	1.48	0.35	0.57	0.48	8.22	7.35	6.88	7.21	0.30	
12/20/2014	0.78	2.30	0.56	1.34	0.33	0.52	0.37	7.90	5.65	6.02	7.04	0.25	
12/21/2014	0.68	2.00	0.50	1.22	0.30	0.48	0.48	7.19	5.93	5.77	6.55	0.26	
12/22/2014	0.60	1.75	0.43	1.11	0.28	0.45	0.58	7.25	5.95	5.22	5.97	0.23	
12/23/2014	0.54	1.54	0.40	1.01	0.25	0.42	0.66	6.51	5.96	4.73	5.51	0.21	
12/24/2014	0.50	1.37	0.39	0.92	0.24	0.40	0.70	5.48	5.68	4.41	4.79	0.21	
12/25/2014	0.46	1.15	0.35	0.79	0.23	0.38	0.76	7.17	5.79	4.50	5.80	0.22	
12/26/2014	0.41	0.98	0.33	0.70	0.23	0.34	0.77	7.90	6.12	4.68	5.68	0.21	
12/27/2014	0.40	0.86	0.32	0.63	0.24	0.32	0.79	7.67	6.33	4.60	5.51	0.21	
12/28/2014	0.38	0.76	0.32	0.56	0.25	0.30	0.84	7.81	6.47	4.45	5.18	0.23	
12/29/2014	0.37	0.68	0.31	0.51	0.25	0.29	0.88	7.13	6.73	4.11	4.50	0.24	
12/30/2014	0.37	0.62	0.31	0.46	0.27	0.28	0.87	8.88	5.93	4.40	4.37	0.24	
12/31/2014	0.36	0.56	0.31	0.42	0.28	0.28	0.87	7.09	5.80	4.50	4.52	0.25	
01/01/2015	0.36	0.51	0.32	0.39	0.28	0.27	0.86	5.91	5.51	4.17	4.25	0.31	
01/02/2015	0.36	0.47	0.32	0.37	0.30	0.27		NR	4.73	5.40	4.25	4.35	0.33
01/03/2015	-- NR	NC	0.32	0.35	0.30	0.26		NR	4.65	5.45	e	e	0.36
01/04/2015	-- NR	NC	0.32	0.34	0.30	0.26		NR	5.56	5.34	4.17	e	0.35
01/05/2015	0.44	NC	0.32	0.33	0.31	0.27		NR	5.96	5.16	4.03	e	0.55

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

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
12/07/2014	0.79	1.38	1.22	0.82	0.71	0.64	0.59	0.61	1,510	147	150 e	b
12/08/2014	0.68	1.36	1.25	0.86	0.74	0.64	0.59	0.60	1,231	156	150 e	b
12/09/2014	0.55	1.32	1.26	0.91	0.77	0.64	0.58	0.58	1,013	165	150 e	c
12/10/2014	0.55	1.27	1.28	0.90	0.81	0.63	0.60	0.58	874	174	150 e	c
12/11/2014	0.88	1.25	1.35	0.89	0.82	0.63	0.62	0.58	1,055	175	150 e	c
12/12/2014	0.41	1.23	1.20	0.86	0.81	0.60	0.62	0.60	799	174	150 e	c
12/13/2014	0.34	1.21	1.17	0.85	0.81	0.57	0.65	0.62	606	175	150 e	c
12/14/2014	0.30	1.16	1.15	0.84	0.82	0.55	0.64	0.67	472	176	150 e	c
12/15/2014	0.21	1.09	1.13	0.80	0.80	0.54	0.62	0.68	403	172	150 e	r
12/16/2014	0.18	1.02	1.13	0.76	0.78	0.53	0.64	0.65	346	166	150 e	r
12/17/2014	0.24	1.01	1.10	0.73	0.76	0.52	0.62	0.64	314	160	150 e	r
12/18/2014	0.29	0.94	1.06	0.70	0.73	0.52	0.63	0.66	266	154	150 e	r
12/19/2014	0.28	0.82	1.03	0.68	0.71	0.54	0.67	0.69	215	149	150 e	r
12/20/2014	0.27	0.73	1.00	0.65	0.69	0.64	0.72	0.71	177	143	150 e	r
12/21/2014	0.26	0.65	0.96	0.59	0.67	0.65	0.74	0.74	148	137	150 e	r
12/22/2014	0.26	0.59	0.92	0.59	0.65	0.65	0.77	0.75	121	132	150 e	r
12/23/2014	0.23	0.51	NR	0.54	0.63	0.67	0.77	0.76	103	126	150 e	r
12/24/2014	0.22	0.46	NR	0.51	0.59	0.67	0.78	0.76	90	117	150 e	r
12/25/2014	0.21	0.50	NR	0.43	0.55	0.68	0.75	0.76	77	107	150 e	r
12/26/2014	0.20	0.41	NR	0.43	0.53	0.69	0.78	0.77	61	101	150 e	r
12/27/2014	0.20	0.36	NR	0.43	0.51	0.68	0.77	0.78	56	95	150 e	r
12/28/2014	0.21	0.34	NR	0.42	0.47	0.67	0.71	0.80	50	86	150 e	r
12/29/2014	0.22	0.33	NR	0.41	0.45	0.66	0.64	0.79	49	80	150 e	r
12/30/2014	0.23	0.33	0.61	0.33	0.43	0.67	0.61	0.80	48	74	NR	r
12/31/2014	0.25	0.32	0.57	0.35	0.41	0.68	0.59	0.78	46	69	NR	r
01/01/2015	0.26	0.31	0.56	0.35	0.39	0.67	0.54	0.79	43	63	NR	r
01/02/2015	0.26	0.31	0.53	0.35	0.38	0.69	0.53	0.80	45	60	NR	r
01/03/2015	0.28	0.31	0.51	0.35	0.38	0.68	0.52	0.79		60	NR	r
01/04/2015	0.28	0.31	0.50	0.35	0.37	0.67	0.53	0.70		59	NR	r
01/05/2015	0.29	0.32	0.50	0.35	0.37	0.71	0.51	0.66	71	58	NR	r

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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

**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
12/07/2014	0.64	0.56	0.61	0.51	0.68	0.69	0.55	NC
12/08/2014	0.72	0.57	0.63	0.52	0.66	0.70	0.60	NC
12/09/2014	0.88	0.59	0.65	0.53	0.65	0.70	0.63	NC
12/10/2014	0.91	0.60	0.71	0.54	0.69	0.71	0.67	NC
12/11/2014	0.81	0.61	0.84	0.56	0.79	0.72	0.80	NC
12/12/2014	0.64	0.62	0.90	0.58	0.83	0.73	0.78	NC
12/13/2014	0.45	0.61	0.89	0.59	0.83	0.73	0.74	NC
12/14/2014	0.47	0.61	0.85	0.60	1.01	0.75	0.49	NC
12/15/2014	0.59	0.61	0.81	0.62	0.93	0.76	0.43	NC
12/16/2014	0.70	0.62	0.79	0.63	0.93	0.76	0.52	NC
12/17/2014	0.82	0.63	0.67	0.63	0.84	0.77	0.61	NC
12/18/2014	0.85	0.64	0.59	0.63	0.77	0.77	0.71	NC
12/19/2014	0.91	0.65	0.68	0.64	0.84	0.77	0.81	NC
12/20/2014	1.00	0.67	0.79	0.65	0.97	0.78	0.82	NC
12/21/2014	1.01	0.69	0.80	0.66	1.01	0.79	0.91	NC
12/22/2014	1.09	0.70	0.85	0.67	1.04	0.80	0.96	NC
12/23/2014	1.17	0.72	0.92	0.68	1.12	0.81	0.99	NC
12/24/2014	1.18	0.74	0.94	0.69	1.19	0.83	1.07	NC
12/25/2014	1.17	0.76	0.97	0.71	1.21	0.85	1.12	NC
12/26/2014	1.17	0.78	1.05	0.72	1.30	0.86	1.13	NC
12/27/2014	1.18	0.80	1.11	0.74	1.50	0.89	1.13	NC
12/28/2014	1.18	0.81	1.12	0.76	1.55	0.92	1.14	NC
12/29/2014	1.18	0.83	1.13	0.78	1.58	0.94	1.16	NC
12/30/2014	1.17	0.85	1.14	0.80	1.53	0.97	1.15	0.79
12/31/2014	1.15	0.86	1.15	0.82	1.47	0.99	1.16	0.80
01/01/2015	1.13	0.88	1.15	0.84	1.55	1.02	1.15	0.82
01/02/2015	1.12	0.90	1.15	0.85	1.37	1.03	1.13	0.84
01/03/2015	1.07	0.92	1.15	0.87	1.32	1.05	1.13	0.85
01/04/2015	1.06	0.93	1.16	0.89	1.32	1.07	1.12	0.87
01/05/2015	1.08	0.95	1.16	0.91	1.33	1.09	1.09	0.89

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, February 03, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	45 %	33 %
NDOI, monthly average *	>= 4,000 cfs	6,057 cfs
NDOI, 7 day average*	>= 3,000 cfs	6,057 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	175 days	34 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	50 mg/l
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	1.0 mS/cm
Brandt Bridge	<=1.0 mS/cm	1.1 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.3 mS/cm
Old River Near Middle River	<=1.0 mS/cm	1.0 mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                      0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status :    Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, January 1, 2015)

Previous Month's Index (8RI for Dec): 2.91 MAF  
 Water Year Type: Below Normal  
 Sacramento valley water year type index (40/30/30) @ 50%: 6.7 MAF (Below Normal)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.4 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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                      s - substituted 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
01/05/2015	6.02	3.94	8,715	13.82	5.84	2.42	1.82	1.46	0.56	0.43	0.27
01/06/2015	5.96	4.00	8,622	14.43	6.47	2.83	1.97	1.59	0.65	0.51	0.29
01/07/2015	5.92	4.08	7,105	15.06	7.24	3.30	2.50	2.07	0.77	0.61	0.32
01/08/2015	5.77	4.12	6,622	15.93	8.07	3.84	3.04	2.57	0.93	0.82	0.36
01/09/2015	5.60	4.20	6,130	15.68	8.59	4.42	3.55	3.06	1.13	1.02	0.42
01/10/2015	5.47	4.14	6,049	15.68	9.29	5.05	3.89	3.39	1.36	1.20	0.49
01/11/2015	5.54	4.01	5,788	15.81	9.62	5.69	4.10	3.59	1.60	1.29	0.56
01/12/2015	5.43	3.75	5,675	15.83	9.74	6.30	3.94	3.43	1.82	1.45	0.65
01/13/2015	5.49	3.66	5,565	16.55	10.05	6.90	4.30	3.78	2.08	1.61	0.75
01/14/2015	5.59	3.70	5,051	18.26	11.35	7.57	5.24	4.70	2.39	2.06	0.88
01/15/2015	5.77	3.78	4,606	20.91	13.23	8.27	6.47	5.93	2.78	2.57	1.04
01/16/2015	6.10	3.92	5,029	22.92	15.27	9.00	7.81	7.30	3.24	3.55	1.27
01/17/2015	6.22	3.96	5,041	23.62	15.98	9.75	8.83	8.37	3.76	4.39	1.56
01/18/2015	6.30	3.98	5,031	23.68	16.25	10.50	9.31	8.87	4.29	4.84	1.88
01/19/2015	6.27	3.93	4,996	23.76	16.42	11.25	9.51	9.08	4.84	5.17	2.22
01/20/2015	6.37	4.04	4,983	24.19	16.80	11.99	10.16	9.76	5.42	5.84	2.60
01/21/2015	6.19	3.97	4,980	23.65	16.61	12.66	10.15	9.76	5.97	5.92	2.98
01/22/2015	5.71	3.70	5,040	23.00	15.71	13.21	9.45	9.01	6.43	5.38	3.31
01/23/2015	5.49	3.68	4,977	22.28	15.55	13.70	9.43	8.99	6.85	5.15	3.60
01/24/2015	5.27	3.69	4,857	22.59	15.33	14.14	9.27	8.82	7.24	5.11	3.88
01/25/2015	5.39	3.64	4,848	22.38	15.35	14.54	9.15	8.70	7.61	5.10	4.15
01/26/2015	5.70	3.80	4,784	22.67	15.99	14.99	9.46	9.03	8.01	5.68	4.46
01/27/2015	6.03	3.87	4,878	23.33	16.16	15.43	10.08	9.68	8.43	6.01	4.77
01/28/2015	5.95	3.82	4,953	23.31	16.36	15.79	9.99	9.59	8.78	5.84	5.04
01/29/2015	6.05	3.96	4,838	23.82	16.92	16.05	10.25	9.87	9.06	5.96	5.28
01/30/2015	6.22	4.13	4,675	24.03	17.92	16.24	10.99	10.66	9.30	6.86	5.52
01/31/2015	6.25	4.20	4,772	24.79	17.76	16.37	10.86	10.51	9.45	7.45	5.74
02/01/2015	6.09	4.05	6,071	24.10	17.12	16.43	10.93	10.59	9.57	6.62	5.86
02/02/2015	5.93	3.92	5,926	23.69	16.93	16.46	10.56	10.20	9.65	6.43	5.95
02/03/2015	5.84	3.91	6,173	23.51	16.65	16.45	10.17	9.78	9.66	6.20	5.98

Antioch Tides measured in feet above mean sea level.  
 Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.  
 Chippis 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                      s - substituted value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
01/05/2015	0.44	0.41	0.32	0.33	0.31	0.27	NR	5.96	5.16	4.03	e	0.55
01/06/2015	0.48	0.41	0.32	0.33	0.31	0.27	NR	5.82	4.53	3.61	2.30	0.50
01/07/2015	0.53	0.41	0.32	0.32	0.31	0.27	NR	5.88	4.23	3.17	2.01	0.67
01/08/2015	0.60	0.42	0.33	0.32	0.31	0.28	NR	5.47	3.91	3.05	1.83	0.84
01/09/2015	0.66	0.44	0.33	0.32	0.32	0.29	NR	5.49	3.65	2.76	1.60	1.42
01/10/2015	0.71	0.46	0.34	0.32	0.32	0.29	NR	5.51	3.55	2.64	1.54	1.48
01/11/2015	0.73	0.48	0.34	0.32	0.32	0.30	NR	5.57	3.60	2.69	1.62	1.62
01/12/2015	0.71	0.51	0.34	0.32	0.32	0.30	NR	6.18	4.15	3.01	1.74	1.86
01/13/2015	0.80	0.54	0.34	0.33	0.33	0.31	NR	7.18	4.48	3.30	1.93	2.55
01/14/2015	1.02	0.59	0.36	0.33	0.32	0.31	NR	7.96	5.44	3.83	2.22	3.47
01/15/2015	1.61	0.68	0.38	0.33	0.33	0.31	NR	8.24	6.25	5.07	3.21	3.20
01/16/2015	1.93	0.79	0.42	0.34	0.37	0.32	NR	8.01	7.86	6.50	3.73	5.62
01/17/2015	2.35	0.93	0.46	0.35	0.42	0.33	NR	8.79	8.36	6.58	3.37	6.62
01/18/2015	2.66	1.09	0.51	0.36	0.49	0.34	NR	9.33	8.28	6.62	3.46	7.65
01/19/2015	2.79	1.26	0.54	0.38	0.54	0.36	NR	9.66	8.31	6.57	4.08	7.74
01/20/2015	3.22	1.45	0.62	0.40	0.63	0.38	NR	10.20	7.99	5.64	5.09	7.52
01/21/2015	3.25	1.65	0.64	0.42	0.63	0.40	NR	10.38	7.68	5.91	5.35	7.23
01/22/2015	2.92	1.81	0.60	0.44	0.55	0.42	NR	10.10	7.68	6.11	5.80	6.62
01/23/2015	2.91	1.97	0.63	0.46	0.53	0.44	NR	9.91	7.58	6.09	5.93	6.68
01/24/2015	3.01	2.14	0.67	0.49	0.54	0.45	NR	9.89	7.66	6.15	6.04	6.59
01/25/2015	3.04	2.30	0.70	0.51	0.56	0.47	NR	9.87	7.68	6.01	5.76	6.10
01/26/2015	3.16	2.48	0.79	0.55	0.65	0.49	NR	9.89	7.44	6.19	5.61	6.87
01/27/2015	3.61	2.68	0.88	0.59	0.80	0.53	NR	10.29	8.02	6.70	5.74	7.63
01/28/2015	3.63	2.86	0.89	0.62	0.80	0.56	NR	10.85	7.83	7.23	5.97	8.12
01/29/2015	3.92	3.03	0.99	0.67	0.83	0.60	NR	10.79	8.05	7.47	6.33	8.03
01/30/2015	4.30	3.20	1.10	0.72	0.84	0.63	NR	10.94	9.00	7.81	6.66	8.89
01/31/2015	4.25	3.33	1.14	0.76	0.87	0.66	NR	11.08	8.74	7.93	6.77	9.50
02/01/2015	4.20	3.44	1.14	0.81	0.97	0.70	NR	11.35	9.71	7.41	6.80	7.68
02/02/2015	3.93	3.53	1.04	0.85	0.87	0.72	NR	11.65	8.68	7.39	7.32	7.92
02/03/2015	3.83	3.57	1.03	0.88	0.84	0.73	NR	11.97	9.65	7.45	7.68	8.19

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
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 md : mean daily  
 NR : No Record  
 NC : Average not computed due to insufficient data  
 BR : Below Rating  
 e : estimated value                      s : substituted value

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
01/05/2015	0.29	0.32	0.50	0.35	0.37	0.71	0.51	0.66	71	58	89 s	r
01/06/2015	0.29	0.30	0.50	0.35	0.37	0.77	0.53	0.68	81	58	80 s	r
01/07/2015	0.31	0.32	0.49	0.35	0.37	0.75	0.57	0.71	98	57	79 s	r
01/08/2015	0.32	0.32	0.49	0.35	0.36	0.65	0.56	0.68	120	56	70 s	r
01/09/2015	0.33	0.32	0.49	0.35	0.36	NR	0.54	0.76	140	55	65 s	r
01/10/2015	0.34	0.32	0.49	0.35	0.36	NR	0.57	0.74	155	55	66 s	r
01/11/2015	0.34	0.33	0.49	0.34	0.36	NR	0.57	0.76	164	54	67 s	r
01/12/2015	0.33	0.33	0.49	0.35	0.36	0.71	0.60	0.78	155	55	69 s	r
01/13/2015	0.32	0.33	0.49	0.34	0.36	0.69	0.54	0.82	185	54	82 s	r
01/14/2015	0.32	0.33	0.48	0.34	0.35	0.69	0.53	0.75	256	54	61 s	r
01/15/2015	0.41	0.34	0.48	0.35	0.35	0.64	0.50	0.73	443	54	70 s	b
01/16/2015	0.62	0.34	0.47	0.35	0.35	0.55	0.44	0.71	544	53	60 s	b
01/17/2015	0.76	0.34	0.47	0.35	0.35	0.56	0.45	0.66	680	54	59 s	b
01/18/2015	1.00	0.35	0.47	0.35	0.35	0.57	0.47	0.66	776	54	58 s	b
01/19/2015	1.11	0.35	0.46	0.35	0.36	0.51	0.48	0.68	820	55	57 s	b
01/20/2015	1.36	0.36	0.47	0.36	0.36	0.53	0.48	0.67	957	55	55 s	b
01/21/2015	1.33	0.37	0.47	0.36	0.36	0.52	0.48	0.70	965	56	52 s	b
01/22/2015	1.10	0.38	0.48	0.36	0.36	0.58	0.50	0.67	859	57	53 s	b
01/23/2015	1.04	0.39	0.49	0.37	0.37	0.64	0.51	0.69	858	58	51 s	b
01/24/2015	1.11	0.39	0.49	0.37	0.37	0.55	0.47	0.67	890	58	53 s	b
01/25/2015	1.10	0.42	0.50	0.38	0.37	0.43	0.46	0.64	899	59	50 s	b
01/26/2015	1.22	0.44	0.51	0.38	0.38	0.42	0.45	0.65	936	60	52 s	b
01/27/2015	1.39	0.46	0.53	0.39	0.38	0.51	0.47	0.65	1,081	62	52 s	b
01/28/2015	1.31	0.46	0.53	0.40	0.39	0.51	0.47	0.65	1,086	63	49 s	b
01/29/2015	1.41	0.52	0.56	0.41	0.39	0.43	0.41	0.65	1,179	65	53 s	b
01/30/2015	1.50	0.53	0.60	0.42	0.40	0.43	0.44	0.62	1,298	67	51 s	b
01/31/2015	1.59	0.55	0.63	0.45	0.42	0.46	0.45	0.62	1,283	70	52 s	b
02/01/2015	1.78	0.61	0.65	0.45	0.43	0.47	0.46	0.64	1,269	74	52 s	b
02/02/2015	1.57	0.64	0.66	0.47	0.44	0.49	0.50	0.63	1,183	77	52 s	b
02/03/2015	1.60	0.65	0.68	0.49	0.45	0.42	0.57	0.64	1,150	79	50 e	b

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                      s : substituted value  
 Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

# 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
01/05/2015	1.08	0.95	1.16	0.91	1.33	1.09	1.09	0.89
01/06/2015	1.07	0.96	1.16	0.93	1.39	1.12	1.08	0.91
01/07/2015	1.05	0.98	1.16	0.95	1.37	1.14	1.09	0.92
01/08/2015	1.04	0.98	1.15	0.96	1.37	1.16	1.08	0.94
01/09/2015	1.02	0.98	1.15	0.98	1.41	1.19	1.07	0.95
01/10/2015	0.98	0.99	1.15	0.99	1.35	1.21	1.06	0.96
01/11/2015	0.97	1.00	1.14	1.00	1.38	1.22	1.03	0.97
01/12/2015	0.97	1.02	1.12	1.00	1.43	1.24	0.99	0.98
01/13/2015	0.97	1.03	1.10	1.01	1.49	1.26	0.98	0.99
01/14/2015	0.96	1.05	1.09	1.02	1.62	1.28	0.98	1.01
01/15/2015	0.91	1.05	1.08	1.03	1.64	1.31	0.98	1.03
01/16/2015	0.85	1.05	1.07	1.04	1.53	1.33	0.97	1.04
01/17/2015	0.87	1.06	1.07	1.06	1.47	1.35	0.90	1.05
01/18/2015	0.86	1.05	1.05	1.07	1.37	1.37	0.87	1.05
01/19/2015	0.86	1.05	1.04	1.08	1.26	1.38	0.88	1.05
01/20/2015	0.87	1.04	1.03	1.09	1.22	1.39	0.87	1.05
01/21/2015	0.85	1.04	1.02	1.09	1.18	1.39	0.87	1.04
01/22/2015	0.83	1.03	1.00	1.10	1.20	1.40	0.88	1.04
01/23/2015	0.83	1.01	1.00	1.10	1.23	1.40	0.87	1.03
01/24/2015	0.87	1.00	1.00	1.10	1.31	1.40	0.86	1.03
01/25/2015	0.91	0.99	1.00	1.10	1.35	1.40	0.85	1.02
01/26/2015	0.95	0.99	1.01	1.10	1.35	1.40	0.88	1.01
01/27/2015	1.01	0.98	1.02	1.09	1.30	1.39	0.91	1.00
01/28/2015	1.01	0.98	1.02	1.09	1.27	1.38	0.94	0.99
01/29/2015	0.98	0.97	1.02	1.08	1.26	1.37	0.99	0.99
01/30/2015	1.04	0.97	1.04	1.08	1.33	1.36	1.00	0.98
01/31/2015	1.00	0.96	1.05	1.08	1.31	1.36	0.98	0.98
02/01/2015	1.02	0.96	1.04	1.07	1.26	1.35	0.97	0.97
02/02/2015	1.18	0.96	1.03	1.07	1.24	1.35	0.97	0.97
02/03/2015	1.32	0.97	1.02	1.07	1.26	1.35	0.98	0.96

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

s : substituted value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, March 05, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	35 %
NDOI, monthly average *	>= 4,000 cfs	5,578 cfs
NDOI, 7 day average*	>= 3,000 cfs	5,578 cfs
Vernalis Base Flow : Monthly average *	>= 500 cfs	704 cfs
7 Day average *	>= 400 cfs	704 cfs
Habitat Protection, X2 / Flow	31 day at Chipps Island	5 days
* 20 Chipps days as carryover from Febru	31 days at Collinsville	5 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	59 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	158 mg/l
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	1.0 mS/cm
Brandt Bridge	<=1.0 mS/cm	1.0 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.2 mS/cm
Old River Near Middle River	<=1.0 mS/cm	1.0 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, February 1, 2015)

Previous Month's Index (8RI for Jan): 0.805 MAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 5.1 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.1 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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                      s - substituted 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
02/04/2015	5.88	4.04	7,194	23.53	16.88	16.47	10.41	10.03	9.67	6.52	6.02
02/05/2015	6.05	4.28	7,002	24.58	17.39	16.59	11.28	10.96	9.81	6.77	6.12
02/06/2015	6.46	4.81	7,197	25.87	19.30	16.86	12.18	11.93	10.02	6.85	6.24
02/07/2015	6.27	4.56	9,392	24.45	17.67	17.03	11.12	10.79	10.16	6.75	6.36
02/08/2015	5.84	4.62	18,244	22.82	16.41	17.10	10.14	9.75	10.24	5.23	6.37
02/09/2015	6.34	4.42	24,498	21.23	14.14	16.97	8.05	7.55	10.13	3.90	6.24
02/10/2015	5.64	3.92	39,822	17.40	9.72	16.51	4.24	3.72	9.71	1.46	5.92
02/11/2015	5.68	3.82	39,879	15.03	7.08	15.85	2.53	2.11	9.17	0.76	5.55
02/12/2015	5.62	3.86	36,707	14.51	5.58	15.04	1.65	1.31	8.56	0.51	5.16
02/13/2015	5.92	4.04	33,818	15.28	5.35	14.14	1.38	1.07	7.88	0.43	4.71
02/14/2015	6.14	4.16	29,486	16.03	6.45	13.33	1.52	1.20	7.21	0.40	4.20
02/15/2015	6.28	4.21	24,399	16.65	7.15	12.62	1.70	1.35	6.55	0.39	3.76
02/16/2015	6.36	4.24	20,307	15.93	7.34	11.94	1.93	1.56	5.94	0.43	3.33
02/17/2015	6.42	4.30	17,399	16.52	7.92	11.31	2.24	1.83	5.37	0.53	2.92
02/18/2015	6.21	4.15	14,977	15.01	7.04	10.61	1.89	1.52	4.76	0.50	2.49
02/19/2015	6.05	4.08	13,243	14.73	6.68	9.84	1.87	1.50	4.09	0.52	2.05
02/20/2015	5.86	4.04	11,698	14.77	6.70	8.94	1.98	1.60	3.35	0.55	1.60
02/21/2015	5.80	4.17	10,260	15.48	7.23	8.20	2.36	1.94	2.72	0.57	1.16
02/22/2015	6.09	4.22	10,228	14.85	7.14	7.54	2.40	1.98	2.16	0.84	0.84
02/23/2015	5.99	3.99	10,638	14.45	6.17	6.97	1.99	1.61	1.74	0.88	0.63
02/24/2015	5.84	3.80	9,866	14.50	7.09	6.78	2.14	1.75	1.60	0.71	0.57
02/25/2015	5.78	3.85	8,971	14.36	7.12	6.78	2.18	1.79	1.57	0.72	0.57
02/26/2015	5.81	3.95	7,562	14.77	8.05	6.96	2.56	2.13	1.63	0.79	0.59
02/27/2015	5.87	4.20	6,633	16.51	9.52	7.26	3.39	2.90	1.76	1.08	0.64
02/28/2015	5.97	4.18	5,805	17.11	9.13	7.45	3.42	2.94	1.89	1.25	0.70
03/01/2015	5.80	4.03	5,927	16.87	8.98	7.58	3.35	2.87	2.00	1.37	0.77
03/02/2015	6.04	4.17	5,924	18.05	11.04	7.84	4.38	3.85	2.16	1.65	0.85
03/03/2015	5.70	3.97	5,230	17.74	10.51	8.03	4.27	3.75	2.30	1.57	0.93
03/04/2015	5.54	3.90	5,412	18.04	10.60	8.28	4.27	3.75	2.45	1.68	1.01
03/05/2015	5.20	3.61	5,395	17.60	10.18	8.53	4.13	3.61	2.61	1.51	1.08

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                      s - substituted value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
02/04/2015	3.83	3.61	1.01	0.90	0.82	0.75	NR	12.13	8.45	7.24	7.24	7.45
02/05/2015	4.14	3.70	1.09	0.94	0.86	0.77	NR	11.53	8.51	7.19	6.97	8.76
02/06/2015	4.88	3.84	1.23	0.98	0.99	0.80	NR	11.42	9.56	7.73	6.79	8.69
02/07/2015	4.72	3.96	1.12	1.01	0.91	0.83	NR	11.31	9.21 e	7.22	6.75	8.08
02/08/2015	3.73	4.01	0.98	1.03	0.59	0.83	NR	11.33	8.50	7.38	7.15	6.45
02/09/2015	3.28	4.02	0.94	1.04	0.50	0.82	NR	11.37	4.64	6.73	7.53	4.74
02/10/2015	1.65	3.88	0.70	1.03	0.46	0.79	NR	12.33	5.94	6.32	6.99	1.82
02/11/2015	1.19	3.70	0.60	1.01	0.38	0.77	NR	12.55	6.63	6.37	7.13	1.11
02/12/2015	0.98	3.49	0.54	0.98	0.33	0.73	NR	12.07	6.80	6.77	7.15	0.60
02/13/2015	0.84	3.25	0.52	0.93	0.31	0.69	NR	11.46	6.92	6.80	6.76	0.50
02/14/2015	0.74	3.00	0.50	0.89	0.29	0.65	NR	10.56	7.01	6.94	6.56	0.46
02/15/2015	0.68	2.74	0.47	0.84	0.28	0.60	NR	9.98	7.43	6.34	5.96	0.54
02/16/2015	0.66	2.51	0.45	0.80	0.29	0.56	NR	9.42	7.31	5.99	6.00	0.59
02/17/2015	0.64	2.28	0.44	0.76	0.29	0.52	NR	8.75	6.92	5.84	5.22	0.50
02/18/2015	0.62	2.05	0.42	0.71	0.31	0.48	NR	8.25	6.09	5.31	3.78	0.48
02/19/2015	0.60	1.80	0.41	0.66	0.31	0.45	NR	8.13	5.17	4.27	2.46	0.57
02/20/2015	0.60	1.50	0.40	0.61	0.32	0.40	NR	8.18	4.34	3.45	1.71	0.52
02/21/2015	0.61	1.20	0.39	0.55	0.32	0.36	NR	7.65	3.66	3.09	1.45	0.61
02/22/2015	0.62	0.98	0.40	0.51	0.33	0.34	NR	7.26	3.64	2.93	1.37	1.09
02/23/2015	0.58	0.79	0.40	0.47	0.34	0.33	NR	8.87	3.73	2.75	1.28	0.90
02/24/2015	0.57	0.71	0.38	0.45	0.34	0.32	NR	8.97	3.79	3.03	1.28	0.75
02/25/2015	0.58	0.67	0.38	0.44	0.34	0.32	NR	8.65	4.17	2.90	1.34	0.84
02/26/2015	0.61	0.64	0.39	0.42	0.35	0.32	NR	7.57	4.43	2.77	1.36	1.08
02/27/2015	0.69	0.63	0.40	0.42	0.34	0.32	NR	6.62	4.09	2.53	1.36	1.41
02/28/2015	0.74	0.63	0.40	0.41	0.35	0.32	NR	6.42	3.85	3.05	1.43	1.67
03/01/2015	0.74	0.63	0.40	0.40	0.35	0.33	NR	6.92	4.08	2.91	1.58	1.39
03/02/2015	0.85	0.65	0.41	0.40	0.35	0.33	NR	6.52	3.65	2.82	1.65	2.13
03/03/2015	0.87	0.66	0.40	0.40	0.35	0.34	NR	6.66	3.57	2.47	1.83	2.11
03/04/2015	0.90	0.68	0.41	0.40	0.35	0.34	NR	6.77	3.54	2.69	1.87	1.86
03/05/2015	0.87	0.70	0.40	0.40	0.35	0.34	NR	8.10	3.67	2.41	2.09	1.71

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                      s : substituted value

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
02/04/2015	1.65	0.67	0.70	0.49	0.46	0.34	0.50	0.61	1,149	81	56 s	b
02/05/2015	1.81	0.68	0.73	0.51	0.47	0.38	0.51	0.60	1,249	84	58 s	b
02/06/2015	2.35	0.72	0.76	0.50	0.48	0.37	0.48	0.60	1,483	88	59 s	b
02/07/2015	1.57	0.72	0.77	0.48	0.49	0.38	0.62	0.59	1,432	90	58 s	r
02/08/2015	0.99	0.72	0.76	0.50	0.49	0.40	0.59	0.68	1,116	91	59 s	r
02/09/2015	0.54	0.66	0.78	0.50	0.50	0.40	0.60	0.61	976	93	63 s	r
02/10/2015	0.34	0.71	0.74	0.53	0.51	0.40	0.61	0.73	456	94	70 s	r
02/11/2015	0.30	0.63	0.73	0.52	0.51	0.40	0.64	0.67	309	95	71 s	r
02/12/2015	0.28	0.66	0.74	0.54	0.51	0.42	0.61	0.66	242	96	74 s	r
02/13/2015	0.25	0.57	0.74	0.53	0.51	0.42	0.58	0.30	198	96	77 s	r
02/14/2015	0.23	0.53	0.74	0.50	0.51	0.39	0.51	0.56	165	94	91 s	r
02/15/2015	0.23	0.49	0.71	0.49	0.45	0.37	0.54	0.45	147	80	112 s	r
02/16/2015	0.23	0.46	0.69	0.48	0.49	0.36	0.57	0.21	141	89	119 s	r
02/17/2015	0.25	0.43	0.66	0.46	0.47	0.41	0.56	0.20	134	86	109 s	r
02/18/2015	0.26	0.41	0.63	0.43	0.46	0.41	0.56	0.59	128	83	111 s	r
02/19/2015	0.27	0.42	0.60	0.43	0.46	0.38	0.58	0.77	122	81	107 s	r
02/20/2015	0.28	0.41	0.58	0.42	0.44	0.40	0.67	0.71	119	78	102 s	r
02/21/2015	0.28	0.37	0.56	0.41	0.43	0.41	0.71	0.70	124	74	116 s	r
02/22/2015	0.31	0.38	0.54	0.40	0.42	0.41	0.57	0.61	127	71	91 s	r
02/23/2015	0.30	0.38	0.52	0.39	0.41	0.40	0.55	0.74	114	70	89 s	r
02/24/2015	0.30	0.34	0.51	0.39	0.41	0.43	0.55	0.77	111	69	128 s	r
02/25/2015	0.30	0.37	0.50	0.38	0.40	0.46	0.49	0.72	115	67	108 s	r
02/26/2015	0.31	0.36	0.50	0.38	0.40	0.40	0.50	0.74	126	66	108 s	r
02/27/2015	0.33	0.34	0.48	0.38	0.39	0.33	0.47	0.72	149	63	151 s	r
02/28/2015	0.34	0.38	0.46	0.37	0.38	0.35	0.45	0.67	166	62	118 s	r
03/01/2015	0.33	0.38	0.47	0.38	0.38	0.38	0.46	0.73	167	62	160 s	r
03/02/2015	0.37	0.37	0.47	0.38	0.38	0.38	0.46	0.60	201	61	150 s	r
03/03/2015	0.35	0.37	0.47	0.37	0.38	0.41	0.45	0.58	208	61	155 s	r
03/04/2015	0.35	0.36	0.47	0.37	0.38	0.46	0.43	0.59	215	60	158 e	r
03/05/2015	0.34	0.36	0.47	0.38	0.38	0.45	0.46	0.62	206	60	158 e	r

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                      s : substituted value  
 Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:



# 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
02/04/2015	1.27	0.98	1.01	1.06	1.33	1.35	1.11	0.96
02/05/2015	1.14	0.98	1.01	1.06	1.32	1.35	1.23	0.97
02/06/2015	1.09	0.98	1.01	1.05	1.30	1.34	1.22	0.97
02/07/2015	1.05	0.98	1.03	1.05	1.33	1.34	1.12	0.97
02/08/2015	1.01	0.98	1.07	1.04	1.35	1.34	1.02	0.97
02/09/2015	0.97	0.98	1.05	1.04	1.38	1.34	1.02	0.97
02/10/2015	0.89	0.98	1.09	1.04	1.24	1.34	0.95	0.97
02/11/2015	0.97	0.98	1.07	1.04	1.26	1.33	0.90	0.97
02/12/2015	0.97	0.98	1.05	1.04	1.28	1.32	0.84	0.96
02/13/2015	1.08	0.98	1.02	1.03	1.26	1.31	0.93	0.96
02/14/2015	1.10	0.99	0.97	1.03	1.21	1.30	0.94	0.96
02/15/2015	1.05	0.99	0.93	1.03	1.14	1.28	1.04	0.96
02/16/2015	1.01	1.00	0.88	1.02	1.14	1.27	1.07	0.97
02/17/2015	0.98	1.00	0.85	1.01	1.14	1.27	1.05	0.97
02/18/2015	0.92	1.01	0.84	1.01	1.16	1.26	1.02	0.98
02/19/2015	0.87	1.01	0.86	1.00	1.17	1.26	1.00	0.98
02/20/2015	0.83	1.00	0.87	0.99	1.19	1.26	0.92	0.98
02/21/2015	0.87	1.01	0.88	0.99	1.21	1.26	0.86	0.98
02/22/2015	0.87	1.01	0.88	0.99	1.21	1.26	0.81	0.98
02/23/2015	0.90	1.01	0.90	0.98	1.20	1.26	0.88	0.98
02/24/2015	0.84	1.01	0.90	0.98	1.11	1.25	0.87	0.98
02/25/2015	0.81	1.00	0.90	0.98	1.13	1.24	0.89	0.98
02/26/2015	0.82	0.99	0.90	0.97	1.19	1.24	0.86	0.98
02/27/2015	0.84	0.99	0.92	0.97	1.20	1.24	0.84	0.98
02/28/2015	0.87	0.99	0.96	0.97	1.16	1.23	0.86	0.97
03/01/2015	0.99	0.98	1.00	0.97	1.10	1.23	0.87	0.97
03/02/2015	1.07	0.99	1.06	0.97	1.10	1.22	0.88	0.96
03/03/2015	1.07	0.99	1.10	0.97	1.12	1.21	0.95	0.96
03/04/2015	0.98	0.98	1.14	0.97	1.11	1.21	1.02	0.96
03/05/2015	0.85	0.97	1.18	0.98	1.10	1.20	1.08	0.97

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

s : substituted value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh

Thursday, April 02, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	19 %
NDOI, monthly average *	>= 4,000 cfs	4,092 cfs
NDOI, 7 day average*	>= 3,000 cfs	4,092 cfs
Vernalis Base Flow : Monthly average *	>= 500 cfs	822 cfs
7 Day average *	>= 400 cfs	822 cfs
Habitat Protection, X2 / Flow	31 days at Collinsville	0

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	84 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	68 mg/l
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=1.0 mS/cm	0.6 mS/cm
Brandt Bridge	<=1.0 mS/cm	1.1 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.2 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.8 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, March 1, 2015)

Previous Month's Index (8RI for Feb): 2.23 MAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 4.7 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 0.9 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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      s - substituted 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
03/04/2015	5.54	3.90	5,412	18.04	10.60	8.28	4.27	3.75	2.45	1.68	1.01
03/05/2015	5.20	3.61	5,395	17.60	10.18	8.53	4.13	3.61	2.61	1.51	1.08
03/06/2015	5.16	3.62	5,359	18.10	10.65	8.81	4.50	3.97	2.77	1.71	1.17
03/07/2015	5.19	3.78	4,611	19.15	11.37	9.11	4.98	4.44	2.95	2.03	1.27
03/08/2015	5.37	3.86	4,679	18.84	12.01	9.46	5.68	5.14	3.18	2.46	1.39
03/09/2015	5.50	3.91	4,305	19.76	12.45	9.91	5.88	5.34	3.44	2.88	1.53
03/10/2015	5.61	3.93	4,184	20.06	12.71	10.31	6.15	5.61	3.72	3.04	1.70
03/11/2015	5.73	3.94	4,513	20.64	12.85	10.72	6.29	5.75	4.00	3.31	1.88
03/12/2015	5.48	3.74	5,485	20.14	12.48	11.03	5.98	5.43	4.24	3.00	2.04
03/13/2015	5.58	3.86	5,825	20.71	13.08	11.29	6.38	5.84	4.45	3.21	2.19
03/14/2015	5.60	3.95	5,104	20.94	14.08	11.64	6.88	6.35	4.69	3.38	2.34
03/15/2015	5.96	4.09	4,697	22.64	15.24	12.09	8.07	7.58	5.03	4.49	2.56
03/16/2015	5.86	4.00	5,625	23.02	15.84	12.43	8.21	7.72	5.31	4.75	2.79
03/17/2015	5.95	4.07	5,582	22.93	16.24	12.84	9.23	8.78	5.66	5.42	3.06
03/18/2015	5.75	3.93	5,562	20.16	15.73	13.21	8.86	8.40	6.00	5.19	3.31
03/19/2015	5.68	3.90	5,556	19.77	15.65	13.60	8.70	8.23	6.33	5.24	3.58
03/20/2015	5.67	4.02	5,344	20.41	15.86	13.97	9.30	8.85	6.68	5.60	3.86
03/21/2015	5.79	3.99	4,900	20.22	15.81	14.29	9.31	8.87	6.99	5.66	4.12
03/22/2015	5.89	4.02	4,897	20.22	16.17	14.58	9.61	9.18	7.28	5.67	4.35
03/23/2015	5.96	3.97	4,441	19.97	15.81	14.82	9.50	9.07	7.55	5.64	4.54
03/24/2015	5.85	3.86	4,668	20.85	15.55	15.03	9.45	9.01	7.79	5.67	4.73
03/25/2015	5.69	3.77	4,545	21.27	15.42	15.21	8.83	8.37	7.98	5.51	4.89
03/26/2015	5.57	3.79	4,525	21.33	15.11	15.40	8.65	8.18	8.17	5.22	5.05
03/27/2015	5.49	3.96	4,536	20.97	15.49	15.57	9.12	8.67	8.37	5.60	5.22
03/28/2015	5.23	3.77	4,351	22.06	15.42	15.67	8.94	8.48	8.53	5.45	5.36
03/29/2015	5.33	3.83	4,864	21.96	15.75	15.70	9.06	8.60	8.60	5.71	5.45
03/30/2015	5.48	4.01	4,240	22.59	16.61	15.76	9.68	9.26	8.71	6.14	5.55
03/31/2015	5.38	3.99	4,109	24.03	17.02	15.81	10.46	10.08	8.80	6.41	5.62
04/01/2015	5.04	3.56	4,101	22.30	15.91	15.83	9.07	8.61	8.82	5.49	5.64
04/02/2015	5.03	3.49	4,083	22.00	15.24	15.80	8.71	8.24	8.82	5.55	5.67

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                      s - substituted value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
03/04/2015	0.90	0.68	0.41	0.40	0.35	0.34	NR	6.77	3.54	2.69	1.87	1.86
03/05/2015	0.87	0.70	0.40	0.40	0.35	0.34	NR	8.10	3.67	2.41	2.09	1.71
03/06/2015	0.93	0.73	0.41	0.40	0.35	0.34	NR	8.08	3.85	2.70	2.07	2.20
03/07/2015	1.04	0.76	0.42	0.40	0.34	0.34	NR	7.82	3.63	2.72	2.18	2.26
03/08/2015	1.20	0.80	0.44	0.40	0.36	0.35	NR	6.74	3.79	3.08	2.08	3.10
03/09/2015	1.27	0.85	0.46	0.41	0.37	0.35	NR	6.60	4.01	3.41	2.13	3.46
03/10/2015	1.40	0.91	0.47	0.41	0.38	0.35	NR	6.60	4.07	3.62	2.23	4.01
03/11/2015	1.51	0.97	0.50	0.42	0.39	0.35	NR	6.74	4.21	3.88	2.65	4.01
03/12/2015	1.43	1.03	0.49	0.43	0.39	0.36	NR	7.30	4.37	3.97	3.13	3.81
03/13/2015	1.64	1.10	0.52	0.44	0.39	0.36	NR	7.74	4.77	4.06	3.33	4.42
03/14/2015	1.87	1.18	0.55	0.45	0.40	0.36	NR	8.02	5.03	3.85	3.58	4.26
03/15/2015	2.27	1.29	0.60	0.46	0.47	0.37	NR	8.40	5.62	3.72	3.69	6.01
03/16/2015	2.15	1.38	0.59	0.48	0.47	0.38	NR	8.98	5.64	3.78	3.79	5.73
03/17/2015	2.40	1.49	0.62	0.49	0.50	0.39	NR	8.82	5.72	3.98	3.98	6.45
03/18/2015	2.28	1.59	0.60	0.50	0.49	0.40	NR	9.18	5.55	4.08	4.71	6.25
03/19/2015	2.31	1.69	0.62	0.52	0.50	0.41	NR	9.31	6.00	4.09	5.05	5.85
03/20/2015	2.53	1.81	0.65	0.54	0.54	0.43	NR	9.43	6.10	4.46	5.32	6.56
03/21/2015	2.58	1.92	0.67	0.56	0.56	0.44	NR	9.64	6.11	4.51	5.18	6.95
03/22/2015	2.74	2.03	0.71	0.57	0.61	0.46	NR	9.90	6.22	4.56	5.08	6.57
03/23/2015	2.77	2.13	0.72	0.59	0.63	0.48	NR	10.31	6.06	4.66	5.24	6.94
03/24/2015	2.71	2.23	0.71	0.61	0.64	0.50	NR	10.48	6.16	4.74	5.43	7.09
03/25/2015	2.52	2.30	0.69	0.62	0.62	0.51	NR	10.61	6.40	4.92	5.63	6.03
03/26/2015	2.57	2.38	0.70	0.64	0.64	0.53	NR	10.34	6.74	5.61	5.65	6.20
03/27/2015	2.82	2.47	0.73	0.65	0.68	0.55	NR	10.14	7.06	6.45	5.62	6.95
03/28/2015	2.74	2.53	0.70	0.66	0.62	0.57	NR	10.11	7.54	6.08	5.47	6.14
03/29/2015	2.71	2.56	0.72	0.67	0.60	0.58	NR	10.23	7.80	6.33	4.28	7.08
03/30/2015	2.96	2.62	0.75	0.68	0.69	0.59	NR	10.13	7.94	6.62	5.53	7.32
03/31/2015	3.17	2.67	0.78	0.70	0.74	0.61	NR	10.49	8.24	6.34	5.59	7.65
04/01/2015	2.49	2.69	0.66	0.70	0.62	0.62	NR	11.25	7.85	6.17	5.62	6.91
04/02/2015	2.21	2.68	0.67	0.70	0.57	0.62	NR	12.34	7.78	6.29	5.93	6.11

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                      s : substituted value

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
03/04/2015	0.35	0.36	0.47	0.37	0.38	0.46	0.43	0.59	215	60	158 s	r
03/05/2015	0.34	0.36	0.47	0.38	0.38	0.45	0.46	0.62	206	60	172 s	r
03/06/2015	0.35	0.38	0.47	0.38	0.38	0.44	0.46	0.57	227	60	125 s	r
03/07/2015	0.38	0.36	0.47	0.38	0.38	0.44	0.42	0.57	262	60	114 s	r
03/08/2015	0.41	0.38	0.47	0.38	0.37	0.43	0.42	0.55	311	59	95 s	r
03/09/2015	0.43	0.38	0.47	0.38	0.38	0.44	0.42	0.56	335	60	100 s	r
03/10/2015	0.48	0.39	0.48	0.38	0.38	0.47	0.41	0.55	376	60	95 s	r
03/11/2015	0.48	0.39	0.48	0.39	0.38	0.61	0.41	0.53	410	60	89 s	r
03/12/2015	0.42	0.40	0.48	0.39	0.38	0.63	0.42	0.52	386	61	84 s	r
03/13/2015	0.50	0.40	0.49	0.38	0.38	0.57	0.41	0.51	453	62	78 s	r
03/14/2015	0.59	0.41	0.49	0.37	0.38	0.67	0.42	0.48	527	62	87 s	r
03/15/2015	0.79	0.42	0.50	0.37	0.39	0.68	0.42	0.49	652	62	95 s	r
03/16/2015	0.78	0.39	0.50	0.37	0.39	0.74	0.44	0.57	614	63	103 s	b
03/17/2015	0.95	0.41	0.51	0.39	0.39	0.79	0.49	0.57	694	63	103 s	b
03/18/2015	0.91	0.44	0.52	0.40	0.39	0.80	0.46	0.60	657	65	84 s	b
03/19/2015	0.96	0.45	0.52	0.42	0.40	1.04	0.51	0.61	665	66	97 s	b
03/20/2015	1.14	0.44	0.53	0.43	0.40	1.52	0.52	0.62	735	67	103 s	b
03/21/2015	1.21	0.46	0.54	0.44	0.41	1.83	0.50	0.62	752	69	66 s	b
03/22/2015	1.36	0.47	0.55	0.44	0.41	1.90	0.50	0.65	803	70	64 s	b
03/23/2015	1.31	0.46	0.56	0.45	0.42	1.79	0.48	0.65	813	71	63 s	b
03/24/2015	1.30	0.47	0.58	0.46	0.42	1.58	0.50	0.66	793	72	69 s	b
03/25/2015	1.16	0.46	0.59	0.46	0.43	1.23	0.50	0.63	731	73	48 s	b
03/26/2015	1.18	0.48	0.59	0.47	0.43	1.06	0.50	0.62	749	75	62 s	b
03/27/2015	1.30	0.46	0.59	0.48	0.45	0.96	0.51	0.66	827	79	60 s	b
03/28/2015	1.11	0.48	0.59	0.47	0.44	0.84	0.59	0.66	802	77	61 s	b
03/29/2015	1.23	0.50	0.60	0.47	0.45	0.73	0.65	0.68	792	78	60 s	b
03/30/2015	1.48	0.49	0.60	0.48	0.45	0.64	0.64	0.71	872	79	62 s	b
03/31/2015	1.59	0.52	0.62	0.48	0.45	0.58	0.64	0.66	938	79	62 s	b
04/01/2015	1.11	0.50	0.62	0.48	0.45	0.53	0.58	0.66	722	79	74	b
04/02/2015	0.79	0.52	0.63	0.50	0.45	0.49	0.51	0.58	633	80	68	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
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 BR : Below Rating  
 e : estimated value                      s : substituted value  
 Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

# 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
03/04/2015	0.98	0.98	1.14	0.97	1.11	1.21	1.02	0.96
03/05/2015	0.85	0.97	1.18	0.98	1.10	1.20	1.08	0.97
03/06/2015	0.67	0.95	1.21	0.98	1.13	1.20	1.10	0.97
03/07/2015	0.62	0.93	1.23	0.99	1.16	1.19	1.07	0.96
03/08/2015	0.70	0.91	1.24	1.00	1.21	1.19	1.02	0.96
03/09/2015	0.87	0.91	1.24	1.01	1.23	1.19	0.94	0.95
03/10/2015	0.88	0.90	1.25	1.01	1.22	1.18	0.89	0.95
03/11/2015	0.73	0.90	1.25	1.02	1.23	1.18	0.88	0.94
03/12/2015	0.68	0.89	1.26	1.02	1.24	1.18	0.95	0.94
03/13/2015	0.67	0.88	1.25	1.03	1.22	1.18	0.98	0.94
03/14/2015	0.62	0.87	1.25	1.04	1.23	1.17	1.03	0.95
03/15/2015	0.73	0.86	1.24	1.04	1.25	1.17	1.04	0.95
03/16/2015	0.77	0.85	1.23	1.05	1.26	1.18	0.99	0.95
03/17/2015	0.79	0.84	1.24	1.06	1.28	1.18	0.93	0.95
03/18/2015	0.69	0.83	1.25	1.07	1.29	1.18	0.86	0.94
03/19/2015	0.63	0.81	1.24	1.09	1.29	1.19	0.85	0.94
03/20/2015	0.72	0.81	1.23	1.10	1.30	1.19	0.86	0.93
03/21/2015	0.74	0.80	1.24	1.11	1.32	1.20	0.88	0.93
03/22/2015	0.70	0.80	1.23	1.13	1.33	1.20	0.88	0.93
03/23/2015	0.73	0.79	1.21	1.14	1.31	1.21	0.86	0.93
03/24/2015	0.77	0.79	1.20	1.15	1.28	1.21	0.83	0.93
03/25/2015	0.72	0.79	1.18	1.16	1.25	1.21	0.82	0.93
03/26/2015	0.34	0.77	1.15	1.17	1.23	1.22	0.80	0.92
03/27/2015	0.20	0.75	1.11	1.17	1.20	1.22	0.79	0.92
03/28/2015	0.20	0.73	1.01	1.18	1.18	1.22	0.62	0.91
03/29/2015	0.25	0.71	0.79	1.17	1.08	1.21	0.24	0.89
03/30/2015	0.38	0.69	0.45	1.15	0.96	1.21	0.20	0.87
03/31/2015	0.41	0.67	0.26	1.13	0.85	1.20	0.23	0.85
04/01/2015	0.36	0.65	0.22	1.10	0.62	1.18	0.31	0.83
04/02/2015	0.30	0.62	0.26	1.07	0.54	1.16	0.36	0.81

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

s : substituted value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, May 07, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	8 %
NDOI, monthly average *	>= 4,000 cfs	4,425 cfs
NDOI, 7 day average*	>= 3,000 cfs	4,425 cfs
Vernalis Base Flow : Monthly average *	>= 300 cfs	402 cfs
7 Day average *	>= 240 cfs	402 cfs
Habitat Protection, X2 / Flow	31 days at Collinsville	0 days
	0 day (s) at Chipps Island	0 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	119 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	143 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	1.75 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.66 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	0.7 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.3 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates : 0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, April 1, 2015)

Previous Month's Index (8RI for Mar): 840 TAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 4.1 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - 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                      s - substituted 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:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 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 cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
04/08/2015	5.78	3.82	9,749	23.61	16.70	16.43	10.16	9.76	9.30	6.56	6.03
04/09/2015	5.59	3.80	10,786	22.68	16.81	16.56	9.88	9.47	9.40	6.22	6.10
04/10/2015	5.70	3.95	9,558	23.15	17.43	16.69	10.42	10.04	9.49	6.70	6.18
04/11/2015	5.54	3.98	8,994	23.57	17.50	16.84	10.50	10.13	9.61	6.81	6.28
04/12/2015	5.33	3.84	8,867	23.14	17.04	16.93	9.91	9.50	9.68	6.37	6.33
04/13/2015	5.08	3.76	4,740	22.93	17.21	16.98	10.05	9.65	9.70	6.83	6.38
04/14/2015	5.19	3.63	4,221	23.36	16.07	16.91	9.71	9.29	9.65	6.35	6.37
04/15/2015	4.94	3.35	5,263	22.79	16.27	16.93	9.26	8.82	9.66	5.96	6.40
04/16/2015	5.17	3.52	4,960	23.59	16.64	17.03	9.72	9.30	9.74	6.37	6.46
04/17/2015	5.59	3.76	3,879	24.47	17.81	17.17	10.94	10.59	9.87	7.20	6.58
04/18/2015	5.96	4.00	3,798	24.80	18.99	17.32	12.13	11.88	10.02	8.25	6.72
04/19/2015	6.34	4.31	3,450	25.65	19.93	17.50	13.35	13.20	10.23	9.49	6.93
04/20/2015	6.45	4.41	3,318	26.97	20.58	17.71	14.02	13.94	10.50	10.04	7.18
04/21/2015	6.53	4.46	3,890	27.49	21.25	17.87	14.40	14.36	10.71	10.47	7.40
04/22/2015	6.25	4.26	3,644	26.25	20.37	18.13	13.17	13.01	10.94	9.42	7.61
04/23/2015	6.11	4.28	3,751	26.65	18.97	18.29	13.51	13.38	11.22	9.69	7.85
04/24/2015	5.92	4.30	2,822	27.11	20.86	18.53	14.06	13.99	11.50	9.82	8.08
04/25/2015	5.62	4.24	2,895	26.70	19.88	18.70	13.32	13.17	11.72	9.30	8.25
04/26/2015	4.98	3.77	6,427	24.57	18.74	18.83	12.13	11.88	11.89	8.26	8.39
04/27/2015	5.14	3.66	7,292	24.22	18.19	18.90	11.34	11.03	11.99	7.69	8.45
04/28/2015	5.26	3.76	6,737	25.43	18.93	19.10	12.26	12.02	12.18	8.45	8.60
04/29/2015	5.30	3.77	6,058	25.35	19.48	19.33	12.30	12.06	12.42	8.59	8.79
04/30/2015	5.46	3.81	6,433	23.28	19.04	19.50	12.26	12.02	12.61	8.63	8.95
05/01/2015	5.61	4.04	4,241	22.83	20.70	19.71	13.46	13.32	12.80	9.68	9.13
05/02/2015	6.09	4.34	3,649	23.79	21.95	19.92	15.35	15.41	13.06	11.32	9.35
05/03/2015	6.26	4.09 e	4,093	24.00	22.65	20.11	15.99	16.12	13.26	12.08	9.53
05/04/2015	6.37	4.41	3,961	24.06	22.77	20.27	15.95 e	15.65	13.39	11.98	9.67
05/05/2015	6.25 e	4.14 e	4,919	27.06	22.99	20.39	15.35	15.40	13.46	11.00	9.71
05/06/2015	6.19	4.39 e	4,866	28.81	23.10	20.59	15.14	15.18	13.62	10.88	9.81
05/07/2015	6.21	4.20	5,246	28.76	22.74	20.86	14.87	14.88	13.75	10.63	9.88

Antioch Tides measured in feet above mean sea level.  
 Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.  
 Chippis 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                      s - substituted value



## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
04/08/2015	3.39	2.95	0.87	0.77	0.84	0.69	NR	12.36	8.06	5.59	6.12	7.55
04/09/2015	3.26	3.00	0.83	0.78	0.75	0.69	NR	12.39	8.70	6.42	5.70	7.01
04/10/2015	3.44	3.04	0.89	0.79	0.79	0.70	NR	12.07	8.94	7.94	6.86	8.35
04/11/2015	3.45	3.09	0.90	0.81	0.75	0.71	NR	11.94	9.28	8.08	7.16	8.37
04/12/2015	3.16	3.12	0.84	0.81	0.68	0.72	NR	11.82	9.45	8.42	4.64	7.56
04/13/2015	3.19	3.14	0.86	0.82	0.76	0.72	NR	12.19	8.82	7.84	7.24	6.28
04/14/2015	3.10	3.14	0.80	0.82	0.73	0.72	NR	11.63	8.85	8.05	5.60	7.92
04/15/2015	2.51	3.14	0.73	0.83	0.59	0.72	NR	12.07	8.71	7.92	7.37	7.17
04/16/2015	2.82	3.18	0.79	0.84	0.66	0.73	NR	12.09	8.55	7.83	7.37	6.94
04/17/2015	3.42	3.25	0.88	0.85	0.93	0.75	NR	12.20	8.75	7.30	7.02	8.48
04/18/2015	4.02	3.33	1.03	0.87	1.18	0.79	NR	11.86	8.52	7.40	6.56	9.34
04/19/2015	4.72	3.44	1.22	0.90	1.52	0.85	NR	11.80	8.80	7.75	6.51	10.83
04/20/2015	5.13	3.56	1.43	0.94	1.76	0.93	NR	12.20	9.04	7.55	7.02	11.79
04/21/2015	5.32	3.64	1.57	0.97	2.14	1.01	NR	13.52	9.28	8.09	7.97	11.56
04/22/2015	4.85	3.74	1.43	1.01	1.71	1.07	NR	13.78	9.23	8.42	8.86	10.94
04/23/2015	5.04	3.87	1.48	1.06	1.77	1.14	NR	13.67	9.59	9.37	9.68	11.34
04/24/2015	5.52	4.02	1.59	1.11	1.87	1.22	NR	13.62	9.77	9.51	9.89	11.41
04/25/2015	5.17	4.14	1.51	1.15	1.64	1.28	NR	13.47	9.59	9.65	9.63	10.79
04/26/2015	4.47	4.23	1.27	1.18	1.24	1.32	NR	13.38	9.74	9.70	9.62	9.60
04/27/2015	4.06	4.30	1.17	1.21	0.99	1.34	NR	13.31	9.92	10.17	9.76	8.83
04/28/2015	4.46	4.39	1.23	1.24	1.27	1.38	NR	13.44	9.70	9.74	9.39	10.05
04/29/2015	4.53	4.54	1.27	1.28	1.26	1.42	NR	13.43	9.90	9.95	9.07	9.55
04/30/2015	4.71	4.67	1.33	1.31	1.22	1.46	NR	13.44	9.89	10.12	8.49	10.24
05/01/2015	5.32	4.81	1.53	1.36	1.60	1.51	NR	13.47	10.55	10.32	8.82	10.76
05/02/2015	6.11	4.96	1.91	1.42	2.03	1.57	NR	13.75	10.48	10.27	8.79	13.31
05/03/2015	6.66	5.10	2.19	1.49	2.32	1.63	NR	13.95 e	10.43 e	10.10	8.80	11.84 e
05/04/2015	6.49	5.19	2.20	1.55	2.45	1.68	NR	14.26	10.29	9.53	10.30	13.50
05/05/2015	6.61	5.29	2.06	1.58	2.16	1.68	NR	15.04	11.41	10.45	10.58	12.48
05/06/2015	6.40	5.40	2.03	1.63	2.21	1.72	NR	15.17	12.18	10.84	11.60	13.01
05/07/2015	6.41	5.50	2.02	1.66	2.28	1.75	NR	15.16	12.15	11.13	11.69	12.46

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                      s : substituted value

## Delta Water Quality Conditions

Date	Emmaton mdEC	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
04/08/2015	1.45	0.53	0.65	0.50	0.48	0.48	0.48	0.48	1,010	86	66	b
04/09/2015	1.45	0.56	0.65	0.51	0.48	0.48	0.50	0.49	968	86	68	b
04/10/2015	1.65	0.57	0.67	0.52	0.48	0.49	0.50	0.51	1,024	87	70	b
04/11/2015	1.61	0.56	0.68	0.52	0.48	0.50	0.51	0.53	1,027	88	71	b
04/12/2015	1.32	0.54	0.68	0.53	0.49	0.50	0.51	0.52	937	89	73	b
04/13/2015	1.67	0.56	0.69	0.54	0.49	0.51	0.50	0.52	946	90	74	b
04/14/2015	1.24	0.58	0.70	0.54	0.50	0.51	0.51	0.55	919	92	75	b
04/15/2015	0.98	0.55	0.70	0.55	0.50	0.51	0.53	0.58	728	93	76	b
04/16/2015	1.32	0.54	0.70	0.54	0.51	0.51	0.52	0.57	828	96	76	b
04/17/2015	1.91	0.55	0.70	0.53	0.52	0.51	0.51	0.57	1,018	98	77	b
04/18/2015	2.39	0.54	0.72	0.54	0.52	0.52	0.51	0.58	1,209	97	79	b
04/19/2015	2.95	0.59	0.75	0.55	0.52	0.53	0.51	0.57	1,434	97	81	b
04/20/2015	3.41	0.61	0.80	0.57	0.50	0.53	0.51	0.57	1,565	92	83	b
04/21/2015	3.87	0.68	0.87	0.60	0.52	0.54	0.52	0.59	1,624	99	86	b
04/22/2015	3.02	0.70	0.87	0.60	0.53	0.55	0.51	0.61	1,476	101	87	b
04/23/2015	3.22	0.73	0.90	0.65	0.55	0.53	0.52	0.63	1,537	106	89	b
04/24/2015	3.54	0.78	0.97	0.66	0.58	0.55	0.53	0.62	1,689	113	90	b
04/25/2015	3.05	0.80	1.01	0.67	0.60	0.55	0.53	0.59	1,576	118	91	b
04/26/2015	2.23	0.81	1.02	0.64	0.60	0.56	0.53	0.55	1,352	119	92	b
04/27/2015	1.84	0.82	1.02	0.67	0.61	0.57	0.53	0.53	1,224	121	93	b
04/28/2015	2.40	0.82	1.06	0.70	0.64	0.58	0.54	0.52	1,350	129	95	b
04/29/2015	2.37	0.83	1.06	0.72	0.66	0.59	0.55	0.52	1,374	135	98	b
04/30/2015	2.16	0.84	1.05	0.75	0.69	0.61	0.55	0.53	1,430	142	102	b
05/01/2015	2.87	0.85	1.06	0.77	0.71	0.63	0.55	0.52	1,625	147	107	b
05/02/2015	3.69	0.85	1.13	0.78	0.72	0.65	0.58	0.53	1,877	150	112	b
05/03/2015	4.38	0.90	1.28	0.81	0.73	0.67	0.59	0.54	2,052	153	118	b
05/04/2015	4.53	0.95 e	1.38	0.85	0.73	0.69	0.60	0.54	1,998	154	126	b
05/05/2015	3.93 e	1.05 e	1.38	0.85	0.75	0.71	0.61	0.55	2,034	157	133	b
05/06/2015	3.90	1.08	1.41	0.88	0.77	0.72	0.62	0.57	1,969	162	138	b
05/07/2015	3.73	1.10 e	1.42	0.89	0.79	0.73	0.62	0.60	1,973	170	143	b

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                      s : substituted value  
 Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

# 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
04/08/2015	0.13	0.51	0.38	0.90	0.78	1.07	0.43	0.68
04/09/2015	0.15	0.49	0.21	0.87	0.78	1.05	0.26	0.66
04/10/2015	0.16	0.47	0.15	0.83	0.82	1.04	0.15	0.63
04/11/2015	0.16	0.45	0.16	0.80	0.78	1.02	0.17	0.61
04/12/2015	0.17	0.44	0.21	0.76	0.74	1.01	0.21	0.58
04/13/2015	0.12	0.42	0.23	0.73	0.71	0.99	0.23	0.56
04/14/2015	0.11	0.40	0.23	0.69	0.71	0.97	0.23	0.53
04/15/2015	0.14	0.38	0.14	0.66	0.68	0.95	0.19	0.50
04/16/2015	0.14	0.36	0.13	0.62	0.69	0.93	0.13	0.48
04/17/2015	0.15	0.34	0.15	0.58	0.72	0.91	0.16	0.45
04/18/2015	0.18	0.32	0.15	0.55	0.76	0.90	0.17	0.43
04/19/2015	0.20	0.31	0.16	0.51	0.79	0.88	0.17	0.41
04/20/2015	0.22	0.29	0.17	0.48	0.79	0.86	0.18	0.38
04/21/2015	0.25	0.27	0.19	0.44	0.78	0.84	0.19	0.36
04/22/2015	0.29	0.26	0.21	0.41	0.75	0.82	0.21	0.34
04/23/2015	0.35	0.25	0.22	0.38	0.73	0.81	0.23	0.32
04/24/2015	0.41	0.24	0.24	0.34	0.73	0.79	0.25	0.30
04/25/2015	0.42	0.24	0.25	0.31	0.72	0.77	0.28	0.28
04/26/2015	0.44	0.25	0.28	0.29	0.71	0.75	0.31	0.27
04/27/2015	0.45	0.25	0.30	0.26	0.71	0.74	0.35	0.26
04/28/2015	0.46	0.26	0.32	0.25	0.73	0.73	0.39	0.26
04/29/2015	0.44	0.26	0.33	0.24	0.72	0.72	0.43	0.27
04/30/2015	0.48	0.27	0.34	0.25	0.72	0.72	0.47	0.28
05/01/2015	0.51	0.27	0.35	0.25	0.71	0.72	0.50	0.28
05/02/2015	0.45	0.28	0.37	0.25	0.74	0.72	0.53	0.29
05/03/2015	0.44	0.28	0.40	0.26	0.75	0.73	0.55	0.30
05/04/2015	0.43	0.28	0.42	0.26	0.74	0.74	0.57	0.30
05/05/2015	0.46	0.29	0.43	0.26	0.72	0.74	0.61	0.31
05/06/2015	0.50	0.30	0.45	0.26	0.73	0.74	0.61	0.32
05/07/2015	0.45	0.31	0.47	0.27	0.74	0.74	0.60	0.32

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e : estimated value

s : substituted value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Tuesday, June 02, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	35 %	9 %
NDOI, monthly average *	>= 4,000 cfs	3,852 cfs
NDOI, 7 day average*	>= 3,000 cfs	3,852 cfs
Vernalis Base Flow : Monthly average *	>= 200 cfs	320 cfs
7 Day average *	>= 160 cfs	320 cfs
Habitat Protection, X2 / Flow	30 days at Collinsville	0 days
	0 day (s) at Chipps Island	0 days

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	124 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	207 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	1.67 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.59 mS/cm
14dm EC at San Andreas Landing	<= 0.87 mS/cm	0.52 mS/cm
14dm EC at Terminous	<= 0.54 mS/cm	0.16 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.5 mS/cm
Brandt Bridge	<=0.7 mS/cm	0.6 mS/cm
Old River Near Tracy	<=0.7 mS/cm	0.9 mS/cm
Old River Near Middle River	<=0.7 mS/cm	0.7 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :	3 Open / 0 Closed / 0 Full Tide Open
Flashboard Status : Out	Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF

Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)

San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
Chlorides (Cl) in milligrams per liter  
mht - mean high tides  
md - mean daily  
14 dm - fourteen day running mean  
NR - No Record  
NC - 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:  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:  
- 7 day average is progressive daily mean for the first six days of the month.  
- Monthly average is progressive daily mean from the beginning of the month

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
05/04/2015	6.37	4.41	3,961	24.06	22.77	20.27	15.95 e	15.65	13.39	11.98	9.67
05/05/2015	6.25 e	4.14 e	4,919	27.06	22.99	20.39	15.35	15.40	13.46	11.00	9.71
05/06/2015	6.19	4.39 e	4,866	28.81	23.10	20.59	15.14	15.18	13.62	10.88	9.81
05/07/2015	6.21	4.20	5,246	28.76	22.74	20.86	14.87	14.88	13.75	10.63	9.88
05/08/2015	6.11	4.26	5,401	30.33	21.96	20.94	14.48	14.45	13.79	10.30	9.91
05/09/2015	5.86	4.17	5,799	30.00 e	21.76	21.07	15.01	15.03	13.92	11.01	10.04
05/10/2015	5.66	4.15	5,387	30.00 e	21.54	21.27	14.77	14.76	14.13	10.67	10.21
05/11/2015	5.42	4.10	5,319	26.95	21.92	21.54	14.62	14.60	14.38	10.12	10.38
05/12/2015	5.57	4.04	4,858	29.18	21.16	21.70	14.55	14.53	14.56	9.96	10.49
05/13/2015	5.68	3.97	5,620	27.57	21.10	21.81	14.31	14.25	14.72	9.70	10.57
05/14/2015	5.80	3.98	4,993	27.63	21.04	21.96	14.12	14.05	14.86	9.83	10.65
05/15/2015	6.02	4.07	5,964	28.59	21.65	22.02	14.85	14.85	14.97	10.29	10.70
05/16/2015	6.27	4.12	5,447	28.00 e	22.21	22.04	14.89	14.90	14.93	10.23	10.62
05/17/2015	6.36	4.19	6,090	28.00 e	22.14	22.01	14.93	14.94	14.85 e	10.70	10.52
05/18/2015	6.39	4.25	5,476	28.77	22.30	21.97	15.45	15.52	14.81	10.82	10.44
05/19/2015	6.45	4.26	5,865	28.90	22.17	21.91	15.16	15.20	14.80	10.69	10.42
05/20/2015	6.44	4.37	6,193	29.46	22.47	21.87	15.34	15.39	14.81	10.73	10.40
05/21/2015	6.35	4.38	6,150	28.33	22.18	21.83	15.25	15.30	14.84	10.61	10.40
05/22/2015	6.05	4.25	6,422	25.88	21.48	21.79	14.52	14.49	14.84	9.83	10.37
05/23/2015	5.74	4.14	6,055	25.00 e	21.27	21.76	13.68	13.57	14.74	9.09	10.23
05/24/2015	5.41	4.10	6,057	25.00 e	20.78	21.71	13.24	13.09	14.62	8.87	10.10
05/25/2015	5.62	4.11	5,656	25.00 e	19.94	21.56	13.64	13.52	14.54	8.73	10.00
05/26/2015	5.74	4.12	5,160	26.25	20.12	21.49	13.72	13.61	14.48	9.05	9.94
05/27/2015	5.88	4.12	4,711	26.47	19.67	21.39	13.40	13.27	14.41	8.80	9.88
05/28/2015	5.86	4.07	4,278	25.66	19.80	21.30	13.11	12.94	14.33	8.74	9.80
05/29/2015	6.02	4.15	4,461	25.45	20.22	21.20	13.37	13.23	14.21	8.91	9.70
05/30/2015	6.12	4.22	3,858	25.38	20.64	21.08	13.89	13.79	14.13	9.22	9.63
05/31/2015	6.38	4.39	3,904	27.27	21.59	21.04	14.90	14.91	14.13	9.82	9.56
06/01/2015	6.51	4.37	3,265	26.98	21.58	20.99	14.63	14.61	14.07	9.93	9.50
06/02/2015	6.47	4.34	4,439	26.57	21.86	20.97	14.30	14.25	14.00	9.79	9.44

Antioch Tides measured in feet relative to the NAVD88 Datum

Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.

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 : Not Computed due to insufficient data

BR : Below Rating

e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
05/04/2015	6.49	5.19	2.20	1.55	4.53	3.08	2.45	1.68	0.53	0.45	0.19	0.22
05/05/2015	6.61	5.29	2.06	1.58	3.93 e	3.09	2.16	1.68	0.52	0.45	0.20	0.22
05/06/2015	6.40	5.40	2.03	1.63	3.90	3.15	2.21	1.72	0.52	0.46	0.20	0.22
05/07/2015	6.41	5.50	2.02	1.66	3.73	3.19	2.28	1.75	0.55	0.47	0.20	0.21
05/08/2015	6.38	5.56	2.05	1.70	3.66	3.20	2.32	1.78	0.54	0.48	0.20	0.21
05/09/2015	6.21	5.63	2.00	1.73	3.81	3.25	2.18	1.82	0.54	0.49	0.20	0.21
05/10/2015	6.20	5.75	1.93	1.78	3.62	3.35	2.03	1.88	0.54	0.50	0.19	0.21
05/11/2015	5.96	5.89	1.83	1.83	3.47	3.47	1.95	1.95	0.53	0.51	0.19	0.21
05/12/2015	6.06	6.00	1.81	1.87	3.23	3.53	1.86	1.99	0.53	0.51	0.18	0.20
05/13/2015	5.84	6.10	1.76	1.90	3.01	3.57	1.67	2.02	0.52	0.52	0.18	0.20
05/14/2015	5.90	6.18	1.78	1.94	2.99	3.63	1.63	2.05	0.49	0.52	0.18	0.20
05/15/2015	6.11	6.24	1.90	1.96	3.53	3.68	1.90	2.07	0.47	0.52	0.16	0.19
05/16/2015	6.05	6.23	1.82	1.96	3.62	3.67	2.02	2.07	0.48	0.52	0.17	0.19
05/17/2015	6.19	6.20	1.79	1.93	4.01	3.65	2.16	2.06	0.47	0.52	0.19	0.19
05/18/2015	6.28	6.18	1.84	1.90	3.91	3.60	2.30	2.05	0.46	0.51	0.18	0.19
05/19/2015	6.31	6.16	1.89	1.89	3.58	3.58	2.19	2.05	0.50	0.51	0.17	0.19
05/20/2015	6.53	6.17	1.94	1.88	3.68	3.56	2.24	2.05	0.55	0.51	0.17	0.18
05/21/2015	6.57	6.18	2.06	1.89	3.28	3.53	2.08	2.04	0.55	0.51	0.16	0.18
05/22/2015	5.98	6.15	1.79	1.87	2.55	3.45	1.70	1.99	0.52	0.51	0.16	0.18
05/23/2015	5.14	6.08	1.65	1.84	2.20	3.33	1.50	1.94	0.46	0.51	0.16	0.17
05/24/2015	4.79	5.98	1.45	1.81	2.54	3.26	1.40	1.90	0.46	0.50	0.16	0.17
05/25/2015	4.69	5.89	1.37	1.78	2.63	3.20	1.42	1.86	0.45	0.49	0.16	0.17
05/26/2015	4.75	5.79	1.34	1.74	2.63	3.15	1.54	1.84	0.47	0.49	0.16	0.17
05/27/2015	4.87	5.72	1.37	1.71	2.27	3.10	1.44	1.82	0.48	0.49	0.17	0.17
05/28/2015	4.83	5.65	1.35	1.68	2.13	3.04	1.34	1.80	0.52	0.49	0.17	0.17
05/29/2015	5.00	5.57	1.41	1.65	2.38	2.96	1.41	1.77	0.54	0.49	0.17	0.17
05/30/2015	5.07	5.50	1.47	1.62	2.86	2.90	1.51	1.73	0.55	0.50	0.16	0.17
05/31/2015	5.35	5.44	1.68	1.61	3.32	2.85	1.84	1.71	0.59	0.51	0.17	0.16
06/01/2015	5.45	5.38	1.70	1.60	3.49	2.82	2.02	1.69	0.60	0.52	0.17	0.16
06/02/2015	5.76	5.34	1.65	1.59	3.46	2.81	1.93	1.67	0.60	0.52	0.17	0.16

Electrical Conductivity (EC) units: milliSiemens per Centimeter

Chloride (Cl) units: milligrams per liter

md : mean daily

14dm : fourteen day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

## 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
05/04/2015	0.95 e	1.38	0.85	0.73	0.69	0.60	0.54	1,998	154	126	b
05/05/2015	1.05 e	1.38	0.85	0.75	0.71	0.61	0.55	2,034	157	133	b
05/06/2015	1.08	1.41	0.88	0.77	0.72	0.62	0.57	1,969	162	138	b
05/07/2015	1.10 e	1.42	0.89	0.79	0.73	0.62	0.60	1,973	170	143	b
05/08/2015	1.13	1.37	0.87	0.81	0.74	0.64	0.61	1,963	174	145	b
05/09/2015	1.14	1.38	0.90	0.82	0.74	0.66	0.60	1,907	175	145 e	b
05/10/2015	1.13	1.37	0.89	0.82	0.75	0.68	0.59	1,905	178	145 e	b
05/11/2015	1.14	1.36	0.88	0.83	0.76	0.68	0.59	1,827	178	149	b
05/12/2015	1.14	1.37	0.84	0.85	0.77	0.69	0.60	1,861	183	150	b
05/13/2015	1.15	1.37	0.89	0.86	0.78	0.71	0.60	1,789	187	156	b
05/14/2015	1.15	1.41	0.93	0.87	0.79	0.72	0.62	1,809	189	159	b
05/15/2015	1.06	1.41	0.95	0.89	0.80	0.72	0.63	1,876	194	163	b
05/16/2015	1.17	1.40	0.93	0.89	0.82	0.74	0.62	1,856	196	163 e	b
05/17/2015	1.17	1.42	0.94	0.90	0.83	0.77	0.65	1,900	197	163 e	b
05/18/2015	1.17	1.40	0.93	0.91	0.82	0.78	0.70	1,930	200	175	b
05/19/2015	1.17	1.37	0.89	0.92	0.88	0.78	0.78	1,940	204	177	b
05/20/2015	1.16	1.38	0.92	0.92	0.89	0.78	0.79	2,010	204	180	b
05/21/2015	1.17	1.38	0.91	0.93	0.91	0.80	0.79	2,021	206	183	b
05/22/2015	1.16	1.37	0.95	0.92	0.92	0.81	0.79	1,833	204	188	b
05/23/2015	1.16	1.35	0.93	0.92	0.93	0.81	0.79	1,568	203	185 e	b
05/24/2015	1.16	1.33	0.94	0.92	0.94	0.82	0.78	1,455	203	185 e	b
05/25/2015	1.15	1.34	0.92	0.92	0.95	0.82	0.79	1,425	203	185 e	b
05/26/2015	1.14	1.32	0.96	0.92	0.96	0.83	0.79	1,443	203	201	b
05/27/2015	1.09	1.32	0.95	0.93	0.97	0.84	0.80	1,480	205	203	b
05/28/2015	1.08	1.31	0.95	0.92	0.97	0.83	0.84	1,469	204	204	b
05/29/2015	1.08	1.33	0.93	0.92	0.97	0.82	0.84	1,523	203	204	b
05/30/2015	1.07	1.36	0.92	0.91	0.98	0.81	0.85	1,543	201	204 e	b
05/31/2015	1.07	1.41	0.90	0.90	0.98	0.80	0.86	1,633	197	204 e	b
06/01/2015	1.03	1.43	0.87	0.88	0.98	0.81	0.85	1,667	192	206	b
06/02/2015	0.99	1.43	0.87	0.87	0.98	0.81	0.89	1,765	189	207	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 NR : No Record  
 NC : 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 conditions  
 r = excess Delta conditions with restrictions:

**Delta Water Quality Conditions****South Delta Stations**

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
05/04/2015	0.43	0.28	0.42	0.26	0.74	0.74	0.57	0.30
05/05/2015	0.46	0.29	0.43	0.26	0.72	0.74	0.61	0.31
05/06/2015	0.50	0.30	0.45	0.26	0.73	0.74	0.61	0.32
05/07/2015	0.45	0.31	0.47	0.27	0.74	0.74	0.60	0.32
05/08/2015	0.48	0.32	0.49	0.27	0.75	0.74	0.62	0.33
05/09/2015	0.43	0.33	0.52	0.28	0.78	0.74	0.64	0.34
05/10/2015	0.41	0.34	0.55	0.30	0.77	0.74	0.67	0.36
05/11/2015	0.41	0.35	0.60	0.31	0.81	0.74	0.71	0.38
05/12/2015	0.46	0.36	0.63	0.32	0.82	0.74	0.72	0.39
05/13/2015	0.50	0.37	0.64	0.34	0.86	0.75	0.71	0.41
05/14/2015	0.50	0.38	0.65	0.35	0.87	0.75	0.71	0.43
05/15/2015	0.53	0.39	0.65	0.37	0.87	0.76	0.71	0.44
05/16/2015	0.50	0.41	0.66	0.39	0.84	0.76	0.71	0.46
05/17/2015	0.44	0.42	0.66	0.40	0.83	0.77	0.71	0.48
05/18/2015	0.44	0.42	0.67	0.42	0.85	0.77	0.71	0.50
05/19/2015	0.51	0.43	0.68	0.44	0.85	0.77	0.70	0.52
05/20/2015	0.54	0.45	0.68	0.45	0.87	0.77	0.69	0.54
05/21/2015	0.57	0.46	0.70	0.47	0.89	0.78	0.68	0.55
05/22/2015	0.63	0.47	0.70	0.49	0.89	0.78	0.65	0.57
05/23/2015	0.62	0.48	0.70	0.50	0.89	0.79	0.68	0.58
05/24/2015	0.60	0.48	0.70	0.52	0.91	0.79	0.68	0.60
05/25/2015	0.54	0.49	0.71	0.53	0.92	0.80	0.68	0.61
05/26/2015	0.58	0.49	0.71	0.55	0.93	0.81	0.68	0.62
05/27/2015	0.69	0.50	0.70	0.56	0.95	0.82	0.68	0.63
05/28/2015	0.78	0.51	0.71	0.57	0.98	0.82	0.69	0.64
05/29/2015	0.65	0.52	0.73	0.59	1.00	0.83	0.68	0.65
05/30/2015	0.58	0.52	0.75	0.60	1.00	0.84	0.68	0.66
05/31/2015	0.50	0.52	0.78	0.62	1.00	0.85	0.71	0.66
06/01/2015	0.51	0.52	0.80	0.63	1.02	0.86	0.71	0.67
06/02/2015	0.58	0.53	0.81	0.64	1.01	0.87	0.72	0.68

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

30dm : thirty day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value



# Delta Water Quality Conditions

## Suisun Marsh Stations

Date	Collinville	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
05/04/2015	13.50	12.06	10.30	10.29	9.53	14.26
05/05/2015	12.48	10.83	10.58	11.41	10.45	15.04
05/06/2015	13.01	10.51	11.60	12.18	10.84	15.17
05/07/2015	12.46	10.58	11.69	12.15	11.13	15.16
05/08/2015	12.95	9.05	11.43	12.73	12.40	15.11
05/09/2015	13.61	9.98	11.03	12.51	11.61	15.06
05/10/2015	12.89	9.98	10.76	12.22	11.35	15.06
05/11/2015	11.79	9.81	10.71	11.84	10.98	15.14
05/12/2015	11.73	9.09	10.98	11.61	10.98	15.18
05/13/2015	11.30	8.62	10.73	11.43	10.77	15.37
05/14/2015	11.99	8.91	10.46	11.47	10.78	15.49
05/15/2015	12.11	9.48	10.33	11.62	11.04	15.60
05/16/2015	12.25	10.06	10.07	11.39	11.01	15.56
05/17/2015	12.51	10.12	10.12	11.63	10.97	15.54
05/18/2015	12.03	10.16	10.26	11.72	11.05	15.49
05/19/2015	12.24	10.04	10.45	11.31	10.66	15.46
05/20/2015	12.62	10.01	10.84	11.53	10.74	15.60
05/21/2015	12.27	10.19	10.81	11.44	11.09	15.82
05/22/2015	11.75	9.76	10.83	11.10	11.41	15.67
05/23/2015	11.25	9.20	10.89	11.08	10.11	15.41
05/24/2015	11.00	9.02	10.68	10.92	8.74	15.26
05/25/2015	10.78	8.92	10.30	10.90	9.19	15.08
05/26/2015	10.90	8.99	9.70	10.76	9.79	15.11
05/27/2015	10.17	8.88	9.78	11.16	10.40	15.22
05/28/2015	10.63	8.82	9.93	11.47	10.16	15.15
05/29/2015	10.37	9.19	9.97	11.53	10.43	15.18
05/30/2015	9.95	9.57	9.96	11.67	10.70	15.21
05/31/2015	10.88	9.92	9.95	11.32	10.62	15.44
06/01/2015	11.02	10.94	9.96	11.66	11.24	15.94
06/02/2015	11.10	9.64	10.12	11.44	11.02	16.26

Electrical Conductivity (EC) units: milliSiemens per Centimeter

mht : mean high tides

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Monday, July 13, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	7 %
NDOI, monthly average *	>= 3,000 cfs	3,256 cfs
NDOI, 7 day average*	>= 2,000 cfs	3,475 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	124 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	172 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	3.17 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	2.23 mS/cm
14dm EC at San Andreas Landing	<= 0.87 mS/cm	0.62 mS/cm
14dm EC at Terminous	<= 0.54 mS/cm	0.15 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.7 mS/cm
Brandt Bridge	<=0.7 mS/cm	1.1 mS/cm
Old River Near Tracy	<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River	<=0.7 mS/cm	1.1 mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :	3 Open / 0 Closed / 0 Full Tide Open
Flashboard Status : Out	Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF

Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)

San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
Chlorides (Cl) in milligrams per liter  
mht - mean high tides  
md - mean daily  
14 dm - fourteen day running mean  
NR - No Record  
NC - 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:  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:  
- 7 day average is progressive daily mean for the first six days of the month.  
- Monthly average is progressive daily mean from the beginning of the month

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
06/14/2015	7.14	4.85	4,356	32.38	22.30	20.88	15.84	15.95	14.25	11.46	9.92
06/15/2015	7.09	4.70	3,971	31.57	20.59	20.81	15.58	15.66	14.32	10.87	9.99
06/16/2015	6.88	4.53	3,732	30.90	18.98	20.60	14.57	14.55	14.34	10.46	10.04
06/17/2015	6.72	4.49	3,370	30.59	19.74	20.37	14.49	14.46	14.34	10.39	10.09
06/18/2015	6.60	4.47	3,697	30.65	21.19	20.33	14.76	14.76	14.40	10.37	10.14
06/19/2015	6.37	4.34	3,481	30.25	20.53	20.25	14.32	14.27	14.36	10.06	10.10
06/20/2015	6.12	4.39	3,792	29.48	20.25	20.15	13.81	13.71	14.25	9.78	10.01
06/21/2015	5.87	4.32	3,595	30.19	19.97	20.09	14.18	14.12	14.23	9.91	9.99
06/22/2015	5.50	4.13	3,458	29.29	18.17	19.97	13.31	13.16	14.23	9.23	9.99
06/23/2015	5.68	4.04	3,846	28.21	19.00	19.95	13.03	12.86	14.15	8.83	9.93
06/24/2015	5.88	4.09	3,472	28.31	19.31	19.94	13.33	13.18	14.17	8.86	9.93
06/25/2015	6.07	4.15	3,281	29.04	19.67	19.95	13.76 e	13.65 e	14.25	9.14	9.97
06/26/2015	6.45	4.36	3,271	30.09	21.02	20.00	14.74	14.73	14.32	10.46	10.05
06/27/2015	6.41	4.51	3,126	30.92	22.23	20.21	16.09	16.23	14.38	11.58	10.10
06/28/2015	6.48	4.44	2,962	30.82	20.80	20.10	15.90	16.02	14.38	11.42	10.10
06/29/2015	6.58	4.44	3,113	31.16	21.78	20.19	15.63	15.71	14.39	11.09	10.11
06/30/2015	6.63	4.38	3,484	30.01	19.35	20.22	15.09	15.12	14.43	10.77	10.14
07/01/2015	6.76	4.48	3,511	30.63	21.60	20.35	16.00	16.13	14.55	11.26	10.20
07/02/2015	6.88	4.65	3,153	31.32	21.87	20.40	16.72	16.93	14.70	12.08	10.32
07/03/2015	6.97	4.68	2,809	32.23	22.48	20.54	17.12	17.39	14.92	12.58	10.50
07/04/2015	6.91	4.80	2,929	32.61	23.06	20.74	17.55	17.86	15.22	12.89	10.72
07/05/2015	6.83	4.89	2,900	33.16	22.98	20.95	17.93	18.30	15.52	13.21	10.96
07/06/2015	6.36	4.60	2,702	31.87	21.78	21.21	16.59	16.79	15.78	12.22	11.17
07/07/2015	6.14	4.42	3,311	30.36	20.13	21.29	15.97	16.09	16.01	11.26	11.35
07/08/2015	6.41	4.47	3,072	30.48	19.10	21.28	16.17	16.32	16.23 e	11.35	11.52
07/09/2015	6.44	4.42	2,854	30.48	21.09	21.38	15.75	15.85	16.39	11.09	11.66
07/10/2015	6.57	4.34	3,498	29.91	19.86	21.29	15.26	15.31	16.43	10.68	11.68
07/11/2015	6.72	4.48	3,851	30.15	21.75	21.26	15.84	15.96	16.41	11.25	11.65
07/12/2015	6.75	4.53	3,723	30.82	21.81	21.33	16.12	16.26	16.43	11.55	11.66
07/13/2015	6.81	4.59	4,018	30.83	21.95	21.34	15.86	15.98	16.45	11.54	11.70

Antioch Tides measured in feet relative to the NAVD88 Datum

Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.

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 : Not Computed due to insufficient data

BR : Below Rating

e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
06/14/2015	6.73	5.81	2.22	1.76	4.85	3.66	2.91	2.16	0.71	0.63	0.17	0.17
06/15/2015	6.33	5.87	2.08	1.79	4.85	3.76	2.83	2.22	0.70	0.64	0.18	0.18
06/16/2015	6.10	5.90	1.94	1.81	4.48	3.83	2.68	2.27	0.68	0.64	0.18	0.18
06/17/2015	5.99	5.91	1.93	1.83	4.36	3.89	2.55	2.30	0.66	0.65	0.16	0.18
06/18/2015	6.10	5.96	1.78	1.83	4.47	3.97	2.67	2.35	0.62	0.65	0.16	0.17
06/19/2015	5.85	5.93	1.85	1.83	4.28	3.99	2.51	2.37	0.61	0.64	0.16	0.17
06/20/2015	5.71	5.89	1.77	1.82	4.05	3.97	2.45	2.37	0.60	0.63	0.17	0.17
06/21/2015	5.76	5.90	1.78	1.81	4.30	4.00	2.53	2.40	0.58	0.63	0.17	0.17
06/22/2015	5.06	5.88	1.62	1.81	3.60	4.01	2.18	2.41	0.51	0.63	0.17	0.17
06/23/2015	4.94	5.82	1.53	1.80	3.30	3.99	1.95	2.39	0.52	0.62	0.17	0.17
06/24/2015	5.18	5.81	1.55	1.80	3.17	4.00	1.93	2.39	0.57	0.62	0.17	0.17
06/25/2015	5.60	5.84	1.67	1.81	3.06	4.01	1.86	2.40	0.60	0.62	0.17	0.17
06/26/2015	6.35	5.88	1.89	1.83	3.70	4.04	2.04	2.40	0.68	0.62	0.17	0.17
06/27/2015	6.93	5.90	2.21	1.84	4.14	4.04	2.55	2.40	0.69	0.62	0.16	0.17
06/28/2015	6.67	5.90	2.17	1.84	4.31	4.00	2.47	2.37	0.67	0.62	0.15	0.17
06/29/2015	6.43	5.90	2.16	1.85	4.50	3.98	2.57	2.35	0.63	0.62	0.15	0.16
06/30/2015	6.31	5.92	1.99	1.85	4.43	3.98	2.58	2.34	0.60	0.61	0.15	0.16
07/01/2015	6.98	5.99	2.16	1.87	4.81	4.01	2.87	2.37	0.65	0.61	0.15	0.16
07/02/2015	7.44	6.09	2.35	1.91	5.22	4.06	3.19	2.41	0.68	0.61	0.15	0.16
07/03/2015	7.47	6.20	2.42	1.95	5.74	4.17	3.45	2.47	0.72	0.62	0.15	0.16
07/04/2015	7.63	6.34	2.55	2.00	5.98	4.30	3.63	2.56	0.75	0.63	0.15	0.16
07/05/2015	7.95	6.49	2.62	2.06	6.48	4.46	4.10	2.67	0.72	0.64	0.15	0.16
07/06/2015	7.29	6.65	2.42	2.12	5.77	4.62	3.61	2.77	0.62	0.65	0.14	0.16
07/07/2015	6.76	6.78	2.16	2.17	5.10	4.74	3.11	2.85	0.57	0.65	0.15	0.15
07/08/2015	6.90	6.91	2.10	2.20	5.18	4.89	3.21	2.94	0.55	0.65	0.15	0.15
07/09/2015	6.84	7.00	2.09	2.23	5.02	5.03	3.11	3.03	0.54	0.65	0.14	0.15
07/10/2015	6.66	7.02	1.98	2.24	4.66	5.10	2.77	3.09	0.54	0.64	0.14	0.15
07/11/2015	7.17	7.03	2.08	2.23	4.83	5.15	2.88	3.11	0.57	0.63	0.14	0.15
07/12/2015	7.37	7.08	2.30	2.24	5.20	5.21	3.00	3.15	0.61	0.63	0.14	0.15
07/13/2015	6.71	7.10	2.01	2.23	4.81	5.23	2.93	3.17	0.59	0.62	0.14	0.15

Electrical Conductivity (EC) units: milliSiemens per Centimeter

Chloride (Cl) units: milligrams per liter

md : mean daily

14dm : fourteen day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

## 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
06/14/2015	0.95	1.54	0.81	0.76	0.87	0.81	0.90	2,073	161	184	b
06/15/2015	0.90	1.53	0.79	0.76	0.86	0.80	0.87	1,945	162	184	b
06/16/2015	0.85	1.52	0.79	0.76	0.85	0.80	0.91	1,872	161	182	b
06/17/2015	0.86	1.55	0.80	0.74	0.84	0.80	0.88	1,837	156	178	b
06/18/2015	0.87	1.56	0.79	0.75	0.84	0.79	0.88	1,874	159	178	b
06/19/2015	0.87	1.53	0.79	0.74	0.84	0.78	0.86	1,792	156	178	b
06/20/2015	0.87	1.48	0.78	0.75	0.83	0.78	0.84	1,749	157	177	b
06/21/2015	0.89	1.48	0.78	0.75	0.82	0.77	0.84	1,765	158	175	b
06/22/2015	0.89	1.44	0.75	0.71	0.83	0.77	0.83	1,542	146	174	b
06/23/2015	0.86	1.42	0.75	0.73	0.82	0.76	0.82	1,504	153	175	b
06/24/2015	0.86	1.43	0.75	0.72	0.82	0.77	0.82	1,580	149	175	b
06/25/2015	0.86	1.44	0.76	0.74	0.80	0.77	0.82	1,713	156	174	b
06/26/2015	0.88	1.51	0.78	0.74	0.82	0.77	0.82	1,951	155	173	b
06/27/2015	0.96	1.57	0.77	0.74	0.82	0.76	0.82	2,137	154	174	b
06/28/2015	0.95	1.66	0.77	0.74	0.81	0.76	0.81	2,056	155	172	b
06/29/2015	0.96	1.74	0.77	0.74	0.80	0.75	0.80	1,978	155	174	b
06/30/2015	0.91	1.71	0.77	0.74	0.79	0.76	0.80	1,939	155	173	b
07/01/2015	0.89	1.76	0.78	0.74	0.79	0.76	0.80	2,152	156	172	b
07/02/2015	0.92	1.81	0.77	0.74	0.79	0.75	0.80	2,300	156	171	b
07/03/2015	0.95	1.84	0.81	0.71	0.79	0.74	0.81	2,308	148	171 e	b
07/04/2015	0.98	1.88	0.81	0.75	0.79	0.73	0.81	2,362	159	171 e	b
07/05/2015	1.02	1.91	0.76	0.75	0.79	0.73	0.80	2,461	159	171 e	b
07/06/2015	0.99	1.81	0.74	0.75	0.80	0.72	0.78	2,252	159	170	b
07/07/2015	0.97	1.81	0.72	0.75	0.80	0.72	0.77	2,082	158	169	b
07/08/2015	0.94	1.84	0.72	0.74	0.80	0.72	0.77	2,127	156	170	b
07/09/2015	0.95	1.80	0.70	0.74	0.80	0.71	0.77	2,110	155	171	b
07/10/2015	0.94	1.78	0.71	0.73	0.79	0.73	0.76	2,050	153	170	b
07/11/2015	0.95	1.82	0.72	0.73	0.79	0.73	0.77	2,213	152	170 e	b
07/12/2015	0.98	1.89	0.75	0.72	0.78	0.73	0.77	2,278	151	170 e	b
07/13/2015	0.98	1.85	0.75	0.73	0.79	0.73	0.77	2,066	152	172	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 NR : No Record  
 NC : 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 conditions  
 r = excess Delta conditions with restrictions:

**Delta Water Quality Conditions****South Delta Stations**

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
06/14/2015	0.68	0.62	0.98	0.79	1.04	0.96	0.82	0.72
06/15/2015	0.69	0.62	1.02	0.80	1.06	0.97	0.85	0.73
06/16/2015	0.81	0.63	1.04	0.81	1.03	0.98	0.86	0.73
06/17/2015	0.77	0.64	1.06	0.83	1.02	0.98	0.89	0.74
06/18/2015	0.67	0.65	1.09	0.84	1.00	0.99	0.93	0.75
06/19/2015	0.63	0.65	1.08	0.85	1.01	0.99	1.11	0.76
06/20/2015	0.72	0.66	1.07	0.87	1.01	1.00	1.23	0.78
06/21/2015	0.67	0.66	1.07	0.88	1.00	1.00	1.25	0.80
06/22/2015	0.68	0.66	1.04	0.89	1.02	1.01	1.24	0.82
06/23/2015	0.75	0.67	1.01	0.90	1.04	1.01	1.25	0.84
06/24/2015	0.75	0.67	1.01	0.91	1.11	1.02	1.25	0.86
06/25/2015	0.58	0.67	1.03	0.92	1.29	1.03	1.25	0.88
06/26/2015	0.61	0.67	1.05	0.93	1.12	1.03	1.26	0.90
06/27/2015	0.73	0.67	1.08	0.95	1.07	1.04	1.24	0.91
06/28/2015	0.69	0.67	1.12	0.96	1.01	1.04	1.22	0.93
06/29/2015	0.65	0.67	1.13	0.97	1.01	1.04	1.21	0.95
06/30/2015	0.54	0.67	1.12	0.98	1.02	1.04	1.19	0.97
07/01/2015	0.58	0.68	1.13	0.99	1.02	1.04	1.17	0.98
07/02/2015	0.70	0.68	1.15	1.00	1.06	1.04	1.17	1.00
07/03/2015	0.87	0.69	1.16	1.02	1.06	1.04	1.16	1.01
07/04/2015	0.77	0.70	1.17	1.03	1.06 e	1.04	1.14	1.02
07/05/2015	0.68	0.69	1.18	1.04	1.06 e	1.04	1.15	1.04
07/06/2015	0.74	0.69	1.16	1.05	0.96	1.04	1.17	1.05
07/07/2015	0.87	0.70	1.14	1.05	0.96	1.04	1.17	1.06
07/08/2015	0.98	0.71	1.13	1.06	0.96	1.04	1.15	1.07
07/09/2015	0.66	0.71	1.13	1.07	0.95	1.03	1.12	1.09
07/10/2015	0.59	0.70	1.12	1.08	0.96	1.03	1.11	1.10
07/11/2015	0.57	0.70	1.12	1.08	0.95	1.03	1.11	1.11
07/12/2015	0.57	0.69	1.11	1.09	0.93	1.03	1.11	1.12
07/13/2015	0.56	0.69	1.10	1.09	0.92	1.02	1.11	1.13

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

30dm : thirty day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

**Delta Water Quality Conditions****Suisun Marsh Stations**

Date	Collinville	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
06/14/2015	12.64	11.23	15.74	15.45	15.26	19.64
06/15/2015	11.80	11.39	15.88	15.45	15.25	20.66
06/16/2015	11.11	11.70	16.10	16.21	16.12	20.49
06/17/2015	11.42	11.96	16.79	17.81	16.83	20.19
06/18/2015	11.24	12.10	17.19	17.14	16.15	19.85
06/19/2015	10.64	12.35	17.08	15.83	16.35	19.93
06/20/2015	10.99	12.40	17.14	15.63	16.47	19.89
06/21/2015	11.18	12.48	17.19	15.55	16.96	19.78
06/22/2015	10.58	12.52	16.73	15.21	16.84	19.81
06/23/2015	9.83	12.61	16.66	15.16	16.66	19.95
06/24/2015	10.12	12.65	17.01	15.56	16.57	20.07
06/25/2015	10.23	12.73	17.09	15.57	16.43	19.97
06/26/2015	11.89	12.77	17.10	15.61	16.02	19.88
06/27/2015	11.84	12.77	17.07	15.61	16.45	19.92
06/28/2015	12.59	13.23	16.86	15.58	16.10	20.11
06/29/2015	11.98	13.47	17.05	15.86	16.63	20.20
06/30/2015	11.89	13.56	17.13	16.48	17.09	20.44
07/01/2015	12.50	13.63	17.92	16.02	17.25	20.39
07/02/2015	13.79	13.66	18.57	16.40	17.27	20.62
07/03/2015	13.43	13.82	18.46	17.09	16.63	21.18
07/04/2015	14.10	14.16	19.08	17.99	16.13	21.30
07/05/2015	14.59	14.27	19.41	18.37	15.70	21.42
07/06/2015	12.99	14.39	19.31	18.29	15.86	21.77
07/07/2015	12.38	14.26	19.12	18.46	15.92	21.97
07/08/2015	12.80	14.67	18.96	18.64	16.18	22.09
07/09/2015	12.49	14.71	18.96	18.84	16.56	22.16
07/10/2015	11.91	14.67	19.26	18.82	16.76	22.09
07/11/2015	12.00	14.63	19.44	19.00	17.05	21.94
07/12/2015	12.67	14.90	19.47	19.25	17.15	21.90
07/13/2015	12.06	14.79	19.87	19.36	17.60	21.69

Electrical Conductivity (EC) units: milliSiemens per Centimeter

mht : mean high tides

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Sunday, August 09, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	9 %
NDOI, monthly average *	>= 3,000 cfs	3,799 cfs
NDOI, 7 day average*	>= 2,000 cfs	3,780 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	124 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	167 mg/l
14dm EC at Threemile Slough at Sac	<= 2.78 mS/cm	2.73 mS/cm
14dm EC at Jersey Point	<= 2.20 mS/cm	1.90 mS/cm
14dm EC at San Andreas Landing	<= 0.87 mS/cm	0.61 mS/cm
14dm EC at Terminous	<= 0.54 mS/cm	0.14 mS/cm
Maximum 30 day running average of mean daily EC at:		
Vernalis	<=0.7 mS/cm	0.6 mS/cm
Brandt Bridge	<=0.7 mS/cm	1.1 mS/cm
Old River Near Tracy	<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River	<=0.7 mS/cm	1.1 mS/cm

### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :	3 Open / 0 Closed / 0 Full Tide Open
Flashboard Status : Out	Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF

Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)

San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
Chlorides (Cl) in milligrams per liter  
mht - mean high tides  
md - mean daily  
14 dm - fourteen day running mean  
NR - No Record  
NC - 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:  
c = excess Delta conditions  
b = balanced Delta conditions  
r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:  
- 7 day average is progressive daily mean for the first six days of the month.  
- Monthly average is progressive daily mean from the beginning of the month



## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
07/11/2015	6.72	4.48	3,851	30.15	21.75	21.26	15.84	15.96	16.41	11.25	11.65
07/12/2015	6.75	4.53	3,723	30.82	21.81	21.33	16.12	16.26	16.43	11.55	11.66
07/13/2015	6.81	4.59	4,018	30.83	21.95	21.34	15.86	15.98	16.45	11.54	11.70
07/14/2015	6.89	4.61	4,169	31.16	22.52	21.57	16.38	16.55	16.55	11.48	11.75
07/15/2015	6.84	4.64	3,911	30.77	20.98	21.52	16.10	16.24	16.56	11.57	11.77
07/16/2015	6.91	4.78	3,881	32.00	22.88	21.60	16.70	16.92	16.56	12.34	11.79
07/17/2015	6.80	4.80	3,682	31.39	22.42	21.59	16.81	17.04	16.53	12.23	11.76
07/18/2015	6.77	4.82	4,139	31.15	20.09	21.38	16.79	17.02	16.47	12.26	11.72
07/19/2015	6.26	4.42	4,202	30.09	16.68	20.93	14.99	15.01	16.24	10.44	11.52
07/20/2015	5.89	4.38	4,388	29.15	19.50	20.77	14.28	14.23	16.05	9.82	11.35
07/21/2015	6.02	4.52	3,359	29.86	20.47	20.79	14.95	14.96	15.97	10.30	11.28
07/22/2015	6.21	4.60	3,358	30.86	18.77	20.77	15.42	15.49	15.91	10.46	11.21
07/23/2015	6.09	4.44	3,149	29.69	18.79	20.60	14.50	14.46	15.81	9.65	11.11
07/24/2015	6.09	4.25	3,079	28.36	20.39	20.64	13.73	13.62	15.69	9.03	10.99
07/25/2015	6.36	4.34	3,024	29.19	20.13	20.53	14.21	14.15	15.57	9.73	10.89
07/26/2015	6.70	4.63	3,183	30.95	19.09	20.33	15.28	15.33	15.50	10.65	10.82
07/27/2015	6.72	4.61	2,775	29.83	17.19	19.99	15.06	15.09	15.43	9.64	10.69
07/28/2015	6.78	4.61	3,510	30.25	19.25	19.76	15.17	15.21	15.34	10.54	10.62
07/29/2015	6.87	4.71	3,365	30.72	21.93	19.83	16.01	16.14	15.33	11.36	10.60
07/30/2015	7.14	4.86	3,357	31.63	23.39	19.86	17.39	17.68	15.39	12.76	10.63
07/31/2015	7.14	4.80	3,521	31.40	22.71	19.88	17.22	17.49	15.42	12.70	10.67
08/01/2015	7.03	4.74	3,908	31.08	21.44	19.98	17.07	17.33	15.44	12.48	10.68
08/02/2015	6.79	4.67	3,823	31.04	18.14	20.08	16.87	17.10	15.59	12.16	10.81
08/03/2015	6.45	4.61	3,638	30.09	18.88	20.04	16.59	16.79	15.77	11.57	10.93
08/04/2015	6.11	4.41	3,725	30.46	17.23	19.81	15.68	15.77	15.83	10.89	10.97
08/05/2015	6.17	4.20	3,653	29.30	16.44	19.64	14.60	14.57	15.77	9.98	10.94
08/06/2015	6.39	4.30	3,947	28.88	16.66	19.49	14.35	14.30	15.76	9.80	10.95
08/07/2015	6.58	4.51	3,790	30.04	19.55	19.43	15.66	15.75	15.91	10.92	11.08
08/08/2015	6.57	4.50	3,888	30.34	16.79	19.19	15.59	15.67	16.02	11.08	11.18
08/09/2015	6.65	4.50	3,821	29.92	17.01	19.04	15.04	15.06	16.00	10.66	11.18

Antioch Tides measured in feet relative to the NAVD88 Datum

Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.

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 : Not Computed due to insufficient data

BR : Below Rating

e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
07/11/2015	7.17	7.03	2.08	2.23	4.83	5.15	2.88	3.11	0.57	0.63	0.14	0.15
07/12/2015	7.37	7.08	2.30	2.24	5.20	5.21	3.00	3.15	0.61	0.63	0.14	0.15
07/13/2015	6.71	7.10	2.01	2.23	4.81	5.23	2.93	3.17	0.59	0.62	0.14	0.15
07/14/2015	6.99	7.15	1.97	2.23	5.01	5.27	2.94	3.20	0.58	0.62	0.14	0.15
07/15/2015	7.01	7.16	2.06	2.22	4.84	5.27	2.99	3.21	0.60	0.62	0.14	0.14
07/16/2015	7.15	7.13	2.18	2.21	5.21	5.27	3.10	3.20	0.63	0.61	0.14	0.14
07/17/2015	7.07	7.11	2.28	2.20	5.32	5.24	3.06	3.17	0.62	0.61	0.14	0.14
07/18/2015	7.06	7.06	2.28	2.18	5.34	5.20	3.03	3.13	0.62	0.60	0.14	0.14
07/19/2015	6.06	6.93	1.90	2.13	4.11	5.03	2.38	3.01	0.52	0.58	0.14	0.14
07/20/2015	5.73	6.82	1.59	2.07	3.75	4.88	2.14	2.90	0.50	0.57	0.14	0.14
07/21/2015	6.08	6.77	1.70	2.04	3.73	4.79	2.11	2.83	0.57	0.57	0.15	0.14
07/22/2015	6.38	6.73	1.62	2.00	3.54	4.67	2.13	2.75	0.61	0.58	0.14	0.14
07/23/2015	6.08	6.68	1.64	1.97	3.14	4.53	1.77	2.66	0.59	0.58	0.15	0.14
07/24/2015	5.84	6.62	1.57	1.94	2.68	4.39	1.50	2.57	0.58	0.58	0.15	0.14
07/25/2015	6.09	6.54	1.59	1.91	3.03	4.26	1.59	2.48	0.59	0.59	0.14	0.14
07/26/2015	6.45	6.48	1.66	1.86	3.76	4.16	2.01	2.41	0.63	0.59	0.14	0.14
07/27/2015	6.40	6.46	1.82	1.85	3.86	4.09	2.36	2.36	0.63	0.59	0.14	0.14
07/28/2015	6.57	6.43	1.74	1.83	4.11	4.03	2.51	2.33	0.63	0.59	0.14	0.14
07/29/2015	6.86	6.42	1.77	1.81	4.68	4.02	2.74	2.32	0.64	0.60	0.14	0.14
07/30/2015	7.52	6.44	2.26	1.82	5.39	4.03	3.24	2.33	0.67	0.60	0.14	0.14
07/31/2015	7.26	6.46	2.14	1.81	5.56	4.05	3.21	2.34	0.65	0.60	0.14	0.14
08/01/2015	7.13	6.46	2.13	1.79	5.69	4.07	3.30	2.36	0.62	0.60	0.14	0.14
08/02/2015	6.99	6.53	2.06	1.81	5.67	4.18	3.28	2.42	0.59	0.61	0.14	0.14
08/03/2015	6.96	6.61	1.97	1.83	5.51	4.31	3.17	2.49	0.56	0.61	0.14	0.14
08/04/2015	6.56	6.65	1.80	1.84	4.81	4.39	2.73	2.54	0.51	0.61	0.14	0.14
08/05/2015	6.06	6.63	1.60	1.84	3.83	4.41	2.27	2.55	0.53	0.60	0.15	0.14
08/06/2015	6.18	6.63	1.64	1.84	3.57	4.44	2.25	2.58	0.59	0.60	0.15	0.14
08/07/2015	7.01	6.72	1.96	1.87	4.05	4.54	2.42	2.65	0.66	0.61	0.15	0.14
08/08/2015	6.93	6.78	1.97	1.89	4.24	4.62	2.47	2.71	0.63	0.61	0.15	0.14
08/09/2015	6.47	6.78	1.75	1.90	3.99	4.64	2.32	2.73	0.60	0.61	0.15	0.14

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 14dm : fourteen day running mean  
 NR : No Record  
 NC : Not Computed due to insufficient data  
 BR : Below Rating  
 e : estimated value

## 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
07/11/2015	0.95	1.82	0.72	0.73	0.79	0.73	0.77	2,213	152	170 e	b
07/12/2015	0.98	1.89	0.75	0.72	0.78	0.73	0.77	2,278	151	170 e	b
07/13/2015	0.98	1.85	0.75	0.73	0.79	0.73	0.77	2,066	152	172	b
07/14/2015	0.96	1.75	0.76	0.73	0.78	0.73	0.77	2,156	153	170	b
07/15/2015	0.95	1.76	0.77	0.73	0.78	0.73	0.76	2,162	153	169	b
07/16/2015	0.97	1.80	0.81	0.73	0.78	0.73	0.77	2,206	153	168	b
07/17/2015	1.02	1.75	0.79	0.73	0.78	0.73	0.77	2,181	154	169	b
07/18/2015	1.02	1.76	0.78	0.74	0.77	0.73	0.77	2,180	155	169 e	b
07/19/2015	0.99	1.68	0.75	0.74	0.77	0.73	0.76	1,861	155	169 e	b
07/20/2015	0.94	1.59	0.76	0.72	0.76	0.73	0.76	1,755	150	170	b
07/21/2015	0.93	1.59	0.77	0.74	0.77	0.73	0.76	1,865	155	167	b
07/22/2015	0.94	1.59	0.77	0.73	0.77	0.73	0.76	1,962	154	168	b
07/23/2015	0.93	1.56	0.75	0.73	0.77	0.73	0.76	1,865	153	168	b
07/24/2015	0.92	1.52	0.74	0.73	0.77	0.75	0.76	1,791	153	170	b
07/25/2015	0.91	1.54	0.74	0.72	0.77	0.77	0.76	1,869	151	170 e	b
07/26/2015	0.91	1.59	0.75	0.72	0.77	0.76	0.76	1,985	149	170 e	b
07/27/2015	0.92	1.59	0.76	0.71	0.77	0.76	0.76	1,969	148	172	b
07/28/2015	0.93	1.60	0.77	0.71	0.77	0.76	0.76	2,022	148	171	b
07/29/2015	0.92	1.63	0.77	0.71	0.77	0.76	0.76	2,116	147	178	b
07/30/2015	0.97	1.73	0.76	0.71	0.77	0.76	0.76	2,326	147	172	b
07/31/2015	0.97	1.79	0.77	0.71	0.77	0.75	0.76	2,242	147	171	b
08/01/2015	0.96	1.79	0.75	0.71	0.77	0.74	0.76	2,201	147	171 e	b
08/02/2015	0.95	1.77	0.73	0.71	0.76	0.73	0.76	2,156	147	171 e	b
08/03/2015	0.94	1.72	0.72	0.71	0.75	0.72	0.75	2,148	147	169	b
08/04/2015	0.93	1.66	0.71	0.70	0.75	0.72	0.75	2,019	146	167	b
08/05/2015	0.93	1.60	0.71	0.70	0.74	0.72	0.75	1,861	145	166	b
08/06/2015	0.91	1.59	0.72	0.70	0.74	0.72	0.75	1,900	144	166	b
08/07/2015	0.91	1.68	0.73	0.69	0.74	0.72	0.75	2,164	143	167	b
08/08/2015	1.01	1.72	0.73	0.69	0.74	0.71	0.74	2,138	143	167 e	b
08/09/2015	0.97	1.70	0.73	0.69	0.74	0.71	0.74	1,990	143	167 e	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 NR : No Record  
 NC : 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 conditions  
 r = excess Delta conditions with restrictions:

**Delta Water Quality Conditions****South Delta Stations**

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
07/11/2015	0.57	0.70	1.12	1.08	0.95	1.03	1.11	1.11
07/12/2015	0.57	0.69	1.11	1.09	0.93	1.03	1.11	1.12
07/13/2015	0.56	0.69	1.10	1.09	0.92	1.02	1.11	1.13
07/14/2015	0.53	0.69	1.09	1.10	0.93	1.02	1.11	1.14
07/15/2015	0.52	0.68	1.08	1.10	0.95	1.02	1.12	1.15
07/16/2015	0.66	0.68	1.08	1.10	0.99	1.01	1.12	1.16
07/17/2015	0.78	0.68	1.08	1.10	0.99	1.01	1.11	1.16
07/18/2015	0.78	0.68	1.09	1.10	0.98	1.01	1.11	1.17
07/19/2015	0.75	0.68	1.08	1.10	0.96	1.01	1.11	1.17
07/20/2015	0.61	0.68	1.07	1.10	0.95	1.01	1.11	1.17
07/21/2015	0.83	0.69	1.07	1.10	0.95	1.01	1.11	1.16
07/22/2015	0.75	0.69	1.08	1.10	0.95	1.00	1.10	1.16
07/23/2015	0.55	0.68	1.08	1.10	0.98	1.00	1.11	1.15
07/24/2015	0.41	0.67	1.06	1.11	1.01	1.00	1.11	1.15
07/25/2015	0.54	0.67	1.06	1.11	1.06	0.99	1.12	1.14
07/26/2015	0.74	0.67	1.07	1.11	1.04	0.99	1.12	1.14
07/27/2015	0.80	0.67	1.07	1.11	1.01	0.99	1.11	1.13
07/28/2015	0.94	0.68	1.07	1.11	1.01	0.99	1.12	1.13
07/29/2015	0.87	0.69	1.08	1.10	0.97	0.99	1.09	1.13
07/30/2015	0.93	0.70	1.09	1.10	0.95	0.98	1.11	1.12
07/31/2015	0.71	0.71	1.10	1.10	0.93	0.98	1.11	1.12
08/01/2015	0.51	0.70	1.10	1.10	0.94	0.98	1.10	1.12
08/02/2015	0.36	0.68	1.10	1.10	0.94	0.97	1.09	1.12
08/03/2015	0.45	0.67	1.09	1.10	0.96	0.97	1.09	1.12
08/04/2015	0.54	0.67	1.08	1.09	0.98	0.97	1.09	1.11
08/05/2015	0.55	0.66	1.07	1.09	1.00	0.97	1.08	1.11
08/06/2015	0.66	0.66	1.06	1.09	1.09	0.97	1.08	1.11
08/07/2015	0.69	0.65	1.07	1.08	1.16	0.98	1.08	1.11
08/08/2015	0.68	0.65	1.07	1.08	1.13	0.98	1.08	1.10
08/09/2015	0.61	0.65	1.05	1.08	1.06	0.99	1.08	1.10

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

30dm : thirty day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

# Delta Water Quality Conditions

## Suisun Marsh Stations

Date	Collinville	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
07/11/2015	12.00	14.63	19.44	19.00	17.05	21.94
07/12/2015	12.67	14.90	19.47	19.25	17.15	21.90
07/13/2015	12.06	14.79	19.87	19.36	17.60	21.69
07/14/2015	12.37	14.77	19.77	19.55	18.11	21.61
07/15/2015	12.58	15.16	20.14	18.74	18.23	21.59
07/16/2015	13.14	15.75	20.37	18.11	19.02	21.34
07/17/2015	13.01	15.78	20.27	20.12	19.67	21.33
07/18/2015	13.34	15.42	20.23	20.32	19.62	21.29
07/19/2015	11.27	15.56	19.83	20.17	19.01	21.39
07/20/2015	11.06	15.59	19.76	21.02	18.84	21.44
07/21/2015	12.02	15.79	19.95	22.67	18.98	21.28
07/22/2015	11.81	16.12	20.02	21.55	19.15	21.18
07/23/2015	10.37	16.13	20.01	20.92	18.81	21.21
07/24/2015	10.00	15.77	19.83	20.63	18.57	21.39
07/25/2015	10.88	15.30	19.75	20.29	18.53	21.46
07/26/2015	12.05	14.95	19.99	19.99	19.04	21.22
07/27/2015	10.81	14.55	20.02	19.85	19.08	21.08
07/28/2015	11.89	14.61	19.94	19.64	19.04	21.05
07/29/2015	11.73	15.18	20.10	19.58	18.96	20.94
07/30/2015	13.36	15.42	20.08	19.43	19.31	20.73
07/31/2015	13.71	15.47	20.10	20.25	19.23	20.90
08/01/2015	13.60	15.73	20.14	21.31	19.31	21.04
08/02/2015	13.09	16.37	20.22	21.19	19.53	21.26
08/03/2015	12.77	16.59	20.11	21.00	19.58	21.45
08/04/2015	12.03	16.18	20.32	20.76	19.33	21.51
08/05/2015	11.64	16.21	20.48	20.47	19.18	21.50
08/06/2015	11.40	16.45	20.65	20.25	19.11	21.38
08/07/2015	12.03	16.78	20.62	20.17	19.73	21.21
08/08/2015	12.02	16.34	20.60	19.90	19.63	21.07
08/09/2015	11.41	16.23	20.53	19.72	19.72	21.12

Electrical Conductivity (EC) units: milliSiemens per Centimeter

mht : mean high tides

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
 Tuesday, September 01, 2015

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	50 %
NDOI, monthly average *	>= 3,000 cfs	2,592 cfs
NDOI, 7 day average*	>= 2,000 cfs	2,592 cfs
Rio Vista flow, monthly average *	>=2,500	3,269 cfs
Rio Vista flow, 7 day average*	>= 2,000	3,269 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	124 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	161 mg/l

Maximum 30 day running average of mean daily EC at:

Vernalis	<=1.0 mS/cm	0.6 mS/cm
Brandt Bridge	<=1.0 mS/cm	1.0 mS/cm
Old River Near Tracy	<=1.0 mS/cm	1.0 mS/cm
Old River Near Middle River	<=1.0 mS/cm	1.1 mS/cm

#### SUISUN MARSH:

Suisun Marsh Salinity Control Gates :	0 Open / 0 Closed / 3 Full Tide Open
Flashboard Status : In	Boat Lock Status : Closed

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF

Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)

San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - mean high tides  
 md - mean daily  
 14 dm - fourteen day running mean  
 NR - No Record  
 NC - 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:  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:  
 \* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:  
 - 7 day average is progressive daily mean for the first six days of the month.  
 - Monthly average is progressive daily mean from the beginning of the month

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chippis Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
08/03/2015	6.45	4.61	3,638	30.09	18.88	20.04	16.59	16.79	15.77	11.57	10.93
08/04/2015	6.11	4.41	3,725	30.46	17.23	19.81	15.68	15.77	15.83	10.89	10.97
08/05/2015	6.17	4.20	3,653	29.30	16.44	19.64	14.60	14.57	15.77	9.98	10.94
08/06/2015	6.39	4.30	3,947	28.88	16.66	19.49	14.35	14.30	15.76	9.80	10.95
08/07/2015	6.58	4.51	3,790	30.04	19.55	19.43	15.66	15.75	15.91	10.92	11.08
08/08/2015	6.57	4.50	3,888	30.34	16.79	19.19	15.59	15.67	16.02	11.08	11.18
08/09/2015	6.65	4.50	3,821	29.92	17.01	19.04	15.04	15.06	16.00	10.66	11.18
08/10/2015	6.54	4.51	3,877	30.74	22.23	19.40	15.63	15.71	16.04	10.93	11.27
08/11/2015	6.66	4.51	3,605	30.32	18.75	19.37	15.32	15.38	16.05	10.77	11.29
08/12/2015	6.53	4.34	3,551	29.93	19.80	19.22	14.65	14.63	15.95	10.23	11.21
08/13/2015	6.37	4.37	3,804	30.04	17.92	18.82	14.77	14.76	15.74	10.23	11.03
08/14/2015	6.32	4.25	3,745	29.53	17.02	18.42	14.44	14.40	15.52	9.68	10.81
08/15/2015	6.06	4.08	3,714	29.05	15.81	18.01	13.56	13.44	15.24	9.12	10.57
08/16/2015	5.89	4.11	3,505	28.80	18.40	18.03	13.75	13.64	14.99	8.91	10.34
08/17/2015	5.91	4.34	2,964	29.18	16.82	17.89	14.54	14.51	14.83	9.92	10.22
08/18/2015	6.00	4.63	2,529	30.55	16.67	17.85	15.94	16.06	14.85	11.23	10.25
08/19/2015	5.95	4.51	1,700	30.51	19.30	18.05	15.93	16.05	14.96	11.31	10.34
08/20/2015	6.05	4.45	1,966	30.63	18.03	18.15	15.31	15.36	15.03	10.94	10.42
08/21/2015	6.14	4.48	2,133	30.40	20.20	18.20	15.03	15.06	14.98	10.66	10.40
08/22/2015	6.24	4.47	1,887	29.80	19.08	18.36	14.85	14.85	14.92	10.34	10.35
08/23/2015	6.25	4.48	2,313	94.36	18.61	18.47	14.71	14.70	14.90	10.24	10.32
08/24/2015	6.34	4.45	2,584	30.65	16.25	18.05	14.36	14.31	14.80	10.16	10.27
08/25/2015	6.49	4.46	2,754	30.75	18.17	18.01	14.19	14.13	14.71	9.84	10.20
08/26/2015	6.34	4.39	3,196	30.79	18.73	17.93	14.12	14.04	14.67	9.87	10.17
08/27/2015	6.49	4.32	3,231	29.86	16.41	17.82	14.04	13.96	14.61	9.55	10.13
08/28/2015	6.55	4.36	1,613	29.94	17.07	17.82	14.52	14.49	14.62	9.89	10.14
08/29/2015	6.62	4.38	1,731	30.25	19.65	18.10	14.92	14.93	14.72	10.50	10.24
08/30/2015	6.38	4.31	1,693	29.75	17.16	18.01	15.30	15.35	14.84	10.60	10.36
08/31/2015	6.14	4.28	1,645	29.97	15.01	17.88	15.44	15.51	14.92	10.59	10.41
09/01/2015	6.27	4.44	2,592	30.46	18.32	18.00	16.01	16.14	14.92	11.18	10.40

Antioch Tides measured in feet relative to the NAVD88 Datum

Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.

Chippis 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 : Not Computed due to insufficient data

BR : Below Rating

e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
08/03/2015	6.96	6.61	1.97	1.83	5.51	4.31	3.17	2.49	0.56	0.61	0.14	0.14
08/04/2015	6.56	6.65	1.80	1.84	4.81	4.39	2.73	2.54	0.51	0.61	0.14	0.14
08/05/2015	6.06	6.63	1.60	1.84	3.83	4.41	2.27	2.55	0.53	0.60	0.15	0.14
08/06/2015	6.18	6.63	1.64	1.84	3.57	4.44	2.25	2.58	0.59	0.60	0.15	0.14
08/07/2015	7.01	6.72	1.96	1.87	4.05	4.54	2.42	2.65	0.66	0.61	0.15	0.14
08/08/2015	6.93	6.78	1.97	1.89	4.24	4.62	2.47	2.71	0.63	0.61	0.15	0.14
08/09/2015	6.47	6.78	1.75	1.90	3.99	4.64	2.32	2.73	0.60	0.61	0.15	0.14
08/10/2015	6.76	6.81	1.83	1.90	4.47	4.68	2.63	2.75	0.59	0.60	0.15	0.14
08/11/2015	6.56	6.81	1.76	1.90	4.43	4.71	2.60	2.76	0.59	0.60	0.14	0.14
08/12/2015	6.27	6.76	1.70	1.90	3.95	4.65	2.23	2.72	0.59	0.60	0.15	0.15
08/13/2015	6.31	6.68	1.80	1.86	3.65	4.53	2.11	2.64	0.61	0.59	0.15	0.15
08/14/2015	6.08	6.59	1.74	1.83	3.54	4.38	1.95	2.55	0.61	0.59	0.15	0.15
08/15/2015	5.56	6.48	1.60	1.80	2.96	4.19	1.77	2.44	0.56	0.59	0.15	0.15
08/16/2015	5.62	6.38	1.50	1.76	3.21	4.01	1.97	2.35	0.54	0.58	0.15	0.15
08/17/2015	6.03	6.32	1.55	1.73	3.58	3.88	2.19	2.28	0.56	0.58	0.15	0.15
08/18/2015	6.65	6.32	1.76	1.72	4.43	3.85	2.60	2.27	0.61	0.59	0.15	0.15
08/19/2015	6.44	6.35	1.74	1.73	4.39	3.89	2.62	2.29	0.57	0.59	0.16	0.15
08/20/2015	6.04	6.34	1.67	1.74	4.10	3.93	2.43	2.31	0.54	0.59	0.16	0.15
08/21/2015	6.04	6.27	1.64	1.71	4.01	3.92	2.29	2.30	0.54	0.58	0.17	0.15
08/22/2015	5.99	6.20	1.66	1.69	3.85	3.90	2.13	2.27	0.53	0.57	0.16	0.15
08/23/2015	6.17	6.18	1.60	1.68	3.70	3.88	2.07	2.25	0.53	0.57	0.16	0.15
08/24/2015	5.93	6.12	1.56	1.66	3.43	3.80	1.93	2.20	0.51	0.56	0.17	0.16
08/25/2015	5.59	6.05	1.49	1.64	3.19	3.71	1.79	2.15	0.49	0.56	0.17	0.16
08/26/2015	5.54	6.00	1.53	1.63	3.18	3.66	1.80	2.12	0.49	0.55	0.17	0.16
08/27/2015	5.37	5.93	1.48	1.61	3.22	3.63	1.78	2.09	0.48	0.54	0.17	0.16
08/28/2015	5.61	5.90	1.48	1.59	3.37	3.62	1.89	2.09	0.49	0.53	0.17	0.16
08/29/2015	6.16	5.94	1.62	1.59	3.58	3.66	2.13	2.11	0.50	0.53	0.16	0.16
08/30/2015	6.14	5.98	1.57	1.60	3.47	3.68	2.02	2.12	0.50	0.52	0.17	0.16
08/31/2015	6.15	5.99	1.55	1.60	3.39	3.66	1.92	2.10	0.50	0.52	0.19	0.17
09/01/2015	6.62	5.98	1.73	1.59	3.57	3.60	2.14	2.07	0.54	0.51	0.20	0.17

Electrical Conductivity (EC) units: milliSiemens per Centimeter

Chloride (Cl) units: milligrams per liter

md : mean daily

14dm : fourteen day running mean

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value



## 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
08/03/2015	0.94	1.72	0.72	0.71	0.75	0.72	0.75	2,148	147	169	b
08/04/2015	0.93	1.66	0.71	0.70	0.75	0.72	0.75	2,019	146	167	b
08/05/2015	0.93	1.60	0.71	0.70	0.74	0.72	0.75	1,861	145	166	b
08/06/2015	0.91	1.59	0.72	0.70	0.74	0.72	0.75	1,900	144	166	b
08/07/2015	0.91	1.68	0.73	0.69	0.74	0.72	0.75	2,164	143	167	b
08/08/2015	1.01	1.72	0.73	0.69	0.74	0.71	0.74	2,138	143	164	b
08/09/2015	0.97	1.70	0.73	0.69	0.74	0.71	0.74	1,990	143	163	b
08/10/2015	0.95	1.69	0.73	0.69	0.74	0.71	0.74	2,084	143	165	b
08/11/2015	0.94	1.66	0.72	0.69	0.73	0.70	0.74	2,021	143	161	b
08/12/2015	0.94	1.64	0.74	0.69	0.73	0.70	0.73	1,928	143	161	b
08/13/2015	0.95	1.65	0.73	0.69	0.73	0.71	0.73	1,940	143	169	b
08/14/2015	0.96	1.64	0.73	0.69	0.72	0.72	0.73	1,868	143	162	b
08/15/2015	0.95	1.57	0.73	0.69	0.72	0.73	0.74	1,700	143	156	b
08/16/2015	0.94	1.52	0.73	0.69	0.72	0.73	0.74	1,720	143	160	b
08/17/2015	0.93	1.51	0.72	0.69	0.72	0.73	0.74	1,851	144	162	b
08/18/2015	0.94	1.56	0.72	0.69	0.72	0.73	0.74	2,047	143	159	b
08/19/2015	1.02	1.59	0.71	0.69	0.72	0.72	0.74	1,983	143	157	b
08/20/2015	0.98	1.56	0.70	0.69	0.72	0.72	0.74	1,854	142	157	b
08/21/2015	0.93	1.57	0.69	0.69	0.72	0.72	0.74	1,852	142	160	b
08/22/2015	0.95	1.59	0.69	0.69	0.72	0.72	0.72	1,836	141	161	b
08/23/2015	0.98	1.60	0.68	0.68	0.72	0.71	0.72	1,894	141	161	b
08/24/2015	0.99	1.60	0.68	0.68	0.71	0.75	0.72	1,818	140	161	b
08/25/2015	0.97	1.57	0.69	0.68	0.71	0.72	0.72	1,711	140	163	b
08/26/2015	0.96	1.53	0.68	0.68	0.71	0.71	0.71	1,693	140	160	b
08/27/2015	0.96	1.50	0.69	0.68	0.71	0.71	0.71	1,639	139	162	b
08/28/2015	0.95	1.46	0.69	0.68	0.71	0.70	0.70	1,716	139	165	b
08/29/2015	0.95	1.48	0.71	0.66	0.71	0.69	0.69	1,891	135	165 e	b
08/30/2015	0.95	1.50	0.70	0.66	0.71	0.68	0.69	1,886	134	165 e	b
08/31/2015	0.96	1.50	0.67	0.65	0.71	0.67	0.68	1,890	132	162	b
09/01/2015	0.95	1.54	0.69	0.64	0.70	0.67	0.68	2,038	130	161	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 md : mean daily  
 NR : No Record  
 NC : 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 conditions  
 r = excess Delta conditions with restrictions:

# Delta Water Quality Conditions

## South Delta Stations

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
08/03/2015	0.45	0.67	1.09	1.10	0.96	0.97	1.09	1.12
08/04/2015	0.54	0.67	1.08	1.09	0.98	0.97	1.09	1.11
08/05/2015	0.55	0.66	1.07	1.09	1.00	0.97	1.08	1.11
08/06/2015	0.66	0.66	1.06	1.09	1.09	0.97	1.08	1.11
08/07/2015	0.69	0.65	1.07	1.08	1.16	0.98	1.08	1.11
08/08/2015	0.68	0.65	1.07	1.08	1.13	0.98	1.08	1.10
08/09/2015	0.61	0.65	1.05	1.08	1.06	0.99	1.08	1.10
08/10/2015	0.61	0.65	1.05	1.08	0.98	0.99	1.09	1.10
08/11/2015	0.68	0.65	1.04	1.08	0.97	0.99	1.09	1.10
08/12/2015	0.49	0.65	1.03	1.07	0.97	0.99	1.10	1.10
08/13/2015	0.49	0.65	1.01	1.07	0.99	0.99	1.11	1.10
08/14/2015	0.50	0.65	0.99	1.07	1.02	1.00	1.12	1.10
08/15/2015	0.52	0.64	0.95	1.06	1.00	1.00	1.12	1.10
08/16/2015	0.53	0.64	0.92	1.06	1.01	1.00	1.12	1.10
08/17/2015	0.58	0.63	0.91	1.05	1.01	1.00	1.13	1.10
08/18/2015	0.65	0.63	0.92	1.05	0.99	1.00	1.13	1.10
08/19/2015	0.63	0.63	0.92	1.04	0.97	1.00	1.13	1.10
08/20/2015	0.74	0.62	0.91	1.04	0.94	1.00	1.14	1.11
08/21/2015	0.58	0.62	0.91	1.03	0.91	1.00	1.14	1.11
08/22/2015	0.45	0.61	0.91	1.03	0.91	1.00	1.14	1.11
08/23/2015	0.42	0.61	0.91	1.02	0.92	0.99	1.14	1.11
08/24/2015	0.36	0.61	0.90	1.01	0.94	0.99	1.14	1.11
08/25/2015	0.42	0.60	0.89	1.01	0.96	0.99	1.15	1.11
08/26/2015	0.46	0.59	0.89	1.00	0.96	0.98	1.15	1.11
08/27/2015	0.53	0.57	0.88	1.00	0.96	0.98	1.15	1.11
08/28/2015	0.75	0.57	0.88	0.99	0.96	0.98	1.13	1.11
08/29/2015	0.75	0.56	0.88	0.98	0.98	0.98	1.05	1.11
08/30/2015	0.80	0.57	0.89	0.98	0.99	0.99	0.96	1.11
08/31/2015	0.60	0.57	0.89	0.97	1.00	0.99	0.92	1.10
09/01/2015	0.56	0.58	0.89	0.96	0.99	0.99	0.91	1.09

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 md : mean daily  
 30dm : thirty day running mean  
 NR : No Record  
 NC : Not Computed due to insufficient data  
 BR : Below Rating  
 e : estimated value

**Delta Water Quality Conditions****Suisun Marsh Stations**

Date	Collinville	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
08/03/2015	12.77	16.59	20.11	21.00	19.58	21.45
08/04/2015	12.03	16.18	20.32	20.76	19.33	21.51
08/05/2015	11.64	16.21	20.48	20.47	19.18	21.50
08/06/2015	11.40	16.45	20.65	20.25	19.11	21.38
08/07/2015	12.03	16.78	20.62	20.17	19.73	21.21
08/08/2015	12.02	16.34	20.60	19.90	19.63	21.07
08/09/2015	11.41	16.23	20.53	19.72	19.72	21.12
08/10/2015	12.04	16.04	20.45	19.60	19.72	21.09
08/11/2015	11.66	16.58	20.59	19.48	19.70	21.07
08/12/2015	11.57	16.63	20.68	19.24	19.56	21.17
08/13/2015	11.21	16.67	20.78	19.03	19.59	21.13
08/14/2015	10.70	16.46	20.72	18.81	19.62	20.95
08/15/2015	9.71	16.85	20.60	18.69	19.53	20.93
08/16/2015	9.45	16.79	20.65	18.60	19.43	20.65
08/17/2015	10.27	17.45	20.56	18.47	19.54	20.27
08/18/2015	12.41	17.53	20.45	18.48	19.49	19.50
08/19/2015	12.04	16.50	20.53	18.40	19.49	19.39
08/20/2015	11.78	16.05	20.75	18.48	19.89	19.49
08/21/2015	11.58	15.09	20.59	18.52	19.98	19.70
08/22/2015	10.83	14.24	20.42	18.51	19.81	20.01
08/23/2015	10.82	13.85	20.35	18.70	19.50	20.23
08/24/2015	10.80	13.31	20.24	18.63	18.78	20.50
08/25/2015	10.73	13.47	20.13	18.75	18.58	20.66
08/26/2015	11.23	13.09	20.81	18.65	18.42	20.68
08/27/2015	10.65	13.60	20.81	18.64	18.38	20.71
08/28/2015	11.42	12.87	20.79	18.67	18.35	20.58
08/29/2015	12.20	8.98	20.18	18.55	18.80	20.45
08/30/2015	12.73	8.80	18.38	18.07	18.73	20.31
08/31/2015	13.08	8.83	15.74	17.22	17.28	20.25
09/01/2015	13.11	8.99	13.57	16.10	15.24	19.95

Electrical Conductivity (EC) units: milliSiemens per Centimeter

mht : mean high tides

NR : No Record

NC : Not Computed due to insufficient data

BR : Below Rating

e : estimated value