

**TESTIMONY OF ALEX HILDEBRAND
HEARING ON PROPOSED CEASE AND DESIST ORDER TO
DWR AND USBR**

My name is Alex Hildebrand. I was a Director of the South Delta Water Agency (SDWA) for 30 years and am currently the engineer for that Agency. A copy of the Agency's boundaries is provided as Attachment "A." I have testified many times before this Board as well as other regulatory and legislative bodies and was qualified as an expert witness with regard to the water quality and flow issues affecting the South Delta.

A copy of my current statement of qualifications is attached hereto as Attachment "B." Briefly, I have a B.S. in physics with minors in chemistry and engineering, and worked for Chevron until I retired in engineering and technical capacities including Assistant Chief Engineer of the Richmond Refinery and Director of the La Habra Research Laboratory. Since that time I have farmed approximately 150 acres on the San Joaquin River about 12 miles by river downstream of Vernalis in the South Delta. For the past 30 years, I have been intimately involved in the discussions, negotiations, regulatory proceedings and litigation to protect its diverters from the adverse effects of SWP and CVP and to insure the area has an adequate supply of good quality water.

My testimony for this proceeding is divided into four parts following a discussion of background. The first part deals with how the DWR and USBR can meet current salinity standards while using temporary rock barriers. It has been argued that the 0.7 EC requirement in internal channels cannot be reasonably met even after implementation of the SDIP and that it is therefore unreasonable to require it now. That assertion is incorrect. The second deals with the numerous interrelated benefits which result from compliance with permit conditions. The third part explains how I and others are personally affected. And the last part addresses the reconsideration of the Water Quality Response Plan.

I. Background

1) Regulatory Background

As set forth in the 1991 and 1995 Water Quality Control Plans, the two San Joaquin River standards (at Brandt Bridge and Vernalis) were to be implemented promptly. The two Old River standards (Old River near Middle River and Old River at Tracy Road Bridge) were to be implemented no later than December 31, 1997 (see Attachment "C"). The 1995 Plan therefore recognized that the San Joaquin River standards would be addressed with good quality flows on the River, while the Old River standards required other actions such as barriers which could not be immediately implemented.

In D-1641, the Board acknowledged that, “Construction of permanent barriers alone is not expected to result in attainment of the water quality objectives.” The Board went on to note that the “objectives can be met consistently only by providing more dilution or by treatment.” (See Attachment “D” D-1641 at page 88.)

Hence, in 2000, this Board recognized that permanent barrier installation and operation *and* other actions, including additional dilution flows, were necessary to meet the standards.

Since 1995 at the earliest, and 2000 at the latest, DWR and USBR have known that in order to meet the 0.7/1.0EC standards, they had to undertake actions *in addition to the proposed barrier program*. To my knowledge, DWR and USBR have undertaken no actions other than the barrier program.

As I understand the issues before the Board in this proceeding, the questions are first, whether a Cease and Desist Order should issue, and second, if so, what terms should be in such an order.

The answer to the first question is certainly “yes.” Since DWR and USBR do not believe their current operations, including temporary barriers, will result in compliance with their permit terms, especially at the three interior South Delta stations, they should be ordered to comply. There appears to be no logical or practical reason for not requiring compliance with existing Water Quality Objectives and permit terms. This is especially true given that the Board determined over five years ago in D-1641 that compliance would indeed require additional dilution flows (or treatment). The fact that DWR and USBR knew the permanent operable barriers would not be built in the short term and did not undertake the necessary and anticipated other actions to secure and provide additional flows or treatment does not change the need for the objectives or the benefits therefrom.

I note that HR 2828 requires the USBR to develop a plan by the end of this year under which it will meet its water quality obligations on the San Joaquin River (see Attachment “E”). Since the Congress believes the Bureau should meet the objectives, one would think the SWRCB would too.

2) Historical Background

The changes in San Joaquin River flows and water quality pre-CVP and post CVP are set forth in the June 1980 Report entitled “*Effects of the CVP Upon the Southern Delta Water Supply Sacramento - San Joaquin River Delta, California.*” This Report and numerous other studies and investigations (including D-1641) have identified the operation of the CVP as the principle cause of the salinity problem in the lower San Joaquin River and Delta. However, the SWP’s effects on flows in Delta channels and its

joint efforts with the CVP in supplying export water to the San Joaquin Valley are significant contributory causes.

As a consequence of this problem, the SWRCB slowly adopted and even more slowly implemented water quality objectives to protect agricultural beneficial uses. Currently, only dilution water is used to meet the Vernalis standard. The delay in implementing the other three standards has allowed DWR and USBR to avoid taking other actions. [Although temporary barriers do trap some good quality export water which improves water quality in portions of Middle River and Tracy Old River compliance stations, the net flow is back (downstream) over the barriers and the water quality does not approach the 0.7 EC standard.

The dilution water needed to comply with the current Vernalis salinity objectives is required because the westside wetlands and farm lands receive Delta Mendota Canal (DMC) water which contains a large salt load. That salt load is then concentrated by crop and wetland evaporation. Most of the salt then drains to the river where it must be diluted.

II. Compliance with the 0.7/1.0EC internal South Delta salinity standard with Temporary barriers

The subject Water Quality Objectives can be met and the in-channel water supply in internal South Delta channels can be maintained at 0.7 EC from April through August with very little water cost to the CVP and SWP. This is the case both before and after permanent barriers are installed and other concurrent measures are provided. While using temporary barriers the following salinity control measures and others should be utilized.

1) Dilution Needs.

A) As water passes Vernalis, it slowly degrades due to evaporation, consumptive uses and urban discharges. This degradation is reflected in field data which DWR has collected and which is set forth in Attachment "F." The increase in salinity during low flows can be .1 EC or more from Vernalis to Brandt Bridge. The amount of dilution water needed to offset this rise in salinity at Brandt Bridge or elsewhere depends on the quality of the dilution water and the amount of the flow from Vernalis to Brandt Bridge. Dilution provided upstream of Vernalis can be used to lower salinity below 0.7 EC at Vernalis so that it will not rise above 0.7 EC at downstream locations. Dilution with Middle River water can be used to restore salinity to 0.7 EC at the point of dilution. To offset a 0.1 EC rise in salinity would take about 250 cfs of 0.4 EC dilution water when the Vernalis base flow is 1000 cfs. The 0.4 EC is representative of DMC water quality. If the dilution flow was provided from one of the tributaries, less of that better quality

water would be required.

2) Dilution Opportunities.

A) New Melones is currently the only reservoir used by the USBR to meet the Vernalis standard. Whatever additional measures are undertaken to meet the downstream South Delta standards, the New Melones releases that would be required in the absence of these measures to meet the Vernalis standard will continue to be required at least in the short term. Additional releases could also be made from this source to contribute to meeting the other South Delta standards. This year as of June, the Bureau has allocated 180,000 acre-feet of New Melones storage for water quality purposes, but has used none of this amount (see Attachment "G;" personal communication with USBR staff). Obviously, in the short term, water is available from New Melones.

B) Additional water from the tributaries to the San Joaquin River could be purchased for release during the April through August time frame. In the recent past, hundreds of thousands of acre-feet have been purchased from the tributaries for a variety of reasons. As stated above, it would take less of this high quality water to provide the needed dilution than is the case when DMC water is used.

C) Upstream exchanges could also be coordinated to provide dilution flows. Given the various connections of the SWP and CVP distribution systems, exchanges between water users could be made to provide additional flows on the San Joaquin River. For example, this year excess and flood flows from Friant were diverted at the Mendota Pool for delivery to Westlands Water District and others. Some of that water could have been allowed to flow downstream in exchange for other DMC, California Aqueduct, or San Luis Reservoir supplies.

D) Water can also be recirculated through the DMC using one of its wasteways to deliver the flows to the San Joaquin River. The Bureau conducted such a recirculation pilot project in 2004 using DMC water released from the Newman Wasteway. The releases during that project had a significant impact on San Joaquin River quality. (See Attachment "H"). The 250 CFS recirculation release from the Newman Wasteway decreased the EC in the River from 1,200 to 900 (or 1.2 to 0.9 using the same parameters as the 0.7 standard) at the Patterson Measurement Station and from 700 to 600 (or 0.7 to 0.6) at the Vernalis Station. [The differing changes are due to the differing amounts of flow in the River at the two locations.] I also note that D-1641 specifically required the Bureau to investigate the use of such recirculation to assist in meeting water quality standards. I believe the Bureau has failed to meet the deadlines required by D-1641.

E) Transfers for EWA or other purposes can be coordinated such that the transfer water could be released during the April - August time frame. The transfer water

would provide dilution but would not be lost as San Joaquin River and South Delta diversion needs do not change with flow fluctuations.

F) As the Board knows, CVP permits in addition to New Melones are burdened with the requirement of meeting the salinity objectives. Hence, releases from Friant, Shasta, Folsom, or San Luis could be used to supplement San Joaquin River flows. For example, the high flows this year from Friant re-charged (to some degree) the groundwater in the area at and above Gravelly Ford on the San Joaquin. The Bureau missed a perfect opportunity to test how much water would be lost from additional summer releases once that groundwater had been re-charged.

G) Temporary barrier operations result in net downstream flow back over the Middle River and Grant Line Canal barriers. Improved San Joaquin River water quality will also improve the Middle River and Grant Line quality. If this does not result in compliance at the Middle River and Old River Stations, other actions can be undertaken. The Middle River rock barrier can be improved to capture and retain more high tide water, and low lift pumps can be added at the barrier to increase the flow of high quality water up through Middle River and into Old River. This will maintain high quality water in Middle River, and the flow continuing into Old River will blend with the water flowing into the head of Old River. This will further reduce the salinity of the Old River water which is also reduced by the measures discussed above.

3) Recovery of Dilution Flows.

A) Any additional dilution flows added to the San Joaquin River are available for export as they pass through the South Delta. If the water cannot be currently pumped as additional exports, DWR and USBR could coordinate exchanges so that the water is pumped for such things as EWA purposes using the additional 500 CSF export authorization of the SWP or exchanged to replace or substitute for a transfer being accomplished under JPOD operations. Even if none of these authorizations were available, DWR and USBR could petition the Board for short term authorization to allow them to pump these additional dilution flows. One would assume the Board would look favorably upon such a request given that its underlying purpose is to meet existing Water Quality Objectives. Approval of such petition would be similar to D-1641's "no net loss" principle regarding fishery releases. In sum, all additional dilution flows would enter the South Delta and be available for export at the SWP and/or the CVP pumps. The losses should only be minimal. For example, the recirculation pilot program estimated the losses at less than 10%. I recall that carriage water losses for the DWR Dry Year Purchase Program were less than 5% in 2004.

It is important to note that the water deliveries of the CVP to its westside service area of the San Joaquin Valley, as assisted by the SWP, are the cause of the River's

salinity problems. As I understand it, other parties are asserting that the CVP and SWP should not be required to meet the standards if it adversely affects their deliveries or costs. It would be illogical and unfair to allow the continued delivery of the water which causes the salt problem, and yet not require that some of that delivered water be used to mitigate the salt problem.

III. Benefits Resulting From Compliance With The Salinity Objectives

I will now give an overview of the benefits from meeting the Water Quality Objectives which also addresses the question of whether a Cease and Desist Order should issue.

A) As the Board knows, the 0.7/1.0 EC standards were developed to protect agricultural beneficial uses. The voluminous studies, investigations, and testimony previously used by the Board in setting these standards was referenced in SDWA's presentation at the Periodic Review process workshops. Generally, EC's above 0.7 have an incremental adverse effect on crop production, which translates into a monetary damage to farmers.

B) To get a broad estimate of the damage that occurs as the EC of the water rises, I refer the Board to the previously submitted report of Dr. G. T. Orlob attached hereto as Attachment "I," and entitled "Impacts of San Joaquin River Quality On Crop Yields In The South Delta." Therein, Mr. Orlob calculated the crop damage in dollars between actual crop yields and the yields which would result if a standard of 500 TDS had been met. Using 1976 figures and dollars, the crop loss for the South Delta area was (15.70 - 8.64) \$7.06 million. In 2005 dollars, it is approximately \$24 million (using a CPI calculation at <http://woodrow.mpls.frb.fed.us/research/data/us/calc/>). This gives the Board a good idea of the scope of the crop damage if the EC downstream of Vernalis were allowed to exceed the current standard during the April through August time frame. The specific impacts on diverters is exemplified by the testimony of the other SDWA and CDWA witnesses.

C) We also know that virtually all of the San Joaquin River water ends up at the State and Federal pumps (see Testimony of Thomas Zuckerman, Exhibit No. CDWA-10). This is due to the fact that even with temporary barriers, the net flow is downstream over the Grant Line and Middle River barriers, and, that the water which continues down the mainstem of the River also mostly ends up at the pumps. Hence, the quality of export water is partially dependent on the quality of the San Joaquin River. Improving the River water quality in order to meet the standards will benefit export interests, especially municipal water users. Although I do not have the calculations, I understand that the Bureau has done investigations which determined the benefit to municipal water treatment plants resulting from improvements and source water quality.

D) The Board is also well aware of the dissolved oxygen (DO) problem in both the mainstem of the River, specifically in the Stockton Deep Water Ship Channel, and also generally throughout the South Delta. Two Basin Plan Objectives for DO apply to these waters. Additional good quality water added to the system for purpose of meeting the salinity standards will also help improve DO levels both because of the quality of the flows, and the additional flow/circulation they will provide.

E) The additional flows would also provide benefits to the various fisheries. We know that out-migrating salmon smolts are traveling through the system even after the spring pulse flow has ended. These fish would be helped by the higher flows. Other species, such as steelhead and smelt may also be benefitted by the higher flows. Use of the additional flows for dilution would provide an opportunity for the fishery agencies to examine the effects.

IV. Effects On Farming Operations

As I referenced above, I am a farmer on the San Joaquin River. I divert under both appropriative rights (see Attachment “J”) and under my riparian rights (my chain of title documents are being introduced by a CDWA witness as Exhibit No. CDWA-6). I have personally experienced the adverse impacts of the SWP and CVP, and other upstream projects. I have had reduced crop yields due to high salinity of the River water. I have been unable to divert from the River due to decreased upstream flows and the destruction of the high tide which previously extend to the portion of the River I abut. Requiring the DWR and USBR to meet the previously established Water Quality Objectives which are contained in their permits would not only protect me, but also numerous other beneficial users of water. Farmers further downstream have experienced more loss due to salinity because salinity rises above the Vernalis standard as water flows downstream as previously discussed.

Finally, for clarification, the draft Cease and Desist Order states the temporary barriers are installed to mitigate the adverse effects of the HOR fish barrier. This is misleading. Although the federal funding for the temporary barriers was previously linked in CVPIA to the funding for the HOR fish barrier as mitigation of that barrier, that does not accurately describe why the other three tidal barriers are installed. It is my understanding that DWR now shoulders all of the costs of the temporary barrier program, though there may be some arrangement whereby USBR will pay its share in some other way. The temporary tidal barriers are installed to partially mitigate the adverse effects on water levels, quality, and quantity resulting from the operations of the CVP and SWP. At this date, the SWRCB should not be trying to avoid describing the true state of affairs in the South Delta. There is no disagreement that the projects lower water levels, decrease flows, reverse channel flows, cause stagnant zones and worsen water quality. The temporary tidal barriers are one of the preliminary steps in correcting these problems.

V. Water Quality Response Plan

Finally, I will address this Board's reconsideration of the Chief of the Division of Water Rights approval of the current Water Quality Response Plan for Joint Point of Diversion. In approving the current Response Plan, the Division Chief waived compliance with the currently existing Water Quality Objectives for Agricultural Beneficial Uses at the Brandt Bridge, Old River near Middle River and Old River at Tracy Road (sic) Bridge. This would appear to be not only beyond the Division Chief's authority and contrary to D-1641, but also directly contrary to the purpose of the Water Quality Response Plan.

D-1641 requires as a condition to JPOD that the DWR and USBR "develop a response plan to ensure that the water quality in the southern and central Delta will not be significantly degraded through operations of the Joint Point of diversion to the injury of water users in the southern and central Delta" (see for example page 150-151 of D-1641). Approval of the plan was to come from the Division Chief.

The purpose of the plan is to ensure that the incremental affects on water quality resulting from JPOD do not injure other users. Inexplicably, the Division Chief decided that while she was protecting the Delta users from the incremental effects of JPOD on water quality, she would relax the existing Water Quality Objectives. In other words, she allowed a greater impact to water quality than she was protecting through the plan.

This bizarre decision by the Division Chief cannot stand and should be forthwith revoked. No further evidence is necessary to undo such an act which is not only beyond her authority but directly contrary to the explicit and implicit purposes of the Water Quality Response Plan. This Board will consider changes to the 1995 Water Quality Control Plan through the Periodic Review process and perhaps through the process resulting from DWR and USBR's Petition to delay implementation of their permit terms. The Response Plan process did not give any party notice that such a significant change was pending and so it would be unfair and wrong to allow it. Similarly, we believe a change in the standards would require new environmental evaluation.

SDWA requests that the Water Quality Response Plan not include the Division Chief's wrongful waiver of existing standards.